**THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES**

**AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY**

convenes the

# CAMP LEJEUNE COMMUNITY ASSISTANCE PANEL (CAP) WORKING MEETING

June 11, 2014

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# C O N T E N T S

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**P A R T I C I P A N T S**

(alphabetically)

BOVE, DR. FRANK, ATSDR
BRUBAKER, MATT, FMG LEADING
BURK, TONIA, ATSDR
COOPER, PHILLIP, ATSDR
ENSMINGER, JERRY, COMMUNITY MEMBER
EVANS, MARK, ATSDR
FLETCHER,LCDR. CHRIS, ATSDR
FORREST, MELISSA, NAVY/MARINE CORPS
FORRESTER, TINA, ATSDR, DIVISION OF COMMUNITY HEALTH INVESTIGATIONS
FRESHWATER, LORI, CAP MEMBER
GILLIG, RICHARD, ATSDR
IKEDA, ROBIN, ATSDR, ACTING DIRECTOR
MASLIA, MORRIS, ATSDR
MOORE, SUSAN, ATSDR
MURRAY, CAPT. ED, ATSDR
ORRIS, CHRIS, CAP MEMBER
PARTAIN, MIKE, COMMUNITY MEMBER
RAGIN-WILSON, ANGELA, ATSDR, DIVISION OF TOXICOLOGY AND HUMAN HEALTH SCIENCES
ROBINSON, ROB, ATSDR
RUCKART, PERRI, ATSDR
STEPHENS, JIMMY, ATSDR ACTING DEPUTY DIRECTOR
STEVENS, SHEILA, ATSDR, CAP LIAISON
WILDER, LYNN, ATSDR
WILKINS, KEVIN, CAP MEMBER
YARBROUGH, ALAN, ATSDR

**P R O C E E D I N G S**

(9:25 a.m.)

**WELCOME, INTRODUCTIONS AND CHECK-IN**

**MR. BRUBAKER:** Good morning and welcome to today's meeting. We'll go around the table and do some introductions again in a minute, including an introduction of myself, my face may be new to some of you, as well as to talk about the purpose for today's meeting. But before we do that, Robin has a few words to share and an invitation, I believe.

**DR. IKEDA:** Good morning. For those of you who don't know me, I'm Robin, and I'm the Acting Director for NCEH-ATSDR. Thank you very much for being here today. I know you all have busy schedules so we appreciate your spending two days with us.

And I apologize in advance that I need to come in and out of this meeting today but I'll be with you all day tomorrow. And one thing that we had wanted to do last week, and I'm sorry that we're not doing it until now, is we wanted to organize a group dinner tonight. So I have a list, you know, and I'm sorry, it's short notice but hopefully some of you can join us. I'll leave it here and those of you that are interested in joining us, just sign up, and

then I'll come back and get the list, and we can figure out, okay, given whatever the number of people is, we can figure out what might make the most sense.

**MR. ENSMINGER:** Are you guys buying?

**DR. IKEDA:** Are we buying? Unfortunately, no.

**MR. ENSMINGER:** Well.

**DR. IKEDA:** Oh, well, there were a couple different things that we were thinking about. One is we wanted to do something immediately after this meeting, which I know closes at 4:00 o'clock. We could potentially order something like, you know, something not very healthy. But eat it in the cafeteria, which is a nice space. You've all seen the cafeteria. Or, since you're staying at the JW Marriott, there's a number of restaurants within walking distance there, and if you wanted to go back to your hotel room for a while, then we could do something within walking distance. Anyway so I'll just leave the list, and I'll turn it back to Matt. Matt Brubaker from FMG Leading. Those of you who were at the last meeting met -- we introduced him last meeting. He's serving as our backup facilitator. He's facilitating this meeting and he'll be playing the same role tomorrow. Thanks.

**MR. BRUBAKER:** Thank you. And again, thanks for being here today, to humor me as I get to know you folks and begin to provide some support to this team. I'd love to spend a little bit more time than you probably usually do in the introduction process, just like I'm probably asking two or three questions about who you are, why you're here, a little bit about your background and why you're motivated to participate in this group.

It's only fair that I share a little bit about myself with you. As Robin mentioned, I'm part of -- in fact I'm the Chief Operating Officer of a consulting firm called FMG Leading. My practice is in coaching and developing leaders and their teams and guiding group process. Three kids. Two teenage girls and an infant son. I can tell you a story about that some time, as you do the math. I'll be a Social Security college dad. Live in Philadelphia and love to get down here to Atlanta every now and then to see what's happening down here.

**MR. ENSMINGER:** You live in filth-adelphia?

**MR. BRUBAKER:** No comment.

**MR. ENSMINGER:** Really?

**MR. BRUBAKER:** It is a -- it is a special place. In the Philadelphia suburbs actually. My

neighborhood abuts Valley Forge National Park.

**DR. BOVE**: What suburb?

**MR. BRUBAKER:** Oh, Valley Forge. In fact my neighborhood touches Valley Forge Park, so I do my morning runs in, in -- yeah, in and out -- exactly. The Audubon, to be precise.

**MR. ENSMINGER:** Do you take the sure-kill expressway to work?

**MR. BRUBAKER:** I try not to. You guys have been to our fair city, I can tell.

**MR. ENSMINGER:** Well, I'm from Hershey.

**MR. BRUBAKER:** I didn't know that. Small world.

**MR. ENSMINGER:** Right outside of Hershey.

**MR. BRUBAKER:** In Pennsylvania.

**MR. ENSMINGER:** That's where I grew up. I grew up on a dairy farm.

**MR. BRUBAKER:** It's beautiful country up there.

**MR. ENSMINGER:** That's why I joined the Marine Corps; I needed a break.

**MR. BRUBAKER:** So if you wouldn't mind, as we go around the table, first of all names and roles would help me and I think would probably help some of the other new folks as well, just to hear your name and hear your role. But as you go around I'd

also like to hear from you why you're motivated to participate in this forum. What it is about the work, what it is about the mission or the purpose of this CAP that particularly interests or draws you into it. And if there's a personal dimension to that, please feel free to share that. Again, it helps me understand why you're here. I think it also provides an opportunity for others to understand the human beings that are sitting around the table, not just the issues that will be discussed today. So if you wouldn't mind I'm going to go in order. Chris, would you mind?

**LCDR. FLETCHER:** So I'm Chris Fletcher, a health assessor at ATSDR. I'm working with vapor intrusion. The part that I have with that is the data management and data mining of the various data sources. My motivation for working in this particular meeting today is to provide information to the CAP so they see what we're running into and how many sources there are, and kind of give them an idea as to the level of difficulty we're running into as we go through all that, and to show them the progress that we've made to date.

**MR. BRUBAKER:** Thank you.

**MR. ROBINSON:** I'm Rob Robinson, a health

assessor here at ATSDR. I am also a coauthor on the drinking water evaluation part of the PHA. So today I'd like to discuss where we are with that document. But I guess overall, historically, why I got into the public health field and why I think most of my colleagues did is in order to help people or the environment, and I try to bring that to work each day.

**MS. FORREST:** Hi, I'm Melissa Forrest, and I'm new. I am replacing Glenn Markwith from the Navy and Marine Corps Public Health Center. Glenn retired.

**MR. ENSMINGER:** Lucky him.

**MS. FORREST:** So congratulations to Glenn.

**MR. ENSMINGER:** Unlucky you. What'd you do, draw the short straw?

**MS. FORREST:** No, sir. I volunteered. I was happy to come. And so my role is, as Glenn's was, to come and, you know, observe and take back your questions and your concerns to the Marine Corps and the Navy and hopefully get you the answers and the information you need. And I would say something that does motivate me is I've been working at the public health center for 19 years now, and it's a wonderful job. I'd say we bridge the gap between

environmental issues, environmental exposures and public health issues, and it's been a really exciting job for the last 19 years. So that's my goal.

**MR. BRUBAKER:** Thank you.

**MR. WILKINS:** Kevin Wilkins. I'm a Marine Corps veteran and Camp Lejeune victim.

**MS. FRESHWATER:** And a man of few words. My name is Lori Freshwater. My nickname is Lou, so I go by either. I lived on base between around '81 to around '83-'84, and my mother had two babies with neural tube defects who died, and it devastated the family. And then my mother recently -- well, I guess I can't say recently now, but in January of '13 passed away from two types of acute leukemia. So clearly that's what motivates me to be here, but I also -- I'm a writer who recently got my master's in English literature and writing. And I'm motivated to leave a history of what happened on the record, as much as I can. And I want to do some good. I feel like everybody in this room has an opportunity to step up and be a hero, and I mean that. I verge on sentimentality sometimes but I actually do believe that. I think that we have a chance to help the future, and that's -- if there's

no justice, there can be some redemption, and we can find redemption in helping the science. So that's why I'm here.

**MR. ENSMINGER:** I'm Jerry Ensminger. I'm a retired Marine. I spent nearly a quarter of a century of my life serving in the Marine Corps. My only daughter to have either been conceived, carried or born while we lived on the base was Janey, my second daughter. When Janey was six, she was diagnosed with leukemia. I literally watched my child die a little bit at a time for nearly two and a half years. And when she finally did die, it was painful. I went for -- she died in 1985, ironically the same year that the Department of the Navy and Marine Corps saw it fit to take those poison wells offline.

I didn't find out about the water contamination, anything about it, until 1997, when ATSDR issued their public health assessment. And you know, I just said, oh, my God. You know, here's a possible answer to that nagging question that every parent who ever has a child that's diagnosed with a long-term catastrophic illness has, and that is, what happened? Why? And when I heard the TV report about ATSDR's public health assessment, I

said oh, my God, here's a possible answer to that nagging question. And that wasn't 'til 1997, three years after I retired.

That's when my fight began. And I've got to say that every initiative that we have undertaken has been like pulling teeth, and I don't know why. Now, when I heard that TV report, I got a possible answer to my question but I also realized that there were thousands, if not hundreds of thousands, of other people out there that were now literally spread out all over the world that had their own nagging question, and I swore that evening when I walked out on my farm, that night. I was thinking about this, the very night that I heard that report on the news, that it was my duty to give those people some possible hope of getting an answer to their own nagging question. And that's been my mission since 1997. I've got almost another whole career in this, 17 years this August.

**MR. BRUBAKER:** Thanks.

**MR. PARTAIN:** Well, my name is Mike Partain, and up until seven years ago, Camp Lejeune meant nothing more to me than just the name on my birth certificate. That all changed in April of 2007 when I was diagnosed with male breast cancer. There's no

history of the disease in my family, male or female. And I was subsequently tested to -- for the BRCA hereditary markers and found to be negative. We were all puzzled why I developed the disease, and I do not drink, don't smoke and, you know, it just was a big enigma for my family.

That question was answered about two months after my diagnosis, when I saw Jerry on CNN, after he testified in Congress about the children born at Camp Lejeune between January of 1968 and December of 1985, and how those children had been exposed to toxins in the drinking water. And my birthday's January 30, 1968. So I had my moment where, you know, life as I knew it completely turned upside-down. Yeah, an epiphany.

My background is in history. My BA is in history. I work as a claims investigator with State Farm Insurance. And I got involved shortly after my chemotherapy completed, and I've been involved in this now seven years.

I recently began my master's degree in history, which coincidentally is going to be focusing on environmental history, specifically Camp Lejeune. Thank you.

**MR. ORRIS:** My name is Chris Orris, and like

Mike, most of life my birth certificate said I was born in Camp Lejeune, which made for an interesting topic if it ever came up. My father still actually works on the base at Camp Lejeune as a civilian. My -- between my two parents, they did 56 years in the Marine Corps.

And I'd never heard about the toxic water at Camp Lejeune until 2011, when all of a sudden I started becoming weak, and nobody could figure out why. And then a cardiologist looked at my heart and said that I had a congenital birth defect that had gone undiagnosed for 36 years, and that I had two years to live. And so unless I did a Warden procedure to get that fixed.

**MR. ENSMINGER:** Did you do it?

**MR. ORRIS:** I did do it.

(multiple speakers)

**MR. ORRIS:** But it wasn't until after my surgery when I saw the Act signed by President Obama, and then I watched *Semper Fi*, the movie, that I understood what had occurred. And I said, you know, if I have not known about it, and my family hales from the Jacksonville and New Bern area, you know, how many other people have not heard about it.

And my career as an auditor for major financial

institutions, and I want to apply my expertise in trying to figure out what has happened and what has occurred as well. That's what I'm here for as well as to raise more public awareness about it and to make sure that every person who was affected knows about it and knows what they can do to help themselves. So that's why I'm here.

And I want to personally thank you and Mike for everything that you have done so far.

**MR. ENSMINGER:** You're welcome. I'll bet those companies love seeing you walk in the door. Do you wear body armor?

**DR. FORRESTER:** Good morning. My name is Tina Forrester, and I've been at ATSDR for over 23 years, and I've probably worked 50, 60 -- 50 to 60 sites and had about five different jobs here. And I've never left because I feel that serving the public and helping them with their health issues has been a really rewarding career and really important job working directly with the public, and I don't know many other places where you can do that.

My role in this project is that for the last two and a half years I've been the acting director for this division. And what I bring to the table is that I will make sure you have the right team to

answer the question, ensure you have the proper data to be analyzed, to be sure that we understand how the exposures occurred so that we make all those assumptions in our health risk assessment and that we get the product done when we say we're going to get it done. So if you have issues or concerns, please let me know. And thank you for coming and spending a whole day with us.

**MR. ENSMINGER:** Speaking of getting the product done when you say it's going to get done, nobody's given us a date when the public health assessment's going to be reissued, so.

**DR. FORRESTER:** We have some information in the slides today to give you a timeline. We're very close on the first half of the health assessment, to go into the discussion about the peer review process, which you all engage with with us.

On the second piece, it may be a little more difficult because the data mining may take a while. I'm sure you want us to be thorough on the data analysis so -- the job is big. And we'll make sure we have the right data. But I can assure you that every day that this team, and there is probably five to six people, and then I bring more in the division. Our division is very small. I've got

probably over a third of the division working on Camp Lejeune. They are all very dedicated folks, and I think you've got the best support you could possibly get to do this project.

**MR. ENSMINGER:** Well, give us the documents; we'll help.

**MR. GILLIG:** My name is Rick Gillig. I'm the branch chief of the branch that this project is being -- or these projects are being conducted in. I've worked in public health for over 30 years, in part because I felt a calling to work in an area where I'm providing a service and benefit to society.

In short, today, with the hope and expectation that we can open up better lines of communication. We can't do public health without input from the communities we serve. That's very important to all of us, and I'm hoping when we leave this room today sharing information with each other, talking, providing questions to us after we leave the room. We just need to improve our communications.

**MR. BRUBAKER:** We also have some guests and some participants who are sitting on the outskirts. Perhaps have each of you go around and just state your name and your role in the process as well.

**SUSAN MOORE:** My name is Susan Moore, and I'm branch chief for the branch that has done most of the water modeling, and we are supporting the (indiscernible).

**PHILLIP COOPER:** My name is Phillip Cooper. I'm the team leader with this branch, and this project falls under my team.

**CAPTAIN MURRAY:** I'm Ed Murray. I'm the Acting Director for the Division of Toxicology and Human Health Sciences, another division of ATSDR.

**ALAN YARBROUGH:** My name is Alan Yarbrough. I'm Acting Deputy Director for Division of Community Health, with Tina Forrester.

**LYNN WILDER:** Hi, I'm Lynn Wilder. I'm the Associate Director for Science in the Division of Community Health Investigations.

**MR. MASLIA:** My name is Morris Maslia. I've been at ATSDR for over 22 years.

**MR. ENSMINGER:** Say what?

**MR. MASLIA:** Over -- I've been at ATSDR for over 22 years and with federal service for over 35 years. I led the team that did the water modeling -- drinking water study. And I'd like to just (indiscernible).

And I have been with other federal agencies,

and I've stayed with ATSDR because my -- we have not only an ability but also a responsibility to facilitate the public's understanding of some highly technical issues and presenting them with, with information. And that's what I aim to do in tasks that are assigned to me.

And currently I'm facilitating some of our staff that are doing some technical work on the soil vapor investigation. I wouldn't say overseeing that, but coordinating that, I think, would be a better word.

**MS. SHEILA STEVENS:** Morning, I'm Sheila Stevens. I'm the Camp Lejeune CAP coordinator. I just met Chris this morning. So I was doing this work for the policy. About two years ago I came back specifically to work with Camp Lejeune, and I wanted to do this work, so I'm glad to be doing this. I'm a prior military person. I find this work very interesting. It's not boring and it keeps me busy and I'm glad to be here.

**MR. ENSMINGER:** I'm laughing.

**DR. JIMMY STEPHENS:** Hi, I'm Jimmy Stephens. I'm the Acting Deputy Director of NCEH-ATSDR.

**DR. BOVE:** My name is Frank Bove. I started working with ATSDR in '91 and still here. And

almost been working to some degree on Lejeune since then.

**MS. RUCKART:** Perri Ruckart, I'm in the division that does the health studies. I've been working on Camp Lejeune since about 2003. And I just wanted to see today how -- what we're talking about, my corresponding health studies and (indiscernible).

**DR. RAGIN-WILSON:** My name is Angela Ragin-Wilson. I'm the Branch Chief for Environmental Epidemiology Branch, and we're the branch that conducts the health studies at Camp Lejeune.

**MR. BRUBAKER:** Okay, thank you for taking the time to introduce yourselves. It's extremely helpful to me, not that that's your job, but the role that I'm here to provide is to simply guide the process and, as instructed to, to ensure that the greater resource of all of your time and more experience, citing in your passion can be channeled towards productive means. To me it's a humbling place to sit around a table with this many people with this much insight and technical skill, this much personal impact from the situation at hand and have the opportunity to bring that together. And so

my role in it is to, number one, to guide the process, and number two, to remind you that behind the issues and the concerns and the data and the problems that we have to solve is a bunch of human beings who are deeply passionate about the reasons we're in the room.

So my role will be to invite you to show up today and first of all, represent the science, the history, the stories, the pain, the fear, the hope, all of that. Represent that; that's why you're here. And number two, remember that every other person sitting around the table is a human being with some of that behind the story as well.

And so again, thank you for being here and thanks for allowing me to catch up. Right before we take a restroom break and grab a cup of coffee, Rick has put together a summary of why this meeting has been called. And I'd like to invite you -- I think it's on a paper.

Let's just clarify objectives and rules for today, and if you have a question about these, let's get aligned in the front end so that when we've achieved the time at 4:00 o'clock, we can look back and say yes, we did those things or no, we didn't.

**MR. GILLIG:** So everyone should have a handout

on the purpose of today's meeting. So the first purpose that I've identified was that we want to ensure that you all understand how we're collecting the data. There's a lot of different sources of data out there so we want you to have an understanding of how we're collecting it, reviewing it and how that'll fit into our investigation.

Chris is making the first presentation and he's providing a general overview of those 16 data sources that we've talked about on the conference calls and at previous CAP meetings.

We want to make sure that you understand how we are assessing the data. Again, there's an awful lot of information out there. We don't need all of it. We want to focus on what is pertinent to soil vapor intrusion. We have two presentations today to help with that. Tonia and Mark are presenting later on this afternoon.

Tonia will give us a general overview of how ATSDR does its vapor intrusion investigations at sites. And Mark will provide a general overview of the process that he proposes to investigate vapor intrusion at Camp Lejeune.

We're going to provide you an update on our evaluation of exposures to contaminates in drinking

water. We've done that at previous CAP meetings. Rob is going to update us on where he is with his work on that topic. We -- you've provided input in previous meetings on exposure scenarios and conditions that we need to be aware of. We welcome that input. So as we discuss our approach, again, if you have suggestions, things that we need to take into consideration, we welcome that. And as I stated earlier, we want to open up constructive and effective dialogue with you all. It helps us do our work in a better fashion. It will alleviate some of your anxieties, some of your concerns, so we are very open to that. And I hope we leave today's meeting with a better understanding of -- you having a better understanding of what we're doing, us having a better understanding of your concerns and then moving forward.

**MR. BRUBAKER:** Thanks. So there's certainly a lot of territory to cover in terms of content. There's also enough time built into the agenda for interaction after each presentation to make sure there's dialogue and input on each of these key issues. No doubt we'll make sure that we're moving forward and getting everybody out of here on time. We're also at a place where we can take a quick

break. I know some of you need a chance to get coffee or use the restroom. We'll stop now and reconvene at 10:00 o'clock promptly. Yes?

**MR. ENSMINGER:** Can we get the gate-keeper, which is Robin, to get the key master to turn the thermostat down, so that this is more comfortable in here?

**MR. BRUBAKER:** We'll work on that.

**DR. IKEDA:** We've already turned it down. It's not any better? We've turned it down.

**MR. PARTAIN:** It's pretty hot in here.

**MR. BRUBAKER:** Before we break, restrooms are two hallways in that direction, on the right.

**MR. ENSMINGER:** There's a little cross hallway. You gotta make a right.

(Break, 9:53 to 10:09 a.m.)

## DEMONSTRATION/DISCUSSION OF DATA SOURCES BEING USED FOR SVI PROJECT

**MR. BRUBAKER:** Welcome back, folks. We're ready to reconvene and our first section's the demonstration and discussion of the data sources. I'll hand it over to you, Chris.

**LCDR. FLETCHER:** Okay. So, as I said earlier, my part in this is looking through the data sources and trying to find the relevant documents, which is

a big -- we'll jump right in here.

So what we're looking for, these are the types of data we're looking for: indoor air, ambient air, sub-slab data, soil gas and shallow ground water. The reason we're looking for those is, if we find sufficient quantity of quality data, we find what we need, we could do dose calculations, and Mark's going to get into that later. We're also looking to do some estimating using Morris, as was spoken about earlier. It just depends on what we find and if it's enough that we can use that to do those things, so.

**MR. PARTAIN:** Hey, Chris, when you say quality data, what are you talking about? Can you define that?

**LCDR. FLETCHER:** Quantitative data --

**MR. PARTAIN:** As far as --

**LCDR. FLETCHER:** So a lot of what we're finding, and I'll get into this in a few slides, a lot of what we're finding is PID and FID reading. That's photo ionization and flame ionization detection, which is more or less a yes or no answer, is it present or not. And if that's all we find, there's no way to modify it unless Morris has some tricks up his sleeve that I'm not aware of. But I'm

not a modeler.

