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**U.S. ARMY CORPS OF ENGINEERS**

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PUBLIC INFORMATION SESSION ON THE REMEDIAL INVESTIGATION REPORT OF THE NIAGARA FALLS STORAGE SITE.

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**PUBLIC HEARING** held on Wednesday, May 7, 2008, at the Lewiston Senior Center, 4361 Lower River Road, Youngstown, New York, commencing at 7:15 p.m., before Denise C. Burger, Court Reporter and Notary Public of the State of New York.

MR. KOWALEWSKI: Okay. Good evening. Welcome to the U.S. Army Corps of Engineers Public Information Session on the Remedial Investigation Report of the Niagara Falls Storage Site.

My name is Bill Kowalewski and I am the Program Manager for the Corps; project here at the former Lake Ontario ordinance works and the Niagara Falls Storage Site.

The Corps' projects at this site are planned and executed by a team of scientists and engineers from throughout the country and we have brought them here tonight to engage you on the finding of this report and to take your questions and comments.

We take this work very seriously and we value your time coming tonight to learn more about the site. We want to share with you our findings and to accept your input and to answer your questions.

We have really two purposes for tonight's meeting. First, is to provide you with an introduction, and overview of our findings from this lengthy study and share with you that information. That information is basically about the contamination that is at the site. The risks that it poses and the possible movements of that waste or contamination over time. The second objective of the meeting is to open up a dialogue with the community for your concerns with those findings in advance of another meeting to be held in August. And the purpose of the second meeting is to zero in on those issues which appear to be of most interest to the local community and go into more depth of the technology, if you desire so, or to address other issues related to the project that you want to know more about from the Corps of Engineers.

Before we begin the presentation, I'd like to make some quick introductions of the Project Team that's here tonight so you recognize them when they're briefing and when they are addressing questions.

First, tonight's presenters, and I am going to ask them to just stand up and be recognized, Hallie Serazin, Risk Assessor; David King, Health

Physicist; Erik Evans and Don DeMarco, and they will be presenting on the HydroGeoLogic Model. Thank you.

Now I would like to introduce the rest of the Corps' Project Team that's with us here tonight. Again, from the Risk Assessment Community, Dr. Karen Keil; Health Physicists, Hank Specter and John Peterson. Hydro geologist Bill Frederick. We have several engineers and scientists here tonight. Michelle Rhodes, Dr. Judith Leithner, Tom Mahichick(sic) Dave Kulikowski. Our Public Affairs Officer is Lou Sanders and he's in the rear of the room. And on Community Outreach we have Ellen Reagan and Arleen Kreusch. Arleen Kreusch is the Outreach Specialist for the Buffalo District. She handles environmental issues for communities throughout New York, Pennsylvania and Ohio where the Corps is conducting these sorts of environmental investigations.

That's about it for introductions. Oh, don't do this publically, forget to introduce your boss, that would be Mr. Jack Rintoul, and he's representing the District Commander tonight, Lieutenant Colonel John Hurly. Jack is the Senior Civilian at the Buffalo District. Okay, I think that's it for introductions for the Corps staff. I am going to turn it over to Arleen to kind of go through tonight's agenda and how we would like to work it with you tonight.

MS. KREUSCH: Thank you, Bill. I am going to just briefly review the agenda for tonight. We are going to start with the Remedial Investigation and Baseline Risk Assessment presentation and then we're going to have a brief question and answer session that will last about fifteen minutes and then we will be doing the groundwater modeling and future actions. And we did receive a request yesterday to extend our question period for the public so we are going to be taking questions for the next half hour after the ground water modeling presentation and the future actions presentation.

Anyone that came in early for the availability session, you might have noticed that we had note takers taking down the questions that we received tonight. We want to make sure that we captured all of your questions so that when we do come back in August, that we will be sure and have answers for you, and have the presentation tailored to meet your needs based on the concerns that you have.

We also have a court reporter here tonight who is going to be taking a transcript of the meeting and all of the questions. When we do get to the question and answer period, if you want, you can state your name before you ask your question so that you're on record as asking a question. If you don't want to, you don't have to.

You also received a folder when you came in and there's a comment card in there or a question card in there. If you don't want to stand up and ask a question but you do have one, there's a box in the back, you can just write your question on the comment card and stick it in the box. We're going to be posting the transcript, the questions we get and then the responses that we get on our website, so that you'll all have access to that information.

We do also have CDs available of the presentation tonight. If you'd like to pick one up after the meeting, they will be at the sign-in table where you signed in when you came in.

So I think that's -- I also -- oh, and I have an easel here so that if there's anything that we can't get back to you on tonight, we will write it on the easel so that we'll have it kind of the parking lot to make sure that we address it the next time or address it on our website.

And with that I would like to introduce Hallie Serazin and David King. Thank you.

MS. SERAZIN: I am told I am soft spoken so I'll try to make this loud. Tonight we're here to present a summary of the Niagara Falls Storage Site Remedial Investigation, including the Baseline Risk Assessment and the Groundwater Contamination Phase Transport Modeling. The Remedial Investigation was conducted to determine the nature and extent of both radiological and chemical contamination at the site.

To maintain the integrity of the Interim

Waste Containment Structure, no intrusive sampling was conducted during the remedial investigation. The contents of the IWCS were described using detailed historic records and the integrity of the IWCS caps and sidewalls were determined, or were evaluated using geophysical survey techniques.

The Remedial Investigation involved numerous activities starting with a historic document review to gain an understanding of the site operations and how they may have contributed to site contamination. The field sampling and laboratory analysis was conducted in three phases, beginning with site-wide comprehensive sampling and narrowing down to answer more specific questions. A site-wide gamma walkover survey was conducted to evaluate gamma-emitting radionuclides in the top six inches of soil.

Background analysis was performed to establish a baseline for non-impacted -- of non-impacted areas in off-site properties. The background survey included sampling for groundwater, soil, surface water and sediment.

And it also included a gamma walkover survey of the Lewiston/Porter School Campus.

The geophysical survey was used to identify potential contamination, potential underground features such as pipelines and buried utilities, which could act as contaminated pathways.

The geophysical survey was also used to evaluate the integrity of the IWCS caps and sidewalks. Environmental surveillances currently ongoing at the site, and it includes sampling of air for radon emissions and gamma radiation from the site. It also includes an evaluation of surface water sediment and groundwater. The Niagara Falls Storage Site includes 191 acres, so the site was subdivided into exposure units, which are geographic areas over which a receptor was assumed to live or work. The exposure units were defined in coordination with the New York State Department of Environmental Conservation based on available data and site history.

Field screening was used to elect specific sample locations and was focused on sample -- on locations or areas where we thought chemical or radiological contamination was most likely to be found. So, for instance, the results of the gamma walkover survey were used to select sample locations with the highest gamma readings. The IR evaluated numerous environmental media and they're listed there, surface and subsurface soil, groundwater, sediment surface water, pipeline contents, railroad ballast, road and building cores and floor drains.

The Baseline Risk Assessment used the data generated in the remedial investigation to access potential exposures and risks to current and hypothetical future on-site receptors. The Baseline Risk Assessment is a decision-making tool that's used to help determine the need for further investigation or site clean up.

It includes a Screening-Level Ecological Risk Assessment to assess ecosystems with and a human health risk assessment to evaluate potential risk to on-site human receptors. Because the model is used to evaluate chemical and radiological risks were different, these two risk sources were evaluated and quantified separately.

Where a Screening Level Ecological Risk Assessment indicator species were selected to represent land-based or terrestrial ecosystems or communities as well as water-based or aquatic communities. The indicator species were also selected to represent all levels of the food chain, so they range from earthworms and red fox to mayflies and the Great Blue Heron.

The Screening Level Ecological Risk Assessment found no unacceptable radiological dose to ecological receptors. Several chemicals did fail out the very conservative screening steps of the assessment such as metals in surface water, however, field observations showed relatively healthy and functioning terrestrial and aquatic ecosystems.

Although much of the available habitat at the property has been disturbed, the ecosystems present appear to be relatively healthy and functioning, so impacts to the ecosystems are more believed to be due to a loss of habitat rather than to a toxic impact. The recommendation was for no further actions for the relatively productive and recovering ecosystem at the Niagara Falls Storage Site.

So let's look at the Human Health Risk Assessment. The Human Health Risk Assessment has four major components beginning with data evaluation, which asks the question, does contamination exist and if yes, what is the nature of this contamination.Exposure Assessment asks the question, who may be exposed? How often? How long? How much? The Exposure Assessment was used to calculate chemical and radiological intake. The Toxicity Assessment asks the question, how harmful is it and gathers toxicity information on the substances being evaluated. Risk Characterization asks the question, how much risk or what is the likelihood that a receptor might experience some adverse health effect due to on-site contaminations.

Now I'd like to take a little bit more of an in-depth look at each of these four components. Data evaluation, does contamination exist? To answer this question, a lot of sample and analysis were conducted. In fact, the Niagara Falls Storage Site data set includes approximately 1400 samples with over 150,000 analytical results. To select chemicals and radionuclides that are concerned, the analytical results were compared to background levels and to conservative screening levels.

Exposure Assessment, who may be exposed. The Exposure Assessment identifies current and potential future on-site receptors. Under current conditions, we assessed adults and adolescent trespassers as well as maintenance workers. Under future conditions, we assessed the adult and adolescent trespassers, maintenance workers, construction workers, industrial workers and both adult and child residents and subsistence farmers.

Next, complete exposure pathways were identified and those would be things such as ingestion or inhalation. I'll describe that on the next slide as well. So as to not underestimate risks, all of the exposure assumptions used to evaluate exposures to the hypothetical receptors were very conservative.

And then finally contributions from the multi -- the multiple exposure pathways were summed to estimate intake. So for an exposure path -- and exposure to occur, you really need four things, starting with a source. That source of contamination has to then be transported. So you need a transport media, you need a point of exposure and you need an exposure route. If any one of these four elements is missing, the exposure pathway is incomplete and no risk exists.

For the Niagara Falls Storage Site, the source of contamination is historic government operations at the site that resulted in releases to soil. Contaminants released to soil have since been transported or moved through various mechanisms, including wind erosion, volatilization or leaching. There's more on the figure there.

