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TRI-CITIES DIOXIN COMMUNITY MEETING

MAY 7, 2008

6:30 - 9:30 p.m.

Horizons Center, 6200 State Street, Saginaw

REPORTED BY: Natalie A. Gilbert, CSR-4607, RPR  
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CHUCK NELSON: Good evening. I want to welcome you to the quarterly Tri-Cities dioxin community meeting of May the 7th. Just a couple of ground rules to go through. First, my name is Chuck Nelson. I'm the facilitator. A couple of ground rules to think about. We're going to work very diligently to stay on time tonight. We have an extremely full agenda, so I want to work hard to keep folks on time. So for all those speakers, when you see me raise my hand, that doesn't mean victory. It means you have two minutes left, okay. So just keep an eye on me and this will give everybody an opportunity to have their proper amount of time on the agenda.

Secondly, we are providing an opportunity for the entities that are represented here, Dow, DEQ, the EPA, the Department of Community Health, to provide a response to any presentation prior to us doing questions, comments from the audience. So I will turn to the folks who didn't make a presentation when a presentation is done and say, do you have a response, and if so, please, come up to the mike, we have limited time, okay, but I will provide that opportunity for everyone.

1           Third thing is that all the organizations that  
2           are doing a presentation tonight will stay afterwards,  
3           so you have a tremendous opportunity to ask more  
4           in-depth questions, something that you have a  
5           particular concern that you want a lengthier type  
6           answer, great opportunity here, so, please, avail  
7           yourselves of those opportunities. So the DEQ will  
8           stay. The EPA will stay. Dow will stay. The Fish  
9           and Wildlife Service will stay. The Michigan  
10          Department of Community Health will stay. So we have  
11          a good representation of folks and I really want to  
12          encourage you to chat with them.

13          For folks who are members of the public and for  
14          the organizations represented, please, make your  
15          presentations at a mike. The folks who run the  
16          cameras, this makes their life a lot easier. It also  
17          makes Natalie's life a lot easier as she's getting  
18          down what everyone says. So we appreciate that.

19          Jim, I think it's your turn here to come up and  
20          introduce your folks and then you can kind of turn it  
21          over to the others in turn.

22          JIM SYGO: Thanks, Chuck, and I did want to  
23          say a couple of other words than just introductions,  
24          because as you noted from some of the comments that  
25          Chuck already provided, we're trying on a little

1 different format. The format now is oriented more  
2 with the State managing the meeting as a result of  
3 issues that had come up earlier in terms of who's  
4 controlling this, and now that we're affirmed that  
5 under RCRA and our Part 111 regulations the State is  
6 the lead on this particular project, we've taken more  
7 control of the agenda, identifying what items we want  
8 on the agenda. We're working close with our partners  
9 at EPA as well to provide the support that's necessary  
10 for that.

11 We're also working with Dow to make sure that  
12 they're providing the information that's coming out of  
13 the studies and that we're getting that information  
14 and present it properly. Historically, we typically  
15 looked at each other's presentations so we had at  
16 least a flavor for what was going to be said. That's  
17 what we were calling collaboration I guess more, and  
18 now we're not seeing those. So we'll be responding,  
19 as Chuck had indicated, between the sessions in the  
20 presentations so that you have an understanding of  
21 where we're coming from and what we believe the issues  
22 are, as you will have a perspective from Dow as well.

23 We're going to continue this -- by the way, as a  
24 result, we've assumed the cost of the room itself.  
25 That's why you don't see any refreshments because the

1 State doesn't have that kind of money and we've also  
2 assumed the cost right now for the facilitator as  
3 well, and we're going to be trying this for a while to  
4 see how this goes and see what kind of response we get  
5 from the public as well, but again part of this is to  
6 assert the type of control we have in this and to  
7 administer the program in an effective way.

8 So with that, let me just read off the folks that  
9 are here from my staff and Community Health and then  
10 we'll move on. From DEQ, we've got George Bruchmann,  
11 Chief of our Waste and Hazardous Materials Division;  
12 we have Steve Buda; Al Taylor, who's our geologist on  
13 the project; Dr. Deb MacKenzie-Taylor, who's our  
14 toxicologist on the project; Art Ostaszewski, who's  
15 our Environmental Quality Analyst; Terry Walkington in  
16 the back of the room who's our District Supervisor;  
17 Cheryl didn't make it today and Trisha didn't make it.

18 Then with the Michigan Department of Community  
19 Health, we have Dr. Linda Dykema, also a toxicologist  
20 and the Manager of the Toxicology and Response  
21 Section; we have Kory Groetsch, a toxicologist; and  
22 then representing the Natural Resources Damages  
23 Trustees, Dr. Lisa Williams is here with the Fish and  
24 Wildlife Service. There she is holding up her hand.  
25 Judie Gapp is in the back of the room there. Judie is

1 with DEQ and is the DEQ's Trustee Representative, and  
2 then I'll introduce Jason El-Zein, who's with EPA out  
3 of the Grosse Ile office, and let him introduce his  
4 staff.

5 JASON EL-ZEIN: Good evening. Again my name  
6 is Jason El-Zein. I'm the Grant Chief with the  
7 Emergency Response Program. With me, I have people  
8 from the Office of Superfund. I also have people from  
9 the Land and Chemical Office. We have people from the  
10 Office of Public Affairs and I do have people from the  
11 Great Lakes National Program Office and we have people  
12 from the Office of the Regional Consult. The EPA  
13 folks are sitting here in the first two rows. We will  
14 be presenting on the residential sampling assessment  
15 activities and we'll be here to answer your questions  
16 and we'll stay here until the end. Thank you.

17 JOHN MUSSER: I have succumbed to a  
18 different process myself here. I'm not going to try  
19 to remember everybody's name because I had a small  
20 stroke the last time I was up here and couldn't  
21 remember some of the names of my team members. So I'm  
22 going to ask the Dow folks and our contractors to  
23 please stand, introduce yourself, and give your  
24 affiliation, starting with you, Peter.

25 PETER SIMON: Peter Simon, Ann Arbor

1 Technical Services.

2 BOB BUDINSKY: Bob Budinsky, toxicologist

3 with Dow Chemical.

4 JIM COLLINS: Jim Collins, epidemiologist,

5 Dow Chemical.

6 RYAN HOLEM: Ryan Holem, ENTRIX.

7 SEAN RORK: Sean Roark, ENTRIX also.

8 TODD KONECHNE: Todd Konechne, Dow Chemical.

9 VICTOR MAGAR: Victor Magar, Environmental

10 Engineer with Environ.

11 MARY SORENSON: Mary Sorenson with Environ.

12 RICH HUBNER: Rich Hubner with the Sapphire

13 Group.

14 LESA ALYWARD: Lesa Alyward, Summit

15 Toxicology.

16 LISA YOST: Lisa Yost, Human Health Risk

17 Assessment with Exponent.

18 DENISE KAY: Denise Kay with ENTRIX,

19 Ecological Risk Assessment.

20 RENADA KIMBROUGH: Renada Kimbrough, Health

21 Risk Evaluation.

22 BRYCE LAMBERG: Bryce Landenberger with Dow

23 Chemical Risk Assessment.

24 JACK ZABIK: Jack Zabik, Risk Assessment, Dow Chemical.

25 PAUL PRICE: Paul Price, Risk Assessment,

1 Dow Chemical.

2 GREG ROWLANDS: Greg Rowlands, toxicology, Dow Chemical.

3 PETER WRIGHT: Peter Wright with Dow.

4 JOHN MUSSER: Thank you. Just one other  
5 comment. In case there's any hard feelings about  
6 there not being any cookies or drinks, I want you to  
7 know we offered.

8 CHUCK NELSON: Okay. Let's get started with  
9 Dow's presentation about sampling data for the Middle  
10 Tittabawassee River, the Saginaw River, and Saginaw  
11 Bay.

12 PETER SIMON: I'm going to apologize right  
13 now. Somehow this afternoon I started picking up a  
14 cold or something, so I'm going to try and keep  
15 clearing my throat down to a minimum but it may happen  
16 on occasion. My name is Peter Simon. I'm with Ann  
17 Arbor Technical Services. I'm the Project Manager for  
18 what I'll refer to as the GeoMorph investigation for  
19 the Tittabawassee River. The GeoMorph based  
20 investigation is something we presented actually  
21 nearly two years ago today. It's a GeoMorph based  
22 patent transport investigation process that we've been  
23 working on and tonight I'm here to kind of give you an  
24 update of the extensive sampling activities that we've  
25 undertaken over the course of the last two years.

1           2007 investigation summary, the in-channel  
2           sampling and analysis, this year's effort, or 2007  
3           effort, started at the Dow dam or what we refer to as  
4           Reach E and continued down about 9.4 river miles to  
5           Freeland Road. It involved 451 sampling locations  
6           which resulted in more than 2,600 samples that were  
7           collected. 2,261 of those were analyzed for furans  
8           and dioxins. 84 of those were analyzed for secondary  
9           COI or a much broader list of other constituents.

10           Overbank sampling started just south of Smith's  
11           Crossing, roughly about a mile, and continued down to  
12           State Road, which I believe is right out here, or  
13           roughly 11 river miles. It involved 854 overbank  
14           sampling locations resulting in 5,000 samples that  
15           were collected. 4,678 of those were analyzed for  
16           dioxins and furans. 204 of those samples were  
17           analyzed for secondary COI or again a much broader  
18           list of other constituents.

19           Tonight I'm going to present TEQ concentrations,  
20           dioxin and furan concentrations, in a couple of  
21           different ways. The first way is surface  
22           concentration. This represents the more accurate  
23           deposition zone and also maximum, which is kind of a  
24           three-dimensional projection of two-dimensional  
25           information, so anywhere within the soil boring or

1 soil core where the concentration -- whatever the  
2 highest concentration is, that will also be presented,  
3 so you kind of get a worst case scenario and you get a  
4 surficial understanding.

5 One of the other things that's important to  
6 understand is the GeoMorph based investigation is  
7 really like trying to peel back the layers of the  
8 onion over time. The release history is something in  
9 the range of 75 to 100 years and we're not interested  
10 in geologic time. We're interested in that time  
11 period. So performing layer-based sampling is the  
12 best way to get an understanding of deposition  
13 patterns and other characteristics of those GeoMorphic  
14 features.

15 Typical river setting, we're going to talk  
16 initially about the in-channel sampling area. This is  
17 the area really between the natural levees.  
18 In-channel surface TEQ concentration, this is again a  
19 combination of the Upper and Middle Tittabawassee  
20 River and I'm going to go through these pretty  
21 quickly. We've got a lot of information in 10 minutes  
22 to really present 22 river miles, so I'm going to have  
23 to go through them pretty quick so I don't get pulled  
24 off stage.

25 88 percent of the sampling locations for

1 in-channel had concentrations less than 100 ppt at the  
2 surface. It's quite remarkable actually. 8.3 percent  
3 were between 100 and 1,000 and then you can see 1.9  
4 and 1.4. Again these are surficial concentrations.