**MR. ENSMINGER:** Well --

**LCDR. FLETCHER:** So we're looking for numbers statistical but -- or not statistical but analytical results.

**MR. PARTAIN:** And are you finding those analytical results?

**LCDR. FLETCHER:** Some.

**MR. ENSMINGER:** We got shallow soil vapor readings around buildings. I mean there's -- they're all through these reports that were done by Department of Navy contractors. And I mean, those were taken in just a few inches into the grounds at the surface. You can construct a model from those, could you not, Morris?

**MR. MASLIA:** You could construct -- you could construct some scenarios, some what we would refer to as simple models, in other words they look at basic key factors for basic principles. You can't construct a numerical model, like what we used for drinking water. And that's another -- an approach. If you go into the modeling literature you'll see that that is an approach is to look at key components, key factors. We don't necessarily calibrate with models but if you -- you know, is it

above a certain standard or limit, or way below. If you get within a certain range of a standard or limit, those models are not useful because they cannot be applied. So that's why you want to go through a scenario testing type approach.

**MR. ENSMINGER:** And we have documented evidence.

**MR. MASLIA:** Okay.

**MR. ENSMINGER:** Yeah, we've got documented evidence that the Department of the Navy and the Navy Environmental Health Center possessed a Hewlett-Packard gas chromatograph mass spectrometer back in 1981. And it was brought down to Camp Lejeune to do vapor -- ambient air quality samples in the former daycare center. I also have a message, it was dated in 1985, where they were expediting the funding to purchase a gas chromatograph mass spectrometer for the base laboratory.

Now, somebody in the Department of the Navy and Marine Corps has to answer some questions as to why they weren't doing these vapor readings whenever they were cited in a 1988 report as being required or needed for the protection.

**MR. PARTAIN:** One thing I'd like to --

**MR. ENSMINGER:** And that was in May 1988 feasibility or remedial investigation feasibility study by environmental science and engineering firm.

**MR. GILLIG:** And we did ask the Navy specifically for the results of that and were told they did not have results.

**MR. ENSMINGER:** Well, then they're in violation of CERCLA, because those tests, the last piece of paperwork we got is a letter dated in October of 1988, was written by the chief of staff -- or not chief of staff, the assistant chief of staff of facilities, Colonel Baltzell, requesting funding to contract an outside source contractor to come in and execute the ambient air quality monitoring in these buildings that were identified in that report. And then ten years later they had to evacuate those buildings, some of them. And then subsequently they demolished like seven of them; they were that bad.

So October '88 that letter went out. So that means that those air quality samples either got done late '89, '88 or sometime during 1989. Camp Lejeune was declared a Superfund site on 4 October, 1989. Well within their, quote/unquote, document retention period. So those documents pertained to contamination. Anything pertaining to contamination

or pollution on a Superfund site is required to become part of the administrative record and be maintained for 50-plus years. So the Department of the Navy and Marine Corps are admitting that they're in violation of CERCLA.

**MR. GILLIG:** And we still are in the discovery review, or the data discovery and review process, so at the end of that process we'll see what we have.

**MR. ENSMINGER:** And when they evacuated building 1101 in 1999, for the benzene gasoline fumes in there, and prior to that there's reports of complaints about fumes in those buildings for years. Why didn't they take their gas chromatograph mass spectrometer in there and test the air then? Were they playing ostrich? They stick their head in the sand and hoped this all went away? Probably.

**MR. PARTAIN:** Well, one thing that would be telling, Chris, and I'd like to see what the data points and the actual readings that you get from the GCMS, that are useful for what you need to do, have that plotted out over time. And also the readings where you're getting a yes/no indicator from -- I can't remember the name of it.

**LCDR. FLETCHER:** PID --

**MR. PARTAIN:** Yeah, the PID indicator -- plot

those out concurrently and see if that shows a pattern. And I'd like to see that.

**LCDR. FLETCHER:** That's what we're hoping to do with the data.

**MR. PARTAIN:** Okay. 'Cause I mean, it would be very interesting, especially if you're seeing a lot of hits in testing and there's no analytical testing behind it. I'd be very curious --

**LCDR. FLETCHER:** I agree. That's something we hope to do, and part of what -- the end result of what I'm trying to do is hopefully a large database with everything in it. I haven't been able to find one source where everything is succinctly stored, and so that's part of what we're going to do as we extract the data from all the PDFs. We're constructing an Access database so hopefully at the end of it we can do a search building-by-building and by date or date range, and we'll find what's available.

**MR. PARTAIN:** When you construct that table or that graph or however format is comes out, would you be able to share that with us so we can see it too?

**LDCR. FLETCHER:** I certainly think we will.

**MR. PARTAIN:** Okay. And Jerry's point about the Superfund and the CERCLA retention requirements,

like Jerry said, we have documented evidence where they said they ordered the testing, they were carrying and conducting -- carrying out the testing but yet there's no analytical results.

Is there something that y'all should have at ATSDR -- I don't know if Robin's still in the room or not. No? Okay. I mean, obviously there's a problem. You know, you guys -- this is the data and information that ATSDR needs to conduct their health studies. It's supposedly in the administrative record; it's missing. So to me, there should be a letter sent out on behalf of ATSDR to EPA asking why this isn't in here, and also to the Navy/Marine Corps, and get a formal answer to that question. Because if they're in violation of the law, what good is the law if no one does anything to follow up and enforce it?

**MR. ENSMINGER:** Yeah.

**MR. PARTAIN:** So that -- I mean, that --

**MR. ENSMINGER:** And that's to cover you. That's to cover you as well. That's just not some vendetta we're on. I mean, that's to cover your back sides too.

**MR. GILLIG:** Yeah.

**MR. ENSMINGER:** Because you can't do your

Congressionally mandated mission unless these people are following the law. And if they're not following the law, you need to highlight that, because somebody's going to come back to you and say, hey, here's the recommendations that this got done in this report, and here is where the Department of the Navy and Marine Corps, in a public meeting, announced that they were going to conduct these. And here is a letter going to headquarters up in (indiscernible) at Norfolk requesting the funding to contract that out to an outside contractor. Now, where are the analytical results for these tests? And if you don't have them, you need to respond in kind, in writing, signed by an official, stating that you do not have those results, and that will cover you. And that'll also put them on the spot, where they need to be.

**MR. PARTAIN:** Who knows, maybe they'll produce the test results.

**MR. GILLIG:** Well, you know we're -- as Chris will point out, we are going through volumes and volumes of data. And if they're in there, we'll find them.

**MR. ENSMINGER:** If they put them in there.

**DR. FORRESTER:** Some key words around -- that

defines that, you know, like the date or --

**MR. ENSMINGER:** What do you mean?

**MR. PARTAIN:** Well, the letter -- I mean, the, the TRC meeting and the letter --

**MR. ENSMINGER:** You got the report, then you got -- that was in May of '88, RIFS, which is Remedial Investigation Feasibility Study. It was issued by Environmental Science and Engineering, where they cited those protective measures that needed to be taking place while the contamination sites were being cleaned up, to prevent any further human exposures.

Then you had the August of 1988 TRC meeting, which is the Technical Review Committee meeting, where the Assistant Chief of Staff of the four facilities, Colonel Baltzell, announced publicly that those protective measures were going to be executed, including the ambient air quality sampling. And then we've got a like a point paper that was done by the Naval hospital about why they couldn't do it. And then we have the letter from Colonel Baltzell in October, going to lam div (ph), requesting the funding to get -- to hire an outside contractor to come in and execute these tests.

**MR. GILLIG:** Yeah, I think you shared all those

documents with us.

**MR. ENSMINGER:** Yeah. I mean, you've got a beautiful paper trail as enclosures to your letter.

**DR. FORRESTER:** So we can do some cross-referencing that include dates.

**MR. ENSMINGER:** Oh, yeah.

**DR. FORRESTER:** These key words and other things and see if anything shows up in the searches.

**MR. ENSMINGER:** But that would be somewhere between October of '88 until oh, Lord knows.

**MR. GILLIG:** And again, we are looking at all the data so if results are out there, then we should find it.

**MR. PARTAIN:** Hopefully a letter -- you know, a letter to what we were talking about goes out sooner than later so we don't run into other delays waiting for a response or waiting -- or when you're almost done, here's some data we found.

**MR. ENSMINGER:** Yeah.

**MR. GILLIG:** I may be wrong on this but I believe we have already sent a letter to them asking specifically for the results of the sample --

**MR. ENSMINGER:** Did they respond back to you?

**MR. GILLIG:** They responded back that they --

**DR. FORRESTER:** Didn't have it.

**MR. GILLIG:** If I recall they did not --

**MR. ENSMINGER:** Did they give you a letter?

**DR. FORRESTER:** We gave this to you all, I'm sure.

**LCDR. FLETCHER:** You remember what -- the July 13th response -- or July 2013 response to our June 13th letter requesting specifically that.

**MR. ENSMINGER:** They got you a letter back?

**MR. GILLIG:** Yes, sir.

**MR. ENSMINGER:** That they don't have them, a negative response.

**DR. FORRESTER:** No, that's not what they said. They said they didn't know where the data was.

**MR. GILLIG:** Yeah, they couldn't locate the data. I don't know the specific wording.

**MR. PARTAIN:** But then, if they can't locate the data, then the next step is, okay, EPA, this is supposed to have been in the administrative record. Why aren't they compliant? I mean, if it was in the administrative record, they wouldn't have a problem locating it.

**MR. ENSMINGER:** I mean, these would be the data points that you would need for a model.

**MR. GILLIG:** Well, and these -- I agree, they're some of the data points. There's a lot of

data out there and a lot of --

**MR. ENSMINGER:** A lot of different sites.

**MR. GILLIG:** -- a lot of things to look at.

**MR. ENSMINGER:** Yeah, a lot of different sites and different plumes. I mean, you got 1601 down on the south end, then you got 903 and 901 up in the north end. You got the fuel farm in between. I mean, the place is a nightmare.

**MR. PARTAIN:** So but, you know, like I said, if they put it in the administrative record where it belonged, we wouldn't be dealing with this issue right now. So if they -- if their response back to you all is oh, we can't find it and we don't have it, I would think the next -- I'm assuming the EPA is the one that would be the next recourse, saying, hey, this is not being done. It's not here. Put them on notice and try to put a little pressure, see what happens.

**LCDR. FLETCHER:** Okay. So this next slide is the slide after, again to try to illustrate the variety, the location and how difficult it is to move through all of our data sources.

As you can see here I've got several bubbles indicating the number of data sources that we have. The sizes aren't exact. They don't mean much other

than I have a larger source or a smaller source. But they don't mean -- they don't correlate the number of documents in each key source.

The light green circles are U.S. Marine Corps-owned data. The dark blue circles are Department of the Navy-owned data. You see an EPA bubble, a North Carolina Department of the Environment and Natural Resources database. The documents that ATSDR's data mining technical work group owns. There's a contractor database and a contractor with the U.S. Marine Corps specifically there at Camp Lejeune. And then in Marine Corps colors, the petitioner's documents, which is anything that we've received from the CAP.

So as you can see, there's quite a few databases where they overlap. That is an indication that the documents for the data within that data source are located in other data sources. Where the circles are stand-alone, they are indeed a stand-alone source of data on base, particularly on the left side, where you've the Camp Lejeune public works MCI East
Regional Geospatial Information & Services Division G-F.

**MR. PARTAIN:** So these stand-alones are not

intersecting with any of the other prior document libraries?

**LCDR. FLETCHER:** That's correct. So if you look in the center, where the official document inventory, it houses the DART archive, which is in itself constantly being added to; although I think we're at the end of that, so it's been something that's updated since we started this project two years ago. And they're migrating that into the official document inventory. There's overlap of the environmental management database. There's an overlap of NIRIS. There's overlap of North Carolina DENR and there's overlap of US EPA.

**MR. PARTAIN:** Now, these stand-alones, and what concerns me is the Naval hospital, the hygiene database, the fire department and the safety. I mean, that's where I would expect to find some of these data points.

**LCDR. FLETCHER:** Right. And these are all data sources that we are reviewing.

**MR. PARTAIN:** The -- I mean, where are they housed? At Lejeune? I mean, is the Naval (indiscernible)?

**LCDR. FLETCHER:** The safety database and the fire department database are onboard at Camp

Lejeune. They're only accessible -- and I'm going to get into details on all of these as I go through my slides. But the industrial hygiene database, we do have a copy of that.

**MR. ENSMINGER:** I got a question. Does the base quality control laboratory have their own files?

**LCDR. FLETCHER:** I don't know of a base quality control lab but I'll ask.

**MR. ENSMINGER:** I saw the message requesting the funds to purchase it, emergency funds, was in '85.

**MR. PARTAIN:** 'Cause Julian might know.

**LCDR. FLETCHER:** So now I'm going to -- the rest of my slides kind of go through each of those one at a time and hopefully shed a little more light on it.

So the Official Document Inventory is a database of documents. It's available through a web portal. It does require clearance to get into so it's not open to the public. The reports and information from Camp Lejeune, mostly CERCLA documents, that contains NIRIS and UST documents. At the time I downloaded the index in September of 2012, when we first started this, it had a little

over 15,000 documents in the database. Since then they've added additional documents, and we're keeping up with that as they add documents, and reviewing those additional document titles. Here's a screen shot of what it looks like in the database. So it's just a list of documents. I've got full access to everything in there. And so we're reviewing that.

**MR. PARTAIN:** Now, I do know that, from prior conversations, that you said they're restricted. What about getting an index or an inventory, like a spreadsheet of each of these databases so we know what's in there?

**LCDR. FLETCHER:** I do have that. I've got an index of the document titles from the official document inventory.

**MR. PARTAIN:** And can we get those or is that classified too, or are we allowed to get --

**LCDR. FLETCHER:** I don't know that it's classified but that's not my data to share. That's -- I believe we're going to have to refer you to the source on that or I can ask if we can provide it as part of what we're --

**MR. PARTAIN:** Well, as the CAP -- as the CAP -- I mean, we would like to request -- I know, I

understand that we don't have access to the inventories themselves but we would like an index of what's in each of these inventories. And that's a starting point so we can at least look and see what's in there.

**MR. ENSMINGER:** Yeah, I mean, you guys have already asked the Department of the Navy and Marine Corps in the letter. That's been out, what, a couple weeks? Did you get any reply back?

**MS. SHEILA STEVENS:** Jerry, that letter is on -- it's supposed to be signed by Robin, and I need to check on that.

**MR. ENSMINGER:** No, I'm --

**MS. SHEILA STEVENS:** But that letter, that was that piece I was telling you about, that CERCLA, RCRA we kept going back and forth on. And it shouldn't -- it should be done. It should be up for signature. But yes, it should be done. But yeah, it's taking a while.

**LCDR. FLETCHER:** So the next source of data that we're reviewing is the NIRIS database, which is a database of documents and some actual data, outside of documents. Again, available through a web portal. Also a web portal that I have access to, not available to the public. Mostly CERCLA

administrative records are contained within. Mostly UST and solid waste management documents in there. At the time I downloaded my index in February of 2013, there was 5,489 documents on that. Since then there have been a few documents added. We're also looking into those additional document titles to see what may be of interest to vapor intrusion.

**MR. ENSMINGER:** What is their excuse for not releasing these documents publicly?

**LCDR. FLETCHER:** Most of these documents contain or have the potential to contain personally identifiable information, which is names, Social Security Numbers, dates that they worked, locations on the base, as well as in some instances, they've got underground utilities locations, which would be a security issue. That's what the Department of the Navy perceives as a security issue (indiscernible) terrorist acts. So that's not information they want in the public domain.

**MR. ENSMINGER:** Let me tell you something, you remember when the water model was going to be released, and all the stink about any map showing any locations of any water wells, that thumb drive right there, which I got from the Washington Post the other day? The 11th document in the first

document file is a map of every water supply well that has ever existed onboard Camp Lejeune.

Now, an FOUO is not, is not, a legitimate FOIA exclusion. So they need to release these documents.

**LCDR. FLETCHER:** So here's a screen shot of a NIRIS database, what it looks like --

**MR. ENSMINGER:** It was supposed to be part of the administrative record anyhow.

**LCDR. FLETCHER:** Not that exciting, just a list of document titles, and we can download each of those documents as we identify the need to.

**MR. MASLIA:** (Indiscernible) project. That's a double-sided portal. The titles are the same on most (indiscernible), and there is a public access entry to NIRIS. And then there's --

**MR. ENSMINGER:** Is it on the Navy facility's?

**MR. MASLIA:** It should -- it should be. A little history on this, when they went from what we refer to it as the Baker or whoever did the CERCLA thing. And then the Navy housed or their contractor housed the CERCLA administrative records. And then NIRIS took it over or they put it into NIRIS because of some federal law for naming conventions. They created a double entry type of web portal, okay? One was an official entry, and then one was for the

public entry.

Now, what we were told back then, and obviously more documents have been put in since when we were dealing with it, is that there were identical documents on both sides, okay. It's just that the public side may not be able to retrieve the document and see the title and all that. On our side, we went in and retrieved the document. I don't know in the last two or three years what that -- that specifically with the NIRIS. I know that was in double public and private entry.

**MR. GILLIG:** Yeah, and I believe getting the actual document on the public side --

**MR. MASLIA:** Yeah.

**MR. GILLIG:** -- you can get like an abstract --

**MR. MASLIA:** Yes.

**MR. GILLIG:** Obtaining the document is --

**MR. MASLIA:** Right.

**LCDR. FLETCHER:** So Morris jogs my memory on something else I need to bring up about these -- all of these data sources is that there are -- there is a lot of duplication between data sources. And each data source has its own unique naming convention. Sometimes they're numbers; sometimes it's just the document title or a different version of the

document title. So it's extremely difficult to reconcile documents from one data set to the next. It literally requires opening the document and comparing them side by side to see that we got them all. And I'll get into a little bit more of how we're going about overcoming that, as we get further along in the slide set.

The next data set is the Document Archive Retrieval Tool, commonly called DART. This is an archive of the Environmental Management Division's documents, which were housed in building 1101, also referred to as the building 1101 documents, and a few other various locations on the base. It's just their archived documents that they've been scanning in.

At the time we did an index retrieval on that, there were a little over 9,000 document titles. A few have been added since then, and we are -- we've gained copies of those as well. And again, like the other data sources, we've got full access to this database or data source, just as we did with the others. No, there's no web portal on this so I don't have a screen shot to show you. This is just an internal accessible-only model for Camp Lejeune data source.

The next data source is the Underground Storage Tank Portal. I've heard some other names, and I think they may have come from the CAP, about a leaking UST portal. Anything that's got to do with underground storage tanks is in this portal. There's no secondary portal. And I have asked when -- when that question came to me from our management, I made sure to ask my Camp Lejeune contacts if there was a second portal, and there's not.

**MR. MASLIA:** Just to clarify what occurred is the concept of having a portal took place, which was July of 2003. They referred to the physical in the reports as leaking underground, okay. Once they officially contracted out for this in the maintenance of the portal, which was contained by -- what's the contactor -- but anyway, it's in our documents.

**MR. PARTAIN:** Caplin, I think.

**MR. MASLIA:** What?

**MR. PARTAIN:** Caplin.

**MR. MASLIA:** Caplin, yeah, yeah. In Caplin's log, there are a couple of different names. But anyway, Caplin, who is the contractor that maintains the portal for them. And the water modeling there

is an official title. But generally it contains anything that's leaking or -- and/or underground storage tanks.

**LCDR. FLETCHER:** Exactly. So there's a screen shot of that portal.

Next slide. So at the time we did our export there were 1,974 documents that ATSDR already owned as part of the data mining technical workgroup for the drinking water. So we included those in the review. At the time we first looked at this, there were an additional -- in addition to that 1,535 documents, there were an additional 439 that had been uploaded to the UST portal. So we've got all those.

Since then they've continued to add more documents, some with current sites beyond our line in the sand, which is July 2013. And they've added some that have to do with sites prior to that date. So we just requested a dump of everything else they've got, an export of all the recently added documents. So we'll be sure to include all of those in our review as well.

**MR. PARTAIN:** The 439 documents, what are the dates on those documents? Are those newly generated documents or is this stuff --

**LCDR. FLETCHER:** Not necessarily. As they update their UST portal, it could be documents that were in someone's office, in hard copy, that had to do with something historically which may be recent or not so recent history, that they've scanned in. It could also be a site that they just found last week, and they've started a new file for that.

**MR. PARTAIN:** Okay.

**LCDR. FLETCHER:** Which is why we've requested a complete export of everything in it.

**MR. PARTAIN:** Are you segregating the new documents from the old? 'Cause we have the 1,535, we have an index for that. And I'd like to see what the new documents were -- are, titles and dates.

**LCDR. FLETCHER:** We, we are not segregating those. I've just kind of separated them here to give an idea to let you know what we're looking at what you've already seen. Let you know what we're working on.

**MR. PARTAIN:** But I mean, going back to -- and I guess I understand that we're still fighting the objections about releasing the documents but having a workable index of what's in there, with dates and titles, you know, would be something that we can work with, 'cause we do have the 40,000 documents we

got from USA Today. So we've got a large set that we can start looking through, but we need the index. And then that's something, you know, that I've been asking for since this whole document archive or document, for lack of a better word, was first discussed. And it's been about a year now, so if I ask for an index of these new documents and everything. So I hope it's not another year before we get it.

**LCDR. FLETCHER:** We're working to complete that list and share it with the CAP as soon as we can.

**MR. PARTAIN:** But the Navy and the Marine Corps should have -- I mean, I don't --

**LCDR. FLETCHER:** I believe they should have a list.

**MR. PARTAIN:** I don't think they're going to be operating within the blind without some type of index or some -- it's like going back with Morris, when he was doing his water model, when the UST portal came up. They let Morris flounder around for how many months, I don't remember, without direction how to run the damn thing. And they, oh, by the way, here's the instruction manual. Are they doing this again? I mean, I just, I cannot believe --

**LCDR. FLETCHER:** Some sources I can export and

index some titles, others I cannot. Where I cannot, that takes us time to go through and create the index on our side. So that's what partly taking some time to put together, and that's why there's a delay in that. You can't just instantly hand that out because it doesn't exist.