The exposure point would be the location where populations may actually come in contact with that contamination. So for instance, contamination that was released to sill may now have an exposure point in through food. And then the route itself would be ingestion of the contaminated food source.

Once we have estimated intake, we need to ask ourselves how harmful is it. A very long time ago, the Greek Philosopher, Paracelsus, developed one of the founding laws of toxicology that dose, not exposure determines harm. In other words, exposure does not equal risk. The practical example of this is if you drink a cup of coffee or an alcoholic beverage, you may be fine but if you drink ten cups of coffee or you have ten alcoholic drinks, it could make you sick or worse. The toxicity assessment for the Niagara Falls Storage Site Baseline Risk Assessment used Environmental Protection Agency-approved toxicity criteria to calculate the likelihood that a receptor might experience adverse health effects or risk.

Then finally we moved to the Risk Characterization, which answered the question, how much risk? The Risk Characterization integrates the findings of the Exposure Assessment intake with the results of the Toxicity Characterization, the Toxicity Assessment or those values, the toxicity criteria to determine risk.

The Risk Characterization estimated the likelihood that a receptor may experience an adverse health effect and compare those levels, those risk results to the regulatory limits, to determine whether action is warranted.

Now David King is going to present some of the key findings of the Remedial Investigation and the Baseline Risk Assessment.

MR. KING: All right. First of all, I'd like to say that I made my connecting flight today but my bag did not, so I am giving this presentation in my comfy travel cloths, I hope that's acceptable.

I am going to discuss today the key findings of the remedial investigation and the Baseline Risk Assessment starting with Interim Waste Containment Structure. Which I will also refer to as the cell. Two types of data -- two types of data have been collected over the last eight years, over the cell. Geophysical data and environmental surveillance data, including radon measurements and gamma radiation survey.

The geophysical data confirmed that the cell is not deteriorating. No void spaces have been found. No significant cracks of fissures have been identified, et cetera. The radon and gamma radiation data are also well below federal standards, which is good.

Now as Hallie pointed out, these are nonintrusive data. That means they do not puncture the cell and directly samples the materials underneath. There's discussion during the remedial investigation planning session that it's -- historical data are good enough and where -- there's no reason to risk at this point puncturing into that material and potentially exposing workers or producing environmental release. That's why the nonintrusive approach was taken. And that's understood that the cell is not a permanent storage facility.

The feasibility study will evaluate

alternatives for developing a permanent solution for the waste inside the cell. So again, in summary, the geophysical data and environmental surveillance data shows that these cells hold up nicely.

Moving onto a key finding for the soils; approximately 1000 surface soil and subsurface samples, soil samples, have been collected during the IR phase. This figure illustrates the location of the those samples. Specifically where chemicals have been identified above the risk grade screening levels, you see a purple circle, and where the radionuclides are concerned, have been identified at that risk base screening level, you see a green circle. And where no chemical or radionuclide of concern have been identified, you see a gray shaded circle.

Now both chemicals and radionuclides have been identified above background levels for both surface and subsurface soils. Now getting a little more specific for radionuclides, the constituents detected most frequently in soil are radium, thorium and uranium. And for surface soil, also cesium. For chemicals, chlorinated solvents have been identified near buildings and former activities associated with low activities. The low processes. And also PAH's and PCB's and some metals have been identified in more isolated spots. And you can see from the figure that some of the chemicals are really more isolated to a few locations, relative to the radionuclides, which show more widespread contamination across the site.

And something else I'd like to point out about this figure is that in general, we can consider, from a risk standpoint, a farmer or resident receptor across everywhere except exposure unit ten. In this area there really wasn't a need to identify a resident there because we knew if the resident broke into the cell, there would be an unacceptable risk. So what we looked at was more of a -- the current situation, who was exposed to exposure unit ten, and that would be a maintenance worker.

So still some contaminants were of concern, chemicals specifically or I'm sorry, radionuclides were still identified in exposure unit ten. But you also see that we did not collect any cells -- and samples within the footprint of the cell.

Now moving on to sediment surface water and the pipelines. The sediment and surface water only exist in some areas of the site and for surface water, during only part of the year. The pipelines are -- were manufactured or constructed back in the 40's associated with TNT manufacture -- the TNT Manufacturing Plant and have been capped into boundaries that are no longer in use. Dealing with sediment and surface water first, first of all you see, I am sorry, back up a little bit, this -- talk about this figure, this figure uses the same color scheme as the last figure. The purple circles represent where chemicals of concern have been identified above the screening level and the green represents where radionuclides have been identified above screening levels. And again, if nothing was identified, you see a gray dot.

One thing is obvious from this figure, we don't have any green dots anywhere. The green, the radionuclides were identified above background but not above -- not to produce an unacceptable risk. Which leaves only chemicals. For sediment, actually no chemical of concern was also identified. Leaving only surface water and then the pipelines. For surface water, the only chemical of concern was lead and lead was selected as a chemical of concern because surface water concentrations of lead in this ditch here exceeds a very conservative drinking water action level. So the assumption is somebody is going to get all their drinking water from this ditch, which only has water in it part of the year, which is a very conservative step. For -- for the pipelines a PCB was identified as a chemical of concern leading at concentration primarily right here and lead was also again identified in the -- the pipelines using the conservative drinking water action level. I have already mentioned that the pipelines have all been cut off at the site boundary, the -- they -- our remedial investigation also showed that surface water and sediment contamination is not migrating off the site.

Moving now to groundwater. Groundwater on the site is -- was really located into two zones, the upper water bearing zone, which is closer to the ground surface and the lower water bearing zone. We see the upper water bearing zone here and the lower water bearing zone here. These zones are separated by an average of about twenty feet of clay, which is identified here at the aquitard. The lower water bearing zone data does show some results above background but nothing exceeding risk -- a risk threshold. A contamination has been identified in the upper water bearing zone, primarily associated with these isolated sand lenses and also associated with soil contamination. So the idea is if you get rid of the soil contamination, which is the source of the groundwater contamination, you're also taking care of the groundwater problem.

In the upper water bearing zone, some plumes have been identified, specifically for radionuclides, uranium was the only one identified. And then we have magnesium -- manganese, boron, some chlorinated solvents, and that there. I'm a rad guy so I would call this bis2 for future reference.

This figure uses the same color scheme as we had for the prior figures, with the purple representing a chemical, in this case a plume instead of an individual location and then the green now is -- is instead of a radionuclides, is uranium plumes that were identified. And then we added in this uranium screening level, maximum concentration level I think is what it's called, MCL, which is a drinking water standard for uranium.

So we see this is where we're starting to detect uranium above background and also what is associated with this drinking water standard, this all in the upper water bearing zone. And what we see here is just like for soils, for example, we see some isolated occurrences of chemicals. This is boron. I believe these are the chlorinated solvents and this is bis2.

Of particular importance in this case is we have up in the exposure unit one, we have this plume that appears to be crossing the site boundary. This is ongoing surveillance and is going on to the monitor what is going on here and I am not even sure we have any sample locations across it. We do know, we think that it's leaving the site. Which is of a particular interest for obvious reasons.

Okay. In conclusion, one of the most important things, there is a no immediate off-site risk to the nearby communities. The RI data confirms that the cell is not degrading. There is no radon problems or gamma radiation coming from the cell. Surface water and sediment contamination is not migrating off-site. The pipelines are capped at the boundary, so we don't have any off-site risk or problems

The one groundwater plume was identified and environmental surveillance and maintenance activities will continue. And finally, the feasibility study, which is coming up, will examine the variety of options to address long-term risks presented by site contamination.

And that concludes my presentation.

MS. KREUSCH: Thank you, Hallie and David. Could somebody turn the light back up for the question part. If anybody needs to stand up and stretch or anything while we're doing this, please feel free to go ahead.

I just want to pull this out so that I can write anything down we need to write down. Just if everybody is okay, a couple of ground rules kind of, we'll try to have one person go at a time and try to give everybody a chance to talk and be respectful and listen of everyone. Is there any other kind of operating rules that anyone would like to suggest for the questions and answers? Is everybody okay with those? Okay. Does anybody have any questions?

MS. ROBERTS: I have a couple. Do you want me to come up front?

MS. KREUSCH: Whichever you prefer.

MS. ROBERTS: Can you hear or can everybody hear? Okay, my name is Ann Roberts and I have been interested in the NFSS for quite a long time. One question I had was the -- of particular concern to me is a uranium plume, which is south of the contained south. I think in the RIR presentation it shows up as green just south of the cell. But the levels of uranium are very high and they're of the order of I think 9000, which seems is that right? Maybe the coffee got to my math. I read it as -- let me see, to me it looks like --- can you read that 9580, yeah, 9580, which seems way above any other, you know, levels in groundwater.

I had a discussion earlier with some of the engineers about the fact that their sample was taken from a pipeline. I think my question is what accounts for levels that high, even if it's in the pipeline, so you might confine it more as a mixture of infiltrated water from above. It still seems very high and I just have worries about the southern boundary of the containment cell leaking and somehow, you know, the first thing you would see is uranium. So I would appreciate any other information that will put my mind at rest on that particular question.

MS. RHODES: You can't really see the

concentration on here but it refers to kind of this area right here and when we were drawing the groundwater plume map, we wanted to make sure we were very conservative on how they -- we drew them. So we took not only what was in the groundwater itself but also what was in the associated pipeline content.

The reason we did that is obviously if it's in the pipeline, if the pipeline is breached, there's the potential for it to leach into groundwater. What we have here, and it's not shown very well, is there's actually a building south of the -- the southern dike on the containment cell. This is former building 409. It was originally part of a low waste water treatment plant. It wasn't included in the cell itself because there wasn't storage of the residues in it. However, we actually did a geophysical survey and determined that there was extensive metal in this building. So based on some of the documentation, what they have done is actually taken some of the demolition debris from when they originally were putting the residues in the building and put it in inside that building 409.

The geophysical defines that area where 409 was and we -- we sampled the boundaries of that, both soil and groundwater to make sure it wasn't a source of the -- of the, you know, the contamination along the side where Ann pointed out. This was drawn very conservatively and if you look on this map, which unfortunately you don't have, but it's in the Remedial Investigation Report, there's actually sample here, sample location here, here and there (indicating) that was in the pipeline itself. And so there was no sampling done here. We just automatically assumed what was on this side would obviously be on that side

This whole area was an area of a lot of activity in the 80's when the Department of Energy was constructing the cell. There was former rad storage piles on this specific area and another rad storage area was right here, you could see. That obviously has a plume associated with it. So it's not surprising that there is a plume there, and especially since this is where the, you know, the higher activity residues were stored at one point, not K65s specifically.