5 This is the top of the sediment. These are  
6 in-channel.

7 In-channel maximum TEQ, 63 percent less than 100  
8 and you can see 19 percent between 100 to 1,000, 1,000  
9 to 5,000, 5,000 to 15,000. A lot of people have heard  
10 about, oh, 140,000, well, we've got all these high  
11 concentration, that's these right here, okay. 5.4  
12 percent between 5,000 and 15,000, and 3.6 percent  
13 actually greater than 15,000. We know where those are  
14 at. Those are in buried deposits generally with clean  
15 material at the surface, anything ranging from a half  
16 a foot to maybe as much as 2 feet. They're at depth.  
17 We believe those deposits are stable. They've been  
18 there for roughly 75 years or so and so we understand  
19 where those are at. From a profile perspective, this  
20 is what they look like. This is the Reach L deposit.  
21 We have characterized this area and again it's a  
22 buried deposit generally with anywhere from a foot to  
23 maybe two and a half feet of clean sediment over the  
24 top of it.

25 Typical river setting related to the overbank or

1 the floodplain area. In this one, I'm going to spend  
2 a little bit more time because it's a little bit more  
3 complicated because there's a lot of action. There's  
4 a lot of depositional settings that are different.  
5 It's not just a straight, you know, flat surface.  
6 Depending on where you're at, whether you're on a  
7 historic natural levee, whether you're on an  
8 intermediate surface adjacent to that, you're on a  
9 wetland, on the upland scarp, or intermediate surface  
10 on the far side of a wetland, they all behave  
11 differently. Wetlands have a characteristic where  
12 they fill up with water before the flood area begins  
13 over top of banks, so it has an effect on the  
14 deposition characteristics.

15 One of the more important things to understand is  
16 the highest concentrations we've seen in the  
17 floodplain in the overbank areas are in the natural  
18 levees. They're generally at depth in the range of  
19 4 to 6 feet. We've seen a little bit of shift in that  
20 from the Upper Tittabawassee down to the Middle  
21 Tittabawassee River, really kind of coming up in terms  
22 of elevation, but the overall impacted zone has  
23 actually decreased as well. Concentrations seem to be  
24 declining, and so we know, we understand the natural  
25 levee component of that.

1           The historic natural levee, or what we refer to  
2           as the pre-industrial age levee, this is where the  
3           river was prior to industrialization, prior to the  
4           logging era effects, and that is a clean levee, okay.  
5           It's a non-contaminated levee, with the exception of  
6           the surface. That's an active deposition zone.  
7           Concentrations in that area are generally within the  
8           top 1 to 2 feet, maybe a little bit deeper, and, you  
9           know, again I'm trying to characterize 5,000 samples,  
10          but generally speaking, the historic natural levee is  
11          a very predictable concentration generally at the  
12          surface.

13          And that holds true as you move away from the  
14          floodplain generally speaking. Elevated  
15          concentrations are at the surface. Depending on where  
16          you're at, if you're in the Upper Tittabawassee, the  
17          Upper Middle, or the Lower Middle, the impacted zone  
18          in the floodplain can vary. It can go anywhere from a  
19          foot or two in the upper parts of the Tittabawassee as  
20          you get down into the lower part. The floodplain, the  
21          impacted zones, and kind of the near area where a lot  
22          of these GeoMorphic wetlands are, are a little bit --  
23          they're thicker. The impacted zone is thicker, but as  
24          you move away from that towards the scarp, the upland  
25          scarp, which is a historic river valley, it's a

1 geologic river valley, concentrations decline as you  
2 move up that scarp, and as you get out of the scarp,  
3 the concentrations generally are less than 90 ppt.  
4 It's very clean.

5 Bank and floodplain surface TEQ, again this is  
6 the surface concentrations and this just shows the  
7 general data distribution. Less than 1 percent are  
8 greater than 15,000. You've got something in the  
9 range of 60 to 70 percent are less than 1,000 ppt and  
10 we know where these are. This is one of the strengths  
11 of the GeoMorph based investigation is, once you  
12 understand how the river evolves or has been evolving,  
13 there's a number of GeoMorphic features or surfaces,  
14 ridge and swale, natural levee, splays, one pervos  
15 clay on the river, kind of an interesting phenomenon,  
16 but there is one. There's other GeoMorphic features  
17 there and I'm not going to get into those, but once  
18 you understand those depositional characteristics and  
19 the size and extent and orientation of them, you get a  
20 much better understanding of the contaminant  
21 distribution across those areas.

22 Max TEQ, concentrations are again 17, 39 percent,  
23 28 percent. The most important thing probably to take  
24 away from this is again these are max TEQ  
25 concentrations. We know where these are at. This is

1 the 5,000 to 15,000. This is the greater than 15,000.  
2 We know where these are at. This generally speaking,  
3 with the exception of a couple of areas, these are in  
4 the natural levees and they're buried. They're under  
5 2 to 4 feet, maybe 6 feet, of clean sediment, and as  
6 you move away from the river, this is the general  
7 contaminant distribution and again it's a general  
8 contaminant distribution.

9 As you move away from the river, concentrations  
10 decline. Impacted zones decline because it doesn't  
11 get a high recurrence interval flood, so you don't  
12 have as much solids historically being deposited  
13 there. So again the more important thing to  
14 understand here is we understand the river  
15 characteristics, and based on the strength of the  
16 morphologic characterization, it allows us to say,  
17 this is what we can expect here. We'll sample it,  
18 yep, the concentration range is between 1 and 1,000,  
19 1,000 and 5,000, and so forth.

20 What does it all mean? I mean, that's really  
21 kind of the bottom line. Nature and extent summary  
22 for the Upper and Middle Tittabawassee River,  
23 in-channel surface TEQ concentrations, 96 percent of  
24 the locations that have been sampled, and remember,  
25 the number that we've talked about in terms of the

1 Upper and Middle, are less than 1,000 ppt. 88 percent  
2 of them are less than 100 ppt. That's for 9.4 river  
3 miles presently starting at Poseyville Road and  
4 extending down to Freeland Road. Buried deposits,  
5 again those high concentrations are in buried deposits  
6 that are isolated and appear to be relatively stable  
7 based on a number of the other channel stability  
8 assessment work that we're doing to understand the  
9 dynamics of the river bottom in this area.

10 Overbank, the highest concentrations occur within  
11 industrial levees. Again this is the post-industrial  
12 age levees. These are the banks right next to the  
13 river. Elevated concentrations at depth. We also  
14 have deltaic overbank areas. Well, what is that?  
15 Well, this is an area where you have some steep or  
16 high curvature in the river, and during flooding  
17 conditions, the river will jump its bank. Well, when  
18 it jumps its bank, it's a lot like the J/K area, it  
19 takes part of the natural levee with it, and then  
20 based on the energy gradient across there, coarse  
21 material will fall out first, fine material will fall  
22 out, and you get this kind of deltaic deposition  
23 pattern in these areas, so they are there, and there's  
24 several of them in the Middle and a couple of them in  
25 the Upper Tittabawassee.

1 Ridge and swale, that's really just a natural  
2 progression of channel banks. These are meander  
3 scrolls. Historically, as the river has moved, it's a  
4 series of levees that have evolved over time, and  
5 GeoMorphic wetland complexes, again these are areas  
6 that are in the floodplain and fill up with water.  
7 The deposition is relatively stable and are primary  
8 deposition areas during flood conditions.

9 Investigation summary to date to give you an idea  
10 of the level of effort to come to some of these  
11 conclusions and again this is two years into the  
12 process. We haven't completed the characterization  
13 but this is 11.4 in-channel river miles from the  
14 Tridge down to Freeland Road. 653 locations have been  
15 sampled. That's what you've seen in terms of the  
16 summaries. 3,500 samples have been collected. Just  
17 over 3,000 have been analyzed for furans and dioxins.  
18 So this is not a small dataset. This is a very large  
19 dataset covering 11.4 river miles, and again  
20 88 percent are less than 100 ppt in terms of surface  
21 concentrations in the river. 106 of those have been  
22 analyzed for broader constituents, secondary COI. If  
23 you want to have an understanding of what is involved  
24 in that, I'll be at the table in the back and I'll be  
25 more than happy to show you what other constituents

1 have been involved in that analysis. They're part of  
2 the 2008 site characterization report update.

3 Overbank sampling from the Tridge or Poseyville  
4 Road down to State Road, 17 river miles, 1,786  
5 overbank sampling locations or floodplain sampling  
6 locations. 9,400 samples collected. 8,643 of those  
7 analyzed for furans and dioxins. Again this is the  
8 dataset that we're using to present the distribution  
9 of TEQ for floodplain, in-channel, max and surface  
10 TEQ. 268 samples analyzed for secondary COI, again  
11 that broader list of constituents. That's all I have  
12 tonight. Thank you.

13 CHUCK NELSON: We're ahead of schedule.  
14 Victor, are you part of this, too?

15 JOHN MUSSER: Yes. I have one more.

16 VICTOR MAGAR: Well, hello everyone. I'm  
17 Victor Magar and I will talk about the Saginaw River  
18 and Bay work. I came here last November to talk about  
19 the work that we were planning and now I have an  
20 opportunity to talk about some of the results we have  
21 from the Saginaw River. In this work, we did quite an  
22 extensive investigation last fall and we were really  
23 trying to take advantage of this opportunity, what we  
24 saw as an opportunity, to collect data before the end  
25 of the year, before winter, to support an

1 understanding of the river and also to support data as  
2 we move forward toward a remedial investigation that  
3 we're working on right now and we're developing a  
4 workplan for that.

5 So we looked at bathymetry and topography. Those  
6 are surface elevations. Bathymetry tells you what the  
7 surface elevation is of the sediment. Topography  
8 tells you what the elevation of the land is, and this  
9 informs flow behavior and tells us how the river is  
10 flowing and moving through the system, and we use a  
11 lot of that information for hydrologic monitoring, as  
12 well as for modeling purposes. We were looking at  
13 river morphology and I'll talk briefly about some of  
14 the morphology and how the river is behaving.

15 We did a bank stability assessment. That was  
16 important to us to understand how the sediment banks  
17 are behaving. This is a very different system than  
18 what was just described for the levees and banks. In  
19 this system, most of the banks are actually what we  
20 say hard banks or constructed. There are sheet piles.  
21 Well over 50 percent of the banks in the Saginaw River  
22 have either sheet piling, rip raft, a very different  
23 connectivity of the river to the bank to the  
24 floodplain; in fact, much less of a floodplain  
25 footprint than what we see again in that more dynamic

1 situation we see in the Tittabawassee River, and then  
2 we did surface sediment sampling. We looked at  
3 in-channel sediment concentrations, Bay sediment  
4 concentrations, soils in the beaches, in four  
5 different beaches, and finally floodplain soils, so  
6 I'll talk about those briefly.

7 And what we begin to see as a river profile --  
8 and I show here a profile of the river, including the  
9 Tittabawassee River, the Saginaw River, and Saginaw  
10 Bay, and if you could imagine a center line all the  
11 way down the center of both rivers and out to the Bay,  
12 I've cut through that center line, so it's a different  
13 kind of profile than what we saw, which was cutting  
14 across the river. This is going along the length of  
15 the river, and it shows the elevation of the river in  
16 the Tittabawassee and it shows the elevation of the  
17 Saginaw River with distance, and what we start to see  
18 is a fairly steep or a steeper profile in the  
19 Tittabawassee River, a little bit of an increase in  
20 that grade. If you can imagine being in a car driving  
21 down, you'd be going at 1 foot per mile of an  
22 elevation difference in the Tittabawassee River. It  
23 increased to about 2 feet per mile and then you would  
24 start to flatten out very quickly and that flattening  
25 out occurs around the Sixth Street Turning Basin.