**MR. PARTAIN:** Well, and the Navy doesn't have one or whoever owns the documents, they don't have one for themselves?

**LCDR. FLETCHER:** I specifically requested that, because like you, it seems to me like there would be one.

**MR. PARTAIN:** And they responded in writing or just a telephone call, no, or what?

**LCDR. FLETCHER:** I believe it's in writing. We don't typically write internal letters. I think I've got pretty open communication with the folks at Camp Lejeune, my counterparts there. And we openly email back and forth, which is a matter of public record. So I believe I've got that in an email but I'd have to go look to find out.

**MR. PARTAIN:** 'Cause I mean, you know, and I understand not putting everything in writing like that; you have to have some type of verbal communication. But when you get to choke points

such as document libraries and indexes and everything, that's where we do need to have a paper trail, 'cause I mean, it's a critical point. I mean, 40,000 documents, if you -- and as was mentioned earlier, trying to target specific documents creates other problems. Understanding, yes, you're looking for just data points to fit in to what you need for the vapor intrusion, but -- and I'll use the benzene and the public health assessment from back in 2009 -- you know, we kept hearing the same things: Oh, we've gone over everything; we've looked at everything. And by doing a separate investigation with a different mind set, we uncovered the fact -- and established that benzene was indeed in the water, where it had been missed by ATSDR for over a decade. And, you know, if you're just targeting that one specific thing, you might be missing details that lead to other sources of information, other data points or other document libraries that haven't been disclosed. 'Cause frankly, you know, it has been proven over and over again, the Navy and the Marine Corps have not been forthright. They have not been trustworthy in their dealings with us. And we keep finding things.

**LCDR. FLETCHER:** Well, I saw with the vapor intrusion that they've been responsive and very open with everything that I've -- with all the requests that I've made for data and data sources. So if you know of a data source that I'm not discussing today or isn't in that slide --

**MR. PARTAIN:** Well, that's the problem. We, you know, it's you have to ask the -- it's the right question at the right time in the correct manner and fashion, and hope that they're in their good graces when they reveal it. As in the case in the vapor intrusion -- I mean, the UST portal, that was found by a complete accident. I mean, we have in writing in 2009, when Senators Burr and Hagan asked the Navy specifically how much fuel had been -- I mean, what was the fuel loss at Hadnot Point. The response from Headquarters Marine Corps was: According to our inventory records, we lost 30- to 50,000-gallons of fuel, which is a correct answer because -- if you rely on the fact that their inventory records is the caveat in the question. According to our inventory records. Well, yes, that is a truthful statement, according to the inventory records, but what they didn't answer was the question. They knew that they had lost 1.5 million gallons of fuel estimated, but

because we didn't ask the question correctly, they didn't answer it that way. They just said according to our inventory records.

So they may be being truthful to you but it comes down to, you know, with these document libraries, you know, too many things have appeared over the past five years that should have been disclosed a long time ago. And when we deal with things like this, I want something concrete, to be able to look at, such as an index and, you know, the archival inventory so we can understand what's there.

And, you know, it's just like with the bubbles that you're showing up here. The naval hygiene unit, the industrial hygiene unit, that's where I would expect to see a lot of this data because they were the ones that were tasked and regulated to do these -- the GCMS readings. And that seems to be segregated completely away from the other stuff at, at Camp Lejeune. So are these readings sitting somewhere in Norfolk? I don't know. I mean, obviously if I had that, then we'd have this information. But you have to do -- you have to approach this with an investigative mindset to look for and, and dig up these documents. If you just

rely on their good graces, no, you're not going to find anything else.

**LCDR. FLETCHER:** Well, I think you've learned a lot, through your interaction with Morris and his group earlier, and I think we have a better understanding of what we're looking for now.

**MR. PARTAIN:** Oh, yeah, you have a better understanding. FOUO, you can't show this to anyone. They've done everything they can to exclude the CAP from seeing anything that comes out, and that's a problem. So anyways, the index is something that I -- what type of time frame do you think you could get together an index for us to start looking at?

**LCDR. FLETCHER:** I'm hoping that within a few weeks we'll have the rest of it put together.

**MR. PARTAIN:** Okay.

**LCDR. FLETCHER:** Again, it's -- the differences and nomenclature, the way they've named documents and when they've uploaded and changed names and when we've downloaded them, it's difficult to reconcile that list to make sure we've got everything accurately reflected on the list that we hand to you and for us for our own use.

**MR. PARTAIN:** Well, I understand it's gonna change. But just getting something that we can

start working with is, is important too. And within a few weeks would be great. I'd love to see something in a few weeks.

**MR. GILLIG:** Mike, the index we provided back in early May, is that --

**MR. PARTAIN:** Yeah, the index -- what I'd like to see as far as an index for each of these document libraries.

**MR. GILLIG:** Each of the data sources.

**MR. PARTAIN:** Yes. And like for example with the one here, with this 439 additional documents that have been uploaded and everything, I'd like to see what those are, where they came from, what they're -- you know, what they're dealing with, because they may have -- okay, here's your DVD, Senator Burr, and then that disseminated down to us, and then a week or two after they gave it -- or gave us that information, they loaded up some key documents that have a lot of pertinent information that we are now not seeing. I mean, 439 documents to be uploaded, I mean, that's a lot. And that's why I asked you if this was recent material, because if it was all dated 2013-'14, okay, they're doing the -- you know, this ongoing study. But if we're seeing documents from the 70s, 80s, 90s, that are

being uploaded, as far as that 439, I have some concerns with that, 'cause that should have been there to begin with.

**DR. FORRESTER:** Can I go back and clarify --

**MR. PARTAIN:** Yeah.

**DR. FORRESTER:** -- what, what you want in the next two weeks is an index for each database.

**MR. PARTAIN:** Yes.

**DR. FORRESTER:** I promise you we cannot get all that done. If we index what we've -- already are using, we can get those done in the next two weeks. We're hiring three or four more contractors to help us through the data.

**MR. PARTAIN:** Okay.

**DR. FORRESTER:** It's just -- it's a mess we've got.

**MR. PARTAIN:** I mean, this is going on what Chris said.

**LCDR. FLETCHER:** No, I thought you were asking for the update from our recent site visited --

**DR. FORRESTER:** No, he wants --

**LCDR. FLETCHER:** You want an index of every --

**DR. FORRESTER:** -- every report.

**LCDR. FLETCHER:** -- every database?

**MR. PARTAIN:** Well, yeah, I think the database.

'Cause that's where --

**LCDR. FLETCHER:** I couldn't even give you a guess on that.

**MR. PARTAIN:** 'Cause that goes back to my point that there's -- I'm sure the Navy and the Marine Corps have an index for each of these document bases and databases. You know, you just don't plug things into a computer and forget about them or put them in a box and squirrel them in a corner. You got to know what's there. And, you know, that's where maybe something should be put in writing, formally say, hey, and get that formal response and disseminate that to the CAP too. But no, I thought Chris was saying that you all had it all organized already but --

**LCDR. FLETCHER:** No.

**MR. GILLIG:** No.

**MR. PARTAIN:** So when do you think you -- when would be a time frame to expect something like that?

**DR. FORRESTER:** Contractors are not coming on 'til the end of June.

**LCDR. FLETCHER:** Our contract doesn't reflect that we're asking to make an index.

**DR. FORRESTER:** I know but we, we can work on the contract. I'm just saying I can't give you a

time frame right this minute. We have to see the magnitude of the job.

**LCDR. FLETCHER:** We'll also have to get contractors access to these data sources.

**DR. FORRESTER:** But maybe we can get Morris to help us too, and ask, see if they have them.

**MR. ORRIS:** Well, can we get a list from the update that you sent back in May reflecting which documents are new?

**LCDR. FLETCHER:** That's what we're working toward.

**MR. ORRIS:** Okay. Okay. That would be a good start. And especially --

**LCDR. FLETCHER:** It's something we'll work on.

**MR. ORRIS: --** highlighting that those documents are newly uploaded.

**MS. FORREST:** So are you asking for me to go back and ask if they have an index for each of these individual --

**MS. FRESHWATER:** I was just wondering who went -- who is -- what is staff that goes to the actual visits, who actually goes to the base?

**DR. FORRESTER:** Some of these people in this room have been.

**LCDR. FLETCHER:** So most recently the May site

visit was myself, Captain Parham, Commander LeCoultre, and then two other staff that are working with us, helping us review the documents here. So they're all health assessors. Dr. Tonia Burk will be in later, met with us as well.

**MS. FRESHWATER:** How long were you there?

**LCDR. FLETCHER:** We were there a week. And that was -- what that was -- the purpose of that visit was to review and scan documents that were available in hard copy only for us to bring back here and include in our investigation.

The identification of those documents was based on a title search that we did back in, I guess, early 2013, where we had all the large document indices, and we had a set of keywords we used to try to identify. And then we went through and looked at each title individually to identify documents that might have something to do with vapor intrusion. And we were very liberal in that search so that we could request the full documents, so when we got them here, we can look through those full documents and better determine which are going to be useful and which are not. So there's going to be a lot of fat to cut off from that large request.

**MS. FRESHWATER:** So do you feel like -- how

many more times do you feel you need to go to get all of the things on -- scanned that are still hard copied?

**LCDR. FLETCHER:** I think at this point we've been through everything. I don't foresee the need for a return site visit, not for scanning hard-copy documents, but I wouldn't rule it out completely, just I don't want to tell you no, and then need to go back.

**MS. FRESHWATER:** But it is --

**LCDR. FLETCHER:** Everything that I'm aware of that exists, we've been through at this point.

**MR. GILLIG:** That and the base has contractors that are busy scanning documents. So if we can get them to scan the documents, and we learn of additional documents that are of interest, we don't have to send a team out to scan if they can send it to us electronically or on disk.

**MR. ENSMINGER:** They're still scanning hard-copy documents?

**LCDR. FLETCHER:** I think there's the last few documents that they're trying to go through and scan. I think those are -- there's a subset of documents they're working on. We looked through those while we were there and scanned what we

needed, what we felt was important to vapor intrusion.

**MS. FRESHWATER:** I'm sorry, Jerry, about how many did you, like round about, did you scan yourself?

**LCDR. FLETCHER:** We brought back several hundred.

**MR. ENSMINGER:** When did the -- you know, you've been through these documents. When did they actually put forth a concerted effort down there to start testing ambient air quality in the buildings?

**LCDR. FLETCHER:** I don't know. I haven't been through the documents at that level yet so I don't know. We're still searching -- with the tens of thousands of documents, we're still searching for documents that have data. And once we get to that level, we can see which of these tens of thousands -- there will be a smaller stack of documents to go through. Then we'll start reading through the documents we've identified.

**MR. ENSMINGER:** Well, I've seen some of this stuff that ATSDR's published, and it showed a starting date of 2001 for vapor intrusion. Why that date?

**MR. GILLIG:** That is the date EPA came out with

guidance on how to investigate and assess vapor intrusion. That's why we used that 2001 date.

**MR. ENSMINGER:** Does that mean that that didn't exist before or what?

**MR. GILLIG:** It means the methodology for investigating vapor intrusion was -- it was not EPA guidance until, in 2001, I believe, is when EPA issued their first guidance.

**MR. ENSMINGER:** I'm totally convinced that there are a lot of buildings down there on that base right now that are still dangerous.

**DR. FORRESTER:** And again, that's one of the goals of this process, past, present and if there's future to address in the health assessment.

**MR. ENSMINGER:** Especially 1201, 1202. That's base maintenance and base motors. Those shops.

**MS. FRESHWATER:** And that's why I brought up this school, the TTT -- TT2 school, because I know, you know, there was a tank underneath my school, and if they put the new one near it, I'd like to know that those kids now aren't getting poisoned. Just 'cause they tear down the building, we now know that doesn't mean that the kids are safe.

**MR. GILLIG:** Yeah, you had mentioned that in the CAP meeting -- the last CAP meeting.

**MR. ENSMINGER:** Well, I remember when the water model for TT was released, and Morris and them did a brief evaluation of vapor intrusion threat at Tarawa Terrace, and the EPA about had a crap hemorrhage over that one, so.

**MS. FRESHWATER:** Thanks, Jerry.

**LCDR. FLETCHER:** So jumping back into the slides, this is a screen shot of UST portal. Again, this is a list of documents, documents associated with each site.

The Environmental Management Library, these are hard-copy documents. They've got a library of, I guess, recently produced documents that they keep up with that are eventually scanned in.

**MR. ENSMINGER:** Was that the vault?

**LCDR. FLETCHER:** No, sir, no, sir, not the vault. This is the EMD's, the actual environmental management folks. The vault is a separate building over in the industrial area where they keep maps and blueprints, as-builts, that pertain to the buildings.

This is the Environmental Management Library where they store the various components that they have that make up the environmental checks and balances there on base. So the indoor air

monitoring stuff is in there, the UST folks. I think there's a public works representative in there. And there are others.

The online version, which they do have an online version, it's an internet -- intranet site, sorry, only available with, I guess, clearance and not available to the public. It's their -- where they keep the working files, what they refer to as working files. We would call them draft files or draft documents. And it's got links to CERCLA records. But there's not a tremendous amount of stand-alone data there that's not duplicated somewhere else.

**MR. ENSMINGER:** Do you have access to that?

**LCDR. FLETCHER:** Yes, sir. I've got full access to all these documents.

Some of the files have been converted to PDF. Everything we're getting is pretty much PDF. I wouldn't say a hundred percent of it but most of it is, which doesn't make it easy for data extraction. We went in 2014, back in May -- this is what I was just discussing a minute ago, that we went in and --

**MR. MASLIA:** Chris, just to clarify, there were graphic image PDFs and not -- that's what we ran into. They're just graphic scans.

**MR. PARTAIN:** They're not searchable.

**MR. MASLIA:** No, and even if you do OCR, where you start dealing with numbers and it's not recognizing them, so they're not -- they're -- so that's what makes you have to, then, go in page by page and see that they're graphic image PDFs.

**MR. ENSMINGER:** Yeah, we've been there. We did page by page, all those on that disk.

**LCDR. FLETCHER:** So here's a screen shot of the EMD library. It's a SharePoint site. If you're familiar with Microsoft programs, a SharePoint site's (indiscernible). So you see there some of the different groups they have or at least their acronyms.

The next data source we're looking through, or will eventually, is for the Installation Development Division. They do not have a web portal. They don't have an exportable index of document titles. It's only available on base.

Basically what our intention is to send them the documents, or rather, the building numbers of interest, once we have a complete list, which is a pretty long list at this point, of buildings that we're looking at. And then request documents relevant to those buildings.

Next data source, the Industrial Hygiene Database. There's no web portal to this. They have two Microsoft Access databases. They kind of divided them up to pre and post-2000. I don't know why; that's just the what they did. So we've got them both. The pre-2000 database has approximately 22,000 records; the post-2000, approximately 26,000 records. Most of this database was put together for OSHA sampling and OSHA compliance for its personnel monitoring. There is some air monitoring and some general area monitoring, and we're looking through that now.

Just a quick snapshot, to help you understand what we've got in there, out of the pre -- in the pre-2000 database, out of 22,000 approximate records that are in there, when you search by building number, there are only 146 records that deal with building 1101. Similarly in the post-2000 database, there are only 480 records that deal with building 1101. There's not a tremendous amount of data in there but we are looking and considering looking at all the data that is in there. Again, we search that by building number.

The next source is the Base Safety Database. There is a web portal they use in ESAMS, I think

that's how they commonly refer to it on base. It's just an acronym for Enterprise Safety Application Management System. It maintains records back to 2008 when they started using ESAMS. Prior to that they kept hard-copy records and managed those, I guess, per their record storage guidance. There's no way of exporting those documents from that system. We've done a search including building numbers, and so far have returned no results when we searched their system.

This database, the title looks like it would have a lot, I think, of what the CAP is expecting. But what is in it is -- basically it's an OSHA reporting system where they track inspections, inefficiencies, and incident and mishap reporting. It's kind of a triage system for workers. When workers call in and say, hey, I think there's something going on over here; I want you to take a look at it. This is where the call is tracked. Then they farm that out to someone else on base to go have a look at.

**MS. FRESHWATER:** So if someone smells gas in the building, they do that?

**LDCR. FLETCHER:** If they smell gas these days, I'm pretty sure they'll call the base 9-1-1 system,

which I'll get into in a minute. They could have called base safety in the past or they might still call base safety now.

**MR. ORRIS:** And there's no archival?

**LCDR. FLETCHER:** Prior to 2008, there are no archive records that I am aware of, and I have asked for those. They apparently --

**MR. ORRIS:** I find that hard to believe.

**MR. ENSMINGER:** There's no what?

**MR. ORRIS:** There's no archival records prior to 2008.

**MR. ENSMINGER:** For what?

**MR. ORRIS:** This database.

**LCDR. FLETCHER:** The Base Safety Database.

**MS. FRESHWATER:** It's only 2008.

**MR. ENSMINGER:** Really.

**MS. FRESHWATER:** No hard copies, nothing?

**LCDR. FLETCHER:** I've asked and they said no.

**MR. PARTAIN:** They're probably with the well logs.

**MR. ENSMINGER:** Yeah, they're in the fly ash dump.

**MR. MARK EVANS:** Well, they're probably following a protocol which mandates them to maintain those records for a certain period of time.

**MR. ENSMINGER:** No, no, wait a minute. Not if you're a Superfund site.

**MR. MARK EVANS:** (Indiscernible). That part of it isn't being (indiscernible).

**LCDR. FLETCHER:** So here's a screen shot of the Base Safety Database portal. There's a couple of parts in this where we can go in and do some searching and we've done some. We'll do a little more but so far we've not returned anything useful.

So Camp Lejeune Fire Department, no web portal or index of document titles. This is an emergency reporting database, anybody contacted the fire department. We've sent our building numbers to the fire department, and they've sent back a few records, which I haven't had time to look at yet. I've got them sitting in my email account, ready for me to look at them.

They only keep the most recent three years of calls in their database. Anything prior to that -- I think they told me there's an archive system that is in an antiquated system and nobody can retrieve documents from that anymore.

**MS. FRESHWATER:** What does that mean?

**LCDR. FLETCHER:** I really don't know. That's all they've been able to tell me when I asked the

question can you access them.

**MR. MASLIA:** We ran into this. They -- even as -- and I say recent, when we were doing the testing in 2004 and 2005, the water utility data system was still using floppy disks and DOS. So when the floppy disk drive went out they would not get approval to buy a floppy disk replacement to read. And my suspicion is that's the same issue here. I won't tell you how they (indiscernible); that's a story for another time. But that is, I will say, probably they say they can't retrieve it; it's probably either -- it may even be on an old DOS system or --

**MR. ENSMINGER:** Probably.

**MR. MASLIA:** -- or Windows 3-point-something, with floppy disks. And you do have the issue with floppy disks they're probably brittle.

**MR. ENSMINGER:** MS-DOS was their main operating system in the past.

**MR. MASLIA:** Yeah, and so that's most likely what they are referring to.

**MS. FRESHWATER:** Can we get clarification on it?

**LCDR. FLETCHER:** I've already taken the note and I'll get some clarification on it.

**MS. FRESHWATER:** Thank you.

**LCDR. FLETCHER:** So other sources, the contractor sources, which they've got numerous contractors. CH2M Hill and CATLIN are their largest contractors, they use most frequently. They maintain the analytical databases and databases' documents as well as GIS data. They do not have an exportable index of document titles.

So far any time we've made a request, they've needed to go to their contractor and pass their request to them, it's been responded, so I feel like we've gotten what we need from those data sources.

Camp Lejeune Public Works, they maintain as-built drawings and design and this is the vault, for everyone else in the room, that Jerry mentioned earlier. We'll request drawings and data from them later, as we investigate buildings of interest.

**MR. ENSMINGER:** Were you at the vault?

**LCDR. FLETCHER:** I've been in the vault, yes, sir.

**MR. ENSMINGER:** Do they still have armed guards at the vault?

**LCDR. FLETCHER:** Not when I was there, sir.

**MR. ENSMINGER:** They used to.

**LCDR. FLETCHER:** Additionally we're going to

review the documents gathered through the Data Mining Technical Workgroup, which was the data water modeling, Morris's documents. Hopefully those documents we will have seen and may have filtered some out and may have filtered some in through our search already as we go through their source of data. These documents all came from NIRIS or the EMD library, building 1101, and some of the other sources that we were looking at. But we're going to include these documents as we do keyword searches, to make sure that we don't miss anything there.

Other sources that we remain to look through are the US EPA documents, the site administrative record. There is no web portal for these. I think at some point we'll have a site visit, I guess, for lack of a better word, to the regional office, to review their hard-copy documents, which is here in Atlanta so that should be easy.

**MR. ENSMINGER:** Yeah. Not many there so you won't have any problem flipping through them.

**LCDR. FLETCHER:** That's what I've been told. We're going to take a scanner and go do our best.

So the North Carolina Department of Environment Natural Resources has an administrative record. They have a web portal available to the public, so

for those of you on the CAP, you want to jot that down.

**MR. ENSMINGER:** Where is that?

**LCDR. FLETCHER:** There on the bottom, sir. They call it CARA, which is, I think, a manufacturer -- the company they bought their web portal software through. I don't know what CARA stands for. I don't think it is anything meaningful. Anyway so that's what they call it, their CARA portal, at the very -- the bottom there.

So they've got a little over 6,200 document titles that have something to do with Camp Lejeune. I've got an export of that sitting on my desk top. That's in the queue to look at. What the North Carolina folks have told me is that most of those documents are their comments and write-ups and mark-ups on documents that we most likely will have already seen in the NIRIS database. So we'll do a comparison of titles and review those documents if necessary.