So like I said, we were conservative as far as including that in our groundwater maps just for a potential to get to groundwater. We wanted to make sure we captured it and didn't lose sight of it because of the concentration associated with it. Not saying it's in the groundwater now but we wanted to account for it in that manner. So it is elevated and definitely is likely due to former rad storage in the southern portion.

MS. ROBERTS: Michelle, could you be certain that that's the cause though, because you obviously don't take samples within the containment cell for obvious reasons, so how would you know if it was, if the cell should be leaking on that southern boundary, how would you know?

MS. RHODES: Actually what is not shown here either, is we do have what's called nestor welpairs(sic), and actually our next presentation will elaborate on that a little bit more. We have an Environmental Surveillance Program that we do each year and part of it is sampling the groundwater wells surrounding the waste containment structures. There's actually wells along the southern side and actually another well here that we do sample to determine if there is a penetration, you know, of the waste containment structure.

MS. ROBERTS: Would these actually show, you know, that the cell was leaking because the wells are a certain distance apart and if you had pipelines remaining from building 409, they haven't been removed, you could get material traveling preferentially along those pathways to building 409 and then giving you a plume that emanates from that.

MS. RHODES: Building 409 is, you know, around this area. The dike that was constructed, the southern dike, obviously was between the southern building within the waste containment cell 409, so they actually did excavate that quite far down to install that cut off wall and again, HGL will get into that a little bit more .

What is good about this site is that there is tight clay, now obviously clay is not, you know -- will allow some groundwater flow through it but it's not, you know, it makes -- that's why it makes a landfill is that, you know, it doesn't allow water to flow through it readily. What we found is these plumes are collocated or the same location as sand lenses. So we did extensive sampling, specifically in this area, you can see on the soil map as well, to look for potential sand pockets or anything that might indicate that those wells couldn't capture any kind of groundwater issues.

So we wanted to make sure that, especially in this southern area, I think that's the area most in question as far as, you know, potential for leak, for leaking, that we address the southern portion extensively to make sure that we had adequate well distribution. I can't remember, let's see, there's about five wells across here, so they're very closely spaced. We actually have a couple outside of this as well. And they're both in the upper and lower water bearing zones.

So we do continue to monitor them. Anything that has been -- has gotten into the groundwater seems to be within these individual sand pockets, which makes sense when you consider groundwater prefers to flow through sand instead of clay.

MS. ROBERTS: Do you know if the pipes still exist though in 409 on the outside containment zones? Because that's my concern, if you do have pipes still there, the -- if the cap is deteriorated over time and you did have some leakage, it would flow along the pipe and that would not be picked up by the -- well presumably.

MS. RHODES: The geophysical didn't show any connecting pipe. Now obviously, geophysical is not perfect. It has its own limitations associated with it. So the actual construction of the dike at the cut off wall went down to the gray clay, which is about twenty feet roughly on average, that varies, and we found that the pipelines didn't really extend much below, you know, most of our lines on-site are about ten to twelve feet. Obviously some are a little deeper, but any construction of the actual clay dike itself would have forced the Department of Energy, when they were constructing the cap, to sever those lines and cap them.

I have some photos available, not specifically, I was looking at 409 itself, but some of the other buildings associated with this. It was a former, you know, that's your -- I guess your concern is correct, it was a former fresh water treatment plant so obviously it had pipelines associated with that. But I have some photos of, you know, the actual capping and fill critting grouting associated with those lines.

MS. KREUSCH: Does anyone else have another question? Dr. Beck.

DR. BECK: Dr. William Beck, Chair of the Radiological Committee. I have got a couple of questions and most of them relate to the contents of the Interim Waste Containment Structure, because that's where almost all of the radioactivity on site is located.

So will the Corps drill into the Interim Waste Containment Site before the feasibility study to get data on the internal movement of radioactive contamination, particularly between the storage building such as 411 and the eastern clay wall in the vicinity of the central drainage ditch?

This data is critical for determining the extent of any excavations in the feasibility studies. If there is contamination beneath the building and adjacent to the buildings, we are now talking demolishing that entire massive structure in order to excavate underneath it.

I think before you can assess the feasibility, we need to know how much movement has occurred in the twenty-five years since the waste was placed there. And that's an unanswerable question, I will leave it out there and follow that with a second question.

MS. KREUSCH: Okay.

DR. BECK: Inside building 411, okay, there was a pazometer (sic) and there are photographs in it, I have seen the photographs, it is non functional. Attributed to lightening damage. Will those be repaired or a new one inserted, again, the key to the release of radioactivity from that building and what is the buildup of liquid inside those powder wet residues? Okay. Two pieces if information, if the groundwater level inside the residue is rising, this is an indication of how much rain water and irrigation water is coming downwards and collecting in the building. Okay, there is a computer model projecting this, this would be ground truth as to how well that model is doing. And secondly, if there is a seasonal variation, if it is actually going up and going down inside the building, this is then evidence that there is a leak near the bottom and groundwater is forcing itself up into the building when the groundwater is high and as the groundwater drops, it would be showing a change in the building as well.

So for this reason I believe a measurement inside that building, inside the residue is important for any feasibility study to decide what has to be done and of course to set up how you're going to do it.

MS. KREUSCH: Is that something that will be addressed in the next presentation or does somebody want to respond to that tonight or just keep it on the --

DR. BECK: Well, the third one is again going to the same issue, the geophysical testing, because I suspect of the steel in the concrete building, that we're talking about, building 411, has not examined the east, the west, or the south side of that adjacent to the building.

And again, this is -- we're all counting on that clay wall for our safety and as far as I know, I have seen no evidence that it's been examined and what technology there is available to reassure us that that part of the clay wall is also undisturbed. I realize that the upper part, the northern part has been examined, and I am not arguing about that. What I am saying the whole piece that hasn't been looked at

MS. KREUSCH: So that was the building 411 steel? I just want to make sure I got that down right?

DR. BECK: Yeah, I believe in all of

those buildings there is reinforced concrete --

MS. KREUSCH: Okay.

DR. BECK: -- and steel --

MS. KREUSCH: Okay.

DR. BECK: -- resulting in that the electromagnetic technique found a lot of steel. It didn't tell us anything about -- thank you.

MS. RHODES: I am a lot shorter than Dave. So first I'd like to publically acknowledge the radiation committee, they had submitted a document to us for our review and consideration of the feasibility study that was excellent. I know they put a lot of work behind it and did a lot of research and mainly a lot of it was focusing on the Interim Waste Containment Structure so we appreciate that.

Second, just to start with your point number one, Dr. Beck, there are definitely, you know, we did an extensive look at the history, is this even helping? We did an extensive historical search to obtain as much information as we could. We also talked to the former workers on site that actually helped construct the landfill itself and were able to get a little bit more information.

Now obviously do we know 100 percent exactly where everything is perfectly? No. And it never will be that way. There will always be uncertainties but there are certain ways to handle uncertainties. At this point, as far as the penetration of the cell, as Dave King had mentioned during the RI planning, we have just determined that based on the historical information, we had enough sufficient information at least to assess some of the alternatives that we're going to be looking at in the feasibility study. Obviously there are data gaps and we're trying to fill those and obviously if there is any information that people have that can help us with it, we'd appreciate it.

We did that for a reason that the landfill was constructed for a reason. You know, obviously the clay cap on it was designed to, you know, minimize any infiltration of rain water, you know, as the rain water would infiltrate it would cause leaching and that could go to groundwater. So we wanted to be protective in that manner. Additionally, the residues that are buried inside the landfill generate radon, so part of the reason that the cap was designed the way it was, was to prevent this radon from releasing and that's something that we test during our environmental surveillance program.

So I guess we weighed the benefit of penetrating the cell adverses what additional information or value we would get from it and determine that we had enough sufficient information, although not perfect, we definitely agree, to use for our planning purposes.

The pazometer, as Dr. Beck had mentioned, when the cap was originally designed, it had pressure transducers and all it means is it monitors the levels of the water rising and falling and obviously in a perfect situation, the landfill, you want them to remain constant. You don't want them to show any kind of seasonal changes that would indicate that your, you know, your containment amount is not -- has been breached.

In the 80s I guess there was a lightning storm and the power associated with those I guess fried the system and so that information is no longer available for us to use. And again, not wanting to penetrate the cell again is an issue. However, we're still searching there in the microfiche and I know Dr. Beck is very particular with that. There was old vapor pressure transducer data that we're trying to find so that would be helpful -- helpful to our investigation. We're constantly looking for that, to assist with our planning.

The geophysical of the building that Dr. Beck was referring to, we had done a seismic survey in the landfill and the reason we did it was to determine what -- where the water table was and based on the geophysics we did to the northern portion of the waste containment cell, it appeared to be about three feet below building 4 level, where the residues were stored. Now obviously this not directly under the residues. One of the limitations of geophysics is you're trying to see a water table underneath metal and there's an interference there that won't allow you to see it.

We realize that -- that, you know, that was a limitation in the study, although it appears that there is no -- that it's not, you know, above the residues and we can talk a little bit to, HGL is going to talk a little bit about the model and how that was addressed. So we were aware that there is definitely -- there's more information to be had. We're constantly looking for more information but at this point we have done an extensive search and as far as planning, you know, we feel that we have sufficient data.

DR. BECK: One short comment, I have repeatedly asked for drilling into the interim waste containment structure and make only one point, if it's as you believe, it is clean outside the building, I have always asked for a drill to do go in an area outside of the building close enough so that if there is leakage, it will be detected but both of us hope you will hit nothing but clean water. It does not raise a significant radon risk, that of course can be dealt with. And it will not interfere directly with the structure.

Now the request for pazometer is another issue. That would be directly into the residue. But it is a key question that is sitting there in the modeling and we have zero, zero data to validate the model and that's then impinges upon the rest of your groundwater migration models, because inside that area you have zero data. It's a guess at best. And we both want to have data to come to some reasonable conclusions as to what is happening.