1           So why is that important and why is that of  
2 interest to us? It is of interest because it relates  
3 a lot to the flow and how solids or sediment is moving  
4 through this system as well. We know that there's a  
5 fair amount of energy at times, especially during  
6 storms, in the Tittabawassee River. We see after the  
7 confluence that that energy, we have this mixing zone  
8 in the upper 6 miles, and then that starts to  
9 dissipate very quickly, and this deeper water depth  
10 becomes very important, because with deeper water  
11 depths with a larger area, you slow down the velocity,  
12 and with a slower velocity, you have less ability to  
13 move sediment down the river, and that becomes very  
14 important to what our TEQ distribution is then in the  
15 river as well.

16           So what we know from our hydrodynamic work is  
17 that we have relatively low flows in the Saginaw  
18 River. They're actually controlled and bounded very  
19 much by the Bay. In that very flat portion, the  
20 gradient, the slope was about 1 inch per mile, if you  
21 can imagine that flat a profile, and that creates what  
22 is a very depositional environment. We have mostly  
23 engineered banks that have little connection to the  
24 floodplain, and this Lower Saginaw River we should  
25 remember is also actively dredged, so that has a very

1 significant impact on sediment export out of this  
2 system. So even as the sediment is depositing into  
3 the river, depositing into areas where they have  
4 dredged, we now see a lot of that exported out, and  
5 particularly that becomes important around the Sixth  
6 Street Turning Basin, which is as you know we're very  
7 interested in looking at that particular deposition  
8 zone that could be used to manage sediment and to move  
9 it out of this system.

10 So what does it look like when we start to look  
11 at TEQ concentration, the dioxin and furan  
12 concentration? What we show here is another profile  
13 of the river. This time we're just looking at the  
14 Saginaw River and we start at the beginning of this  
15 Saginaw River at the confluence and we move all the  
16 way down to Saginaw Bay. The miles are inverse, so we  
17 start at the 0-mile point at Saginaw Bay and we go out  
18 to about 22 miles, it's a 22-mile long river, to the  
19 confluence, and then we have concentrations on the  
20 Y axis, from 0 to 12,000 parts per trillion.

21 And what we see is, by the time we get to  
22 Zilwaukee or even around the Sixth Street Turning  
23 Basin, the transition zone, that's where we see some  
24 of those highest concentrations but we also find that  
25 we're really dominated by very low concentrations. I

1 should mention that this is all that historical data.  
2 This includes everything that preceded our work in  
3 2007 last year, and it includes samples collected by  
4 DEQ, by the Army Corps of Engineers, by others over  
5 about the last ten years.

6 When we start to superimpose our data on top of  
7 that, we see pretty much the same story, which I  
8 thought was very reassuring. The blue diamonds are  
9 clusters that we collected. We focused in what we  
10 think of as our depositional areas where we have  
11 really the highest potential for deposits for what we  
12 think is the highest potential for high concentrations  
13 to accumulate, and yet, we see little difference from  
14 the historical data. We see a system that is  
15 dominated primarily by low concentrations, but, yes,  
16 there are also high concentrations intermittently  
17 present even amongst the low concentrations.

18 And so we start to think of that statistically or  
19 mathematically, what does that mean for a distribution  
20 of concentrations, because what I see in this data is  
21 really a lower impacted river, which I think is  
22 certainly a good thing ultimately. We do recognize  
23 some of the higher concentrations in this transition  
24 zone, particularly approaching the Sixth Street  
25 Turning Basin, and we use a median value. The median

1 means 50 percent of the samples are higher, 50 percent  
2 are below, but it gives kind of that central tendency  
3 to the data.

4 So for the Upper Saginaw River, that central  
5 tendency is about 39 parts per trillion. The lower  
6 Saginaw River is much lower, it's about 0.8, and  
7 that's reflected in much lower concentrations here.

8 For the entire river, if I look at it as a whole, I  
9 can look at that, that's a 2.1. If we go out to the  
10 Bay, that central tendency is about .5 parts per  
11 trillion, and then we also collected beach soil  
12 samples that was 1.9 or about 2 parts per trillion.  
13 When we hear numbers that 90 parts per trillion being  
14 a goal or even 1,000 parts per trillion, it really  
15 starts to get us to think that this is a system that  
16 has really much lower concentrations, even in those  
17 target concentrations of 90 or 1,000.

18 You saw a bar chart, a distribution, in the  
19 previous presentation and we can show the distribution  
20 and it starts to explain why the data looks the way it  
21 does, that we have those low TEQ values, because  
22 there's so many samples, 60, depending on the median,  
23 to 95 percent of the samples that end up being less  
24 than 100 parts per trillion, and we have represented  
25 here bank soil samples in blue, the bed sediment

1 samples, the bay sediment samples, and beach soils,  
2 and a range of concentrations but still very much  
3 dominated by these low concentrations. We do see some  
4 that are in the 100 to 1,000 and even some that are  
5 above 1,000 parts per trillion, very few that are much  
6 farther north, just a handful. All of this is really  
7 occurring in that upper 6-mile transition zone.

8 I'm going to step back one slide. I might  
9 mention here that I think it's important to recognize  
10 or to remember that we also saw a much higher  
11 concentrations in the Wicks Park area. Remember, that  
12 concentration was about 1.6 ppm, and it is represented  
13 here, but because that sample was not validated or  
14 could not be validated by the lab, we had to repeat  
15 the sampling, and we ended up with a concentration on  
16 the order of 11,000 ppt, so that's represented. We've  
17 also heard another story about bed load sampling. I  
18 think that, too, is showing that much of those  
19 concentrations are not moving down in this river,  
20 moving down beyond the Sixth Street Turning Basin.

21 So to conclude, we saw the Saginaw as a slow  
22 moving river. We see that solids transport is  
23 controlled by the energy at the confluence of the  
24 river, and that once that begins to dissipate, by the  
25 time we get to the Sixth Street Turning Basin or in

1 that gradient, then we start to see a lot of the  
2 solids drop out and a much lower concentration profile  
3 down river. The TEQs are generally low, very low  
4 median concentrations, and deposition of coarser  
5 grained solids that we saw with elevated TEQs really  
6 occurs in the upper 6 miles. Much finer grained  
7 solids with lower TEQs we see in the lower portion of  
8 the river.

9 So that would conclude my talk and I would be  
10 very happy to offer -- I would also mention that I  
11 have a poster in the back and I'll be happy to talk  
12 about more of these findings if people are interested  
13 after the talk.

14 RYAN HOLEM: Thanks, John. I apologize if  
15 I move a little faster. My name is Ryan Holm. I'm  
16 with ENTRIX. I was the lead on some comprehensive  
17 fish and wildgame collections that took place last  
18 summer. Wildgame were collected from three different  
19 locations last summer represented by the orange  
20 circles, one near Imerman Park, one on the Shiawassee  
21 National Wildlife Refuge, and one on Crow Island State  
22 Game Area. If you recall a couple of years back, late  
23 2003 and early 2004, additional wildgame collections  
24 were done near Sanford, Smith's Crossing, and Imerman  
25 Park.

1           Tonight I'll be discussing the 2007 data only.  
2           Looking at both collections combined, 237 animals were  
3           collected, 6 different species were collected, and  
4           this slide depicts the number of individuals of each  
5           species that were collected from each location. Again  
6           SNWR is Shiawassee National Wildlife Refuge. CISGA is  
7           Crow Island State Game Area. A variety of tissues  
8           were harvested from these animals. The intent was to  
9           collect and analyze tissues that would best represent  
10          what is consumed by hunters or people consuming game.  
11          For example, from deer, we collected muscle and liver  
12          tissue. From the birds, we collected skin-on and  
13          skin-off muscle samples.

14          The yellow circles here represent reaches for  
15          fish collections. Reach One was up near the Dow Damn.  
16          The downstream boundary of Reach Two was Freeland Road  
17          Bridge. Downstream Reach Three was State Street Road  
18          Bridge. The downstream boundary of Reach Four was the  
19          terminis of the Tittabawassee River. Reaches Five and  
20          Six were on the Saginaw River. Reach Five was bounded  
21          on the downstream side by the Zilwaukee Bridge and  
22          then the downstream portion of Reach Six was the  
23          Saginaw Bay.

24          Approximately 380 fish were collected last  
25          summer. I believe a total of about 11 species.

1 Skin-on and skin-off fillet samples were harvested  
2 from the fish in Reaches One through Four on the  
3 Tittabawassee, again Five and Six on the Saginaw  
4 River. Approximately 750 tissue samples in total were  
5 analyzed for a suite of compounds, including the 17  
6 dioxin and furan congeners, dioxin-like PCB congeners,  
7 and then a suite of other compounds of interest,  
8 including metals, chlorinated pesticides, and some  
9 volatile organic compounds.

10 Getting into the data briefly, this slide depicts  
11 the minimum, average, and maximum dioxin and furan TEQ  
12 values in wildgame tissues harvested in both  
13 collections. So what you can pretty clearly see is  
14 that deer liver, wild turkey, and wood duck were the  
15 highest. The bottom of the black bars is the minimum  
16 or the lowest value. The black diamond represents the  
17 average value and the top of the black bar represents  
18 the maximum value. For all other tissue types, other  
19 than deer liver, turkey, and wood duck, the average  
20 value was less than one-half parts per trillion TEQ  
21 from dioxins and furans. This does not include the  
22 upstream reference sites. This is the target sites  
23 only.

24 This slide presents the dioxin and furan TEQ in  
25 the livers of deer harvested from the Tittabawassee

1 and the Saginaw River floodplains, again the minimum,  
2 average, and maximum concentrations. What you can see  
3 is the concentrations increase as you move downstream  
4 maxing out near the Imerman Park area, decreasing at  
5 Shiawassee National Wildlife Refuge, and decreasing  
6 even further at Crow Island State Game Area.

7 On this slide, we have dioxin and furan TEQ in  
8 skin-on waterfowl, again minimum, average, and maximum  
9 values. Your wood duck had your highest values, quite  
10 a bit higher than geese. Skin-on samples, regardless  
11 of waterfowl species, were higher than skin-off  
12 samples.

13 Just to wrap up, with the fish, we've got on this  
14 slide dioxin and furan TEQ values in fish fillets from  
15 the Tittabawassee and Saginaw River, so both rivers  
16 combined. Minimum, average, and maximum values are  
17 presented. This black line represents the 10 parts  
18 per trillion dioxin TEQ advisory level that Michigan  
19 Department of Community Health uses. What you can see  
20 is that carp and channel catfish are the highest  
21 species. The very popular and pursued walleye tends  
22 to be quite low in comparison to the carp and the  
23 channel catfish. What's interesting and neat about  
24 this information is that a lot of these species had  
25 never been collected and analyzed prior to the 2007

1 collection, in particular species towards the right of  
2 the slide, the white sucker, the large mouth bass,  
3 crappie, pan fish, and fresh water drum. Most of  
4 these had never been collected and analyzed prior to  
5 2007, and relative to carp and channel catfish, they  
6 are quite low.

7 Very important to note that other contaminants  
8 are considered when setting fish consumption  
9 advisories. This slide only displays TEQ from dioxins  
10 and furans only and does not display the PCBs. I  
11 believe after this Kory will be discussing the use and  
12 setting of fish consumption advisories for the State  
13 of Michigan, and I will be available for questions  
14 after the meeting as well. Thanks.