**MR. ENSMINGER:** How long have you known about this?

**LCDR. FLETCHER:** A few months.

**MR. ENSMINGER:** Okay, now, the reason I asked that, this goes back to what you said earlier about

improving communications with the CAP. Why couldn't we have been told this, that this was accessible months ago? I mean, this is what -- I mean, you want to improve the communications? We need -- I mean, you could have sent this to us via email, where we could have been looking at this stuff months ago.

**MR. GILLIG:** I apologize, Jerry.

**MR. ENSMINGER:** But, you know, that's my main beef with the communications and the lack of them. I mean, we have no back and forth between you guys and us at all. We want to help.

**MS. FRESHWATER:** Free labor.

**MR. ENSMINGER:** Unfortunately it's free.

**MR. GILLIG:** We gave you cookies.

**MR. ENSMINGER:** And Mike's not allowed to have any.

**LCDR. FLETCHER:** So here's a screen shot of the North Carolina database portal. You can see they've got some different search criteria you can use at the top, and then it displays a list of documents at the bottom. And you can open those documents and save them to a hard drive.

**MR. ORRIS:** And that's a public access?

**LCDR. FLETCHER:** Yes, sir.

**MR. GILLIG:** Yes.

**LCDR. FLETCHER:** Does everyone have that web address written down?

**DR. FORRESTER:** It's in the hand out.--

**LCDR. FLETCHER:** So the next resource is one I mentioned earlier, the MCI East Regional Geospatial Information Services. No web portal, no index of document titles. They don't really have documents per se as they do GIS files, different layers to put into our mapping software. The layers that they have anything to do with Camp Lejeune will be made available to me, and I've requested them all. So we have them all.

The last source is the Petitioners' Documents or documents submitted by the CAP. Those are included in our keyword searching and in our review, and will be given special attention to make sure that we're looking at what you found in your searching and highlighted as noteworthy. So we will definitely review the documents and include the data contained within.

That does it for the data sources that I'm aware of today. If we uncover other data sources as we go, we'll update you as we go. Or if you uncover data sources that I haven't discussed today, you can

please share that with me. I'll be sure to look through them. What questions do you have for me?

**MS. FORREST:** I have a question about the Navy action items; you had Navy/marine Corps. It looked to me like throughout your presentation you identified the databases that had an index. Isn't that what you're asking me to do? So you're just asking for the Navy/Marine Corps to look at your presentation and verify where you've indicated that there is or is not an index? That's what I'm confused on.

**DR. FORRESTER:** Can you verify which one -- they want to know actually the title of every document in the database, right?

**MR. PARTAIN:** No, we want the index.

**MS. FORREST:** They want an index. And Chris has indicated under each one of these data sources whether or not an index was available, which sounds exactly like the action item you just --

**LCDR. FLETCHER:** So I think you're asking -- they want a copy of the index that we know exist. And for the sources where I don't have an index, because I've been told it isn't exportable, they want an index of those documents from those sources. Is that right?

**MR. ENSMINGER:** Yeah.

**MR. PARTAIN:** Correct. Thank you.

**LCDR. FLETCHER:** No questions? I answered them all. Excellent, my work is done here.

**MR. ENSMINGER:** You think.

**MR. GILLIG:** We're just getting started. So as you see, there's a ton of data sources. There's thousands of documents in each of these and it takes us a lot of time to go through them. I mean, they're all PDF documents, and when it comes down to it, we're going to have to extract that manually. And what that means is open an Excel spreadsheet on one screen, open the PDF on the other, and type into the Excel spreadsheet what we're seeing in the PDF document. Then once that's all done, throw it in a database, which that's actually a pretty easy step, put it in the database. Then we can start running statistics and take it from there.

**MR. ENSMINGER:** You're not telling us anything. We've done it. We've been through it.

**MS. FRESHWATER:** Can she -- can you help facilitate the updates to us as we -- as he goes? I mean, even if it's small gains. You said you had emails that you hadn't opened. You know, even if it's a small gain, it would be worth getting it in

little bits instead of --

**LCDR. FLETCHER:** Progress updates?

**MS. FRESHWATER:** Yeah.

**LCDR. FLETCHER:** Yeah, I'll be happy to do that.

**MR. GILLIG:** We can cover that on the monthly calls.

**MS. FRESHWATER:** Okay. That would be great.

**MR. ENSMINGER:** We went through all the CERCLA and CLW documents, page by page --

**LCDR. FLETCHER:** I know your pain.

**MR. ENSMINGER:** Huh?

**LCDR. FLETCHER:** I know your pain with document review. It's not an easy process.

**MR. ENSMINGER:** Hey, but we found some real gems. On documents that you would have never thought that there was any useful information on them. All of a sudden somebody in a meeting blurts something out. Wow.

**MR. PARTAIN:** I mean, you were asking about us discovering things, that's how we find it. And I mean, we're not going to rely on the Navy/Marine Corps to send us an email saying, hey, and by the way we had this document archive --

**MR. ENSMINGER:** We found this damning

information you guys might be interested in. Oh, really?

**MR. BRUBAKER:** Yeah, it's -- allow me to make an observation here. There are really two strong competencies represented in what I hear coming from the citizen CAP members and the ATSDR folks. There's a macro -- how do we sift the ocean, get it on the one map that we can trust foundation. Then there's a very different form of search in there, that you were describing, which is find something, looks interesting, sniff it out, follow it and see where it leads. Both of them seem to have value and have produced valuable results. My question for you guys, since we're a little early, is what agreements do you need to have with each other, knowing that both of those methods are going to be required in order to really get this thing forward? I hear a request for incremental updates, you know, there's a couple of letters and things that need to be exchanged. What agreements do y'all need to have with each other about how you're going to work this on both fronts? Macro, verifiable, solid database, reference and simultaneously give us something new to look at so we can see if there's anything interesting.

**MR. PARTAIN:** Well, the monkey wrench in that whole process is on the part of the Navy and the Marine Corps.

**MR. ENSMINGER:** Access to the documents.

**MR. PARTAIN:** Because as -- you know, shortly after we prove the value of what we've been doing for the past seven years, mainly going through the documents, putting stories together and helping Morris do what he was doing with the water model, the Marine Corps and the Navy started putting in, oh, this is FOUO, you can't show this to anybody, or this is going to show the distribution points of the water towers and lines and utilities. That's protected under the Patriot Act; you can't release that. That's what we've been running into for the past, what, three years now? About three and a half years. So and it has also hampered communications of ATSDR to the CAP, because, you know, every time ATSDR gets into a document archive or something like that, the Navy is putting conditions to not show us or not reveal a particular document to us.

**MS. FRESHWATER:** Because they know that Mike knows more than they do.

**MR. ENSMINGER:** Well, I mean --

**MS. FRESHWATER:** They know that he can find

things that they're not even aware is there.

**MR. ENSMINGER:** I mean, look at the water -- the stuff about the water systems when the water model was released. Oh, you cannot reveal the location of any wells, the water towers, which are humongous things that are painted red and white checkered, that you can see from the highway as you're driving by. And then when I testified to the Judiciary Committee in the Senate, I told Chairman Leahy, I said, I want to know when, you know, when are they going to develop a cloaking device for these water towers, okay? I mean, it's crazy.

**MS. FRESHWATER:** I know. They're not in camouflage.

**MR. ENSMINGER:** It's crazy. I mean, it is -- all it is is them protecting their butt.

**MR. MARK EVANS:** I was actually doing a lot of work in the national ground water data information in databases, and the rules changed. Unfortunately as a result of both the Patriot Act, basically all that information used to be widely available. That's how basically it's all gotten out there. But that changed. And then there went -- they went through this process of actually restricting data sources like that. So the rules changed. That's

all I can say.

**MR. ENSMINGER:** Well, I mean, here they are raising Cain --

**MR. MARK EVANS:** It's not like they're trying to hide --

**MR. PARTAIN:** Well, the Patriot Act was --

**MR. ENSMINGER:** No, wait a minute, wait a minute. When they came out and put their foot down about releasing different information on the water model, and they -- I mean, they, they dug their heels in on this one. And I went to the USGS's website, and right there on their website was the grid coordinates for every damn well that was located on Camp Lejeune, even the closed ones, and they're still there.

**MR. PARTAIN:** The law was passed but the actual enforcement was not an issue until the interactions of the CAP with ATSDR.

**MR. MARK EVANS:** Well, like I said, it did change and different agencies have implemented those changes at different points.

**MS. FRESHWATER:** Can you deputize us? So we can get clearance?

**MR. ORRIS:** As an auditor for Fortune 5 banks, I can tell you flat out that they never restrict

access to any document, and the ones that they do try to restrict access to are the ones I'm always interested in. And it's very disappointing that documents are restricted and that we cannot review them. That raises very big red flags for me.

**MS. FRESHWATER:** And that they won't come to this meeting still.

**MR. ORRIS:** Yes. I mean, we should have full access.

**MR. BRUBAKER:** So again, the question -- and then we can move past it and talk about what we'll do next, if it's getting close to -- the question is are there any other agreements that need to be made about how document processing and database architecture needs to be achieved in a collaborative way? I heard a request for incremental updates and I heard some specific deliverables around letters and clarification and formal requests for data, and I believe those are all owned by individuals at the table. Is there anything else we need to collectively agree to before we can move forward with the agenda?

**MR. ENSMINGER:** Well, we got the letter now, that was signed and it's going out.

**MS. SHEILA STEVENS:** And I will also send it

out electronically to all the CAP members.

**MR. BRUBAKER:** Excellent.

**CAPTAIN MURRAY:** I want to say something. When people go out and the doors are shut, they automatically lock except for that one, so just push it.

**MR. ENSMINGER:** I came in that door and it was open.

**CAPTAIN MURRAY:** Well, they may have that one padded if something was wrong, but just push because the handles are...

**MR. BRUBAKER:** Excellent. So we have a choice here. We're a little bit ahead of time.

**MR. ENSMINGER:** Let's go eat. I gotta make some more phone calls.

**MR. BRUBAKER:** Are you guys comfortable adjourning for a 90-minute lunch, reconvene at 1:00 o'clock?

**MR. ENSMINGER:** That's a typical time --

**MR. BRUBAKER:** We can meet a half an hour earlier.

**MR. ENSMINGER:** No, that's a typical military lunch is an hour and a half. It is.

**MR. BRUBAKER:** Ninety-minute lunch. We'll reconvene sharp at 1:00 o'clock.

(Lunch recess 11:22 a.m. to 12:58 p.m.)

**MR. BRUBAKER:** We're ready to begin our afternoon session.

**OVERVIEW OF SOIL VAPOR INTRUSION EVALUATION PROCESS**

**MR. BRUBAKER:** The first item on the agenda is an Overview of Soil Vapor Intrusion Evaluation Process.

**DR. BURK:** Hi, I'm Tonia Burk. I've been with ATSDR for about seven years now, and a large portion of that time I've spent working with vapor intrusion issues, researching the topic, reviewing a lot of the reports that go through our agency, and going to conferences and trainings, that sort of thing. So I'm just going to give you a, pretty much, a quick four-slide overview, or five-slide overview, of the vapor intrusion process and how we assess these sites.

The first slide is -- this is a generic figure of what vapor intrusion sites look like. We tend to have a source, which is either in the ground water or, or somewhere in the soil zone. And the vapor that vaporizes from the ground water or the vapors that are present in the soil, they are pulled up

into buildings because of the pressure difference.

When you have ventilation systems, where the house is heated, or even in some cases air conditioned, there can be pressure like a vacuum. And the house sucks up, or the building sucks up, vapors into the building through the cracks in the foundation and the slab or through the crawl space.

And the way that we assess these cites is we try to figure out how much attenuation is occurring from the chemicals in the soil area or the ground water area to the indoor air area, because we're mainly interested in the indoor concentrations and what people are exposed to for our health assessment.

There's a lot of factors that affect this process, hydrogeological factors, such as if you have bedrock or a solidish clay area, that would block the vapors. And if you have high soil moisture, that can sort of block the vapors flowing through the soil pores. If you have gravel or sand, the vapors -- it's very porous and the vapors just flow right through there easily.

The next slide, another factor that affects the vapor intrusion process a lot is what type of chemical you have, whether it's chlorinated or

whether it's petroleum or oily. And the main two differences would be this: one, whenever you have a high level of chlorinated chemicals or chlorine chemicals, they'll separate into a separate phase like an Italian dressing, you have the oil and the water phase. So it’s important to separate phase. But chlorinated chemicals are denser than water so that separate phase will sink to the bottom of the ground water.

If you have petroleum, it's lighter than water so it tends to float on top of the ground water surface, the aquifer surface, like an oil slick underneath the ground. And petroleum, it degrades with oxygen really easily. It, it tends to degrade as it approaches the surface because oxygen is defusing in from the surface. And the chlorinated chemicals it takes a lot longer for them to degrade. Petroleum tends to degrade over a period of decades pretty substantially, but chlorinated chemicals require much longer to degrade.

**MR. ENSMINGER:** Well, we found documents where they have found pockets of gasoline at the Hadnot Point fuel farm that showed no weathering and no breakdown whatsoever. This stuff was pristine.

**DR. BURK:** Okay. And that's one of the things

that we have to look at. If there's no oxygen that's penetrating through it, it doesn't degrade. If it's very deep, it doesn't degrade very quickly. And the more volatile chemicals tend to come off as it weathers, like benzene, its vaporizesoff faster than other less volatile chemicals. So I haven't looked at the data for the site. I'm only just sort of giving technical assistance. Mark may be able to provide more information.

**MR. ENSMINGER:** And also at Camp Lejeune, they had confining layers of clay that were incomplete layers that would go for a ways and then just fizzle out, and you had deep sand that would allow a DNAPL to go down deep. But by the same token, any of those areas where you had a confining layer of clay, it was keeping them up there.

**DR. BURK:** That can occur and is called a perched aquifer.

**MR. ENSMINGER:** So you're going to have to have the geology of all -- where all these plumes are located for your evaluation.

**DR. BURK:** So given that we have all these factors that make it difficult to assess vapor intrusion and how we have the subsurface heterogeneity and all these building factors, how do

you put a number to vapor intrusion to how much is getting into the actual air? The method that is used by EPA and all the guidance that's out there is attenuation. They measure the attenuation from the source zone, which is either in the soil or ground water, they measure that attenuation as it moves to the indoor air. So they do a ratio of the indoor air to -- indoor air concentration to the concentration in the media. So for example a soil gas, a sub-slab gas attenuation factor would be the ratio of the indoor air concentration to the soil gas concentration beneath the slab, and similarly for water.

And there's really a great deal of variability from vapor intrusion. Over a year there tends to be a change in a factor of about 100, because in warm weather you may open the windows and doors and have a lot more dilution of the air. In the winter you may run the heating a lot, and that's pulling a vacuum from underneath and pulling all the vapors indoors. So it can change a lot from season to season, and even from day to day, if it rains or if there's barometric pressure changes from the weather, that can change.

So any time they do measurements they usually

do measurements for 24 hours or eight hours, whatever people are exposed during the day. And that's just going to be an estimate of what people are exposed to but it does vary a lot.

So the approach that most of the guidances use is called multiple lines of evidence approach. The EPA has draft guidance, and they've been trying to finalize it for 12 years. We have a draft guidance we just received peer review comments on and we're trying to get through those as fast as we can. We've only had them -- we got the last few this week. So we're still working on those to come out with a guidance that's easier for our health assess research teams. EPA's guidance is 200 pages so it's really complex. Ours is like 38 pages, I think.

But the meaning of multiple lines of evidence approach is generally that you have to have a site-specific approach for each site. You have to look at all the factors that are affecting vapor intrusion, and you want to assess what the range of exposures people are experiencing at the site in indoor air, because there's not just one level that they're exposed to. And I already mentioned some of the things that can affect it: seasonal changes, ground water depth and flow direction, distance from

the plume. And also if they've got any mitigation systems or remediation like soil vapor extraction, that's obviously going to make a big difference in how the vapors are flowing and what's there and what's going to be over time.

And also we have to deal with the fact that if you do indoor air measurements, a lot of times there's background sources, such as gasoline is used frequently in Tiki torch fuel, a lot of commercial products, dry cleaning clothes. A lot of these chemicals are present as background indoor air in normal homes that aren't exposed to chemical environmental sources at greater than ten to minus four cancer risk level. So we just have to try to figure out what/where the source is.

And then after we look at that, we can also do modeling and compare the model results to what we've seen in the sample data, to sort of calibrate the model, so to speak, and to see if all the assumptions that were made in the model are matching up with what we're actually measuring. And that's pretty much how we try to assess how much uncertainty is in the indoor air levels we're using to assess vapor intrusion.

**MR. ENSMINGER:** Now, are you talking about

going to Camp Lejeune and actually going and taking samples?

**DR. BURK:** I've not been really involved in that part of the project, but usually we use samples collected by EPA or contractors. We are not sampling -- we're not equipped to sample in our division. We do have a small exposure investigations unit that does that, but that's different. I don't know what they're criteria is for doing that.

**MR. GILLIG:** Jerry, at this point, we have not planned on collecting samples, indoor air samples, at Camp Lejeune. We want to see what data's out there, so we're still in that process.

**DR. FORRESTER:** And also we need the old data for the historical part. We can't reconstruct the past so we need the old data sets. The problem is even if we did exposure investigation, we couldn't collect enough data over time to show all the variability. We don't want just a snapshot in time. You want to make sure that all potentials exposure. So reviewing the data sets that we have, better answer the question.

**MR. PARTAIN:** Well, we do know that an exposure took place.

**DR. FORRESTER:** Yes.

**MR. PARTAIN:** And that there was results -- or you know, resulting exposures to personnel on the base. In the process of doing this vapor intrusion study or investigation, if, you know, what are you going to do with it if you find that -- you know, you have some findings in the Hadnot Point area or even in Tarawa Terrace, where these contamination plumes are? Would ATSDR then look to see if any current personnel and families are being exposed? I mean, that's something -- these contaminants are still in the ground, and, you know, we have a pathway that was recently ongoing up until the early 2000s.

**DR. FORRESTER:** We found ongoing exposure for most sites. Our general approach is to recommend additional sampling or if it's critical, recommend mitigation immediately.

**MR. ENSMINGER:** You got to look at what land use and building use controls have already been put in place also.

**DR. FORRESTER:** I think Mark will explain a lot more of this in his presentation to the whole process, from past to present to looking at the future.

**MR. PARTAIN:** I know things have been done at Hadnot Point but my concern would be Tarawa Terrace and the PCE, TCE plume from ABC One-Hour Cleaners. And I mean, they've bulldozed the houses over there and rebuilt houses up and everything, but are those families still in danger? That's one thing I'd like to see come out of this as an end point.

**MR. ENSMINGER:** Well, at Hadnot Point, you know, especially in the industrial area, those buildings were constructed in '41 and '42 for the most part. And I can attest to the fact that over all those years, I mean, they were going in those buildings and drilling holes to mount different pieces of equipment to the floor, and the slabs cracked. I mean, you know, those -- the decks in those buildings were just horrendous, and those were avenues for all that stuff to come right up into the buildings. They had utilities, especially utilities.

I mean, they had a pipeline that came from the fuel farm, came down Ash Street and then cut across by building 1111 and 1114, and went all the way down through the industrial area down to building 1601 down in the southern end of the area. I mean, those -- and those were fuel lines so that they

could transfer fuel without doing it through a vehicle; they did it through pipe lines. And those pipe lines were -- yeah, conduits.

**MS. FRESHWATER:** When I was on base last October I was riding around, looking at some of the wells and just trying to get a sense of space between things. And I know that when I was riding around the fencing, where -- I think it was 201, 201, where they had fenced it off, and right along the fences there were still buildings where they were storing, it looked to me like vehicles, you know. And I just thought, well, where do they decide to put that fence? The, the guys that are still working in that building are safe on the other side of that fence? But yet it's dangerous if you walk on that side. You know, it just -- it was a little worrisome to see that they were -- they still had guys working that close, quite literally on the other side of that fence. And it was not -- I mean, there were guys in there. It wasn't a place not being, you know, used just to store vehicles or anything.

So I would just like to say I second, third, whatever, that I have a lot of concerns, just since I've been trying to catch up with vapor intrusion,

so I wouldn't be clueless when I walked in here, completely clueless at least. And it's definitely raised the alarm in my mind, and I can understand, I think, why it's such a -- it can be such a controversial issue with EPA, because, you know, it's -- a lot of money's going to be involved with a lot of places, a lot of dry cleaners across the country and all that kind of stuff.

And that was my next question to you. It seems to me, from what I've been able to read, that the EPA really hasn't kind of come down with hard guidelines yet or that it's kind of a moving target. Is that true now still?

**DR. BURK:** That's correct. They have a draft guidance and they put it out for public comment about a year ago, and they still haven't come out with a date that they're planning to finalize it.

**MR. ENSMINGER:** That's done on purpose.

**DR. BURK:** It's taking a long time. And that -- I mean, the guidance that they have out was published in 2002 and they haven't published anything since then, other than a series of technical documents. If you Google EPA and the word vapor, the first thing that comes up is the EPA vapor intrusion website, and it has a dozen or so

documents on there about vapor intrusion. And they're saying that when we come out with a guidance it's going to mainly be based on these documents.

**MS. FRESHWATER:** Right. I think I looked at those.

**DR. BURK:** And they have a FAQs page about frequently asked questions, that's really helpful for understanding most of the aspects of the technical stuff and a screening spreadsheet. And they also have a petroleum vapor intrusion guidance that's in draft, and that petroleum guidance is available at EPA's underground storage tank website. There's a link to that EPA vapor intrusion website. And that -- they're proposing a screening process for if there's ground water that's -- if there's contaminated ground water with petroleum, if it's more than six feet deep, they're saying that generally oxygen will degrade anything before it can migrate to indoors, and then it can be screened out. And they're saying that there's -- I'm sorry, 15 feet. And if there's an LNAPL six feet, they're saying it can be screened out. But I'm less familiar with the petroleum vapor intrusion work and how well that guidance is being received, so I can't say anything for certain.

**MS. FRESHWATER:** Just my gut. When I'd started -- I was looking through that site and just my gut was anything that looks like this means that there's going to be a lot of cost involved with what they say.