MS. RHODES: Can you clarify what data, I am sorry, what data; you're talking the actual concentrations of the residue or --

DR. BECK: No, we know the residues were put inside the former water treatment plant, okay. We don't know if there has been any movement of those residues or leaching out of the building. My suggestion is a bore hole next to the building and find and answer that question, particularly the location right between the drainage ditch and the building.

In particular, I have looked at, because there are documents provided by you, there were a number of pipelines in that area which would provide short circuit paths, if it is getting outside of the buildings. If any of the eight plugs have leaked, this is the place to be looking for it moving in that direction. And we would all like to find a negative answer. But until someone goes in there and takes some data, you have an opinion, I have an opinion, we agree to disagree.

MS. KREUSCH: Okay. Thank you. Bill gave me the high sign a while ago for our first fifteen-minute session being done so if you don't mind, we'll start the next presentation.

(Whereupon, the hearing concluded at 7:50 p.m.)

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**U.S. ARMY CORPS OF ENGINEERS**

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PUBLIC INFORMATION SESSION ON THE REMEDIAL INVESTIGATION REPORT OF THE NIAGARA FALLS STORAGE SITE: **GROUNDWATER MODEL & FUTURE ACTIONS**

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**HYDROGEOLOGIC GROUNDWATER MODEL PRESENTATION** held on Wednesday, May 7, 2008, at the Lewiston Senior Center, 4361 Lower River Road, Youngstown, New York, commencing at 7:55 p.m., before Denise C. burger, Court Reporter and Notary Public of the State of New York.

MR. KREUSCH: I'd like to introduce Eric Evans and Don DeMarco. And can we put the lights back on.

MR. EVANS: Can you people hear me okay? Okay. I am Eric Evans, with HydroGeoLogic. We were asked in 2001 to develop a groundwater model for the Niagara Falls Storage Site. The purpose of the model was to predict the long-term migration of contaminants from the Niagara Falls Storage Site.

We're going to provide kind of a fairly general overview of the modeling analysis that was performed. We're going to talk a little bit about kind of the process that was followed for the modeling. It consisted of four primary steps. First we did -- we did an extensive effort where we collected a lot of data. We evaluated that data to kind of gain a conceptual understanding of groundwater flow in the vicinity of the Niagara Falls Storage Site.

From that we developed a groundwater flow model capable of simulating the flow of water. After that, based on the flow model, we developed a groundwater contaminant transport model that uses the velocities from the flow model to simulate how contaminants might move in the subsurface. We used the model to do predictive simulations. That was the final step in the modeling analysis.

They said I'm going -- we're going to go through this in kind of a broad --broad brush view and we can answer any questions at the end. And we also, we documented the modeling approach, the data that went into the model, our assumptions and the results and a modeling report dated December 2007.

A groundwater model is really, it's a computer model that uses -- well, it solves a series of mathematical equations that describe groundwater flow and solu transport, so it's similar to a lot of other types of models that people are more familiar with.

It helps us to get an understanding of groundwater flow. We can't see beneath the subsurface so it allows us to make predictions. It is a very common tool for predicting what is going to happen in the future and also making some observations or determining what might have happened in the past.

A groundwater model typically should be constructed and calibrated with real field data. In this case, we had an extensive amount of data that we used for both the construction and the calibration in this model and I'll talk about that in a little bit. This comprehensive modeling study spans several years. It began in 2001, it wasn't continuous but it started in 2001.

At that point we compiled a lot of both historical data and more recent data related to the site's hydro-geology. We also collected a lot of data from surrounding facilities. We got data from modern landfills, CWM. D.C. gave us some data. We got data from the army -- excuse me the USDS. We picked through documents in the Army Corps' warehouse. We have looked through microfiche. We looked at a lot of records to try to build an understanding of what is going on in terms of the hydro-geology of the Niagara Falls

Storage Site and the surrounding area.

This information was compiled into a database and from that database we also developed a geographic information system that allowed us to visualize this data on maps. Things like water level elevations, hydraulic properties such as hydraulic connectivity for example. The tops and bottoms of various geologic units in the sub surface. That type of information.

The GIS allows us to visualize it, to understand it and ultimately put it into a format that we could bring it into a numerical model. From the GIS we were also able to construct a conceptual model which really describes all the important aspects that control groundwater flow and contaminated transport to the site and from that conceptual model we developed our groundwater flow and solu transport models. So 3D, three dimensional model. And finally we used that model and the recent phase of the project to do several predictive simulations.

A few key features of the model that we developed, we put this together using a code called mod HMS. It's kind of -- it was built around the USGS mod flow model, which is very common. It's a commonly used model. Mod HMS allows us to do some other things, like simulate solu transport, which mod flow doesn't allow us to do. And also has some very unique features. It lets us simulate radioactive decay and ingrowth, which is very important at this site.

We obviously need to simulate that process because the key constituents are radionuclides. Our domain for the area that we're simulating is a 60 square mile area and as I said, it was based on a lot of data. Over a hundred thousand records in the database that we constructed.

In terms of the predictive simulations that were performed, to date we have done base -- baseline case simulations and base -- baseline simulations are really simulations where we looked at trying to predict the long term migration of contaminants up to actually ten thousand years as if things right now wouldn't change. So the IWCS has maintained that the integrity of the cap stays the same. The base of the structure stays the same. So everything is basically the same as today.

We see precipitation much like we see today. It's variable but it's within the range of what we have seen over the last thirty years. We did simulations where we looked at some worse case scenarios. We looked at inadvertent penetration of the IWCS, where we made the assumption that somebody would put wells, drill wells through the entire IWCS and allow contaminated water to migrate all the way down to the lower water bearing zone.

We looked at a scenario where we had an earthquake, catastrophic earthquake where it would disrupt the integrity of the cap and also break up the foundation at the base of the building 411 and we looked at a scenario where we considered a breach of the cap where maybe the cap wasn't maintained for a series of years and it really wasn't working effectively. So those are the scenarios that we have done to date. We are also going to be using a model to evaluate various remedial alternatives as part of the feasibility study process, which is the next step in all of this.

I think everybody knows there is uncertainty in all models. Those uncertainties really are based on the fact that we -- there are data gaps. We don't have a complete understanding of the subsurface at all locations. We, on this particular site, I think have relatively low uncertainty. We have a lot of data that base this model around. Much more than we have at a typical site. We also have the luxury that we were able to gather data from the surrounding facilities, which helped us reduce some uncertainty.

There are still gaps. There is still uncertainty and one of the ways that we dealt with that is we made conservative assumptions whenever possible when there were significant data gaps that would allow us to ensure that the predictions that we did make with the model, if anything, overestimated the gamma concentrations. And this slide just shows a few of them. One we conduced the simulations for ten thousand years.

We did it for a very extensive time period. Typically for this type of project you might go out 5, 200, maybe 1000 years. Ten thousand years is a long time frame.

Cases where we didn't have site-specific data for the transport properties, we used conservative values that we derived from literature. The values that would overestimate contaminate concentrations. We assumed that the upper portion of -- the upper portion of the Queenston shale, the bedrock underlying the region was fractured and weathered. Also, I think as Dave indicated, the spacial distribution of contaminants and groundwater and soil, I think are fairly conservatively estimated. The actual extent is more than likely smaller. And this information was fed into the model.

Finally, I think this is something that we have been discussing a little bit in the question and answer period, the clay dikes that Michelle was discussing are right here and IWCS, and those were constructed to impede groundwater flow from IWCS. And they surround the whole entire structure. We made the assumption in our modeling analysis that they -- they're not present, so we used properties that are similar to the surrounding area. So we didn't take credit for any kind of affects that these clay dykes might have in terms of impeding groundwater flow.

One key aspect of the modeling analysis up front was to really get a handle on the sub surface geography or stratigraphy beneath the site. And some of you may have noticed the three-dimensional animation in the other room. We put a lot of effort into defining the geology. We had a lot of data that we used to construct kind of a three-dimensional representation of the stratigraphy. But in general, as Dave, Dave King mentioned, we have three hydro stratigraphic units essentially beneath the site. In broad terms, we have an upper water bearing zone, which consists of this upper clay till, which is a low permeability glacial sediment. Mainly clay.

It does have some sand lenses in it and we did a study several years back where we did a geo statistical analysis to try to determine the continuity of the sand lenses to see if they're extensive, they might be a pathway for contaminant migration. Based on that study, the sand lenses appear to be fifteen to twenty feet in length. That's the degree of spacial continuity.

There is this aquitard right here consisting of clays. Basically glacial lake clays and then a higher transvicity unit down here, Alluvial sand and gravel and then the Queenston formation, the upper portion of the Queenston formation. All the sediments from here down are very tight. They are mainly clays. Water doesn't move very easily through these materials.

One of the first steps in the model construction process is to superimpose what we call find a difference grid. It's really kind of a mathematical grid that overlays the area that you're interested in. A series of rows and columns and at the center of each of these rows and columns you solve the equations. So their computer model solves the equations describing groundwater flow and contaminant migration.

So at the center of each of the cells in here, you can't see them real well, we compute water level elevations, groundwater velocities, contaminant concentrations. And you -- you can notice that the grid is a lot finer around the Niagara Falls Storage Site. That's because we have a lot more data there. We also -- that's the area where we are mostly interested in so we need a lot more resolution there.

Also note that the model extends up to Lake Ontario to the north of the Niagara River over to the west. And it's quite an extensive area, and part of the reason that we extended the model out to that wide area is because when we started the modeling analysis, we went into it without any preconceived notions as far as how far contaminant migration might occur. So we want to make sure that the domain of the model, the boundaries of the model, were out far enough so that we can predict how far contaminants might make it in ten thousand years, another thing to note.

One other thing about these, these are, I guess, regional hydrologic features, groundwater flow throughout this whole entire region either goes to the Niagara River to the west or Lake Ontario to the north, or one of these smaller screenings. But in general, the flow across this area is either to the west or to the north or to the northwest right here. Also represented in the model is all the, are all these little streams, drainage ditches and that kind of thing.

We also had to define kind of the, there's five different grids and the vertical direction. So we have four layers of these cells that we solve these mathematical equations that the model does. Layer one represents upper clay till. Layer two, Glacio-Lactustrine clay. Layer three, Alluvial sand and gravel and layer four is the Queenston formation.