15 CHUCK NELSON: Kory, are you ready to talk  
16 about the fish and wildgame advisory development  
17 process?

18 KORY GROETSCH: Again my name is Kory  
19 Groetsch. I'm from the Michigan Department of  
20 Community Health. Oh, I guess I've been up here a  
21 couple of times to talk about fish consumption  
22 advisories. My face is hopefully familiar to some of  
23 you, and the reason I'm up here is that the Department  
24 of Community Health is the one that issues Michigan's  
25 fish consumption advisories, and I was asked tonight

1 actually to just give some context around fish  
2 contaminant data and how fish advisories sort of play  
3 into this region and to what is this site here or this  
4 work here is really the off-site corrective action.

5 Now that term, I'm not sure if you're familiar  
6 with it, is really what this meeting is about.

7 Off-site corrective action, just as Ryan just  
8 presented the fish data and the wildgame data and all  
9 that sediment data, is conducted by Dow Chemical and  
10 it's done under the direction of DEQ and EPA, and as  
11 we just saw, most of it focuses on dioxins and furans,  
12 and you know, the general purpose of it is to  
13 determine where those dioxins and furans have gone to  
14 once they've left the plant site and to help in trying  
15 to figure out cleanup options, okay. So that's what  
16 off-site corrective action is. That's what the  
17 purpose of this meeting is.

18 Now fish consumption advisories is something very  
19 separate from that. First of all, they began way back  
20 in 1970. They've grown into a statewide program. So  
21 we don't just test from the Saginaw River or the Bay  
22 or just in this area. We look at water bodies all  
23 over the state. We also look at, as Ryan mentioned, a  
24 whole broad range of chemicals that can build up into  
25 the fish flesh, you know, the fillets issue, the part

1 that people most commonly eat. So when we go out, we  
2 base our fish consumption advisories on measured  
3 contaminant data. So we go out and measure it. We  
4 look for a whole host of chemicals.

5 From there, we use a science based process  
6 commonly referred to as a risk assessment. It  
7 involves these screening values, one of which Ryan put  
8 up there, the dioxin 10 parts per trillion number.  
9 That's actually -- it's a collaborative effort in the  
10 State actually, four departments work on this, and the  
11 Department of Environmental Quality does the initial  
12 review of the data, okay, so they do the data  
13 management part. They take those screening values.  
14 They take the measured fish concentrations. They  
15 compare both of them and they come up with  
16 recommendations to the Health Department saying, oh,  
17 you guys should take a closer look at this fish and  
18 this species from this river because either it needs  
19 potentially a new advisory or you maybe can rescind an  
20 advisory, and each year both of those activities  
21 happen multiple times, okay.

22 Now that actual fish contaminant data is written  
23 up and all of this is written up in what is called the  
24 Fish Contaminant Monitoring Program. Go on the  
25 website. Anybody can view it anytime they want. It's

1 very thick. It's start with an introduction. It has  
2 all the methods. It describes everything in great  
3 detail, and so it's all there and well documented. So  
4 when that then comes, the recommendation from the  
5 Health Department, the Health Department then  
6 evaluates the data really in relation to our mission,  
7 and this is where I think a lot of sometimes confusion  
8 exists, but you got a State Health Department. What  
9 is our mission? And I'll read it to you. It's fairly  
10 simply. It says, to protect, preserve, and promote  
11 the health and safety of the people of Michigan with  
12 particular attention to providing for the needs of  
13 vulnerable and underserved populations.

14 So who are these folks? You know, when we say  
15 people of Michigan, that is a pretty broad group.  
16 That's young kids. It's pregnant mothers with the  
17 little baby in their stomach, right. We have the  
18 obligation to be protective of them. It's people who  
19 may have weakened immune systems or also a wide range  
20 of chronic illnesses who may be more sensitive to  
21 chemical contamination. So we take that into  
22 consideration. We set those fish advisories. We put  
23 them into a document that we hope to be useful to the  
24 public for them to simply make an informed choice. So  
25 when they go out fishing and if they like to fish, you

1 know, the same water body and they eat it frequently,  
2 we hope that that document they can use that, you  
3 know, to sort of select fish that are lower in  
4 contamination and make that healthy choice, because  
5 really, fish consumption on the other side if you  
6 think of it are a good choice when they don't have too  
7 much chemical contamination in them, okay.

8       Some of the other chemicals just to mention, as I  
9 say, if you look at testing of other chemicals, I  
10 mean, it includes things like, say, some of the  
11 Saginaw Fish, Saginaw Bay fish, you'll find chemicals  
12 like PCBs, mercury, DET. Also in there we look at the  
13 totality of the data. On these water bodies, the  
14 Tittabawassee River, the Saginaw River, and Bay, these  
15 advisories went into place -- oh, on the Saginaw  
16 River, it was back in 1977; Saginaw Bay 1979;  
17 Tittabawassee River 1981, and they've been on the  
18 advisory ever since, either due to dioxins, PCBs, PBB  
19 back then was an issue as well.

20       And I guess the main point is that, as Ryan  
21 pointed out on his last side, within the context of  
22 off-site corrective action, very interesting for this  
23 process, but it isn't a fish advisory, and if you want  
24 to know what the fish advisory says, I would just urge  
25 you to pick up this little brochure in the back, and

1 all the information obviously isn't in here, but if  
2 you go to the backside, there's a little website and  
3 you can go to the website and look up the fish  
4 advisory and look up your favorite water body and your  
5 favorite species, and if you have questions, feel free  
6 to call us.

7 And I guess the final point is we will be coming  
8 out with the new fish advisories I think before the  
9 end of the month, and it will also include -- now Ryan  
10 threw up that wildgame data and so there actually will  
11 be some wildgame advisories as well, so watch for  
12 those, and that was about it. Thank you.

13 CHUCK NELSON: So we have time now for  
14 clarification, response. DEQ, is there any response,  
15 EPA, to the presentation that was made by Dow and  
16 their contractors?

17 AL TAYLOR: I'm going to take care of mine  
18 in my presentation.

19 CHUCK NELSON: Dow folks, any response to  
20 Kory's presentation?

21 RICH HUBNER: I have a quick clarification  
22 question. My name is Rich Hubner. I'm with the  
23 Sapphire Group. I'm one of the contractors for Dow,  
24 and I'm just trying to get my head around the fish  
25 advisories as well, and I just wanted to make sure I

1 was clear about something you had said and what I saw  
2 in the pamphlet. So based on the fish advisories, and  
3 you're charged to protect for health, so the fish  
4 advisories are risk based as you said, and so are they  
5 protective of human health, i.e., if I follow to the  
6 letter the fish advisories, is there any adverse  
7 health effects that would be related to the  
8 consumption of fish based on the fish advisories?

9 KORY GROETSCH: Let me understand, so is the  
10 fish advisory absolutely safe?

11 RICH HUBNER: I didn't say that. I said, is  
12 it protective of human health based on the fish  
13 advisories?

14 KORY GROETSCH: You know, we like to think  
15 so, but in the world of science, we learn new things  
16 from the scientific literature from year to year. One  
17 of the things I didn't mention is that, you know, a  
18 lot of those screening values, initial screening  
19 values, we use in the process were originally set back  
20 in the 1980's, and so, you know, there's a lot of time  
21 since then and a lot of scientific literature that has  
22 been published. So review of those is ongoing, and  
23 you know, that's one area of uncertainty with them.  
24 As you know with any risk assessment -- I mean, we  
25 sort of talked about this five to six hours ago in

1 that meeting, but you know, there are uncertainties.

2 So I mean, I wouldn't say -- I believe that you're  
3 much safer following that fish advisory and eating  
4 within those limits than ignoring it --

5 RICH HUBNER: I didn't say ignoring it.

6 KORY GROETSCH: -- and not eating within  
7 those limits, but you go to the literature and one of  
8 the realities is that people who frequently eat fish  
9 with elevated concentrations of contaminants find that  
10 they have an elevated amount of those contaminants in  
11 their blood. Now what does that mean? I do not have  
12 a good answer for that. Just as you know, you go into  
13 the scientific literature, there's lots of suggestive  
14 concerns from epidemiologic observational data, but  
15 those studies are not designed to link cause and  
16 effect, but you know, they suggest that those  
17 chemicals can contribute to some negative health  
18 outcomes.

19 You combine that with animal toxicology  
20 literature and again you reach a point where the  
21 Health Department simply looks at it in a health  
22 protective way, which is we find concentrations in  
23 water bodies around the state that are normally high  
24 and then we look at the literature and say, look,  
25 these chemicals are a potential concern for public

1 health if people are eating them too often, and  
2 because of that, we're going to try to give them a  
3 tool called the Fish Consumption Advisory, and  
4 imperfect tool, I admit it is not perfect, but a tool  
5 better than none at all, and if one follows it, I  
6 think one is better off and public health is more  
7 protected.

8 So, you know, I'd love to see more work done to  
9 prove it but it is what it is right now and I feel  
10 confident to say, use the advisory better than  
11 ignoring the advisory. I guess the last thing I would  
12 say is, you know, make your own personal choice. If  
13 you're not comfortable with it, if you're not  
14 comfortable eating the walleye from the river, even  
15 though the advisory says go ahead and eat certain ones  
16 at certain rates, don't do it. It's really a personal  
17 choice.

18 CHUCK NELSON: Again there will be more time  
19 to follow up with these issues during our question and  
20 discussion period beginning at 8:15. Now we have the  
21 EPA discussing residential assessment sampling  
22 activities.

23 MARK DURNO: My name is Mark Durno. I'm the  
24 Chief of the Emergency Response Section covering Ohio  
25 and Michigan and I want to give you just a quick

1 update on what we're doing with respect to the removal  
2 program here at EPA, but I'm going to focus obviously  
3 what the agenda says on the residential assessment  
4 program that we've been working with DEQ, DCH, and  
5 some other health and response partners. Before I do  
6 that, I also want to introduce Brian Schlieger, one of  
7 our on-scene coordinators that you're going to see in  
8 the area or you have seen in the area the last couple  
9 of years, and Mr. Jeff Kimble, who's going to give a  
10 part of this talk here in a moment.

11 As I get into this, I'm going to focus on two  
12 things. One, a very quick recap of what we oversaw  
13 back in 2007 in terms of removal actions that Dow  
14 undertook, and secondly, the residential assessment  
15 program that we initiated this year. First of all,  
16 those of you that were at the January 31st meeting in  
17 Saginaw, you saw this figure. What I want to do is  
18 quickly recap the work that was negotiated,  
19 administered, and then overseen by us which Dow  
20 performed back in 2007. There were three areas on the  
21 Tittabawassee River stretching from Midland downstream  
22 in the Tittabawassee where cleanup actions occurred,  
23 as just about all of you are aware.

24 In Reach D, there were approximately 17,000 yards  
25 of material removed. This slide is a little bit out

1 of date. It says that minor cleanup remains. It's my  
2 understanding that those minor cleanup activities have  
3 occurred and I think some restoration activity still  
4 has to occur at that location, but basically, the main  
5 components of the order have been met. Reach J/K is  
6 complete. I believe Dow has received a completion  
7 letter from EPA on that. We oversaw the removal of  
8 over 23,000 yards of material that were removed from  
9 the floodplain and that included a 42-acre cap in that  
10 area, and down at Reach O, over 16,000 yards of  
11 material were removed from the river.