**DR. BURK:** Yes. And because there's so much variation, like over space, from one house to the next, there can be a hundred-fold difference in the vapor intrusion, just because, you know, like you said, there may be this clay layer under one, may be the heating and air conditioning's different in one. But it's really -- it's much harder than drinking water where you can just look at what's coming out of the well and see what people are drinking.

**MS. FRESHWATER:** I printed something out, and they said that rodent tracks -- they've seen rodent tracks become a pathway.

**DR. BURK:** I've heard that.

**MS. FRESHWATER:** Very difficult to know which house has rodent tracks.

**MR. PARTAIN:** Well, we've also had, was it last year, where families have -- well, one family in particular gave documents showing that the fuel -- fuel oil storage tank, that they used for the

heating of the house, had leaked and leaked petroleum products under the house, and they actually ended up demolishing the house or had it fenced off. And a lot of these houses on base had those tanks, and they've been in there, what, since 1950s and --

**MR. ENSMINGER:** 'Forty.

**MR. PARTAIN:** 40s and 50s, and those were leaking too. They weren't picked up under Morris's study because they were too small, didn't really, from what I -- I don't want to misquote Morris, but they -- when we discussed it with him, it was basically too small to really affect the ground water and where it wouldn't show up in his model, and yet this is something that would affect the vapor intrusion, I would think.

**DR. BURK:** Yes, we have a source that's just right under the industrial buildings.

**MR. PARTAIN:** Yeah, these tanks were -- were they above-ground, Jerry?

**MR. ENSMINGER:** Underground.

**MR. PARTAIN:** Underground, so.

**DR. BURK:** I haven't heard of many sites where they just gave up and demolished buildings because of vapor intrusion.

**MR. ENSMINGER:** They had to do that.

**MR. PARTAIN:** There's at least eight at Camp Lejeune, industrial buildings. And then this one house that this family --

**MR. ENSMINGER:** Several houses.

**MR. PARTAIN:** -- notified us about. So and we've got the documents on that too.

**DR. BURK:** Okay. Usually the, the vapor extraction systems that they installed work pretty well, similar to radon systems.

**MR. PARTAIN:** Well, they were trying all kinds of measures, like they did the trenching around 1101. They made some trenching around it, trying to draw the fluids out and the vapors out, and nothing worked apparently. You got that.

**DR. BURK:** But we do --

**MR. ENSMINGER:** Yeah, they drilled a monitoring well inside a building.

**MS. FRESHWATER:** Seems like the perfect place to study.

**DR. BURK:** Yes, they usually, when they have a slab in a building, they usually drill several, I think, per so many hundred square feet, they'll recommend that sub-slab gas port be drilled in a certain amount of area under the buildings, so that

they can actually see. 'Cause it does vary across the slab. A lot of times you can have like structural supports that are underneath the slab like concrete walls, so to speak, so it can block off vapors from moving from one side to the other. Which we have like the venting system that's causing the air to be pulled up more on one side of the house than the other, under the slab.

**MR. PARTAIN:** Now, did we provide y'all with the documents from what I was talking about, with the family that found their house bulldozed, fenced off, and it was from the UST from their home? Did we give those to them?

**DR. BURK:** Do you have them, Chris?

**MR. GILLIG:** That doesn't sound familiar.

**MR. PARTAIN:** I mean, is that something that you would value for your vapor intrusion project?

**MR. GILLIG:** Yes.

**MR. PARTAIN:** Okay. Then we'll find them and give them to you.

**MR. ENSMINGER:** They're on those thumb drives.

**MR. PARTAIN:** Oh, they are?

**MR. ENSMINGER:** Yes.

**DR. BURK:** Well, I'm going to stay in the room. So if you guys come up with any other questions, I'd

be happy to answer.

**MR. BRUBAKER:** Thank you, great. Little be ahead of schedule, we'll turn to Mark for a deep discussion of the process. Would you like to come up here?

**DISCUSSION ON SOIL VAPOR INTRUSION EVALUATION PROCESS**

**DR. EVANS:** Okay. Basically we're going to -- in order to implement the process, the timings described, we're going to have identify the buildings of concern, looking at a building's specific air contaminants, building characteristics that may affect VI. The main industrial buildings are going to have completely different exposure characteristics in terms of intrusion than, for instance, say any small residential structure. We're going to have to define the exposure factors for the building occupants, who's in those buildings. Are they, in terms of the industrial area, are they civilian workers, are they military personnel, how long are they there, kind of, how much are they occupying those buildings? And that actually gets back to characterizing the specific contaminants. For most of the -- the most conservative screening values that we're looking at

are basically for lifetime exposures, very long-term exposures, for cancer evaluation. So if a Marine is on base for three years, that's different than, for instance, a civilian worker that may be there 15 years. Eight hours a day versus in a barracks or a residential occupation. So basically we have to identify the populations and the exposure factors of those populations, how they're being exposed, who's exposed, how often and how long.

**MR. ENSMINGER:** And you got to take into consideration they were drinking it also.

**MS. FRESHWATER:** Yeah, that was my next question, the --

**DR. EVANS:** If the vapor intrusion occurred in areas where they, for instance, on base, so yes, absolutely. It's a potential for a cumulative exposure. So basically what are the contaminate concentrations that we can ascertain, either current or historic? And then finally determine if those potential vapor intrusion exposures occurred at levels of health concern.

So we're not starting from zero on this process. There is a really extensive vapor intrusion study that was conducted at the base beginning about 2007. So beginning about 2008

they've been collecting indoor air samples, soil gas samples, ground water samples. And the process was iterative. Basically they identified all the buildings within a hundred feet of contaminated ground water, and then used a variety of different screening levels to determine whether or not they needed to take the next step which was to install soil gas monitoring or indoor air monitoring.

And one of the things they did, Tonia again mentioned, the attenuation factors. For many of these buildings they actually calculated building-specific soil gas to indoor air attenuation factors. So that's actually something -- and that's empirical data that can be used both for current exposures as well as evaluating historic exposures, so that's a really valuable piece of information that takes us beyond typical modeling to the point that we're doing -- we can do semi-empirical kinds of evaluations of historical data.

**MS. FRESHWATER:** I have a stupid question. When you say they, is that the Marine Corps or the EPA?

**DR. EVANS:** It was the Marine Corps -- CH2M Hill, through the Marine Corps, was contractor for -- to the base.

**MS. FRESHWATER:** CH?

**DR. EVANS:** CH2M Hill is a large environmental consulting firm.

**MS. FRESHWATER:** Thank you.

**DR. EVANS:** So on top of that, they actually, as a result of that process, they've expanded the number of soil vapor extraction treatment systems that they've put in different buildings, so I think that they're up to about 20. Twenty different buildings have treatment systems for extracting soil vapors. And this process is continuing. So they've monitored the effectiveness, efficacy of those systems to make sure that they are protective of current conditions.

**MS. FRESHWATER:** Do we know those buildings?

**DR. EVANS:** Yeah.

**MS. FRESHWATER:** Are there any schools?

**DR. EVANS:** No. And so we've got a lot of data there, okay? And that runs the gamut from indoor air, beginning about 2008, and through current conditions. They're continuing to monitor that different times of the year. So that's a really good data set.

There are several problems with that, from a vapor intrusion perspective. Again, this started in

2008, so any assessment of historical conditions. By the time they actually were doing this vapor intrusion assessment, the major proportion of the fuels in the industrial area had already been remediated, either extracted or they reduced the footprint of free product. I mean, it's continuing but they've essentially instituted remediation procedures which make direct linear interpolation of current conditions backwards very difficult.

**MR. PARTAIN:** Well, a lot of the early -- when you say remediation of fuel and everything, they were having all kinds of problems with their remediation protocols. When the air (indiscernible) deactivated, the stuff was coming up in building 1101.

**MR. ENSMINGER:** They tried to blame it on that.

**DR. EVANS:** Well, they were --

**MR. ENSMINGER:** I thought you said you can calculate back from --

**DR. EVANS:** What, what we can do, we do have several lines of evidence. The next piece of information we got, beyond this kind of current vapor intrusion study, is we've got the modeling that ATSDR and Georgia Tech did for looking at LNAPLs and ground water contaminants for the fuel

facility area, for Hadnot Point, okay? So I'll illustrate this in a couple slides. But again, that's another piece of information that we can use for looking at historic exposures.

Then finally we've got a lot of environmental sample data, and that's actually what we're trying to document with looking at all of the available records and data points and things like that. But that includes ground water, air, soil gas, et cetera.

So these are the kinds of exposure scenarios that we're going to be looking at, at least for the buildings that look like they're going to be a potential problem. Civilian workers, these are actually the same exposure factors that Rob will discuss for the drinking water. So we're trying to be consistent across there, in terms of duration, frequency, lifetime, body weights, things like that.

Next slide. This is an example of some of the building-specific information from the CH2M Hill vapor intrusion study. That's building 3, which is related to the former dry cleaning --

**MR. ENSMINGER:** Dry cleaner.

**DR. EVANS:** -- area, building 25, in the Hadnot Point area. And this illustrates -- and it's a

really busy slide, and I put it in there on purpose because it illustrates that there's a lot of data. I think those green dots are indoor air samples in the building, and they're continuing to sample those. The yellow squares inside the building are soil gas values. So we've got that -- so already that shows you that we can describe empirical attenuation factors from soil gas to indoor air. And then there's a variety of different either soil gas or ground water values in different monitor wells around the perimeter of these buildings.

**MR. ENSMINGER:** And some of that stuff is sky high.

**DR. EVANS:** Some of the values are, but keep in mind that the ground water values are attenuated before they get -- there's a factor of about a thousand to 10,000 reduction in terms of the attenuation from the ground water to the indoor air.

**MR. ENSMINGER:** Well, they used those ionized iron shavings, slurry, to --

**DR. EVANS:** To try to remediate.

**MR. ENSMINGER:** Yeah. But it's still flowing.

**DR. EVANS:** Yeah, oh, yeah. And there's --

**MR. ENSMINGER:** I mean, it's headed toward the river.

**DR. EVANS:** There's still contamination there.

**MR. ENSMINGER:** And it drops off deep --

**DR. EVANS:** Right.

**MR. ENSMINGER:** -- after building 3.

**DR. EVANS:** And the other point that I'll add is --

**MR. ENSMINGER:** 'Cause I'm on the RAB.

**DR. EVANS:** -- in the fuel facility area, Morris's group already did ground water modeling. So we've got historical models, and this -- I'll show you what this looks like, but in this area, they didn't do that. And so they're currently working on that now. They're doing an analytical model. This is basically PCE and TCE for the -- from the former dry cleaner. And they only started -- they only switched to PCE in that facility in 1970.

**MR. ENSMINGER:** Yeah, they went from petroleum varsol.

**DR. EVANS:** In other words, basically cleaner, mineral spirits. So anyways, but there is a DNAPL there, and so we're looking at -- we know what kind of -- in this case, we actually have a really good idea of when the DNAPL was instituted, and then when -- so we can look at transport post-1970 for

this area, although we'll have to look at the varsol from about '41.

Okay, next slide. Okay, this is actually some of the results from some of the hydrocarbon plume modeling that Georgia Tech did. And this is actually looking at the footprint basically of either free product or LNAPL, circa 1951, I believe. And so you can see that there is actually a spatial outline of where the footprint is as well as a saturation level. So keep in mind what they call free product in the ground really isn't pure gasoline; it's some mixture of gasoline and water, even though it's much lighter than water and it's floating on top of it. So the saturation levels go from very low, and this is in percent, to about 20 percent. Okay, so we can use it.

So this -- yeah, next. So from that footprint, then, they did their contaminant modeling. And this is pretty difficult to see but in the -- it begins about 1951, and then there's different type of -- this is all upper most layer. And you can see that the spread basically, if you will, of the LNAPL and the dissolved component of benzene in ground water. And because of the way they did this modeling, this is actually -- it's on a 50-foot grid. And so

basically beneath -- we've got model data points for concentration values under each of these buildings, actually multiple data points under each of these buildings. And so this is a really good point to start in terms of looking at historical reconstructions of vapor intrusion into the buildings.

And next -- and okay, this is similar for the site 88, the dry cleaning building. That's a footprint of the PCE distribution, the DNAPL. And again, this is what we're having them expand now, looking at the expansion of the dissolution of PCE and TCE from that footprint and the down-gradient migration into subsequent -- down-gradient buildings.

Okay, next. So basically the site 22, which is the fuel facility, site 88, it’s got (indiscernible) you all are well aware. But this is the Hadnot Point fuel facility vapor intrusion evaluation. So for this, the primary contaminants are BTEX. There's also some PCE and TCE in different areas but much lower levels than the other area. So what we're going to be looking at, basically, it's historic vapor intrusion air exposures based on modeled and measured LNAPL and ground water

contaminations, using the models and the model results that we currently have available, comparing those and correcting those with indoor air models, basically, the EPA, there's a biovapor model produced by the API, the American Petroleum Institute, or the EPA has got similar models. Basically all -- they're all based on the Johnson and Ettinger transport model from subsurface to indoor air.

We've got building-specific data. When CH2M Hill conducted their vapor intrusion study, as illustrated in that past slide, there is a lot of characteristics of the specific buildings. They had the number of windows, the number of doors, the opening. They went inside, they evaluated the integrity of the slab as well as -- because they actually measured the attenuation factors, we know what those attenuation factors are from soil gas to indoor air. So that's really good empirical data.

And then we can compare that with -- if we come up with any good historic air data. Most of the air data I've seen so far, as Chris mentioned, was PID or FID data, which is piddly or diddly, I guess. 'Cause it's nonquantitative data, that you can't actually use in doing any kind of quantitative

evaluation. To your point about looking at that data in a temporal sense, very difficult to do because they were measuring different areas, different times. Most of the data that I've seen are either nondetects or nonquantitative detections, which means to say the it's -- the value --

**MR. PARTAIN:** There's something in there but we don't know what.

**DR. EVANS:** -- the value says less than. In most cases all it says is we can sniff a little bit of gasoline and that's about it.

Again, many of these buildings were mechanical transport vehicle maintenance things. They had many indoor air sources, so that was actually one -- again, that was something that was described and quantified in the CH2M Hill study uses. Now, some of them we'll have to go back to historic uses but some of those main buildings haven't changed that much.

So and then -- wait a minute. What was that last thing? Oh, and then the recent air exposures are based on measured current air evaluations. So there's a lot of data there. As I said they also conducted efficacy studies for the soil vapor extraction treatment systems. For the most part, we

looked at all those and they're all working. There's one or two questionable values. But again, what we have to be concerned about here, particularly for the venting, is, you know, long-term exposures. If somebody was exposed for a day, it's way different than exposed to levels for 15 or 20 years, because what we're looking at in terms of that is the cancer risks, which are based on chronic exposures.

**MS. FRESHWATER:** So like if you're pumping gas?

**DR. EVANS:** If you're pumping gas, you get a real snootful all at once.

**MS. FRESHWATER:** So but -- but I mean, if you -- I'm saying if you measured that same thing in a building, it would look like big danger but we do it every day.

**DR. EVANS:** Every day, right. And so -- and that's part of the problem with looking at some of this, this historic data. It's not in context, right? I mean, they may have gone -- well, let me -- there's one other thing. Basically they were using the OSHA standards as their benchmark, and there's two problems with that. First, the OSHA standard is not protective of health, okay? So their detection levels were way too high, which is

why we're getting so many nondetects, okay? And the other point, which actually goes to their industrial hygiene program, is that OSHA excludes fuel facilities, of which some portions of this were. And it also is not to be applied to vapor intrusion, because OSHA condition -- OSHA considers vapor intrusion an action or activity for which the work is not a normal workplace activity so they don't consider their standard to include vapor intrusion. So we actually have to make sure that we're separating benzene in the air from vapor intrusion versus benzene in the ambient air or something like that or pumping gas.

**MR. ENSMINGER:** So Hill environmental used OSHA standards?

**DR. EVANS:** No, no, they didn't. Their data is, is a good quantitative data set.

**MR. ENSMINGER:** Okay.

**DR. EVANS:** It was the base industrial hygiene that was using OSHA standards. I mean, that is standard operating procedure every place. I mean, that's unfortunately somebody needs to send them a memo.

**MR. ENSMINGER:** I'll do that.

**MS. FRESHWATER:** I knew that was coming.

**DR. EVANS:** This is kind of the process for site 88, the building 25 area, and the buildings -- there's a number of buildings associated there. The difference is the primary contaminants are PCE, TCE, and the difference is we don't have, you know, to the extent modeling but we're in the process of acquiring it for looking at the historical stuff. So we'll have to look at -- there's a little bit of benzene in varsol but it's much lower than there is in gasoline. It's on the few parts per million level as opposed to gasoline, that's about a percent.

**MR. ENSMINGER:** Yeah.

**DR. EVANS:** So anyway, so that's what we're doing there. Same basic process but again, we're having to do some modeling to look at historic exposures. Then we've got the building-specific data, we've got the recent data, and we'll have similar ground water, indoor air models. A little bit different because we're looking at chlorinated hydro -- chlorinated solvents versus hydrocarbons, but same basic principles.

Okay, next. So this is where we are. Identify the buildings of concern, confine the exposure factors, and then look at the contaminant

concentrations from current and historic.

And then finally, when appropriate, include cumulative exposures. For many cases -- okay, next is just a ubiquitous slide.

**MR. ENSMINGER:** I didn't see any illustrations of the DNAPL plumes. You had the LNAPLs there.

**DR. EVANS:** There was one with the building 25.

**MR. ENSMINGER:** Yeah, but I'm talking about --

**DR. EVANS:** There are other DNAPL plumes in the industrial --

**MR. ENSMINGER:** Big ones, yeah.

**DR. EVANS:** -- facilities. Yeah, but they're, at least, based on the CH2M Hill evaluation of buildings, it doesn't look like there's significant vapor intrusion. The build -- they're not over the buildings in those.

**MR. ENSMINGER:** They're what?

**DR. EVANS:** Right now, we're looking at all of them, but we're going to concentrate on the worst ones first. And then we'll step through the process, looking at the different levels of exposure.

**MS. FRESHWATER:** So what kind of activity is there on Tarawa Terrace?

**DR. EVANS:** Basically the same process.

**MS. FRESHWATER:** But I mean, are there any buildings --

**DR. EVANS:** The CH2M Hill study identified several buildings in there that were evaluated. Nothing that came and went through the multiple -- I don't know if they're doing any there -- any continuous air modeling -- air monitoring, because the soil gas levels -- basically what they looked at is whether or not there was contaminated ground water close to a building. And then if it was, then they looked at the levels. And if the levels were above a very conservative screening level, for ground water to indoor air, then they conducted soil gas samples. And then if those -- then they looked at those levels to find out if they -- if the soil gas levels exceeded screening levels to get the indoor air. And if they did, then they measured indoor air. So they measured indoor air -- although the process was base wide, how far they went on each step depended on what they found.

**MS. FRESHWATER:** So they built on what --

**DR. EVANS:** Right.

**MS. FRESHWATER:** -- evidence they were finding --

**DR. EVANS:** Right.

**MS. FRESHWATER:** -- and that kind of led them --

**DR. EVANS:** Right. And from that, they -- you know, the bases installed about 20 different SVE systems. And then they're continuing to monitor the different building, efficiency of the systems and things like that.

**MS. FRESHWATER:** Okay, so what about where there aren't buildings? I mean, this, I guess, might, you know, be a kind of a more broad question. Can you get vapor intrusion -- like when the guys are in the field? When they're --

**DR. EVANS:** It would be vapor extrusion, then.

**MS. FRESHWATER:** Extrusion.

**DR. EVANS:** And, and no, you --

**MS. FRESHWATER:** You have to have that pathway --

**DR. EVANS:** Well, you've got to have a condition where --

**MR. PARTAIN:** A gas chamber.

**DR. EVANS:** -- the atmosphere is contained --

**MS. FRESHWATER:** Right.

**DR. EVANS:** -- and so that it can accumulate.

**MS. FRESHWATER:** Right.

**MR. PARTAIN:** You have to have a gas chamber.

**DR. EVANS:** Otherwise, otherwise it's basically dissipated too fast.

**MS. FRESHWATER:** In the air, okay.

**DR. EVANS:** Right.

**MS. FRESHWATER:** 'Cause I had a guy ask me about that in particular, 'cause he used to camp out on the field, and he was like I drank out of, bulls? Is that the right thing, Kevin?

**MR. PARTAIN:** Buffalos.

**MS. FRESHWATER:** Huh?

**MR. PARTAIN:** Buffalos.

**MS. FRESHWATER:** Yeah, he called it bulls, so. 'Cause he was at Geiger and he said --

**MR. PARTAIN:** Evidently he had too much water.

**MS. FRESHWATER:** Yeah. He was at Geiger so he didn't think he had been exposed. And I had to, you know, remind him that he was a non-Geiger all the time.

**DR. EVANS:** It just depends on where they filled those buffalos. But anyway, so we've got a lot of stuff to evaluate. There's both data, there's models, and --

**MR. PARTAIN:** When looking at that, Mark -- when you're looking at the data -- and excuse me, my eyes are burning, dried out here some kind of -- is

there any sign posts or indicators that you would be looking for to show that things aren't on the up-and-up as far as testing? Is there any red flags that would show up or that you've seen as far as how they conducted tests? I know we talked about the PID and FID.

**DR. EVANS:** Right. No, actually for my evaluation -- I mean, CH2M Hill has produced a number of different reports and --

**MR. PARTAIN:** Well, I'm more concerned with -- yeah, the contractor reports I'm not worried about per se. This early OSHA, the hygiene unit testing and things that were done, it just concerns me that -- you know, without seeing the documents, I don't know. Something doesn't seem right, especially when they have the capability of testing, why are they doing that? I mean, is there a reason why they're doing what they're doing?

**DR. EVANS:** Well, I mean, it's pretty standard actually.

**MR. PARTAIN:** Okay.

**DR. EVANS:** You know, and I mean, I've seen this at other bases and other institutions and agencies. It's like that's how they -- they'll go in there first with a PID or FID and find out what

they've got.