Once the model is constructed, we have basically the grid overlaying. We -- we specify all the sources and sinks of groundwater. We specify all the rivers and creeks, precipitation recharge. Then we go through the model calibration process and that involves adjusting some of these parameters in the model within observed ranges. So we use the field data to kind of bracket how far we can move some of these parameters. And we honor the field data when we have it. We adjust these so that we get a good match between field observations and what's predicted by the model.

In our case, we used the water level variations elevations measured in monitoring wells. We use these to evaluate how accurate our model is in terms of being able to make predictions and we achieve a very good calibration of the mean residual. Our residual was the difference between observed and stimulated water levels at each of these wells. The mean residual was less than point one feet. So you can't really see it very well, but most of these residuals are less than two feet on the Niagara Falls Storage Site. And we also -- the model does a good job matching the general trend in water levels across this site as well.

So with that I am going to let Don talk a little bit about the contaminant transport and also some of the modeling results.

MR. DEMARCO: Thank you, Eric. So as Eric had indicated, I am going to discuss some of the solu transport components of the modeling efforts and basically like when we looked at the objective of the solu transport modeling, was to be able to use the model to obtain some insight into the questions of what is the concentration spatially at a certain location in the model domain both in space and in time.

So let's say, for example, if we have a quantity of a constituent, let's say in the IWCS, what we're looking to the model to provide us a prediction of is will this constituent migrate out of the IWCS based on our known understanding of the geometry and physical characteristics of the IWCS and the hydro-geology in the zone. Will this constituent migrate from the IWCS and travel with groundwater to, for example, a receptor or a point such as the Niagara Falls Storage Site property and if it does reach the property, when does it reach it and what is the concentration.

And so we're looking to the model to provide us with that type of information. But we're not just looking at one constituent and we simulated twenty-four different constituents. And as you can see here, the twenty-four constituents are listed. And we selected these constituents, and we limited it to twenty-four, but we selected them based on various physical and chemical properties of the constituents such as, for example, the contaminant mass. Is the mass present in a notable quantity on site, or concentrations or solubility or mobility and they're listed here on the slide.

Mobility is one that pertains to the ability of the contaminant to move. Some contaminants -- some constituents are highly absorbed and they don't have a tendency to move. So we took that into consideration looking at constituents that are more mobile in selecting this list of twenty-four constituents that we simulated.

And as you can see here, they're grouped into three different categories. We have our radionuclides in a box at the top. We have some metals here in the middle of the screen and then at the bottom we also have some chlorinated solvents, including the, you know, the bis that Dave referred to. So we narrowed it down to these twenty-four constituents and then based on extensive field data that's been collected, we then took that data and put it into the model. Data for example, the reported concentrations of various constituents in groundwater. So here we mapped out the plumes and we took that information and we incorporated it into the model so the model will then be able to, during its simulations, account for the movement of these plumes.

As Dave pointed out, there was also some contamination identified within the soil and although this contamination was not necessarily in the groundwater at this point, we considered the possibility that it may then leach from the soil down to the groundwater and then from there migrate with the groundwater. And considering the simulation times that we're looking at, we're looking at simulations extending out to ten thousand years; some of these processes take time.

But over that time frame, you know, we realize, you know, these are things we have to consider, are these contaminants going to migrate through the soil and so on. And then, of course, we have up here the wastes that are within the IWCS. Of course the IWCS accounting for the bulk of the radionuclide material on the site. And in doing the solu transport model, a lot of our effort focused on the IWCS. And so as you can see here on this slide, it shows the schematic of the IWCS and some of the physical processes that our modeling had to account for.

And now as Eric had indicated, we built a three-dimensional model that simulates groundwater flow and when looking at the solu transport modeling, in particular, the transport modeling for the IWCS, we went to two other tools to perform -- to, you know, to determine the concentrations that are getting down to groundwater the most accurate way that we could. And one of the tools that we used is called a help model. Now the help model is a very commonly used model to calculate the infiltration through a landfill. Through a layered system such as we have here in the IWCS. And the help model will account for several of these processes that are illustrated here such as precipitation and runoff and so on, and it will calculate the infiltration into the IWCS.

So we ran the help model and came up with a prediction of how much water are we expecting to get into the IWCS. And then here we just see a little cutaway showing a sort of schematic ladder and so on. And then understanding, you know, looking at the model predictions of the water flow into the cell, we then went to another model to simulate the one-dimensional solu transport through the cell, and understanding in each bay, each bay has its own different thicknesses of units, different quantities of waste and so on.

So we then used that one-dimensional model in conjunction with the predicted water flux to come up with an estimate of the concentrations that are coming out of the bottom of the IWCS and it's those concentrations that we then input into the 3D model to then use as a basis for, you know, the predictions of these transports across the site and so on.

So the solu transport model then incorporated an extensive amount of data and information that had been collected. This information was put into the model under various QAQC control and so on and run. And then we have results. But now the challenge that we're faced with is how do we look at these results and how do we interpret them. And one of the tools that we go to that we find to be very useful is to look at animations. Okay, and so what we have here, I am showing a preview screen of an animation that will start running in a minute but just to orient you with some of the features that are on the screen, before I run the animation first. So you can see here we have a planned view of the Niagara Falls Storage Site. You can see the IWCS of course and I will just draw your attention down here, time equals zero. As I run the animation, you'll see time move forward.

You can see on the Niagara Falls Storage Site property here, there are various colored regions which correspond to the groundwater plumes that have been measured. And looking up at the ledge in here, we can see that the ledge stands from, this is for uranium transport, and it spans from a background concentration up to higher levels. So these existing groundwater plumes, they're already in the -- in the groundwater at this point. The model is right at zero ready to run and so we see that they're there. And you can see here also there is shown some contours of hydraulic head indicating the groundwater flow direction and a couple cross sections. So we have A to A prime here. This is a slice through the model, so then we can look at not just the lateral transport of these plumes and IWCS constituents, but we can also look at the movement predicted by the model in a vertical sense.

And so this cross section A to A prime is then shown up here and you can even make out the sort of topography feature here, this is the IWCS vertically exaggerated in this image up here and it goes across. So the A to A prime. And likewise we have B to B prime coming up here and B to B prime and notice here how this cross section crosses across two plumes and you can see how those groundwater plumes are also shown in the cross section.

So, Dave, if you would just, yeah, go ahead and start it. Okay, so this must have been when the power outage happened at the site. Okay, there we go. It looks as though maybe we could even just go back a slide. So if you just take the mouse and left click with the mouse on the image itself, there you go. Okay, so what you can see here, we can see some vertical movement here coming from, this is a C soil source. Some of the contamination that we have seen in soil, the model predicting that it gets down to the groundwater table. We're coming up to 380 years now. But you can also see here we have some waste being, the model is predicting that these wastes are moving out of the IWCS at this time and but you will notice here too that many of the existing plumes remain fairly mobile even after 800 years, this is going to run up to a thousand years, the plumes are remaining somewhat stationary. And this is a reflection of the permeability of that upper clay till. And so we looked at the animations as one way of visualizing and understanding our model results. Another way we look at it, is we look at, okay, let's look at the specific concentrations, for example, at the property boundary. We're interested in looking at these predictions, see how the model predicts concentrations of property boundary. And so in a querying of concentration property boundaries, we find that of course here's this contentious plume up in the northwest corner. It's a groundwater plume that is suspected to be already at the boundary. It's based on a couple of well points there but it -- at time equals zero, the concentrations are suspected to be crossing the boundary.

And, of course, this is an area where these concentrations are not in any way associated with the waste coming; that's stored within the

Interim Waste Containment Structure and the source of this plume is different, this is uranium and this is also an area too where groundwater is not being used for any source of drinking water or anything like that but for the sake of comparison we're showing it here.

But that is the only -- the only constituent of the twenty-four that we simulated that reaches, is predicted to reach the property boundary within a thousand years. And so then our solu transport model is telling us that we have these twenty-four constituents in there. We let it run out. We ran it out to ten thousand years but just looking at the first thousand years, this is the only one that occurs at times zero.

We also looked at constituents that are predicted to exceed background or MCL concentrations within the property boundary and there was a number of constituents that are listed here which -- which did exceed background or MCL values and many of those, like uranium up here, exceedance is already occurring. Although here we find out the case is for arsenic, the model is predicting that after 400 years the concentrations of arsenic in the groundwater will exceed a background value based on the model result.

So in summary and just to sort of capture the modeling efforts, we developed a three-dimensional model of groundwater flow. It was a regional model but it incorporated a lot of data, not just of the Niagara Falls Storage Site, but adjacent properties. And the model was then calibrated to observe groundwater data and then a solu transport model was then adapted to run in conjunction with this 3D flow model.

And the solu transport model is telling us a few things and I have just put -- kept taking three saline points here to put on this slide and it's that within the Niagara Falls Storage Site there are a number of constituents that are predicted to exceed background concentrations or MCLs within a thousand years and they are listed here as I had just presented on the last slide. And we have here also this point that is indicating that again the model is predicting that there are, of the twenty-four constituents simulated, none will be elevated beyond MCL or background levels at the NFST property boundary with the exception of uranium, which is currently exceeding those background values.

And also, you know, this is one result here that I put into the summary but I didn't necessarily mention it in the previous slides and that is we also -- in addition to looking at the concentrations and a lateral sense of a boundary within a site, we also looked at what the model predicted the concentrations to be below the cell and so we found that an exceedance of uranium, that is uranium exceeding a background or MCL value occurs after 160 years, okay.

So this is a model prediction that then accounts for, you know, we have the help modeling predicts the flux, we have the one-dimensional solu transport modeling and then it's that one dimensional solu transport modeling, it's like how long is it going to take based upon our understanding of the integrity of the cell and so on. How long is it going to take for concentrations within a cell to migrate outward and the model indicates it's 160 years.

So on that note that concludes our presentation of the modeling. And we look forward to answering any questions or providing any additional information that might not have been covered.

MR. KOWALEWSKI: Okay. Folks, before we open up the next round of questions and answers, what I wanted to do for you is to kind of put all of this information into context for you. What does the future hold, what is the Corps required to do in the short-term with regards to this Remedial Investigation Report and the data generated by it.