12 In addition to that, as you're aware, there were  
13 over 600 yards of sediment removed from the Wicks Park  
14 area of the Saginaw River, the famous high hit of  
15 dioxin contamination that occurred in the sediment.  
16 There was some additional sediment removed from around  
17 that location from the characterization effort that  
18 occurred and again that removal was done in November  
19 and December, and in December, it was complete.

20 Again the focus here is what we're doing this  
21 year. As we took a look at the GeoMorph sampling that  
22 was presented earlier, we started to see some  
23 interesting trends in the data and you saw a graphic  
24 earlier from one of the first presentations today and  
25 it referenced that there were a number of locations in

1       which contamination was in the lower percentages but  
2       nonetheless contamination at higher levels were  
3       present in overbank areas of the Tittabawassee River.  
4       We started focusing on some of that contamination and  
5       there were some very distinct areas in the floodplain  
6       where we felt that there might be a threat to human  
7       health as a result of contamination that was present.

8               So we pulled the team together, the regulatory  
9       team, which is EPA, DEQ, DCH, ATSDR, which is the  
10      Agency for Toxic Substances and Disease Registry, and  
11      we consulted with some of the local health agencies to  
12      begin to discuss what some of this data meant and what  
13      action should be taken or what additional assessment  
14      work should be taken as a result of that, and our  
15      purpose for doing this work is simply as it states to  
16      evaluate exposure and also to evaluate imminent  
17      substantial risk to humanity health in locations where  
18      previous sampling indicates elevated levels of dioxin  
19      and furan contamination in residential locations, and  
20      I put in there greater than 1,000 parts per trillion  
21      because that's the guideline that EPA uses that's been  
22      directed to us to take on additional assessment  
23      activities when this potential direct contact for  
24      dioxin and furan contamination is present.

25             We're looking at several areas on the Lower

1 Tittabawassee for priority and we're going to explain  
2 the prioritization process in a minute but again there  
3 are several areas we're taking a look at right now.  
4 The process that we use to do this assessment work is  
5 first to evaluate the recent data that was generated  
6 from Dow's GeoMorphic sampling. DEQ is taking the  
7 lead on prioritization of areas that need to be  
8 further assessed. Once that occurs, then as a team we  
9 identify specific sampling objectives and those could  
10 be variable depending on the data that's already  
11 present that we're looking at. Again the objectives  
12 can range from full extent of contamination in an  
13 area, again mainly looking at direct surficial  
14 contamination concentrations, or it could just be  
15 simply some limited sampling to evaluate potential  
16 exposure to individuals. Once we've identified our  
17 objectives, we develop our quality assurance plans,  
18 implement our sampling, and then evaluate the data.

19 I'm going to ask Jeff Kimble to give a very  
20 quick overview. He's the guy that you're going to see  
21 on the ground with our crews doing most of the work,  
22 so it makes sense if he talks about the process that  
23 we're going to use to do the work.

24 JEFF KIMBLE: Thanks, Mark. My name is  
25 Jeff Kimble. I'm one of the on-scene coordinators

1 with EPA Region Five and I was asked to be the guy on  
2 the ground leading the assessments here, and  
3 basically, I'm going to quickly explain the process.  
4 What we do once DEQ and others have looked at the  
5 potential areas they would like to further assess  
6 based on the previous sampling, as Mark had talked  
7 about, they give that area or refer that area to us  
8 and then actually accompany us to go out and discuss  
9 with that property owner, asking for permission to  
10 sample on that property.

11 Once that's done, we then start developing our  
12 plans to do the sampling, and in doing that, we  
13 decided to use our VSP or visual sampling plan  
14 software which allows us to put in different goals  
15 into the software, what we're looking for sample-wise,  
16 and it will actually project the number of samples to  
17 meet our goals for us to use the standardized guide in  
18 doing this sampling. Part of that process, when we're  
19 looking at what goals to use in these plans, how we're  
20 going to design the sampling approach, is really use  
21 of the area. Are they high use areas? Are we talking  
22 kid's playground areas? Or is this the woods behind a  
23 residential house or adjacent to a park that gets some  
24 use? We use that when we're designing how many  
25 samples basically over an area we're going to collect.

1 It does provide the group plan based on that and we  
2 are capturing those points using a GPS system so that  
3 we can recreate those locations if needed.

4 This is kind of a blow up example of what our VSP  
5 plan will generate based on a higher use area right  
6 around a house. You want to look at the yard where  
7 people are mowing, walking through it, potentially  
8 gardening, working in their flower beds. This is the  
9 typical interval spacing that you'll see right here  
10 use area. Again our typical approach in areas that  
11 are fairly easy to access is that we're using, and  
12 I'll show you a picture in a minute of it, a geoprobe  
13 unit, basically just probing a quarter of the top  
14 three feet.

15 After initial discussions with DCH and with MDEQ  
16 based on past historical data, we're concerned with  
17 three sample intervals at this point. The surface  
18 sample we're talking about 12 inches. Those samples  
19 are all being analyzed at the laboratories as we're  
20 collecting them. We're also collecting samples from  
21 the cores from the 18- to 24-inch interval below the  
22 ground surface and the 30- to 36-inch interval below  
23 the ground surface, and at this point we're retaining  
24 those samples in case we need to further define the  
25 extent at depth of the contamination if it's found,

1 and again all the samples are being submitted under  
2 EPA Method 1613 B off-site laboratories for those  
3 analysis, and our standard turn to get the lab  
4 packages back is about 28 days, but then again after  
5 that the data needs to be QAQC'd or quality controlled  
6 data. From that point, it needs to be reviewed.

7 And these are just a few photos kind of  
8 showing -- so if you see our people out in the area,  
9 this is just showing them set up the walk behind  
10 geoprobe. You might see it on a track mounted or an  
11 ATV type mounted geoprobe in the future as well as  
12 we're doing the assessment activities. Basically, a  
13 hydraulic press that pushes a stainless core tube into  
14 the ground with a dedicated plastic sleeve inside of  
15 that stainless core and that's what actually taps into  
16 the soil.

17 I have an example of what that tube looks like  
18 here. They pull the plastic liner out of that, put a  
19 capsule in it, and then further process it in our  
20 small lab trailer we have or our small process  
21 trailer. Basically, that's where we cut it open.  
22 Again we're using dedicated equipment, following  
23 proper procedures, and we're combining those intervals  
24 and preparing them basically for off-site shipment to  
25 the laboratory. We're also doing -- in certain areas

1 where we just can't get those rigs into to do the full  
2 3 feet profile that we're looking at right now, we're  
3 really doing some 0- to 12-inch sampling. We're doing  
4 that with hand augers that are being decontaminated  
5 between locations, such as the riverbanks where we  
6 just don't feel safe or it's soft and slippery and we  
7 don't want to put equipment and people in harm's way  
8 to try and get these samples. Mark.

9 MARK DURNO: Thanks, Jeff. So where are we?  
10 We have we done to date? We've only been out there  
11 working for a little over a month now. So far we've  
12 collected samples in three discrete areas. Data is  
13 pending in all of those areas. As Jeff mentioned, it  
14 takes us a month just to get data back and then we  
15 have to go through a quality control process. So  
16 again even in the first area we're just in the process  
17 of beginning to get data back. So unfortunately,  
18 tonight we have nothing to report in terms of  
19 findings, because it takes us some time again as a  
20 team to collect the data, to evaluate the data, and  
21 interpret what it means. One area is currently being  
22 sampled as we speak and prioritization of other areas  
23 are ongoing and Al Taylor for DEQ is going to speak to  
24 that in a moment.

25 What are the next steps for our program? We're

1 going to continue to do what we're doing. We're going  
2 to evaluate this residential assessment data. We're  
3 going to collect more data again in those areas that  
4 you saw earlier that are in that small percentage of  
5 high concentration contaminants at the surface. We're  
6 going to make recommendations for response actions as  
7 appropriate. That doesn't mean we're going to  
8 recommend that response actions take place in every  
9 location. We're going to independently evaluate these  
10 for potential action.

11 One key note that I want to point in closing is  
12 that we are not going to recommend or conduct any  
13 remedial or cleanup activity. We're not going to make  
14 any determination or recommendation until all the  
15 agencies on our team have had a chance to review and  
16 interpret the data and that we've effectively  
17 coordinated with those who might be potentially  
18 affected by the contamination present.

19 And the last note I wanted to make is I apologize  
20 for not providing copies of the presentation.  
21 However, we will post it on the website that has been  
22 dedicated to this particular situation. That website  
23 is [EPA.gov/regionfive/sites](https://www.epa.gov/regionfive/sites), and then click on  
24 Michigan and you'll find the Tittabawassee River site  
25 and that's how you can access this presentation.

1 We'll make sure we get it posted within a week. So  
2 that's all I have. Any questions that you might have  
3 regarding the prioritization process, I think Al is  
4 going to touch on that in his presentation, but I can  
5 take anything else other than that pertaining to the  
6 assessment program.

7 CHUCK NELSON: If there are questions,  
8 please, feel free to come to the microphone here. We  
9 have about seven minutes to do this and then we'll  
10 move on.

11 LISA YOST: I'm Lisa Yost with Exponent  
12 helping Dow in the Human Health Risk Assessment.  
13 First, I've heard about your sampling and I've heard  
14 and I certainly understand and appreciate the need to  
15 better characterize the concentrations greater than  
16 1,000. I guess I'm wondering how extensive your  
17 mapping is and how well it can address issues like  
18 Peter Simon was talking about that much of the  
19 contamination occurs or the higher numbers occur near  
20 the river, not in particular in areas where people are  
21 gardening, mowing and so forth, and when you put the  
22 up the picture of the house with the 45 samples around  
23 it, my blood pressure went up a little bit, and I  
24 guess I wondered about the frequency of sampling and,  
25 you know, considering those sort of subuse areas.

1 Yes, they're zoned residential but are they, in fact,  
2 used in a residential manner, those kind of questions?

3 MARK DURNO: Sure. I'll address it in two  
4 parts. I'll let Jeff talk a little bit about the  
5 frequency of sampling because that's all built into  
6 our program, but before I do that, again we're doing  
7 this as a prioritized process and the objective here  
8 is to take a look at the areas that we're most  
9 concerned with, in other words, areas like the example  
10 picture you saw where we have residential locations  
11 that their yards are essentially in the floodplain,  
12 and where the data that was collected through the  
13 GeoMorph sampling program have demonstrated that there  
14 are high concentrations in those yards. So those are  
15 getting first priority for an assessment.

16 The prioritization process is one that we're  
17 looking at as we're going down the concentration and  
18 landuse scale. It doesn't -- the locations that we're  
19 looking at don't necessarily mean we're going to  
20 actually go out and collect samples in these areas.  
21 We just want to have a better understanding as a team  
22 as to what the data means and recommend further  
23 sampling, if necessary. Again it doesn't necessarily  
24 mean we're going to sample in these areas.

25 Some of the objectives, the objective example you

1 saw in that particular location, again we were  
2 concerned because sampling was in the yard where  
3 direct contact can exist. In some other areas, we may  
4 see contamination down near the riverbank, not  
5 anywhere close to a residential location or a location  
6 where individuals access these properties. In those  
7 cases, we may do very select sampling or recommend  
8 very select sampling doing exactly what you just  
9 described, looking at areas where there might be  
10 access or where soil might be moved. Again we're  
11 going to evaluate land use before we make any broad  
12 recommendations for sampling. What you saw in that  
13 picture may not happen at every location. Jeff, in  
14 terms of the frequency of sampling.