**MR. PARTAIN:** Well, to me, if they walk in there and oh, there's something there, then you follow up with another test. And from what I'm hearing, there's no other tests done.

**DR. EVANS:** Well, in most cases, though, what they were finding was basically nondetects at that level or in a few cases some nonquantitative detections. And so based on that data, it's like it didn't appear to warrant a lot of follow-up.

**MR. PARTAIN:** So on the buildings, again, we do know that eight buildings were ultimately demolished. On the buildings where they did have issues and did take action, what was different in their procedure of walking in there with a PID or FID, that made them do something different? What happened? Can you tell that from the documents or?

**DR. EVANS:** No. Well, for instance, when did they demolish building 25?

**MR. PARTAIN:** I don't think they demolished that. I'm talking about the ones on top of the fuel plumes, the building 1101, 1102.

**DR. EVANS:** Okay, well, those are still there.

**MR. PARTAIN:** Well, no. I forgot.

**MR. MASLIA:** Building 25 was refurbished --

**MR. PARTAIN:** That's the dry cleaner one.

**MR. MASLIA:** Was turned into housing --

**DR. EVANS:** Okay, so it's still there.

**MR. PARTAIN:** Yeah, 1102, I think, is the one I'm talking about, where they turned it into -- it was a fleet data management center, and then it ended up being a warehouse, and then they couldn't do anything with it, and I believe they demolished it.

**DR. EVANS:** Well, several of -- actually I got the records for several of those buildings, I haven't gotten them all, but when I was going through this I asked Charity Richeck (ph) for kind of the history of several of the buildings, just to find out what was --

**MR. PARTAIN:** And that's what I'm after. I want to -- what made it, you know, obviously a different course of action was taken in those areas. Why there are not other buildings in --

**DR. EVANS:** In my -- I don't know, I would be speculating. If I had to speculate I would say it was because mediating the ground water basically required them to get rid of the building.

**MR. PARTAIN:** Okay.

**DR. EVANS:** And in other areas they could --

like to building 25, the DNAPL plume is actually kind of beginning at the edge of the building and then off because the tanks were not directly under the building; they were kind of just outside the building footprint. So that's where the plume started. So I don't think -- I mean, I don't think they had to destroy that, although several documents keep referring to former building 25, I thought.

**MR. PARTAIN:** It may have been repurposed.

**MR. ENSMINGER:** Well, building 25 is gone.

**MR. PARTAIN:** Okay.

**DR. EVANS:** That's what I thought. When did they -- when did they demolish that?

**MR. ENSMINGER:** Oh, Lord. Geez, I don't know. I'd have to go back and check my records --

**DR. EVANS:** Okay.

**MR. ENSMINGER:** -- but it's a parking lot.

**DR. EVANS:** Yeah, that's what I thought. 'Cause that's what the maps --

**MR. ENSMINGER:** It's a parking lot for the barracks.

**DR. EVANS:** Yeah. There were --

**MR. ENSMINGER:** They put a bentonite -- they put a bentonite seal under it.

**DR. EVANS:** Right.

**MR. ENSMINGER:** And they couldn't -- they couldn't stop the flow because right down at building 3, that's the gradient. Right there at building 3, the confining layer discontinued and it just dropped off, I mean, down the --

**DR. EVANS:** Yeah.

**MR. ENSMINGER:** And it's going now, it's down past McHugh Boulevard under the theater, what area the pool was at down there. But it's down underneath there and it's headed toward New River.

**DR. EVANS:** But the flip side of that is it's actually getting much deeper so the likelihood of vapor intrusion is actually going down in those --

**MR. ENSMINGER:** Yeah, true but --

**DR. EVANS:** -- in those buildings further down gradient.

**MR. ENSMINGER:** It's just headed out toward the shrimp, you know.

**MR. PARTAIN:** Threatened shrimp.

**DR. EVANS:** They're self-frying.

**MR. PARTAIN:** Spontaneous combustion.

**MR. ENSMINGER:** No, not with chlorinated solvents.

**MR. PARTAIN:** But I mean, that's what I'm getting at. I'd like to see what the determination

rationale was for them to do something further. I mean, even with the, you know, the data points, maybe we should look at the buildings they did demolish and trace back those histories and see what exactly happened to hit that triggering point so we can get an idea of what they were doing.

**DR. EVANS:** Well, from my perspective, from a public health perspective, when the building's gone, there's no more exposure at that building, and so I don't care. But what I would care about is --

**MR. PARTAIN:** They may affect other buildings that may be a borderline. That's what I'm getting at.

**DR. EVANS:** What I would care about is the previous history --

**MR. ENSMINGER:** That's right.

**DR. EVANS:** -- of that building. And so to that extent, yes, we will have to look at former uses. But why they, you know, demolished some buildings and not others --

**MR. PARTAIN:** I'm curious about them. Like I said, to get to the point of why they're going in to do that, I mean, there's a tipping point somewhere, and, you know, it would be nice to know what that tipping point is and what that rationale -- and

protocol --

**DR. EVANS:** Yeah.

**MR. PARTAIN:** -- for them to do that, because there may be other buildings where borderline, where they didn't do it, and there was an exposure that could be a problem.

**DR. EVANS:** And like I said, I would expect it's a cost-benefit thing.

**MR. PARTAIN:** Exactly.

**DR. EVANS:** The cost of the building versus the cost of the remediation.

**MR. ENSMINGER:** Well, and that RIFS that was written by Environmental Science and Engineering in May of 1988, they actually named the buildings that they were pinpointing for the precautionary measures to be taken and testing the ambient air quality in. They're actually listed in that report.

**MR. BRUBAKER:** Additional questions?

**MS. FRESHWATER:** We -- at the last CAP meeting, we talked about other forms of exposure like the guys swimming in pools and, you know, steam and all that. Where does that fit?

**MR. GILLIG:** That's in Rob’s presentation.

**MS. FRESHWATER:** Thank you.

**MR. BRUBAKER:** Thank you. We're a little ahead

of schedule here, and we are up for a short break. Want to take about a ten-minute break?

**MR. GILLIG:** Can we wait just a second?

**MR. BRUBAKER:** Please.

**MR. GILLIG:** Do you want to move forward to the goals for the vapor intrusion project?

**GOALS FOR SOIL VAPOR INTRUSION PROJECT**

**MR. GILLIG:** So, we have shared these goals via protocols, via the CAP meetings in the past. I just want to make sure we're all onboard with these goals for the vapor intrusion project. We've talked about the need to evaluate the health risks of past and current exposures; the presentations have talked about the procedures we want to apply to determine if mitigation has reduced exposures in those buildings where mitigation systems have been installed; and obviously we want to identify any current vapor intrusion exposures, and if we find those exposures, make recommendations so that those exposures are mitigated. Did we miss anything when we talked about these as the goals for the vapor intrusion project?

**MR. ENSMINGER:** Well, it's like I said, before you make any recommendations to them, you got to

look at what controls they've already got in place for land use and building use, so you don't make yourself look -- and, you know, get embarrassed.

**MR. PARTAIN:** And on the current exposures, I mean, I would assume that there is some type of central point or collective point for complaints, current complaints. You know, hey, come home, my house smells like gas or I walk into the office, it smells, you know, funny in here. Are you guys requesting those call-ins to see if there's patterns and things like that?

**LCDR. FLETCHER:** That's information we would glean from the fire department and 9-1-1 call center as well as the ESAMS, the basic database. That's where those two will be.

**MR. ENSMINGER:** Or if you have to come in to work and turn the faucet on and let it run for ten minutes to get the oil sheen off of the water you're using to make the coffee with.

**DR. EVANS:** I would expect those data may reside in different places. The complaints in the industrial buildings probably would be in a different place than they would have for the residential buildings.

**MR. PARTAIN:** It'd be curious to see if -- I

mean, testing may not be showing those borderline testing I mentioned earlier, but there may be consistent complaints coming out of buildings, hey, there's a funny smell in here. I smell gas or what have you. And, you know, like I say, you've got family housing in Tarawa Terrace where one house after family after family after family is calling in and saying there's something smelling in this house. They may not be doing anything about it but the fact that there's complaints may be showing something too and should be brought out and documented and looked into.

**LCDR. FLETCHER:** That's from a document that you're giving us today?

**MR. PARTAIN:** No, I'm just asking if you guys are looking at that. The one we have we're talking about was the family that came back and saw the house demolished and cordoned off with a fence saying, you know, environmental hazard, don't go here, don't enter. And then they went and got -- FOIA'd some documents about their house and found that, so we do have those.

**MR. ENSMINGER:** Yeah, that really did happen. This guy's a retired chief warrant officer five, when they made the superwarrant officer. He was

supply type. Their first home was the old houses, we called them the cracker boxes across the Wallace Creek there by the Marston Pavilion. They were the original houses for officers that were built on the base. Of course the junior officers are relegated to living in the old stuff. He retired out of the Marine Corps and got a job with a defense logistics agency, and he had to go to a meeting down at Camp Lejeune. So he got down there, and got there early, so he thought he'd go down memory trail, and drive over and look at the -- their old house, the one where they lived when -- two of their three children were conceived in that -- while they lived there. And he drove down the street, got there and there was this orange plastic fence around where their house used to be, and there was a hole in the ground. And signs on the fence: hazardous waste site, contaminated site; keep out. This guy went ballistic 'cause one of his children was born with a heart defect.

**DR. EVANS:** Do you know approximately what year that was?

**MR. ENSMINGER:** That was recent.

**DR. EVANS:** That he went back?

**MR. ENSMINGER:** That just happened, last --

this past year.

**MR. PARTAIN:** And again, he FOIA'd the documents on the houses and provided them to Jerry and I.

**MR. ENSMINGER:** They're on that data -- that thumb drive.

**MS. FRESHWATER:** I used to babysit in those houses.

**MR. PARTAIN:** I mean, that -- going back to my point, that's something that I don't know if you guys are looking at that or, you know, looking into something like that as a possible line of investigation to get --

**DR. EVANS:** We're trying to get records of odor complaints, evacuations, things like that. I mean, I've already requested the evacuations for building 1101, and we'll find out when it was occupied and when it was wasn't, things like that. So yes, we're looking for that kind of thing.

**MR. ENSMINGER:** Well, that was the fleet logistic service building. I mean, that's where -- everything that was ordered on that base went through there. I mean, that thing was manned for years and years and years.

**MR. ORRIS:** Are you requesting that information

from one of the talked-about databases? Is that where you're going to find that?

**DR. EVANS:** Hopefully.

**MR. ORRIS:** Is that the Camp Lejeune fire department database?

**DR. EVANS:** There may be --

**MR. PARTAIN:** That would be one of them, probably.

**DR. EVANS:** -- there may be some in there; there may be some of the other -- there are some other databases.

**MR. ORRIS:** 'Cause I thought that there was only three years of reports for that database.

**MR. PARTAIN:** Yeah, we do have some documents that reference the fire department being called out, and Jerry and I have talked to former --

**MR. ENSMINGER:** Well, wait a minute, wait a minute. When you think rationally about this, there was a PowerPoint that was put together by a contractor. We have the one from the industrial hygienist but there was another one that was done by the -- a report that was written by the contractor. It was like a PowerPoint presentation. And that contractor cited that there had been complaints for many years about vapors in those buildings. So that

stuff's recorded and written down somewhere or they wouldn't have gotten that.

**MR. GILLIG:** Are you talking about 1101 or --

**MR. PARTAIN:** Yeah.

**MR. GILLIG:** We have that. I think you provided that to us.

**MR. PARTAIN:** Yeah, that's in the documents we gave you.

**MR. ORRIS:** I find it hard to believe that 9-1-1 calls would not be kept for more than three years. That has to be a --

**MR. ENSMINGER:** Back in them days there were no 9-1-1.

**MR. ORRIS:** Well, even now, you know, you can't tell me that they don't keep it from 2010.

**MR. ENSMINGER:** Well, they do now, yeah. I mean, back at the time that this was going on --

**MR. PARTAIN:** No, wait. This was in the late 90s when the one surfaced.

**MR. ORRIS:** Yeah, I mean, even there in the 90s with these vapor intrusion complaints, you know, from a legal standpoint, you know, if there's a crime committed with 9-1-1, there has to be a record of that somewhere. Somebody's keeping these documents somewhere or these phone calls.

**MS. FRESHWATER:** What are the immediate physical symptoms that show up for when, just hypothetically say there's a sky high reading for vapor intrusion in the building. Do people get headaches? Do they develop asthma? What are the immediate symptoms that show up?

**DR. EVANS:** (Indiscernible).

**MS. FRESHWATER:** What?

**DR. EVANS:** It depends on what contaminant it is.

**MS. FRESHWATER:** So --

**DR. EVANS:** So yes, typically with hydrocarbons, you know, there will be irritation, things like that.

**MS. FRESHWATER:** Eyes --

**MR. ENSMINGER:** Eyes burning, nose burning.

**MS. FRESHWATER:** So all the things I would assume --

**MR. PARTAIN:** My skin's turning red like I usually do, okay.

**DR. EVANS:** Well, one other thing that is of concern, when I mentioned like long-term exposures to benzene, that is the -- there are some short-term exposure levels that we're looking at too, but typically for benzene, they're quite a bit higher

than the chronic level. For TCE that is not the case, where short-term exposures can't, for a certain subset of the population, can be significant. So we have to look at it a little differently for those contaminants.

**MR. PARTAIN:** Well, to wrap up the thing about the call-ins and stuff, if you guys do identify where this stuff is or where it's housed, I mean, I'd like to, you know, be able to look at it and see what was being called in -- you know, 'cause to me that's the -- that could lead to further investigation of where and what was going on and identifying hot spots of problems and stuff. But it's just curious that -- you know, that it only goes back three years and the other database didn't seem to have anything in it either. That information's somewhere, and it's probably pertinent and important; otherwise, you know, it just seems that, as with a lot of things with Camp Lejeune, the really -- when you get to the point where you can really find a pattern, that documentation's missing.

**DR. EVANS:** One of the things that I run into commonly at these facilities is we can't hold historic record keeping practices to the same standard that we expect of modern digital types of

information. So I mean, in many cases that's why it's hard to find older data, because it was written down, it never got entered into any kind of database, it's in somebody's file. How many people have turned over since that file was created? Who knows.

**MR. ENSMINGER:** But they can find it.

**MR. PARTAIN:** Yeah, but the thing is, Mark, with that is --

**MS. FRESHWATER:** Yeah, but I mean, if I can --

**MR. PARTAIN:** We have documentation brought back --

**MR. ENSMINGER:** They can find the pay records when they paid guys on Guadalcanal, by God, they can find the records from 1980s.

**MR. PARTAIN:** And when you look at the historical documentation, very early on, I think '83-'84, Bob Alexander was -- and he's on record talking about the need to put all these documents together and start storing them and keeping them, they don't. And then going back to the CERCLA document retention requirements, you know, this is --

**MR. ENSMINGER:** Well, you're forgetting one thing, Mike, that was the destruction file.

**MR. PARTAIN:** Yeah. That was the circulator file. But they -- you know, they identified them then, and then by '89 they were required to retain these documents for 50 years. And a lot of the vapor intrusion issues that we're talking about occur after 1989. And if you're dealing with someone calling in on 9-1-1, hey, you know, I've got fuel smell here in this building, it's on an identified IR site, there's no reason why those documents shouldn't be there. And we know they happened because, like Jerry mentioned, they're referenced in the contractors' reports as numerous reports.

**MR. ENSMINGER:** And see that's another thing that we really keyed on when we were doing our document searches, was what other correspondence was referenced in that document.

**MR. PARTAIN:** I mean, that's how we constructed the infamous Walmire (ph) letter. I mean, we were able to -- we don't have the letter. There's just no record of it being preserved, even though it should have been, but you can see where it's referenced in a chain of letters. And you get a pretty good idea that it's an action plan to remediate the ground water before they disclosed it

to the media and everything back in 1983.

**MR. ENSMINGER:** '81.

**MR. PARTAIN:** Well, it goes back to '81. He wrote it in May of '83. But going back to my point, like I said, it just seems to me, especially if we're looking at vapor intrusion, that's the beginning point of investigation. You've got all these complaints, especially if you see patterns where particular buildings are showing up. Yeah, we know they were destroyed but there may be marginal buildings that escaped because of the way they were testing with the sniffers, not doing the full thing, which may have been the protocol at the time, but, you know, it's something we need to look into, make sure in order to not only provide adequate warning for those who worked there but also for people who are still being potentially exposed on the base.

**MS. FRESHWATER:** My brother had severe asthma. We had to take him to the emergency room all the time, and we ended with my mom going to the emergency room with him turning blue. And when we moved off base it went away.

I don't think my house was over a plume. I was in Paradise Point, over by the river, so, you know, I'm not -- I don't know, but I know anecdotally, a

lot of people I talked to had asthma as children on base, and nosebleeds. That's another thing that I hear a lot, and my stepfather's nose was bleeding all the time.

**MR. MASLIA:** Well, there was TCE intermittently at Paradise Point. That was part of the water model. It was resolved but TCE was the one compound that did exceed the MCL.

**MS. FRESHWATER:** Well, it's hard for me to imagine that it wasn't connected in some way, you know, because it really did literally go away.

**MR. MASLIA:** But I mean, that’s a case of the drinking water.

**MR. PARTAIN:** And that's another point. You know, when we're talking about doing the historical investigations and documents for -- I mean, from the get-go, they insisted that there was no transferring between Hadnot Point and Holcomb Boulevard until we started finding the documents and the document references and trails that something was going on, booster pumps and the golf course, and lo and behold, oh, yeah, they were transferring water up.

And as Morris and the CAP started pressing the Marine Corps, first it went from never to maybe sometimes to oh, we were, you know, doing it during

the summer months. And, you know, God knows what the frequency was. But those were things that would not be developed unless we'd asked those hard questions and really dig into the documents.

**MS. FRESHWATER:** And I guess, you know, I know we can't go through medical records but wouldn't it be great to know what areas reported emergency room visits for asthma, you know.

**MR. ENSMINGER:** Well, we're speculating now.

**MR. PARTAIN:** That's why I'm going after with the call-ins on the smell -- you know, the vapor.

**MS. FRESHWATER:** Yeah.

**MR. ENSMINGER:** Okay.

**MR. ORRIS:** Even if you were to find that these records were still on tape, it's pretty common to keep some of those records on tape during that time period, if that's something if you found it on tape you would transcribe it and take a look at it? 'Cause I would imagine from the 80s and the 90s you're going to find these 9-1-1 calls on tape logs, recorded at the facility. Which of course there isn't a document then, you're just going to have a tape.

**MR. ENSMINGER:** Well, look at the school records. ATSDR went down to some place in

Georgia -- where, Alabama or Georgia?

**DR. BOVE:** It was at a fort.

**MS. RUCKART:** Fort Benning?

**MR. ENSMINGER:** Yeah, Benning. And they were on microfiche, then when they got them out they fell apart.

**MS. RUCKART:** But those were really old. I mean, you're talking about --

**MR. ENSMINGER:** It's like the parchment from the Egyptian tombs. You pick it up and --

(multiple speakers)

**MR. ORRIS:** I mean, if they're retrievable, if you come across that. And I would imagine that you're going to come across that; that's probably going to be somewhere there. Would you be able to transcribe that and use that in the investigation?

**DR. EVANS:** I would have to defer that question to Chris.

**MR. PARTAIN:** Well, I think we've beat that -- beat it in the ground enough.

(multiple speakers)

**MR. MASLIA:** (Indiscernible) are potentially linked from the drinking water. And I'll say from the 70s to the late 80s they wrote everything down

in --

**MR. ENSMINGER:** Log books.

**MR. MASLIA:** Log books, okay. And 'cause that's where we found a lot of the critical --

**MR. PARTAIN:** Pump data?

**MR. MASLIA:** Pumps going on and off and all that sort of stuff going on, in those log books.

**MR. ENSMINGER:** Transferring water.

**MR. MASLIA:** When Booz, Allen, Hamilton, whatever they called the... After that, when they went through for the drinking water, of course, they were just keying and filtering on the drinking water but they found the log books. So again, there may be -- but my gut feeling is that they kept -- you know, you're an operator and a call comes in, my gut feeling tells me that they would have jotted that down on a log book, because if you look at the water treatment plant, emergency or all that, every time a vehicle dropped a point of oil some place, they would call in and say, you know, the utility vehicle is broken down or this dog barked or this one calls in that their grandmother passed away. I mean, they would take -- they were under orders to write down any call that they got in.

**MR. ENSMINGER:** Yeah. You know, and talking

about all these data sources that you got, you know, there's got to be a simplified way of -- for them to make all those sources connected. I know you guys can't do it 'cause you don't have the staff or the expertise to do it, but they do. I mean, DOD has a budget and they have contractors that can do this kind of stuff. Didn't they do some of that stuff for the water model?

**MR. MASLIA:** Yeah, they did it inhouse but like Booz, Allen, Hamilton, when they came on base, and at that time they set up a screening mechanism as to which building to look at -- or they looked at all the buildings, but if they had entered keywords and stuff like that. But they set up -- it was basically I think they used an Access database, okay? So for example if they had a keyword, they could do either a report or a search in Access, and then they would identify if there's a document for a certain building, dot, dot, dot, dot, dot, and where that was when they found it, the date and all that sort of stuff. So I don't know. They may, again, you're right, DOD has not only the budget but the contractual mechanisms to do that and all that, and that actually, I think, would cut enormous time off of our effort if there was -- I'm calling it Access,

but that's a generic term. It can be an SQL database or whatever, where they would put all these (indiscernible), websites, database and all that, and we could go through and put in either keywords or key buildings or whatever, and see if it pops up anywhere in these records, individually.

It’s like for instance when we start searching, we did this, you know, search a file, individually searching databases, we found doubt.

**MR. ENSMINGER:** Why don't we request that? I mean, let's put the burden on the perpetrator here.

**MS. FORREST:** Yeah, that's what I was about to say, why not just ask for it all?

**MR. ENSMINGER:** No, no. Get them to -- I mean, even these databases that were, you know, that were MS-DOS or whatever, have them make those things readable instead of you guys trying to do this. They've got the assets.