We're really doing three of four things at once over the next several months. First, we're gathering your questions or concerns or input from this meeting from anything we receive through the mail, through the internet, to plan for another meeting in August. And the purpose of the meeting in August is to follow up from tonight's presentation and focus on those topics that the community expresses an interest in going into some more depth on, okay.

So we are looking for that input tonight. We'll accept it up into, through July. But we will begin putting our presentation together in July and come back out here to the community in August to re-engage you on these topics.

We are also taking a look at our Environmental Surveillance Program. That's the program that's been run for the last twenty or so years that measures the environment around the property to ensure that there's no dose to the public and there is no risk. We're taking the data and what we know from this investigation report to adjust our sampling, adjust our procedures to make sure that we capture new information that was not included in the Environmental Surveillance Program when it was started.

And finally, this data will eventually support a feasibility study. And the feasibility study is the vehicle by which the Corps will evaluate alternatives, long-term alternatives for this site. And so we face a decision here and we're thinking it's going to be in the fall of this year to address some of Dr. Beck's concerns and others. Has the Corp gathered enough information and have a solid enough understanding of this site to resume the feasibility study and to start identifying and evaluating alternatives.

That's what we face over the coming months and we will address these concerns and questions specifically and ultimately the Corps of Engineers faces a decision on whether or not additional IR data required. So that's why your input is important now. We have deliberately built that into the process so that we may get an educated decision when we restart and resume the feasibility study.

With that I'll open up again for questions and answers and, Arleen, if you want come up and help facilitate again. And again, any Corps team member that wishes to contribute to the answer, please do so and we'll follow up to these questions with a written response on our website.

MR. KREUSCH: Okay, we're set to go, who has a question to start? Amy.

AMY: Just a couple comments, a couple requests. First of all, very pleased to hear that we have until the end of June to provide comments, although given the fact that we have got, you know, seven volumes of information, submitting written comments or questions and then getting back a presentation in August is a far cry from the kind of dialogue from, you know, regular interactions with the Army Corps that the community doesn't have anymore in a different type of format for folks who want to read in more detail.

With respect to the Remedial Investigation Presentation, I thought the points, the issues that were identified in the conclusion were excellent. My only problem is is that I disagree with most of the conclusions but I thought in terms of the key issues where we need more dialogue, that a lot of them are contained in the -- in that slide. And the gentleman who made a reference to data gaps in the remedial investigation, I think for -- for those of you who have the time to go through those volumes and read through it, the data gaps are very significant and as a result my comment on the modeling is with the best of intentions and that is AIC is an excellent firm. It's kind of a garbage in, garbage out situation for us.Again, with the best of intentions, there are limitations on the types of investigations that can be done on the site like this, if we can't do any sort of intrusive analysis.

With respect to the requests, again, beyond the seven volumes, we have thousands and thousands of documents that are housed about the low site under something that is called the Administrative Record. The Army Corps has flip-flopped over the past two or three years as to whether or not it's going to maintain that on the internet and what we have in your written materials today is that it's going to be housed in hard copy in the Town of Lewiston Library, which in this day and age, is very limited public access for an enormous volume of documents, which in the Lewiston Library, costs us fifteen cents a page to copy. Which would make your materials there probably worth millions.

But in any case, for a community that has very limited access to technical assistance, sometimes, you know, to get an academic who has got a very narrow expertise that we need, they might be in a different part of the country, a different part of the world and we need to have that access on the internet or we need some assurance that when we make a request to the Army Corps, that we get an entire, complete set of the Administrative Record on disc so that we don't have to run bake sales for ten years to supply somebody in here to sit at the library and put them up in a hotel for two months to read what is on there as we face, as I think Bill made a very good point, some very critical decisions here over the next few years. So I would strongly urge the Army Corps to reconsider where it's going to house the Administrative Record and would encourage you to think beyond a hard copy in the Town of Lewiston Library.

With respect to responsiveness, I hope that the Army Corps will not just respond to what it considers the most common community concerns but in keeping with the Department of Defense Guidelines per the Restoration Advisory Board, that they make a good faith attempt to address every single public concern, whether a majority or a minority so that all opinions, all questions, all voices, can be heard. And if we need to take an extra two weeks to do that or an extra three weeks, this community has been waiting 60 years to have this site cleaned up. I think any -- any person in this community with a question, I am certainly willing to wait to get answers to my questions to make sure that theirs are answered as well. Thank you.

MR. KREUSCH: Thank you. Bill, did you want to?

MR. KOWALEWSKI: Yeah, let me just try to respond to some of your concerns and I agree with you and I think they are very valid concerns and let me provide a little update for you. We recently calculated that we have got over a million pages just of DOE archives at the district, in either hard copy, photographs or microfiche and I agree, we're dealing with, you know, almost 19th century technology today.

We are actively working to see about getting that material scanned, digitized, and available in a digital format through the internet so we can facilitate better research not only for our own team, but for the public as well. So we are actively pursuing that. I think that would be a good step forward. It's a matter of some of the technology and then getting a contract in place for that.

AMY: Will it be done in time, you know, we have twelve months before a record of decision to, you know, utilize it?

MR. KOWALEWSKI: Let me just, the answer I think is yes.

AMY: Okay.

MR. KOWALEWSKI: The record of decision, which, folks, if you want to talk process afterwards, we can show you what that means but that is the formal Corps of Engineers selection of a long-term remedy and we are at least in the 2011 to 12 time frame before that could possibly happen. So we are working to dove tail that effort.

As far as the hard copy versus internet or digital, I believe our office of counsel will tell us we have to maintain both for -- for accessibility for -- with different abilities, we would have to do both, so that's kind of the scope of our effort there and we want to share that information.

We had Dr. Beck come in a couple months ago and kind of go through our archives, go through the photographs that the DOE provided us to sort of help with his research and we want to put that out and I agree, it's not a very user-friendly format at this point.

MR. KREUSCH: Dr. Gardella.

MR. GARDELLA: Joe Gardella, from the RAD Chemical Committee. And, Bill, you can stand up as I have a couple quick questions for you. The first is, is this date of August 6th, is that fixed in stone or can the community have some input as to when that meeting is scheduled?

MR. KOWALEWSKI: At this point it is scheduled. I guess we'd be willing to listen to what time frame you're considering and your reason for that and make a final decision. But at this point --

MR. GARDELLA: I think it would be good to work a little bit on, you know, to work on that date. I appreciate that you want to get it in that time frame but it would be good to consult the community on scheduling that without fixing it to a particular date. That's a key time when a lot of people take vacations so we might be able to find a date that would, with some consensus.

Secondly, as you mentioned the Radiological Committee had a work product that's -- that you have seen in draft and will be issued I think soon in final form sometime in the next week or so probably.

DR. BECK: Two weeks.

MR. GARDELLA: The Chemical Committee is beginning its work on the IR data and also have gotten to move through some of the database, so we'd like to make sure we can have the same kind of interactive access Dr. Beck's Radiological Committee has had in this interim period so that we can have informed analyses similar to his from the chemical standpoint in this period.

I have a specific question that might actually be good, even though it's related to the last presentation; if we can go to the previous presentation and back to that slide 17. It has to do --

MR. KREUSCH: With this presentation?

MR. GARDELLA: No, the previous one because it shows the plumes in the area. So you mentioned this plume at the boundary but I am a bit concerned about this -- this plume given that if you look at the total uranium in surface water, that the sampling points along the Niagara Mohawk boundary here, the same trend in high concentrations of uranium follows the groundwater plumes. So I am wondering and it's my understanding that there's no groundwater sampling points on the Niagara Mohawk property;

is that right?

AUDIENCE MEMBER: Go back to the slide sample location. It would be --

MR. GARDELLA: So there's nothing out here.

AUDIENCE MEMBER: Oh, you're looking beyond.

MR. GARDELLA: Yeah, so even though you have identified this plume as at the boundary, I am wondering why given the connection between the surface water uranium and if we can go back to that 17 slide, and the shape of this plume, why not consider that there might be a plume at that boundary also? There's no data outside and there is no way to follow whether there is movement across that boundary.

AUDIENCE MEMBER: There's an outboard -- well, there's an outboard well at that plume, that's why that plume is drawn, enclosure, because there are lines of, you know, inboard and outboard wells.

MR. GARDELLA: But if you look at the trend of the total uranium in the surface water, it mirrors the high concentrations exactly, which suggests that uranium in the surface waters in that ditch could be connected to the plume.

Here are the numbers if you'd like to look at them. They, you know, the sampling points that are close to that plume follow the same trend as the shape of that plume.

AUDIENCE MEMBER: So just the same concentrations.

MR. GARDELLA: The same trends where there's higher concentration following the shape of that plume. Here's the numbers. Well, that's the question, so I don't need an immediate answer. But I think it's worth considering that that's another plume at a boundary that has to be monitored. And that would suggest then there needs to be something done on the NIMO property.

MR. KREUSCH: So just that I have that down, you have got a western plume reaching boundary and what kind of concentrations?

MR. GARDELLA: The total uranium, the surface water, the total uranium concentrations monitor the same high and low values as the groundwater inside that.

MR. KREUSCH: Okay. Does anyone have a response for that one or is that something we need to get back to?

MR. GARDELLA: So that would -- that would suggest that you need to look beyond that boundary.

MR. KREUSCH: Okay. I am going to put a star by that one. Okay, are there any other questions?Yes, Ann.

MS. ROBERTS: Okay. Can I ask a question about the groundwater modeling, the last question.

MR. KREUSCH: The other presentation?

MS. ROBERTS: Yeah.

MR. KREUSCH: Okay.

MS. ROBERTS: Does the model take into account the underground utilities which interlace the site, because from reading the IRI, there seems to be a close interaction between the surface water, the upper groundwater and the underground pipeline is actually at the shortcuts or the contaminant migration across the site, so is that something you have taken into account?

MR. EVANS: No, the pipelines aren't represented in the model. And are you talking about the pipelines below the water table or above the water table?

MS. ROBERTS: The pipelines below the water table. Certainly, at certain times of the year because groundwater comes up?