15 JEFF KIMBLE: Real quick just to elaborate,  
16 Mark sort of just explained it right there, but really  
17 it's based on what does the property look like, and as  
18 we were explaining, and I can go into this further  
19 with you afterwards if you'd like a better  
20 explanation, but really we're looking to try and  
21 statistically make sure we find contamination, if it's  
22 there, but to not show it's there if it's not.  
23 Basically, we're putting in confidence that we'll find  
24 a certain sized hot spot, if it's there on the  
25 property.

1           We're also putting in a reverse confidence so  
2           that we're going to be able to say, we're not going to  
3           say there's a hot spot there if there's not. So it's  
4           statistically designed in order to capture both of  
5           those, but also it's goal related. The size of the  
6           hot spot we're looking for will change based on land  
7           use and that will also determine the number of samples  
8           on the property. If we're looking for a 15-foot  
9           diameter hot spot as compared to a 60-foot diameter  
10          hot spot, obviously, this can't be the interval. It's  
11          going to be much wider.

12                 MARK DURNO: It's going to vary per  
13                 location. It's not one size fits all for each of  
14                 these potential situations, and we have a question  
15                 back here.

16                 AUDIENCE MEMBER: I just wanted a little  
17                 clarification in your presentation when you said that  
18                 there wouldn't be anymore interim responses until you  
19                 sit down and evaluate data and figure out what's what.  
20                 Does that mean that if they find another say million  
21                 parts per trillion hot spot in one of the rivers in  
22                 that time that you're just going to let it stay there  
23                 for now?

24                 MARK DURNO: No. What that means is the  
25                 data that we looked at and evaluated to date, we don't

1 see any need to jump in and start recommending action.  
2 That's why we're doing this assessment and again this  
3 assessment program is only in areas that are either  
4 residential or a high public use, like parks and so  
5 forth.

6 AUDIENCE MEMBER: Or land use, but in the  
7 river, say if Dow finds more levels like they did last  
8 year, do you plan to just leave it there until you  
9 evaluate it more or are you going to go in with an  
10 emergency response like what was done last year?

11 MARK DURNO: We'll discuss it with the  
12 partners. There's going to be factors that will  
13 determine whether or not we take those actions, just  
14 like we did last year, but if we see something of  
15 major concern, we're going to respond appropriately.

16 AUDIENCE MEMBER: Thank you.

17 LESA ALYWARD: Lisa Alyward, Summit  
18 Toxicology. I'm a Dow contractor. You mentioned that  
19 this was targeted towards trying to evaluate areas  
20 where there might be exposure and concern about  
21 exposure. Have you taken into account or are you  
22 evaluating as part of this process the findings from  
23 the University of Michigan Dioxin Exposure Study which  
24 has looked directly at exposure in populations living  
25 in these areas?

1           MARK DURNO: I have not seen that report  
2 myself. However, again the area that we're targeting  
3 or focusing on are areas where contamination is at  
4 that higher level. So across a broad study area like  
5 that one, we're not looking at the broad picture.  
6 We're looking at those discrete locations where  
7 contamination is higher. So, you know, we're looking  
8 at that small percentage of the properties where there  
9 could be what we consider imminent threats to public  
10 health based on high levels of contamination. We're  
11 not looking at the broad spectrum where we're seeing  
12 lower concentrations.

13           AUDIENCE MEMBER: It was brought out at the  
14 U.S. Fish and Wildlife meeting which was held in  
15 Midland last month that Dow had at one point in time  
16 been injecting into the ground water through their  
17 grind wells for a period of time certain substances.  
18 It's not really clear what it was but this was a  
19 practice that was going on for some time. Is there  
20 any testing of the ground water, in particular the  
21 aquifers that are located underneath these riverbeds  
22 and that are used as ground water sources, going on  
23 currently?

24           MARK DURNO: We have no plans for that but I  
25 will defer to those who might be involved because I'm

1 not aware.

2 AL TAYLOR: Hi. I'm Al Taylor. I'm with  
3 the on-site and off-site corrective action program.  
4 There have historically been some chemical waste  
5 injection wells in the Midland and Dow area. Some of  
6 those are being investigated and have been  
7 investigated as part of the on-site corrective action  
8 program. There's a fairly extensive ground water  
9 monitoring program associated with the Dow plant site  
10 itself. With respect to the dioxin and furan  
11 contamination, we really have not seen and really  
12 don't expect to see much vertical migration of dioxins  
13 and furans down to the water table. It does -- it can  
14 obviously and has gotten into the surface water but  
15 it's not really its nature to migrate vertical in the  
16 soil column.

17 There has been -- in certain areas of the river,  
18 there is some fairly shallow domestic wells, and work  
19 done by DEQ Remediation and Redevelopment Division and  
20 the Department of Community Health looked at  
21 concentrations in those wells to kind of verify that,  
22 and we really weren't able to confirm any elevated  
23 concentrations of dioxins and furans in the water  
24 there, and mainly, what we were concerned about there  
25 is maybe leakage down through the casing or the

1 annulus between the pipe and the surrounding soil.

2 AUDIENCE MEMBER: Is there any measures --

3 CHUCK NELSON: Sir, will you let the lady  
4 behind you get in one question? You've had one and  
5 then we need to move on.

6 AUDIENCE MEMBER: I'm Brenda Bagler. I grew  
7 up across from a brine well and there were ponds  
8 around that stunk and there was liquids from the brine  
9 well, so we all know where that came from. It came  
10 from the brine well, but I'm not up here about that.  
11 I'm up here about around Wicks Park, Vestry Drive,  
12 Park Drive, and the people around there when I worked  
13 as a homecare RN, they're largely African-American,  
14 very poor, and they eat the fish from that river in  
15 large quantities because that's what they can afford  
16 to eat. That's got to have a great effect on their  
17 health. Has there been any health studies on that?

18 AL TAYLOR: I'd ask our health  
19 professionals, are you aware?

20 LINDA DYKEMA: Hopefully, you can hear me  
21 from here. There have not been any health studies  
22 done. The U of M study and then the studies that DCH  
23 have done have been exposure investigations. They  
24 have not been studies where the health of people with  
25 higher dioxin levels have been looked at.

1           AUDIENCE MEMBER: These people were already  
2 retirees from GM Grey Iron Nodular. Their health was  
3 not good to start with by the time they retired and  
4 went into the apartments there.

5           LINDA DYKEMA: Unfortunately health studies  
6 are extraordinarily expensive.

7           AUDIENCE MEMBER: Unfortunately for them.

8           CHUCK NELSON: Okay. Thank you. In the  
9 interest of keeping on time here, and I know others of  
10 you have good questions and we will get to them, so  
11 Al, as I understand, you are next talking about  
12 interim response activities during the 2008 field  
13 season.

14           AL TAYLOR: My name is Al Taylor. I'm a  
15 geologist with the corrective action program of the  
16 Waste and Hazardous Material Division and I'm going to  
17 apologize because a lot of you guys are regular  
18 attendees of these meetings and have seen a number of  
19 these slides before. So if you have, I'll move  
20 through them fast. This is the area that we're  
21 looking at, Midland down the Tittabawassee River to  
22 Saginaw and back up the Saginaw to Bay City. I've got  
23 a new pointer. I can't wait to use it. Down here it  
24 turns and goes out to the Bay.

25           Background, the lower 24 miles of the

1 Tittabawassee River and floodplain, the Saginaw River,  
2 which is about 25 miles, and portions of Saginaw Bay.  
3 Primary contaminants that we've been talking about,  
4 dioxins and furans. Other contaminants are present,  
5 haven't really gotten a lot of discussion, but they  
6 are there. They are significant in some areas,  
7 including chlorobenzenes, parathion, chlorostyrenes,  
8 hexachlorobutadiene, lindane and others. A lot of  
9 this work is going to be dependent on reference work  
10 that's going to be done upstream of Dow and adjacent  
11 to Dow and downstream of Dow. So there are typically  
12 lower concentrations of a number of these compounds in  
13 the water due to energetic activities. What we're  
14 interested in are the ones related to Dow and that are  
15 present at concentrations of concern. Primary source,  
16 Dow Chemical, that's why we're here as part of Dow's  
17 corrective action program. The target population that  
18 we're interested in is affecting people living along  
19 the Tittabawassee and Saginaw Rivers, recreational  
20 users of the Rivers and the Bay.

21 This is basically the reason why. This is the  
22 Tittabawassee River running through this channel here.  
23 This is a typical overbank event. I think this was in  
24 2004. There's the channel and that's kind of the  
25 extent of the flooding. That's how stuff is getting

1 up onto the floodplain. For people who live along the  
2 river, this is a routine and expected event.

3 Part 111/RCRA, this is what's requiring Dow to do  
4 the off-site corrective action. Dow got a hazard  
5 waste operating license in 2003. The license requires  
6 corrective action and specifically requires corrective  
7 action for Midland area soils, the Tittabawassee River  
8 and floodplain, the Saginaw River and floodplain, and  
9 the Saginaw Bay. The license is a primary vehicle for  
10 addressing on-site and off-site releases of  
11 contaminants from Dow and work has been ongoing since  
12 2003 under this operating license.

13 Current Part 111/RCRA operating license activity,  
14 Tittabawassee River sampling programs, I think Peter  
15 Simon described pretty well the methodical approach  
16 that's being used to investigate contamination from  
17 Dow down to the confluence of the Saginaw River and I  
18 guess Environ is doing the investigation from the  
19 Saginaw River out to Saginaw Bay. This is a  
20 comprehensive program. It looks at from the source to  
21 the end point of contamination and it deals with  
22 remediation of that contamination. It uses and  
23 contemplates something called interim response  
24 activities to control sources early. Under the Part  
25 111 operating license of the hazard waste license, Dow

1 has done a whole bunch of characterization, which I  
2 won't repeat. I think Peter did a good job of that.

3 What we're looking at this year in 2008, Dow is  
4 required to complete the soil and sediment  
5 characterization of the Tittabawassee River. This is  
6 about the lower 6 miles and I think it's actually  
7 4.6 miles. I think I lost the 4 point in that  
8 particular slide. Finish the remedial in-channel  
9 characterization, which basically is preceded I think  
10 down to the Freeland Road Bridge going from Freeland  
11 Road Bridge down to the confluence.

12 Floodplain work that's not been completed due to  
13 property access issues, that is a significant issue.  
14 There's some large chunks of property that have not  
15 been investigated as part of this process, mainly  
16 because Dow hasn't been able to gain property access.  
17 In particular, in the upper part of the middle  
18 section, upper part of the middle 11 miles, I think  
19 there's an area in particular that's about one and a  
20 half miles long that they haven't been able to get the  
21 access, and additional work necessary to complete the  
22 investigation phase. This would include additional  
23 PCOI work. This would include more fish sampling,  
24 those types of things. We're currently working on a  
25 remedial investigation workplan with Dow and the two

1 toughest issues here are the human health risk  
2 assessment issues and the ecologic risk assessment  
3 issues.