**DR. BOVE:** I think we're talking about a relational database here. So that you can put one query and it finds --

**MR. ENSMINGER:** It goes through all of these 16 --

**MR. MASLIA:** Yeah, you know, you could do it now, you know, you could generate a report or

whatever, and say it searched XYZ databases, and yes, this popped out. And then you can go and further, you know, either pull that document and actually read that document or whatever, but you normally would have a dozen or half a dozen databases.

**MR. PARTAIN:** More than that.

**MR. MASLIA:** More than that, and that's what I'm saying. That's what's a relational data --

**MR. ENSMINGER:** You could marry these all together.

**MS. FORREST:** Is this something you want me to take back as a request or that you're planning to send them, you know, an official request for -- from you -- the ATSDR? How do you want me to do this?

**DR. FORRESTER:** Well, I mean, the CAP is asking for this.

**MR. ENSMINGER:** Well, yeah, I think this is something that should be strongly considered, to ease your work loads.

**MS. RUCKART:** Think about the timeline. You know, that's what you're getting at.

**MS. MOORE:** Well, it'll speed the timeline or slow it down.

**MR. ENSMINGER:** It'll speed it.

**MS. MOORE:** 'Cause we would continue doing what we're doing entering data, but by the time they make the database, we would be stopping at that point.

**MR. GILLIG:** I was going to ask Morris how long did it take --

**MR. ENSMINGER:** How long did it take?

**MR. MASLIA:** I'll give you an example from our experience. Remember we had an expert panel end of March -- April of 2005, okay? That was the first, and one of the recommendations from them was for the, at the time, the Marine Corps needed to do more to assist us in data archeology. That was the finding in that report.

By November they had not only a contract with Booz, Allen, Hamilton, they had two full colonels, one from Washington and one from the air base overseeing the project. They had developed a search protocol. They had a building with furniture and everything else for Booz, Allen, Hamilton, and they were going through buildings.

**MS. MOORE:** But how long did it take to do the work?

**MR. MASLIA:** Oh, I don't --

**MS. MOORE:** You're saying they got the contract but --

**MR. MASLIA:** Well, I'm saying from our typical -- I mean, from ATSDR's standpoint the contractual mechanism usually takes longer than the work. In other words within six months they already had -- they already had within six months they already had some --

**MR. ENSMINGER:** Useable data.

**MR. MASLIA:** Boxes and all that sort of stuff.

(multiple speakers)

**MR. MASLIA:** My experience is --

**MR. ENSMINGER:** Yeah, but I don't want to speed it up --

**MR. MASLIA:** -- they had the contractual mechanism --

**MR. ENSMINGER:** -- at the sake of the quality either.

**MR. MASLIA:** -- at Lejeune and up at Headquarters.

**MR. GILLIG:** Well, my understanding is that they did get a contractor onboard who tried to do this.

**MR. MASLIA:** Oh, really, okay.

**MR. GILLIG:** And the project was never completed.

**MR. MASLIA:** Oh, okay.

**MR. ENSMINGER:** By design or?

**MR. GILLIG:** My understanding was the contractor said this is such a difficult undertaking that they walked away from the project.

**MR. ENSMINGER:** And who was the contractor?

**MR. GILLIG:** I don't know who the contractor was. We actually have a staff person whose brother worked for the contractor.

**MR. ENSMINGER:** Well, Booz, Allen, Hamilton is the biggest contractor for the department.

**MR. GILLIG:** And I don't think it was --

**MR. ENSMINGER:** They've got assets out the ying yang. It wouldn't hurt to try.

(multiple speakers)

**MS. FORREST:** So you want me to take back a request for the DOD to combine all the databases of information, that Chris presented on earlier, into one manageable searchable database for --

**MR. MASLIA:** No, no, no.

**MR. GILLIG:** Leave the databases --

**MR. MASLIA:** You don't want to do any combining. You either want a searchable relational database approach that you can search --

**MS. FORREST:** So you want us to make --

**MR. MASLIA:** Databases or web portals or

anything else.

(multiple speakers)

**MR. MASLIA:** Physically search that. You can search the title, okay, in other words you can get a hit on the title and assess whether that's potentially useful documents to start going through.

**MR. GILLIG:** Well, that's kind of the process we're using, the keyword searches. A relational database, my experience with two -- building two relational databases --

**MR. MASLIA:** Right.

**MR. GILLIG:** -- is that it takes a considerable amount of time because you're entering specific data into a database that allows linkages. And we're talking about a lot of documents. It would be wonderful if we had that. But I would assume we're talking about multiple years to develop a relational database.

**MS. MOORE:** That's what -- I think it could possibly -- I don't know but it could be years. But we don't want to stop for two years --

**MR. MASLIA:** Oh, no, I was not suggesting --

**MS. MOORE:** I mean, the military could do that.

**DR. FORRESTER:** Chris should talk a little bit about the strategy of the very up-front, up-front of

going through the databases, about identifying the titles of concern and then keyword searching them. We didn't really talk about that. How did you go from 40 to --

**LCDR. FLETCHER:** So what we did was with those databases that had exportable indices, we have a list of keywords that we used to go through and search those indices that we thought would highlight documents of interest. Then after that, to make sure we didn't miss anything, because the title was misspelled, we read all the titles and made our request from that. So that's how we narrowed from the approximately 40,000 titles to approximately 4,500 titles that are being requested.

**DR. FORRESTER:** And then the second layer --

**LCDR. FLETCHER:** So the next layer, once we get those, we're running those through a PDF compressor, 'cause everything's coming as PDF, or there are a few cases like a Word document, which we just converted to PDF. So we run those through a PDF compressor, it's a software that performs an optical character recognition, OCR, and compresses the file to make it a little faster to search. And stick all those in one big folder, and we can keyword search those with building numbers or words like vapor, a

large list of keywords that we've developed. And we're getting hits on those that -- so we're going back on the documents that are identified in that search and looking at those to see what they can show us. In most cases they have data or in some cases they have data. In some cases it's a computer misidentifying a word. So we still have to have a human filter to go through and just to look at those documents.

**MS. FRESHWATER:** So that work can be continuing, even if it does -- I mean, everything kind of moves, no offense, but in geological time anyway, so why not have that, you know, for the history and for -- and to make sure we're not missing anything, you know. Just to -- I would say. I would support asking for it.

(multiple speakers)

**MR. ORRIS:** For future work that might need to be done. All right, I can see the value of building it now. Trying to use it for the current water vapor studies but having it available for anything in the future would certainly cut down the time, geological time.

**MS. FRESHWATER:** Yeah.

**MR. ORRIS:** And, you know, because that --

**MR. ENSMINGER:** It's called glacial speed.

**MR. ORRIS:** That comes back to there are real people with real illnesses and real needs that are counting on the work that's being done here, and you know, if we can save time, now or in the future, then I think that that should be looked into.

**MS. FRESHWATER:** Yeah, I mean, I have -- I've started writing on other Superfund sites connected to the military, and I have people contacting me about Hawaii. You know, you and I both wrote about St. Louis. So I think the work here is valuable to have for all kinds of reasons, to make it easier in the future to search it. Who knows what'll show up in the science later.

**MS. FORREST:** So I take it back. That's all I can do is I wouldn't begin to be able to speak to what they're contracting mechanisms are and the time this would take. I'm not an expert on linking databases.

**MS. FRESHWATER:** Take it back with a pretty please.

**MR. BRUBAKER:** So to summarize what I just heard you agree to, and again, I'm probably the least educated person on this that relates to the content, but what I heard you agree to together was

a parallel process or a redundant process to what's happening already, to gain some further future efficiency. And you're going to bring that back. Who in the room do you need access to or to collaborate with to attribute that gets framed in the cleanest way possible? Do you need a partner or follow-up support from somebody or do you think you have what you need?

**MS. FORREST:** They're going to -- here's what I was going to take back, that the CAP wants the Marine Corps, DOD, to link the existing databases that Chris is using in the study so that the information will be more manageable and searchable, that Chris would be continuing on with his project, you know, in identifying the important records, with his mechanism. But that once this was done, it would be a secondary search that could be done in addition to it, to make sure that nothing was missed. Now, is that going to explain it well enough?

**MR. BRUBAKER:** Is that clean enough to get the message across to them?

**MS. MOORE:** Well, if it gets done, I mean, I don't know if we tied --

**MS. FORREST:** I don't know, maybe --

**MS. MOORE:** So I mean, that's a good point, though, I mean.

**MS. FORREST:** I mean, why are they going to do it if --

**MS. MOORE:** But we have to continue our process to do all of our modeling stuff. And then, you know, for the future studies, there might be studies down the road, whatever. It would be a good database for those studies for sure.

**MS. FORREST:** I think there's going to have to be justification as to what it's needed for here. That's going to be my guess.

**MR. MASLIA:** The justification is (indiscernible) DOD.

**MS. FORREST:** No, what I'm saying is the reason -- well, how you're going to use it in your current study. Not just --

**MR. MASLIA:** For what we can ask. We used that when we did the water model. We asked for Eric to provide us with -- to help us get any data that we need to do our job or our mission. I'm just saying that's what we have used in the past. We have used the memorandum of understanding with DOD as the justification --

**MS. MOORE:** But we can move forward.

**MR. MASLIA:** Yes. I'm not suggesting we're not moving forward. I'm suggesting it doesn't have --

**MR. GILLIG:** We have access to the data. What we're talking about being built would be a relational database, which would be for future endeavors, future investigations, at Camp Lejeune. That relational database would be a great ally. We're proceeding with our search process and we're feeling pretty good that we're getting the data we need. We don't want to hold it up to narrow this relational database --

**MR. MASLIA:** I wouldn’t say (indiscernible) the water modeling standpoint. I mean, I know we went through anytime during the water modeling endeavor, we would keep going back through, and I can't tell you how many times I researched and researched -- I mean, you know ran through searches again and again and again. And so my guess is you will not be searching only once. You can call it QA/QC, you can call it something else but I know for a fact that's how we found the booster pump. It must have been on the fifth time we went through, because as you go through, you keep refining terms and keep refining as you're trying to piece these together. That's just -- I mean, searching databases.

**MS. MOORE:** When you searched you (indiscernible).

**MR. MASLIA:** Yeah, yeah, so I'm saying that would be another -- not only in the future but as to be able to repeat or refine or QA/QC or keyword what we've done as to modeling.

**DR. BOVE:** So in other words what your description was was accurate. But it's possible it would be using it as --

**MS. FORREST:** I think you're more likely to get support, and this is just my idea, it's not -- I haven't talked to anybody. If it's tied directly to something that you're doing, just it's going to be useful in the future? Well I mean, we all have to understand budgets are limited. I mean, so there's a lot of things that could be really useful in the future. If it's directly tied to something that you're doing, I think you're going to have more -- you know, I'm just telling you --

**MS. FRESHWATER:** What about if you say if this many Marines were dying and getting sick in a foreign country, would you get the database?

**MS. FORREST:** I can, I can take it back. All I'm trying to say is just saying that it will -- it might be useful in the future --

**MR. ORRIS:** You could sell it as a quality control.

**DR. BOVE:** What you just said, as a secondary QC process, and that process this would be useful.

**MS. FORREST:** But then I heard right behind me that, well, we might not use it because we don't want to slow down our --

**MS. MOORE:** No, no.

**MS. FORREST:** -- project.

**MS. FRESHWATER:** No, she just doesn't want to stop what she's doing.

**MS. MOORE:** It's not that we wouldn't use it. It's just I don't want someone to --

**MR. BRUBAKER:** If I can jump in, I didn't hear anything you said in there as suggesting we had to stop.

**MS. FRESHWATER:** What we have now is slow and we need to go faster 'cause people are getting sick every day. A lot of people are hitting --

**MS. FORREST:** I think we just have to be able to say how it's going to be used, what it's going to be used for. Just it's going to be great for the future is, I just don't perceive it.

**MR. ENSMINGER:** And I don't want to hear anything about DOD budgets, because they spend more

money on toilet paper than they do on their health-related stuff.

**MS. FORREST:** And I don't want to speak to the budget because that's not my budget. I'm just telling you, as my experience as a government employee, and, you know, getting projects through. The more you can justify it and relate it to how you're actually going to use it -- the more --

**MR. BRUBAKER:** This is a great example of dynamic (indiscernible). Now I'm a half strategist-half facilitator. There's a -- let's find this and track it down and let's make the best case we possibly can to ensure we get what we need the right way. So I hear you guys doing some great collaborating here about something redundant that you can use for quality assurance, can be very valuable to you in the future. So my advice would be to establish a small subgroup to nail this down and get it in writing, circulate it among the team so you're sure you're clear on what you're asking for so that it can be articulated, get it done. And it sounds to me like you've achieved a pretty clear sense of what that needs to be. Make your first ask your best ask.

**MR. ENSMINGER:** I know the sure-fire way of

getting this done.

**MS. FRESHWATER:** Why not just ask for it now and say we need it now, period. I mean, if you ask for it now, we need it now, period, and get us working on it. They're not going to call up and ask if she's still working.

**MR. PARTAIN:** And Matt, with all due respect, you haven't seen the end products we're dealing at Headquarters, Marine Corps and Navy. It'll go to a black hole and come out, no.

**MS. FRESHWATER:** So I would say ask for it now because we need it.

**MS. FORREST:** And that's what I was trying to say.

(multiple speakers)

**MR. BRUBAKER:** Okay. We've sort of lost the thread of discussion and I think we've reached a good stopping point for a 15-minute break. We're going to come back and move to the water modeling discussion. We also have some logistics.

**MS. SHEILA STEVENS:** First, for lunch tomorrow I have a boxed lunch menu, so if you could write your name and circle what you want, and it's either sandwich or a salad. And there's a price associated with that so, you know, you can figure out how you

want to pay for that, that would be great. And if there's any questions about that or if you need any different accommodations and you don't care for this, I will certainly --

**MR. ENSMINGER:** Where are we going to eat this at?

**MS. RUCKART:** We're bringing it in, Jerry.

**MS. SHEILA STEVENS:** We're going to bring it in. We'll get it picked up and brought to here and we'll either eat in this room or we can eat in a different room.

**MR. PARTAIN:** Are we holding the meeting here in this room tomorrow?

**MS. RUCKART:** No, no, no.

**MR. ENSMINGER:** Oh, I thought we were having a picnic outside or something.

**MS. SHEILA STEVENS:** And then for those that wanted to eat dinner, we were able to get reservations at Maggiano’s. It’s a lovely Italian restaurant, and I do have the menu --

**MR. ENSMINGER**: When’s this?

**MS. SHEILA STEVENS:** This evening at 6:30.

**MR. ENSMINGER:** Where’s Maggiano’s?

**MS. SHEILA STEVENS:** Maggiano’s, it’s near the hotel. They do have a shuttle that can drive you

there. It's within walking distance if you want to walk, but it's a good walk.

**MR. MASLIA**: Well, through the parking lot it's under a mile. Around the walkways it's probably a mile and a half.

**MR. BRUBAKER:** So we'll reconvene at a quarter till 3:00.

(Break, 2:35 till 2:52 p.m.)

**MR. BRUBAKER:** The final topic on our agenda, we'll turn to Rob, I believe, for the discussion of drinking water assessment.

**MS. FRESHWATER:** Can -- sorry. Have we settled with her on that last topic? Did we -- or do you feel comfortable?

**MS. FORREST:** I was going to go back and present what I gave as my summary.

**MS. FRESHWATER:** Is that okay if we finish that up?

**MR. BRUBAKER:** Sure.

**MS. FORREST:** That you're requesting the Marine Corps DOD to link all the databases of information to make the information more manageable and searchable for future studies, and it will also be used as a secondary search to ensure nothing was missed in the initial review conducted by Chris and

company.

**LCDR. FLETCHER:** I can live with that.

**DR. FORRESTER:** For the public health assessment.

**MS. FORREST:** Is where it will be used.

**MS. FRESHWATER:** Yeah.

**MS. FORREST:** The secondary research for the public health assessment.

**MS. FRESHWATER:** Yes.

**DR. FORRESTER:** And does that pass your test as far as --

**MS. FORREST:** Yeah, I just didn't want to just put it up there like oh, it'd be great to have.

**MS. FRESHWATER:** Right.

**MS. FORREST:** Which would just lead to connect --

**MS. FRESHWATER:** You feel good with that?

**MS. FORREST:** It makes sense to me.

**MS. FRESHWATER:** Okay.

**MR. BRUBAKER:** Excellent. Thanks, Chris. All right, that's good.

**DISCUSSION OF ASSESSING EXPOSURES TO CONTAMINANTS IN DRINKING WATER**

**MR. ROBINSON:** I'm Rob Robinson, and today I'm

going to be speaking about the drinking water evaluation portion of the public health assessment. I have about 12 years of environmental health experience, and five of those years have been with the Agency of Toxic -- ATSDR. And Mark Johnson, who's our Region 5 director, he's also a major contributor to this portion of the document.

So the two main objectives of this drinking water evaluation were to evaluate exposure using ATSDR's historical reconstruction concentrations for the model values. And those model values shows that individuals were exposed to elevated levels of VOCs, and these elevated levels occurred for a long period of time.

Science has also evolved so we are able to use new studies in this evaluation as well as updated exposure parameters. For this we're going to follow the normal process that we would with any other site, using our public health assessment guidance manual protocol.

The second main objective of the drinking water evaluation was to review the drinking -- the lead in drinking water data and -- to see what individuals were exposed to, and to make sure that the base was -- the actions that the base were taking were

adequate to protect health.

So we'll discuss these three things today. We'll start with a flow chart of our drinking water evaluation process. We'll share how we are evaluating exposures and health risks to VOCs in the drinking water and we'll discuss the re-evaluation of lead.

So this is the flow chart. In order to develop a document, this is the process it goes through here. It begins with the data discovery. Then we go into the exposure evaluation. Then we start to draft the document. Then we submit that document for review. I'd like to elaborate a little bit on that text box, in particular the third bullet, which is the external peer review, because this will be the first time that the CAP sees the document.

Now, the peer review is -- it's driven and initiated by the Office of Science. It's not an internal -- it's not driven by the program. And what they do is they select three subject matter experts to review and provide comments on the document. And again, you guys will be seeing it at this stage as well, and you'll be able to provide comments. Usually individuals are given a month to review but we haven't decided exactly how long we're

going to give for this document yet. So after the review is done, we will do the final release for the drinking water evaluation.

So the second -- we're going to look at the VOC exposure evaluation, go over that. And it's kind of four components of that process. The first is to screen chemical concentrations against comparison values. And this is a table that is an example of the comparison values that we would use for the VOC evaluation. And we take in our known data and compare it against these values to determine our contaminants of concern, that warrant further investigation.

When available, we like to use our comparison values because they're strictly health-based values, whereas, say, the EPA or other agencies might have other considerations. Like with the development of the maximum containment levels, they have to take into account economic factors or remediation technology, things like that. There's still certainly a health-based component on the maximum contaminant levels but that's our sole focus here at ATSDR.

Okay, next we, after the screening, we look at -- determine the exposure pathways for the

affected groups.

Next slide. So this is our past completed pathway that shows that people were exposed to contaminated ground water through the drinking water, and they were exposed by breathing it and absorption through the skin as well by showering or other household uses such as dish washing, meal preparation and laundry.

There's also future potential pathway that deals with the existing contamination plumes on base because they have the potential to migrate to existing drinking water supply wells. However, this pathway is unlikely because of the extensive modeling -- or monitoring, rather, that's going on at the base right now.

**MR. PARTAIN:** Rob?

**MR. ROBINSON:** Yes.

**MR. PARTAIN:** On the notes section.

**MR. ROBINSON:** Sure.

**MR. PARTAIN:** Low levels of benzene may have lasted until May of 1996 at Hadnot Point.

**MR. ROBINSON:** Correct, in the drinking water.

**MR. PARTAIN:** What are we talk -- I know that's chemical 4 but that's the first time I'm seeing it written down like this.

**MR. ENSMINGER:** From where?

**MR. ROBINSON:** Well, that was -- I mean, this is, again, we're using -- for all of our exposure evaluation, we're using the historical reconstruction concentrations.

**DR. BOVE:** So it's a couple parts per billion.

**MR. PARTAIN:** Say again, Frank? I can't hear you.

**DR. BOVE:** There were -- yeah.

**MR. MASLIA:** There were -- I think it was --

**MR. PARTAIN:** Was one of the --

**MR. MASLIA:** -- 603. Well 603, at least in here you need to -- I want to be careful that I explain this correctly. But well 602 was the one that had the benzene -- measured benzene hits.

**MR. PARTAIN:** Yeah.

**MR. MASLIA:** Okay. I'm talking about from the data that we received from the Marine Corps.

**DR. BOVE:** Yeah.

**MR. MASLIA:** Well 603 always had nondetects, okay? Whatever. And nondetects, of course, are based on the resolution of the (indiscernible) limit of whatever method they used, and that changes the type. In other words what's a nondetect in 1960 may be a detect in 1970 and 1980 because of changes. So

all the information we obtained from the Marine Corps file, 603 always had nondetects.

In simulating, reconstructing, the concentrations in the drinking water supply wells for 602 had benzene concentrations 'til they shut it off and we had it in the model. 603, if you look at the well log, which is in the back of Chapter A, Supplemental chapter -- Supplemental 1, I think, you will see that was kept running through 1996, I believe. So as a consequence, the model shows low levels, okay? Now, when it shows 2, 3, 4, if you -- you know, how do you interpret that? If there's a detection limit of five or ten, that would be considered a nondetect so it's consistent with the field data, okay, so -- but it's got a numerical value. And that's what you see in, I think it's appendix 3 or 7. Three is the drinking water so it must be appendix 7. Has all the wells in there. And if you go to 603, you'll see it's pumping through '96 or whatever, and you'll see those small hits of benzene.