MR. EVANS: Yeah, the scale mod doesn't incorporate pipes, I mean --

MS. ROBERTS: But isn't that like a major --

MS. RHODES: Actually, the way the model does incorporate the uranium plume as drawn --

MS. ROBERTS: Right, but if you --

MS. RHODES: That is the concentration in the pipeline as well, so they are considered as far as source --

MS. ROBERTS: Right, but the fact that you have got pipelines and you have gravel-filled roundup, that acts as a hide-away if you like, bringing contaminants to zoom across the site comparatively in terms.

MR. KREUSCH: Wait, Michelle, when you answered before we couldn't hear what you said so when Ann gets done can you repeat what you said.

MS. ROBERTS: So does that not negate your groundwater modeling? If you're concerned with how fast contaminants can get moved across the site, if you haven't taken into account the fact that the clay is interlaced with other materials, then what use is your groundwater modeling?

MR. EVANS: My understanding of the pipelines and I am, you know, maybe somebody else can chime in here, is they're not continuous pipelines going across the entire site. So you might have, similar to like the sand lenses, you might have a sand lense that goes a certain distance but that sand lense is completely surrounded by clay, there is only so far that that's going to transmit.

MS. ROBERTS: My understanding is the pipelines would cut off the borders of the NFF, seal the borders as far as I am aware. There hasn't been an exercise to actually chop them up.

So in effect, they are continuous?

MS. RHODES: We did do sampling during our remedial investigation of the bedding material and select locations to determine just that. But we did target the soils to see, you know, to a certain extent possible, logistically, you know, getting a sample down in to see if there was any leaching from the pipeline itself. We targeted that sampling to the areas that have the highest concentration in the pipeline surface water and sediments themselves.

So we do try to address, and you bring up a good point, that obviously if you have bedding materials surrounding the pipeline, that could act as a pathway to the migrated contaminants. So we try to target those elevated areas to ensure, you know, that there wasn't obvious leaching of that material into the soils.

MS. ROBERTS: But that still leaves the question of if your groundwater model doesn't take into account what is actually on the site, then it's not valid.

MR. EVANS: Well, it's a matter of scale

as well, you know, if you look, our models represent groundwater flow contaminant transport of surface scales. You can see we are representing things on a local scale but also a regional scale and our model is not going to be 100 percent accurate if you're looking at a lot of detailed predictions right within the Niagara Falls Storage Site. What is the grid spacing on the site?

MR. DEMARCO: The grid spacing is on the order of about twenty-five feet. So that's -- that's a cell. And I think that, you know, as Eric pointed out here too, is that looking at the time scale the model simulates, if you're looking at rapid movement over say one year, two years, three years, five years, something like that, the model is looking transport over 50 years, 100 years, 1000 years, okay, and so -- so while there may be discrete movement of the transport through the sand lenses, through a pipe, an abandoned pipe system below the water table, we base on your understanding of the site, those -- those features are not continuous.

MS. ROBERTS: But they are, the pipelines are.

MR. EVANS: Over a certain scale. Over a certain scale.

MS. ROBERTS: And when you say over a certain scale --

MR. EVANS: The model is just not capable of simulating down to something below twenty-five feet.

MS. ROBERTS: But the pipeline covers the entire site, so it's like having a grid, a network of highways for contaminants to move, so I don't see how you can produce a model without taking that into account.

AUDIENCE MEMBER: Well, you also have to consider a certain hydraulic head driving that transport condition. If the -- if you want to say the head is around those, that bedding is an equilibrium with your natural system, that preferential pathway is there, it's just that do you have the velocity to have the head differential across the site than regionally to actually move that material off-site.

The radiants are so shallow. The material around the pipes are so tight that it may allow the disburse of nature and kind of follow the bedding, you know, if there's -- depending on the type of bedding that's down there, usually sand or gravel, and it's just a matter of are the hydraulics available within this bedding material, looking at this -- this site in general and which -- on how the hydraulics go, to drive that migration down that bedding in here or there, you know what I mean, in that net area.

MS. ROBERTS: But in the certain case of uranium south of your containment cell, your demonstration shows, and I know you are taking those points of concentration that you have got at the end of the pipe, right, is to --

AUDIENCE MEMBER: From within the pipeline.

MS. ROBERTS: Right, but it's 248, so clearly material has moved quite a long ways. So there must have been some hydraulic head to move it.

MR. EVANS: That's within the pipeline,

so not within the groundwater flow system.

MR. KREUSCH: Can everybody hear Bill before we get too far.

AUDIENCE MEMBER: I am just saying that the plume map that was, that you are looking at, what is the figure number on that?

AUDIENCE MEMBER: Fifty-four.

AUDIENCE MEMBER: Fifty-four, that takes -- that does use surface water like standing water in the pipes. Standing water in the pipe may have been, you know, below the pipe, it doesn't -- it's not indicative of being --

MS. ROBERTS: Right.

AUDIENCE MEMBER: -- a fully filled pipe that we sample because it's full of groundwater. We included the plume maps because in theory, it can become available to the plumes to move. So when -- the starting condition of the model that takes into account all those concentrations already in the ground, it helps us say, okay, well, where would that go if it just moves in the ambien flow system.

These guys were explaining the scale of the model does not allow us to simulate a four-foot wide trench. And it's not an engineering scale model.

MS. ROBERTS: Right.

AUDIENCE MEMBER: It's more of a larger scale. We didn't want to restrict our model domain to where if we transport stuff to the edge of the model, now where does it go. So we chose to sacrifice a little detail, and maybe on this scale of the model and the scale of the site, to see if we can see what the bigger picture was going to be, not knowing what bigger picture was going to be. So I think -- I know what you are saying because what it does, you envision the pipelines as having a labyrinth of available places to go.

MS. ROBERTS: I think, the information that's actually in the IRI that says that the pipelines and the surrounding fill are potentially acting as a transport for --

AUDIENCE MEMBER: Yeah, that's why we sampled some of the material around it. One, because we hit some of the high points inside the pipeline, we wanted to make sure that stuff wasn't getting out of it.

MS. ROBERTS: Right. Because the IRI seems to indicate that the materials are actually moving. You'll find contaminants in areas that the NFSS wouldn't expect ordinarily to find them.

AUDIENCE MEMBER: You have to remember that the DOE housekeeping and the use of the site over the years, really a lot of those plumes are facilitated from surface practices.

MS. ROBERTS: I think the findings of certain contaminants in areas which were not known to have been used for those particular contaminants, I know that's one of the findings of the IRI.

AUDIENCE MEMBER: Well, I think there was a statement in the IRI just basically saying if potential is there for this stuff to get into these, you know, sub surface conduits, I know when we have had discussions, when we were leading into the DFS, how we want to handle these things, because we don't want them to exist, so.

MS. RHODES: When we did find those

pipelines, we actually did look back and did sampling on the bedding material between that specific area we started in and it wasn't leaching into the bedding in that area. So obviously captured the highest areas on that plume map so that was kind of our area of interest specifically for that reason.

So again, we did sample the bedding material between those two hot spot locations in the pipeline to ensure that the bedding material wasn't providing a means of transport basically. But definitely, you know, that is something that is of concern, you have bedding material around a pipeline and it will allow groundwater flow and therefore contaminant transport more readily than if you have just the tight flow around. That's something that we're concerned about.

MR. EVANS: The pipes are below the water table most of the time.

MS. RHODES: Generally these pipes are above the water level, however, the upper water bearing zone fluctuates seasonally and quite significantly in the upper quarter bearing zone, so definitely we were concerned about the potential for fluctuating in that area.

MR. KREUSCH: Can I take another question from someone else before -- okay.

DR. BECK: Just to followup on the same area, mainly the computer model you indicate has a twenty-five foot resolution, so you have the capability if you had to finance, to include the walls of the building, the location of the various pipelines and the clay wall and to model them, and to instead of giving us a uniform block of clay, you give us twenty-five foot blocks of variant permeability, to essentially as a rough scale model, the existence of these pipelines, the capability is there, it hasn't been done, right?

MR. EVANS: It would be hard to represent the pipelines exactly. I mean the pipelines, I mean you could, you could find the grid space to actually. You could make the grid space an area of interest and add pipelines. And I mean at some sites where you have a lot of pipes or below the water table where you have back fill around the pipes, the permeability, the high permeability pathway, it can be done.

DR. BECK: What we have here is the water treatment plant, we have got thirty-inch pipes in there. We have got some documents saying they were plugged. What we don't have is the location of the plugs and we don't know how much of the pipes, thirty-inch openings, are still open. Where the plugs are. How effective those plugs are. We have got diagrams that show you where all the openings of the concrete buildings are. And you could build a model, we know the location, we know they are eight inches, we know they are thirty inches. We know where they are. We have got twenty-five foot resolution. You can come close to getting the aspects of it. And the final point is we don't know what the head is inside the waste contaminant.

So there may be a pressure-head forcing liquid out of that. We may be getting more rain water coming, infiltrating through the cap. And we are lacking the data to deal with the speculation. You can speculate one way, I can speculate another way, neither of us certain of the truth because we are dealing with data gap.

AUDIENCE MEMBER: I mean for the dynamics of more of what I like to refer to it as, an independent scale model, the final resolution, higher tighter spacing on all of your nodes. Putting that together, recalibrating that, probably will also require a greater deal of hydraulic head information. You don't know, we really don't have, I mean how do these conduits, how do these pipelines affect the term groundwater, you know. We actually don't have, we would have to probably make more Swiss cheese of the site to get a date set to calibrate again to give a confident answer. That becomes an exercise in uncertainty.

So the likelihood of producing an engineering scale model that even kind of leads to answering some of these questions, probably would lead to even more questions. The calibration of such a model probably would never be nice. It would be a lot of assumption. A lot of assumption.

DR. BECK: You just endorsed my point that to go forward with a feasibility study without this information is of a great deal of uncertainty to me.

AUDIENCE MEMBER: It's uncertainty that when we look at these feasibility studies, you try to account for that in some way. You say, well, we don't -- we have an ex data gap. We don't know what the heads are inside the contaminant structure. Geophysical data indicates it's below the building 411. Is it a data gap, yes. Are we likely going to go in and investigate that, that seems like something that if that was going to be paid for and gone after in a safety aspect, then it looks like that would be something much farther down the line toward like remedial action. Wherever the remedial study takes us, we have to go through the process, the circle process and our -- we have to know that answer when we get to the eleventh hour to finalize our bill to the government. Then that has to be kind of revisited.