4 Also now that we're into 2007 and 2008 Dow has an  
5 obligation to begin investigating the Saginaw River  
6 and Bay, and now Victor talked about some  
7 pre-investigation or pre-remedial investigation work  
8 that was conducted by Dow in September. Dow and DEQ  
9 are actively meeting to clarify expectations with  
10 respect to the development of a remedial investigation  
11 that DEQ can approve. Dow is contesting a  
12 February 1st approval with modifications that the  
13 Department provided and so we're working through that  
14 process with a number of meetings and we'll see where  
15 we go with it.

16 Here are the three areas that we're talking  
17 about. Here we've got the Upper which was the year  
18 before last, the Middle which was last year, and the  
19 Lower which is this year, and this is Midland and Dow  
20 up here and this is the confluence of the Shiawassee  
21 River down here at Green Point Island. I think this  
22 is a slide we've used a number of times. Basically,  
23 what we see in the floodplain is soil concentrations  
24 ranging up to about 100,000 parts, highest  
25 concentrations generally found in the levee deposits

1 and to a lesser extent in the terraces. It doesn't  
2 mean that all the concentrations are that high,  
3 obviously, but we're also interested in focusing on  
4 the high end concentrations and where people are  
5 exposed to them.

6 Tittabawassee River sediments range up to about  
7 140,000. These are in deposits that are in the  
8 process of being mapped. They appear to represent a  
9 relatively smaller portion of the river at these  
10 extremely high concentrations, but nonetheless,  
11 they're there, and then Saginaw River sediments range  
12 up to the famous 1.6 million parts per trillion,  
13 unvalidated and unconfirmed, but certainly very high  
14 level at Wicks Park that resulted in that removal  
15 action, and then probably even more significant to us  
16 are the bed load component which is stuff that's  
17 actively moving along the bottom of the river and in  
18 transport and some of that data was looking in the  
19 range of 30,000 parts per trillion. There are also  
20 some very low concentrations from the Midland samples,  
21 but obviously, we're interested in the hot stuff.

22 What kind of IRA/PCAP interim response activities  
23 are ongoing, have gone on last year, and are going to  
24 be going on this year? And in response to I think it  
25 was Kathy Henry's question, yeah, there's a process

1 for looking at additional interim response activities  
2 on the Tittabawassee River and also on the Saginaw  
3 River. There's a decision tree that we talked about  
4 before. Basically, what generates some additional  
5 action immediately is an identification of  
6 concentrations at above 10,000 parts per trillion at  
7 any depth in the river. For overbank soil, over  
8 10,000 parts per trillion in the top 1 foot or those  
9 surficial soils and that's for just general property  
10 on the edge of the Tittabawassee River. For  
11 residential soil or property and residential use, step  
12 out sampling is triggered by finding greater than  
13 1,000 parts per trillion.

14 Basically, we evaluate the extent, the exposure  
15 potential, and the vulnerability to migration. I  
16 don't think that's the best phrasing I've ever used  
17 before. Basically, this process is to determine if  
18 interim response activity or a pilot corrective action  
19 program is appropriate before the final remedial  
20 activities are completed.

21 From 2007, this gives you a summary for the  
22 in-channel work that needs to be done in the river.  
23 There were 32 locations -- or 32 samples of 27  
24 locations that were above 10,000 parts per trillion,  
25 and overbank soils, there were 19 samples at 8

1 locations over 10,000, between 10,000 and 26,000.  
2 Then for residential soil samples there were 394  
3 samples taken at 38 properties between 1,000 and  
4 26,000, and it's really those 38 residential  
5 properties and areas like them that we're kind of  
6 focusing on with EPA for some additional  
7 characterization.

8 IRAs for 2008, again responding to one of the  
9 questions that was asked earlier, the DEQ made a  
10 formal determination that additional interim response  
11 activities are necessary and we sent a letter to Dow  
12 to that effect on April 16th, 2008, in accordance with  
13 the conditions of their operating license. According  
14 to the license, Dow has 60 days to respond. DEQ has  
15 about June 16th. Dow is contesting these IRAs.  
16 However, like with the Saginaw River and Bay, we are  
17 continuing to meet with them to resolve these issues  
18 with the goal of implementing these IRAs in 2008.

19 What are the IRAs for 2008? Reach D, you have a  
20 list here that I'm not going to read. Let's just go  
21 ahead and work through them. We've got about seven  
22 things that we're looking at. Actually, I'm going to  
23 back up just a second. These I'll talk about  
24 specifically, but this IRA/PCAP I think I just talked  
25 about a little bit. We're going to have the same type

1 of program. As we go through the GeoMorph type of  
2 characterization and they find greater than 1,000 on  
3 residential properties or 10,000 in sediment of the  
4 river or up on floodplain soils, there will probably  
5 be that additional step out sampling. We don't see  
6 why we would change that.

7       Reach D, Mark talked about this work a little bit  
8 earlier. This is adjacent to the Dow plant site. It  
9 had some quite high levels of dioxins and furans but a  
10 whole bunch of other compounds as well, including a  
11 lot of chlorobenzenes and a number of other  
12 contaminants at quite high levels. It was adjacent  
13 and directly associated with a historical outfall or  
14 outfall complex from Dow, basically where material was  
15 directly discharged to the river via pipe. What we're  
16 doing is we're transitioning the CERCLA removal action  
17 work back into the RCRA formal operating license,  
18 corrective action process. The removal action did a  
19 lot of great things. It was a performance based  
20 removal which means that a certain volume of soil or  
21 contaminated sediment was removed as part of that  
22 process. It didn't really -- it wasn't really a  
23 removal based on concentrations. It did not -- it was  
24 based -- it was developed based on looking at dioxins  
25 and furans and not looking at these other contaminants

1 that were also present at quite high levels.

2 What we want to do is -- substantial work has  
3 been done on Reach D. We want to get that corrective  
4 action completed there and get Reach D into monitoring  
5 mode to make sure that things are stable,  
6 contamination has either been removed or adequately  
7 capped, and that will allow us to do other work in  
8 that area. There is a planned ground water collection  
9 system present there.

10 Just make a quick comment, I think I got five  
11 minutes, so I'm going to make it really quick.  
12 Michigan as part of this RGIS work, I just want to let  
13 you know, in addition to the corrective action work  
14 that's ongoing on-site and off-site, we're working  
15 with Dow to get something called a land disposal  
16 restriction variance to assist -- or to remove some  
17 barriers for disposing of the contaminated hazardous  
18 waste into Dow's landfill.

19 Probably one of the more significant interim  
20 response activities that we're requiring this year is  
21 this bank stabilization of eroding banks. A lot of  
22 eroding banks along the Tittabawassee River. Just to  
23 show you a couple of quick photos here. It's  
24 important because there's high levels of contamination  
25 in the banks directly adjacent to the river. They're

1 active sources of contamination into the river as  
2 these banks erode. It's significant and widespread.  
3 It's throughout the river system. Controlling these  
4 eroding sources is consistent with EPA and DEQ  
5 guidance which is to cut off the sources of  
6 contamination and try and do that early in the  
7 process; otherwise, we're going to continue to  
8 recontaminate the river, and also we want to pilot  
9 some different technologies using softer footprint  
10 technology or looking at what we're terming softer  
11 footprint technology to get this work done.

12 This is an example of a cross section across the  
13 river and here's one of those -- this is in Reach M.  
14 This is the Upper River and here we have some, as  
15 Peter described, about 4 or 5 feet down some quite  
16 high concentrations, around 23,000 in the profile, and  
17 if you take a core and go into the side of the bank,  
18 it was 9,700, 1,400, 50,000, 4,600, 13,000. So what's  
19 happening is this erodes, gets into the river, and it  
20 continues to be a contamination problem, and these are  
21 the types of areas that we want to look at.

22 And this is an example of some sampling that's  
23 been done along the bank. The brighter colors are  
24 higher levels of contamination. The river is moving.  
25 This is the 2004 shoreline right here. This is the

1 1937 shoreline. Between 1937 and 2004 in that area  
2 that we just saw the cross section of, the river has  
3 moved over quite a bit. It shows that erosion is  
4 occurring and that's why we want to stabilize or if  
5 necessary remove these deposits so they don't end up  
6 down the river and back into play in the river.

7 This is an example of the Reach J/K area. This  
8 is an aerial photo of an area where a lot of material  
9 was removed and there's some very high concentration  
10 materials right on the surface here. What we're  
11 trying to do is -- this is necessary in some cases,  
12 like we believe at J/K, but what we want to do is we  
13 want to try and avoid having to take everything down  
14 and then replanting it, which is what has occurred on  
15 J/K.

16 In-channel deposits, talked a little bit earlier,  
17 I think Peter talked about deposits that are  
18 in-channel and stable and what we need to know in  
19 order to determine if we can leave them there and for  
20 what period of time they can be left here is how  
21 stable is it, how exposed to the elevated  
22 concentrations, are there uncontrolled sources  
23 upstream that may make contamination likely, and can  
24 we efficiently remove or control it now, and what  
25 information do we need to make a decision about what

1 action we take. This is basically what the focus of  
2 this interim response activity is, the additional  
3 information.

4 These are maximum detected concentrations in the  
5 Reach J/K area. The reds are really high, basically,  
6 and the oranges are quite high, too. That's at depth  
7 and this is the surficial. So as you can see, you go  
8 back at depth you got some high concentrations, but at  
9 the surface, you got some greens, some lower  
10 concentrations up there, except in this area up here.

11 What we want to do is look at what the stability of a  
12 deposit like this is over time and address them as  
13 necessary and collect some additional data on them,  
14 some additional bathymetry this year, to see how these  
15 deposits are reacting over time and basically to  
16 determine if they need to be capped, removed,  
17 stabilized, or something in the short-term before any  
18 final remedial actions have occurred here.

19 Other instances that we need to look at  
20 addressing where surficial concentrations are high,  
21 Reach H has a quite high level of parathion, like  
22 about 500 parts per million, and it's surficial  
23 material that needs to be addressed, and we talked  
24 about this a little bit. This is Reach L. Again the  
25 maximum and the surface concentrations still has some

1 high ones down here at the surface but that's the type  
2 of evaluation we're looking at, how these are reacting  
3 over time.

4 Residential exposure evaluation, we're going to  
5 re-evaluate some of the residential properties, the  
6 Priority 1 and Property 2 properties that had IRA work  
7 performed in 2005 and 2006, and also some properties  
8 where IRAs weren't implemented and where data shows a  
9 potential concern. We're doing an exposure unit  
10 evaluation with EPA to kind of validate what our  
11 understanding of the distribution of concentrations  
12 are on these residential properties. So on a small  
13 subset of all the properties that have been evaluated,  
14 we're taking some of that detailed sampling that Mark  
15 showed earlier to help us out with that understanding.

16 These are some examples of areas that we'd be  
17 looking at. These boxes are meant to be here. We're  
18 trying to obscure the tax identification number that  
19 comes on these maps. So we look at an area like this,  
20 look at the existing data, which shows some clean  
21 stuff up here and also some quite high stuff further  
22 down. We look at the property use. Is this around  
23 the house, not really. So we factor that into our  
24 evaluation process. In this case, okay, we have some  
25 quite high concentrations that are not bounded on this

1 side. This is 9,700. There's houses over here. We  
2 go out and look at the property, how is this being  
3 used, is it being used as lawn material, is it an  
4 agricultural field, whatever, because it's not just  
5 concentration that we're interested in, and these are  
6 surface concentrations that we're showing here, it's  
7 how the property is being used as part of our  
8 evaluation process. In this case, you know, we got  
9 high, high, high, and then it looks like it rains out  
10 a little bit here, but we're getting pretty close to  
11 the house. This is an example of what we might want  
12 to take a closer look at.