**DR. BOVE:** But it's never above the MCL.

**MR. PARTAIN:** Okay. Now, this chart here, is this specifically -- is this base-wide or only Hadnot Point?

**MR. ROBINSON:** Again, we're using Morris's, so it's Tarawa Terrace, Hadnot Point and Holcomb Boulevard.

**MR. PARTAIN:** Because the reason why I bring that up 'cause that was my point --

**MR. ROBINSON:** Sure.

**MR. PARTAIN:** -- but Tarawa Terrace, the model of Tarawa Terrace, you've got it here, January 1985. Well, we've got PCE exposures with Tarawa Terrace to 1987, according to the model, correct me if I'm wrong, Morris. And also there were detection -- actual measurable quantities of benzene that showed up in Tarawa Terrace throughout 1986. So that needs to be corrected there. Was it just 1986, TT, with the benzene? 'Cause, I know they were having like eight --

**MR. MASLIA:** Well --

**MR. PARTAIN:** -- periodic readings.

**MR. MASLIA:** -- 2 and 8, that was from those JTC reports.

**MR. PARTAIN:** Yeah.

**MR. MASLIA:** And the last file we got was through 1980 -- '86, and there were occasional hits. I don't remember --

**MR. PARTAIN:** And it was the (unintelligible).

**MR. MASLIA:** -- whether it was the well or the treatment plant.

**MR. PARTAIN:** No, it was it treatment plant that was coming up with it.

**MR. MASLIA:** It was the treatment -- it was the treatment plant.

**MR. PARTAIN:** Because there were -- there are some notes in the files where they were talking about it.

**MR. MASLIA:** Yeah.

**MR. PARTAIN:** And they didn't do anything about it but it was actual treated water.

**MR. MASLIA:** -- treatment plant. Just for clarification, we modeled through '87 because at Tarawa Terrace they shut off two or three heavily contaminated wells between February and May of 1985.

**MR. PARTAIN:** Twenty-three.

**MR. ENSMINGER:** Twenty-three.

**MR. MASLIA:** -- 23. And one other one.

**MR. ENSMINGER:** Twenty-five but 25 stayed pumping.

**MR. MASLIA:** But they kept the other wells going through '87, and so as they shut off the contaminated wells, the ones that were low level, of course, contamination -- and those 'til they shut

down the treatment plant in '87. So that's why -- but in Hadnot Point all the wells were shut down.

**MR. ENSMINGER:** Well, they turned 25 back on.

**MR. MASLIA:** What? No. Twenty-five was going -- yeah.

**MR. ROBINSON:** Yeah, and Mike, we kind of looked at them separately. You know, this one -- this is a table, Hadnot Point section, so it should have been more clear on the slide, I agree.

**MR. PARTAIN:** You said it was Hadnot Point? Okay.

**MR. ROBINSON:** Yeah, 'cause it -- see at the bottom.

**MR. PARTAIN:** Jerry broke the fan.

**MR. MASLIA:** Just for clarification, Tarawa Terrace, we do not -- never did -- we did not simulate benzene, okay, because at the time we were doing -- this was 2007 and prior, okay, we were repeatedly told that there were no benzene sources.

**MR. ENSMINGER:** 645.

**MR. PARTAIN:** No, you're talking about TT, Jerry.

**MR. MASLIA:** I'm talking about Tarawa Terrace.

**MR. ENSMINGER:** Yeah, but they were transferring water. After '85 they were -- started

transferring water from the Holcomb Boulevard --

**MR. MASLIA:** But we were not -- but that was still during that same time period when we were told that Holcomb Boulevard was a clean system, an unexposed system. There was no reason to incorporate Holcomb Boulevard for the transfer of water. It was only after we completed Tarawa Terrace, then when we started looking at the Hadnot Point documents, that we started piecing together --

**MR. ENSMINGER:** 645.

**MR. MASLIA:** -- 645.

**DR. BOVE:** Right, so somehow that needs to be factored in.

**MR. MASLIA:** But we never could establish whether 645 was in fact a source or not.

**MR. PARTAIN:** Well, there was a couple wells that were showing up. There was an L well that was up around Lejeune Boulevard that showed -- that they shut down, I think, in the 90s, and then 645, 603.

**MR. MASLIA:** My point was for Tarawa Terrace --

**MR. PARTAIN:** All right, I'm talking about Hadnot Point.

**MR. MASLIA:** -- the reason why there is no reconstructed benzene there. We were not looking at VOCs.

**MR. ROBINSON:** Yeah. Everything from the ABC Cleaner.

**MR. MASLIA:** Yeah, exactly, yeah.

**MR. ROBINSON:** Anymore on this slide before we move forward?

**MR. PARTAIN:** No. That is -- you're saying that that's for Hadnot Point.

**MR. ROBINSON:** Hadnot Point. Yeah.

**MR. PARTAIN:** Okay. Just why I wanted to make sure.

**MR. ROBINSON:** Yeah, yeah. I'm sorry, it should have been indicated better on the slide.

**MR. ENSMINGER:** Are you going to annotate occupations that had higher than normal exposure to water?

**MR. ROBINSON:** We will get to that. I mean, we are conservative in our assumptions.

**MR. ENSMINGER:** Because I know that --

**MR. ROBINSON:** Certain exposure parameters to try to account for some of those things. But the additional exposure scenarios that were brought up at the last CAP meeting, we're looking at those separately. And right -- currently we're determining the best models to use to try to re-create exposure scenarios.

**MR. ENSMINGER:** You know, the cooks -- the folks, the civilians that worked in the industrial laundry, the people in medical fields, where they were washing their hands constantly, doctors, corpsmen, those are high exposure --

**MS. FRESHWATER:** The groundskeepers at the golf course, probably.

**MR. PARTAIN:** The galleys.

**MR. ROBINSON:** The golf course was actually addressed in a previous ATSDR document, Chapter A. And they were deemed by their -- as not a significant source because they were --

**MR. ENSMINGER:** Open air.

**MR. ROBINSON:** -- open air exposure.

**MR. ENSMINGER:** But I know the people that worked in that laundry, that industrial laundry, where they washed all the sheets and pillowcases, all the coveralls, the tablecloths and all that stuff. According to one of my sources that knew all those people, that worked with them, and he's retired now -- he didn't work with them but he carpooled with them -- every one of those people is dead now from cancer.

**MR. ROBINSON:** Was there dry cleaning services in those facilities?

**MR. ENSMINGER:** No, no. This was strictly wash. But every sheet, every pillowcase was pressed. I mean, when you're -- you steam, I mean, and plus those big giant washing machines. I mean, you're talking about a virtual gas chamber inside that place.

**MR. ROBINSON:** Right, and that's some of the information that's really been beneficial for us.

**MR. PARTAIN:** And same thing with the galley.

**MR. ENSMINGER:** Same thing with the cooks and the mess halls.

**MR. PARTAIN:** Matter of fact, (unintelligible) was being interred over at Arlington in about five days. He was -- oversaw the galleys for 1985-1986. He died of a brain tumor.

**MR. ROBINSON:** So the -- and this gets to those points. But these were the four main exposed groups or populations that we felt really represented to those exposed on base. Children who resided on base with their families, adults who resided on base, workers who were employed on the base but lived off base, and then the Marines who trained and lived on base.

**MR. PARTAIN:** And when you say workers, you've got to include the Marines with the laundry and the

food preparation.

**MR. ROBINSON:** Yes, exactly, and that's why there's some bullets under there, because we are -- those were brought up in the last CAP meeting, and so now we are including those in our --

**MR. ENSMINGER:** You got swimming pools under Marines trained. Is that because -- for Marines only?

**MR. ROBINSON:** Well, they'll be included in that component. I mean, we'll also look at the regular adult population because I'm assuming -- that's another -- some more information --

**MR. ENSMINGER:** The kids too.

**MS. FRESHWATER:** You should look at the children because I spent every sing -- like three, four months at the officers' club pool, every day of my life, like all day. I mean, all of my friends and I. That's where we lived.

**MR. ROBINSON:** Yeah. And those were the -- those were Hadnot Point, the pools were Hadnot Point.

**MS. FRESHWATER:** I don't know what the --

**MR. ENSMINGER:** No.

**MR. PARTAIN:** No, Tarawa Terrace.

**MS. FRESHWATER:** No, it was officers' club.

**MR. ROBINSON:** Tarawa Terrace?

**MR. ENSMINGER:** Holcomb.

**MR. ROBINSON:** Holcomb?

**MR. ENSMINGER:** No, what years?

**MR. ROBINSON:** What years?

**MS. FRESHWATER:** It would have been '81 through '85.

**MR. ENSMINGER:** No, that was Holcomb Boulevard water.

**MS. RUCKART:** Even prior to that too. There's people prior to --

**MS. FRESHWATER:** Yeah, I mean, not just for me but --

**DR. BOVE:** Yeah, yeah.

**MR. ENSMINGER:** Well, but wait a minute now. The area pools, the big training pools, the ones that are closed in at Lejeune, they -- I forget whether that was area 5, the pool that's right down from the building 33, that Mark was talking about. You go down across McHugh, what they call it now, but we used to call it the main service road, there's a training pool down there. They opened that on -- in the evenings and on weekends for dependents.

**MR. ROBINSON:** Okay.

**MR. ENSMINGER:** Dependent swimming, during the winter, the colder months. 'Cause I know damn well you weren't in the pool in January at the officers' club.

**MS. FRESHWATER:** You don't know that.

**MR. ROBINSON:** And that indoor pool, that was supplied water by Hadnot Point.

**MR. ENSMINGER:** Hadnot Point, yeah.

**DR. BOVE:** But what Mike was saying was that -- or maybe it was Jerry -- workers who were employed in laundry and food preparation, but there were also Marines doing those tasks.

**MR. PARTAIN:** Yeah, that's --

**MR. ROBINSON:** Yeah, sure.

**MR. PARTAIN:** On these bullet points, you should be Marines and workers who worked at the laundry, blah-blah. And then on the pool area, it would be Marines, dependents and civilians who utilized the pools.

**MR. ROBINSON:** Yeah, and we'll -- they'll -- we'll transfer them to the applicable populations. But they were just kind of up there to show that we are considering them. So yes, we understand that there will be workers who were employed at the base but lived on base as well, and they might be

dependents. So those would be included in adults who resided on base, that did laundry or food preparations. But there also might be, like you say, Marines who were trained and that also worked in the food preparation or dish washing, so they would also be included in that exposure evaluation.

**MS. RUCKART:** What about the civilian employees who worked in areas other than these?

**MR. ROBINSON:** I'm sorry, the civilian employees who worked --

**MS. RUCKART:** Who worked in other areas?

**MR. ROBINSON:** Those would generally be considered adults who resided on base. I mean, 'cause they would get an entire exposure -- their exposure duration would be like a full day, because at work, and then you also come home.

**MS. RUCKART:** But they would live off base.

**MR. ROBINSON:** Well, if they worked -- if they worked on base and lived off base, they would be included in the workers here.

**MS. RUCKART:** Okay, those are just two categories, not the only categories.

**MR. ROBINSON:** Yeah.

**MS. RUCKART:** Okay. Because I thought those were the only two, but that's just an example.

**MR. ROBINSON:** Yes, correct.

**MR. ENSMINGER:** That's Holcomb. It's on the north side of Wallace Creek.

**MR. ROBINSON:** So after we determine the exposure pathways and affected groups, we calculate doses. Sorry I've lost my place. I apologize. All right, here we go. And this is the inputs that we use for our dose calculations. It's a table of all of them. And most of these numbers are generally accepted values but some are site-specific numbers, where we use your valuable input combined with other data sources, such as the Marine-in-training ingestion rates as well as the civilian worker exposure duration.

And then we use these with -- and plug them into Oak Ridge National Laboratory's risk assessment information system, RAIS, chemical risk model to produce our doses. Next slide, please.

**MR. ENSMINGER:** Wait a minute. 4.3 liters of water a day for a Marine in training?

**DR. BOVE:** Because they're not assume --

**MR. ROBINSON:** Because they're not in rigorous training -- seven days a week, kind of. So it's average as a -- if you -- notice the asterisk, and this is information that you provided, that we used

to develop this number, combined with the fluid replacement guidelines of the military, on that reference right there.

**MR. ENSMINGER:** And how did you come up with the inhalation number?

**MR. ROBINSON:** The inhalation was a standard one that our senior toxicologists felt that that was most appropriate for each age group.

**MR. ENSMINGER:** No, no, wait a minute, .5? What's that, parts per billion, .5?

**MR. ROBINSON:** The inhalation is liters per meter cubed.

**DR. BOVE:** But this is standard for how long a shower or is that a 10-minute shower?

**MR. ROBINSON:** I believe they're ten minutes. That's usually --

**DR. BOVE:** So what we're talking about is one shower a day.

**MR. ENSMINGER:** No, that's bull.

**DR. BOVE:** Well, wait, wait, wait. It's not -- I'm asking the question.

**MR. ROBINSON:** Yeah, Mark would have to give you the specifics. He did the VOC exposure evaluation.

**DR. BOVE:** Well, I mean, but this is just for

everyone. So it would probably be one shower or bath a day, right? The bath would be higher than the shower, so actually I don't know why the child fits in one higher. But putting that aside --

**MS. MOORE:** That K over there, that's the volatilization rate.

**MR. ROBINSON:** Okay, okay. So that's -- so that's not the amount of air.

**MS. MOORE:** The inhalation rate --

**MR. ROBINSON:** That's correct, yeah, you're right.

**DR. BOVE:** Is it the ten, the --

**MR. ROBINSON:** Oh, yeah, so the inhalation rates are per body weight. Those varied dependent upon -- see, if you'll notice, the Marine in training is higher than the regular civilian worker, adult resident, to take --

**MR. ENSMINGER:** For what?

**MR. ROBINSON:** -- into account.

**MR. PARTAIN:** Where?

**MR. ENSMINGER:** For inhalation?

**MR. ROBINSON:** See, this column here.

**MR. ENSMINGER:** What's that, IR?

**MR. ROBINSON:** It's inhalation rate divided by body weight.

**MR. ENSMINGER:** Yeah, but it's based on one shower.

(multiple speakers)

**MR. ROBINSON:** That isn't the ingestion rate, though. Sorry, I apologize. I'm sorry, Mark.

**MS. MOORE:** There's no inhalation on here, I don’t think.

**MR. PARTAIN:** But what's the .5 inhalation column, then? What does that mean?

**MR. ROBINSON:** That's a K. Ks are usually constants, so.

**DR. BOVE:** Yeah, that's a constant.

**MS. MOORE:** Volatilization rate.

**MR. ROBINSON:** And the volatilization factor. So that's the rate that the chemical volatilizes.

**MS. MOORE:** Right out of the water 'cause you can look at it for the dermal -- that's used for dermal exposure. You want to see how much is left in the water and how much volatilizes out. So that's what there -- that's not an inhalation rate.

(multiple speakers)

**DR. BOVE:** Right. That was the problem.

**MS. MOORE:** Everybody's looking for something that's not there.

**MR. ENSMINGER:** I mean, we took two showers a

day.

**MR. ROBINSON:** Yeah. And we have that information. We incorporated that into it. If not, we will certainly include that, especially Marine-in-trainings, in their exposure parameters.

**MR. ENSMINGER:** Yeah, we had PT in the mornings, and then we came back to the barracks, got our showers, went to the mess hall, ate chow, morning chow, back for formation, then went to work. Then worked all day. And you were a pig if you got off work all day and went back to the barracks and changed into your civvies and went out on liberty. Then you ended up with a GI shower.

**DR. BOVE:** I would assume two showers a day.

**MR. ENSMINGER:** With scrub brushes and Fels-Naptha soap.

**MR. ORRIS:** What, what is that ADAF for TCE? What are those numbers representing there?

**MR. ROBINSON:** This is an age-dependent adjustment factors for mutagenic chemicals. You'll use those because younger groups for, say, TCE, are more susceptible in those stages of life. So you want to be more conservative in your evaluation with that. And to account for that you multiply by higher -- you use a higher multiplier.

**MR. ORRIS:** That's just a multiplier?

**MR. ROBINSON:** Yeah.

**MR. ORRIS:** Okay.

**MR. ROBINSON:** Now, does that? Okay.

**UNIDENTIFIED SPEAKER:** It's just for mutagens. So it's not for every -- it's not like for benzene and like that. Just TCEs.

**MR. ROBINSON:** And so these are examples of some of the equations that we used in our dose calculations. Just to kind of show you what we were dealing with. And again, they're generally accepted equations that are pulled straight from the Oak Ridge Lab website, which is at the bottom. And if you'd like to try to re-create our process, I'm happy to show you in that website exactly the path to take to reach the chemical risk model.

**DR. BOVE:** It might be useful to actually run through one, maybe not today.

**MR. ROBINSON:** Sure.

**DR. BOVE:** A typical Marine working, you know, on the field three days a week, taking two showers a day, for TCE. Just run through the calculation once and show what you get out of it.

**MR. ROBINSON:** Yeah, sure.

**DR. BOVE:** That might be helpful. If not

tomorrow ...

**MS. FRESHWATER:** Yeah, I don't understand that but I'll understand the larger mechanics of it.

**DR. BOVE:** Well, I think, then, you can see how the -- you know, as you go through it, you have to show what assumptions you're making at each point.

**MR. ROBINSON:** Gotcha, okay.

**MR. ENSMINGER:** And I believe -- isn't the state of California -- I think they are -- if you're living, actually living, where they have contaminated water, I think the state of California's standard is seven liters of water a day, isn't it?

**MS. MOORE:** The only time I've ever seen that, Jerry, is like for migrant workers. They have (unintelligible) when they work in the fields all day, like Arizona, and it is about that, about seven liters.

**DR. BOVE:** If you're talking about the document that they produced years ago, that incorporates showering, the seven-liter equivalent.

**MR. ENSMINGER:** Oh, okay. You got this broken out from drinking to showering -- oh, okay.

**MS. MOORE:** (Unintelligible) migrant workers in fields 12 hours a day.

**DR. BOVE:** Yeah, I'm not sure what you read but I could be wrong.

**MR. ROBINSON:** So from those equations we will calculate doses as -- we'll take those doses to determine any potential non-cancer health effects that we might expect to see. And we'll compare those doses to different studies, and whether it be animal or human epidemiological studies, to see where they are in relation to effects levels.

And we'll take those doses to multiply them by cancer -- multiply them by cancer slope factors to determine cancer risk. And that's pretty much the extent of the VOC evaluation.

So for our lead and drinking water evaluation, we looked at the annual water quality reports of the base. We did basically a summary of their base-wide sampling. And they provide this to all the residents each year. We also discussed the sampling remediation efforts with the environmental management division personnel on the base, and we also looked at the North Carolina drinking water watch website. And this is where they house all the raw data that they provide the state in order to comply with the lead and copper rule sample, the lead and copper rule. And so we'll take those raw

data and we'll run them through EPA's IEUBK model. And that will allow us to evaluate the risk for children.

CDC in 2012 came out with guidance that focused on the primary prevention of lead because they feel that there -- they -- there's no proven safe level of lead in the blood. So CDC and ATSDR now are -- recommend reducing lead exposure wherever possible.

Next slide, please. So the remaining timeline, 'cause we're going back to include all the exposure scenarios that you provided last CAP meeting, and to ensure that we get everything right, our internal review process has already begun for most of the document but we expect to complete that in fall. And the peer review --

**MR. ENSMINGER:** Really? I see you left plenty of time. The whole summer and fall for your internal review process.

**MR. ROBINSON:** Sure. Well, again, because of those additional scenarios that we wanted to enter that we included. We're having to go back and, and determine the best models to --

**MR. ENSMINGER:** Oh.

**MR. ROBINSON:** -- to use for evaluating those.

**MR. ORRIS:** And this meeting -- is this falling

under the expedited review process, as discussed in the last meetings?

**MR. ROBINSON:** This is. I mean, it will be -- with this site everything's as expedited as possible.

**MR. PARTAIN:** Glacially expedited.

**MR. ROBINSON:** So then the peer review again, that's when you guys will be seeing it for the first time. We expect to begin in the winter. And then we'll take your comments, make changes and then have it out for public comment by the spring of 2015. Yeah, I mean, it starts in December.

**DR. FORRESTER:** This is just one part of the health assessment, not the whole thing.

**MR. ENSMINGER:** No.

**DR. FORRESTER:** So I just want to make that clear, 'cause there won't be the introduction --

**MR. ENSMINGER:** No, no. This is water -- yeah.

**DR. FORRESTER:** Yeah. We could wait 'til we finish it all but I don't think you want to do that. You want to keep moving. Makes sense.

**MR. PARTAIN:** A question. How is Morris's water model and the results from that water model being utilized in this drinking water portion of the public health assessment?

**MR. ROBINSON:** I mean, they are the basis for our VOC evaluation. Those are the numbers that we are using for all our dose calculations and everything.

**MR. ENSMINGER:** What do you think, they just threw them out?

**MR. PARTAIN:** Just want to make sure.

**MR. ENSMINGER:** That's it.

**MR. BRUBAKER:** Questions, comments, interaction?

**MR. ENSMINGER:** Nope. Git 'er done. Can't wait to see it.

**MS. FORREST:** I'm kind of dreading it.

**MR. GILLIG:** Yes.

**MS. FORREST:** I'm kind of dreading it. I don't know if I'm ready for that.

**MR. BRUBAKER:** Questions on any of the presentations, any of the projects?

**MR. ENSMINGER:** We asked our questions all -- as we went along, we asked our questions, made our comments.

**MR. BRUBAKER:** All right. Excellent work. Plans for the meals are both handled as far as I understand, and we need -- is there anything outstanding on that?

**MS. SHEILA STEVENS:** I'll collect money tomorrow.

**MR. BRUBAKER:** Yes, you know what you signed up for; bring some cash to pay for your lunch. Excellent, well, our meeting's adjourned.

(Whereupon, the meeting was adjourned, 3:30 p.m.)

**CERTIFICATE OF COURT REPORTER**

**STATE OF GEORGIA**

**COUNTY OF FULTON**

I, Steven Ray Green, Certified Merit Court Reporter, do hereby certify that I reported the above and foregoing on the day of June 11, 2014; and it is a true and accurate transcript of the proceedings captioned herein.

I further certify that I am neither relation nor counsel to any of the parties herein, nor have any interest in the cause named herein.

WITNESS my hand and official seal this the 16th day of July, 2014.

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