Is it great information to have it up front? You're talking to a hydro geologist, oh my God, it would be wonderful. If all those piezometers that were still working, still working inside the IWCS, it would just be a dream of data and we would know exactly what's the infiltration rate, you know, what is the ex-filtration rate. Where we do see a hydraulic variation that might indicate.

So yes, there's -- if there is an internal data gap, did the DEO plan for lightning to strike, I doubt it. So where we almost had the information that could answer all of our questions that way, we don't unfortunately.

DR. BECK: But you are the Corps of Engineers, why didn't you have the engineering data before you got into feasibility.

MR. KOWALEWSKI: Bill, I think -- I think Bill has kind addressed the other side of the coin and that if the engineering data, if the technical solution proves to be a bridge too far, that uncertainty can be built into the feasibility study as potential long-term remedies.

For example, conceptually these pipelines, an analysis for a future long-term remedy could include locating, severing, plugging those pipelines to deal with that uncertainty that's in the model. That is the other way that we can deal with the uncertainty. And I think it's a huge topic and it's very valid and we will respond to that I think with some alternatives to deal with that risk.

DR. BECK: One final comment. Once you put the uncertainty into your models, you have now escalated the cost beyond the ability of the Congress of the United States to finance it, and therefore you have loaded the conclusion by being unable to come up with some reasonable cost because you don't know how much material you have contaminated and where it is, how much excavation is going to be needed to remove it.

AUDIENCE MEMBER: On the contrary, there is quite a bit of visible information regarding the interim waste of the containment structure. Are there things that may have occurred since its burial.

DR. BECK: Twenty-five years?

AUDIENCE MEMBER: Yeah, I mean if there is some internal contamination we haven't exposed in the file. If you look at the plumes that are on the north side and the west side of the Interim Waste Containment Structures, those are probably legacy plumes left over from the R10 pile twenty-five years.

Now are those, that same kind of contamination located around 411 and things like that from closure and they internally closed it? Yeah, I would say that's probably in there as well, around the building. Is there some of that operation that occurred around that building, the slurring and everything may have made of little -- a couple of disasters around that building, I wouldn't doubt it.

So do we -- inside our feasibility study, we may say, well, let's assume there's a halo of soil contamination above the gray clay, in your ground clay, inside your cutoff wall and then we include that as, let's say a remedial item if we ever had to go after that, and that's now become a known -- a pretty well-known volume, we can make some estimates on the thickness of the brown clay, we may not have, you know, point-specific data, but it's not really something that can be included inside my kind of volume and cost structuring and stuff like that.

MR. EVANS: I just wanted to, if I may, I just wanted to point out, you know, as a model, another, if we're talking per site, a fractured rock environment, okay and a fractured rock environment in some ways is impossible to characterize because you may drill and then we look at the fractures that are encountered along the drill, the bore hole and we measure the affature and then we drill another bore hole and we say the affature is this much.

So in building a model then we have a couple of choices, and looking at the available technology, one way is to do what we call discrete fracture modeling, and we build a domain that represents each individual fracture as a discrete affature. And so in the model these are represented as like parallel plates or tubular features to simulate this. And some of them we have to assume fracture lengths, fracture widths, fracture affatures and there's a lot more data and the more data that goes into the model, the more uncertainty that can also be attributed.

And there's the question that begs, like, well we didn't dig a bore hole, is there a fracture there. And so the challenge that, you know, scientists and modelers face in modeling fracture media in addressing this uncertainty, is instead of using a discrete fracture model, they represent a system as an equivalent course media using a single value or, you know, just a few values of like a bulk average hydraulic conductivity.

And over a short time frame discrete fracture models might show, yeah, you have a little contaminant shooting out over here and here. Over 50, 100, 1000 years, the analog, this equivalent course of the media analog matches the results of the discrete fracture model. And so this is a question that's not unique to this site but also what modelers will do is we'll try to, like, try keep it simple but let's also, you know, let's not have one tool that is going to have the extreme amount of complexity and try to answer every question but what we're really looking at here is what is the long-term migration of these constituents and in that case, it's appropriate to consider, let's look at the existence of our scale average permeability rather than trying to incorporate individual --

AUDIENCE MEMBER: I believe in the vicinity of the IWCS, you should use modified permeability but take into account the existence of these items.

MR. KREUSCH: Okay. One more question and then we're going to try to focus --

AUDIENCE MEMBER: What is the cost of the program annually?

MR. KREUSCH: The cost of the program annually.

MR. KOWALEWSKI: The national program that we're operating under is funded by Congress at approximately 130 to 140 million per year nationwide. Of that, this site generally competes for about three million dollars a year in the study phase.

MR. KREUSCH: Okay. I had actually intended to take your question so go ahead.

AUDIENCE MEMBER: We have seen -- we had maps in the past that shows the labyrinth of pipelines, that -- of known pipelines on the site, is that loaded in the machine anywhere?

MR. KOWALEWSKI: In the machine here?

AUDIENCE MEMBER: Yeah.

MR. KOWALEWSKI: No, just for this property or for the entire network?

AUDIENCE MEMBER: No, just this. And showing which ones lead off-site and which do not?

MR. KOWALEWSKI: Yeah, I believe that's fairly well known.

AUDIENCE MEMBER: But I mean one of the things we're going to be concerned about is which of these are going off-site and which have been disrupted, I mean?

MR. KOWALEWSKI: Correct. And there is a

general practice here and on the large and low site with regard to these pipelines, we made a deliberate effort at property boundaries and fence lines when we were sampling them to sever them and plug them to prevent any future migration. We have done that on this site as well.

AUDIENCE MEMBER: So how many, I mean, can you show where the remaining, I mean where that potential, the number of pipes that are -- currently exist that were severed at the property line?

MR. KOWALEWSKI: I don't have that exact answer here tonight. It's generally the ones that --

AUDIENCE MEMBER: Are we talking about one or two or twenty or fifty?

MR. KOWALEWSKI: We're talking I think three or four pipelines in that neighborhood that ran north, south that we investigated.

AUDIENCE MEMBER: You say well at that location near that perimeter?

MR. KOWALEWSKI: I don't know if we have

wells. I understand what you are getting at.

AUDIENCE MEMBER: Is this stuff migrating or a potential for migrating?

MR. KOWALEWSKI: Yeah, that's a fair concern. Okay. The last question and then we're going to have to wrap it up, we're turning the facility back over at 9:30 and we'll go from there.

AUDIENCE MEMBER: One question I have is how does cutting and plugging the pipes keep from migrating the material off-site?

MR. KOWALEWSKI: Outside the pipeline?

AUDIENCE MEMBER: If you were to cut those pipes and plug the lines, how does it keep the contaminants on site without them crossing over into another site if this is a major piping structure throughout the entire -- the old site, how does it keep it from -- if you just cut the lines and plug them up, how does it keep them from migrating further down off the site?

MR. KOWALEWSKI: Well, the short answer there is and excuse the poor plug here, but it depends on the pipeline. Some of them are in bedding material depending on what the piping material was. It may be surrounded by concrete or stone. Some piping is just directly buried in the clay. So cutting it and plugging it to keep material inside the pipeline moving is the simple answer. And that you have now got clay on the end of that pipeline.

AUDIENCE MEMBER: But these are also most likely at the time were steel pipes.

MR. KOWALEWSKI: We have got stainless steel. We have got cast iron. We have got clay pipes. We have got tile pipes. It depends on which pipeline you're talking about.

AUDIENCE MEMBER: And even if it was steel or even stainless steel, does have a tendency over time to start rotting out, start pitting and even though you cut them and plug them up, it doesn't mean that two feet away from where you cut the line, that it's already started to pit. So as material comes through, it's going to go in and exit out through one hole because it is a pipeline and ditch and however it's constructed, can go out one site, bypass your plug and then come up through another hole within that same line.

So again, how do you keep -- basically you might end up having to pull those pipes.

MR. KOWALEWSKI: Conceivably, and we're not attempting to provide a long-term answer tonight.

AUDIENCE MEMBER: Unless you want to do protection which after forty years it's pretty much, you might as well say forget that idea.

MR. KOWALEWSKI: Yeah, okay. Well, we'll see what kind of answers we can provide on that. I don't think we have all the information here tonight to answer that fully.

AUDIENCE MEMBER: That represents the data gap that can be, you know, public data gap brought.

MR. KOWALEWSKI: I guess in closing what I'd like to do is just very quickly, are there, you know, is there is a top three topics that the community would like readdressed or brought up on this report for the next meeting? We don't need to make a decision tonight, I am just curious from the group what those maybe top three topics would be. We will still accept your input any way you want to send it to us to consider for the agenda at the next meeting.

I think the pipelines and the migration is clearly one.

MS. ROBERTS: Could I just add one that we can maybe discuss at the next meeting that we haven't touched on, which is one concern I have about the IRI, is the widespread 137 contamination. I am not concerned about the levels that you found but just the fact that that's there and looking at the IRI, I see no review of the historical data for, you know, the nuclear process and waste that came.

So I also see no reference to the finding of plutonium in building four or one, which was only a small amount, but nevertheless, it was plutonium with no vision products. So I tend to think this is an area that was really swept under the rug and it's not really addressed and it should have been at the initial stages of the historical review documents so.

AUDIENCE MEMBER: If this is the only forum for dialogue with the community, I would submit that every question offered, every issue raised, ought to be the subject of a public meeting and if it needs to be in two parts, so be it but I don't think we should cut or minimize any issues that have been raised.

MR. KOWALEWSKI: Fair enough. Okay. Well, it's been a long night. I do thank you for your patience and your cooperation. I thought the meeting was well run and we appreciate you sticking with us tonight. We will be providing additional details on the future meeting and we'll be gladly accepting any other input that you folks want to provide to us.

MR. KREUSCH: And again, the CD of the presentation is available at the sign-out, sign-in table. And don't forget to turn in your comment card if you have any other questions.

(Whereupon, the deposition concluded at 9:15 p.m.)

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STATE OF NEW YORK)

) SS.

COUNTY OF ERIE )



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IN WITNESS WHEREOF, I have hereunto subscribed my name on this 18th day of June 2008.

Denise C. Burger
Notary Public No. 01BU5080749
State of New York
My commission expires
July 25, 2011

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