13 Sediment pilot trap study, I've got like one  
14 minute, if that. Now just very briefly, we're looking  
15 at in the Saginaw River getting a pilot sediment trap  
16 in place and in operation to limit the migration of  
17 that high bed load downstream. Another one that's a  
18 little bit novel is we have a lot of utility crossings  
19 on the river and a lot of situations where utility  
20 workers, you know, are in the soil of the  
21 Tittabawassee River. We want to have a mechanism to  
22 let the utility workers know about this relatively  
23 large area of contamination. As an example, we're  
24 thinking about using Miss Dig which is someone you  
25 have to call before you can ground trenches. Thanks.

1 CHUCK NELSON: Okay. Any questions,  
2 clarifications? John, you have a response?

3 JOHN MUSSER: I just wanted you to have the  
4 official word from Dow. Al mentioned a couple of  
5 these things, but with respect to our contesting the  
6 scope of work document that was recently approved with  
7 modifications and as well the request for work on  
8 interim response activities, Dow has appealed MDEQ's  
9 February 1 approval with modifications of the scope of  
10 work for the Saginaw River and Bay on February 21 in  
11 Midland County Circuit Court. We've also filed a  
12 contested case petition on the scope of work on  
13 March 28 of this year.

14 On May 6th, we similarly filed an appeal of  
15 MDEQ's interim response action letter, which Al  
16 described in some part. Under the Michigan Statute,  
17 Dow had 21 days to appeal MDEQ's decision to Circuit  
18 Court in each case. The filing of an administrative  
19 contested case has a longer filing period of 60 days.  
20 Our filings, we were within these deadlines, were  
21 there to preserve our rights to object and contest  
22 these actions.

23 Notwithstanding the appeals that we have taken,  
24 Dow has been preparing and discussing with MDEQ the  
25 Saginaw remedial investigation workplan, which is

1 where the scope of work would lead you, the next phase  
2 of the actual work that would be done. We're doing  
3 that and including investigative activities and  
4 interim response actions. All of that is included in  
5 the discussions. Thank you.

6 CHUCK NELSON: We're just right at Lisa's  
7 time right now.

8 LISA WILLIAMS: I don't have any slides  
9 because I don't have very much to talk about. It  
10 would take a longer time just to get the slides up.  
11 My name is Lisa Williams. I'm with the U.S. Fish and  
12 Wildlife Service and tonight I'm here on behalf of the  
13 Natural Resource Trustees, which includes the State of  
14 Michigan and the Saginaw Chippewa Indian Tribe of  
15 Michigan, along with the Bureau of Indian Affairs,  
16 another part of the Federal Government, and I could  
17 talk for 45 minutes or an hour about our assessment  
18 plan that we put out but we did that on April 17th.

19 So what I'm here tonight mainly to say is that  
20 the Trustees are moving forward with the Natural  
21 Resource Damage Assessment. We're engaged in part of  
22 that cooperatively with Dow. This plan describes what  
23 we know now and the information sources we've  
24 assembled on the source of the contamination, the  
25 pathways at which the contamination reaches natural

1 resources, the types of injuries that we're concerned  
2 about, how we're going to assess those, what our goals  
3 are for restoration, restoration criteria as to how we  
4 might select projects and move forward.

5 And in the back, I've got copies of the  
6 presentation that we did on April 17th, as well as the  
7 website where you can get more copies of the report.  
8 I have some CD's with me if you want a copy of the  
9 report and we can chat in the back. Thanks.

10 CHUCK NELSON: Okay. We're at that portion  
11 of the program where it's you folks now. Everyone who  
12 has presented here and whatever they talked about,  
13 other issues related to this, are fair game. So we'd  
14 love to hear from you.

15 DENISE KAY: My name is Denise Kay. I'm a  
16 consultant to Dow on Ecological Risk Assessment but I  
17 have a question for Kory and Linda regarding the  
18 consumption advisories. When the 2003 wildgame data  
19 was evaluated by your group, consumption advisories  
20 were set for some of those animal tissues based on  
21 differences between concentrations and reference  
22 locations and concentrations downstream. Those  
23 advisories were also expanded further downstream onto  
24 the Saginaw in areas where there wasn't data available  
25 at the time, presumably in your charge to be

1 protective.

2 Now at the end of your talk, Kory, you had  
3 suggested that as a result of the 2007 data there may  
4 be new additional advisories brought forward and I'm  
5 wondering if equal consideration will be given to  
6 additional data that's now available, specifically in  
7 Crow Island, that shows that concentrations of the  
8 tissues there are equivalent to reference areas and  
9 potentially rescinding those advisories so that the  
10 hunters who may have been concerned about that, and  
11 now there's data, could continue to enjoy their  
12 hunting there.

13 LINDA DYKEMA: The basic answer is, yes.  
14 The new advisory will take into account the new data  
15 that has been provided, but a good example is we now  
16 have rabbit tissue concentrations that suggest there's  
17 really no human health risk to consuming rabbit, so  
18 the advisory that's issued will say that eating rabbit  
19 is okay, but it will continue to say that, for  
20 example, eating liver of the deer near Imerman Park  
21 still is a concern, so, yeah, it's going to include  
22 the new data.

23 DENISE KAY: Thank you.

24 AUDIENCE MEMBER: I've got a lot of  
25 questions written down.

1 CHUCK NELSON: Let's go one at a time.

2 AUDIENCE MEMBER: I don't know where Al  
3 Taylor went, but I want to know why that 1.6 million  
4 found in the Saginaw River couldn't be validated?

5 CHUCK NELSON: Al is right here and folks  
6 from the EPA I think have a response also.

7 MARK DURNO: Actually, I can take that one.  
8 EPA had three independent reviews of the data quality  
9 assurance package done and the review demonstrated  
10 that the 1.6 million parts per trillion had to be  
11 qualified as an estimate, so it's not invalid, but it  
12 does have been qualified as an estimate.

13 AUDIENCE MEMBER: The other question I  
14 wanted to ask and I guess it's probably more for EPA,  
15 I want to thank this lady for her comments about the  
16 fish consumption in the minority communities consuming  
17 these contaminated fish out of these rivers. I think  
18 it's unethical and immoral that anyone should expect  
19 people to eat those fish out of the river or to assume  
20 or suggest that it's safe. I know Kory Groetsch and  
21 the good folks at MDCH have tried to address the  
22 environmental subsidy issue but budgets are a big  
23 issue in the State of Michigan, and I'm just wondering  
24 if there's something that EPA can do to assist with  
25 that, with the environmental subsidy issue, if you can

1 give some support to MDCH in the way of a grant or  
2 finances or something to help them come into this  
3 community and address, you know, the consumption of  
4 fish by indigent people, by minorities?

5 MARK DURNO: Well, the best we can do, the  
6 group that's here, is take that comment back to the  
7 region. That's the best we can do.

8 AUDIENCE MEMBER: How soon can we get back  
9 with you to get an answer?

10 MARK DURNO: Touch base with us and we'll  
11 let you know what the answer possibly might be but  
12 again I'll have to check with the region to find out  
13 if that's even a possibility.

14 AUDIENCE MEMBER: Okay. Thank you very  
15 much.

16 AUDIENCE MEMBER: Hi. I spoke earlier. I  
17 didn't introduce myself. I'm Zig Zicky and I'm  
18 interested in water quality research. In fact, we're  
19 having a meeting coming up on May 19th to actually  
20 talk about the creation of a water research institute  
21 in this area and I think all these discussions have  
22 been very useful but we keep talking about human  
23 health but we don't have any studies, don't have any  
24 long-term research. We really haven't invested very  
25 much in terms of looking at whether these things that

1 we're talking about even have an impact on human  
2 health and I think that there's some spurious thinking  
3 going on about this and a lot of people are getting  
4 really excited maybe about something that doesn't even  
5 create a problem and I think that what really would be  
6 an important step here would be to actually put down  
7 some really good science to look at these things and  
8 I'm not even sure how these value screening levels get  
9 determined.

10 I mean, how do we know that these things are --  
11 you know, where do you reach out and get these levels  
12 to determine how much fish somebody can eat or how  
13 much exposure there is before somebody's damaged? I  
14 mean, where does that science come from, I'm curious?  
15 Maybe you can answer that because it seems to me as if  
16 there's some reaching going on to come up with these  
17 numbers, but is there documented --

18 CHUCK NELSON: Let him respond.

19 AUDIENCE MEMBER: -- peer review articles  
20 that explain this that I could look at?

21 KORY GROETSCH: Well, it is a risk  
22 assessment process so --

23 AUDIENCE MEMBER: Which is?

24 KORY GROETSCH: Which is this, if you have  
25 risk versus, you know, the other end of it you want to

1 see clinically demonstrated disease. If we talk about  
2 clinically demonstrated disease, the difficulty there  
3 is that there is no system in place that could even  
4 look for those people. So clinical disease is when  
5 you go to your doctor and they say you have this  
6 illness or that illness. Well, there isn't a system  
7 in place right now because, you know, that doesn't  
8 exist. There's no compilation of how much someone  
9 gets exposed to, their personal health effects, and  
10 that's somehow provided to scientists to look at.

11 That would be sort of a health study and there are  
12 obvious, as you mentioned one, financial restrictions  
13 to that.

14 So we use a process called risk assessment which  
15 takes -- in this case specific to dioxin, there is a  
16 document that describes how that number was generated.  
17 It was generated back in 1986 as I said, a data  
18 number, and it's used as an initial screening process  
19 to sort the data out and provide an advisory. Now  
20 remember what an advisory is, it's something you can  
21 choose to follow or not follow, and what it is, is a  
22 document that, as I said earlier, you give it out to  
23 people so that they can have some access to the fish  
24 data and try to make their own informed choice. So it  
25 would be real hard if we just handed people a big

1 stack of fish contaminated data and said you figure it  
2 out. So what we try to do is make it simple and then  
3 they can try to use it and use it to make choices.

4 AUDIENCE MEMBER: You didn't make it simple,  
5 first of all. You made it fuzzy because, you know --  
6 and I don't want to be critical here, but you know, in  
7 all of science, you usually look at the potential  
8 damage and then you go to somebody and say you caused  
9 this, you know, and I think we've got the cart before  
10 the horse here. I mean, you're asking -- and I'm not  
11 a supporter of Dow or anybody. I don't represent  
12 them, but I'm saying that you're asking somebody to  
13 spend hundreds of millions of dollars to clean up  
14 something that may or may not be causing human health  
15 problems and I think that's a real issue here.

16 I mean, it would seem to me -- and you're going  
17 to back up here in a second and probably going to say  
18 something, but it would seem to me that wouldn't it  
19 make sense right now at this moment to do some really  
20 good human health research, some longitudinal studies?  
21 I have a pathologist at Michigan State that's willing  
22 to look at cadavers and look at tissue samples and  
23 then look at the cause of death and start doing some  
24 retrospective work, but there's a lot of ways that we  
25 could find whether or not there is, in fact, a smoking

1 gun here and whether or not health problems, whether  
2 it be neurological or death or whatever, are caused by  
3 any of these agents.

4 What I just heard you explain to me was that you  
5 have an advisory that was reached by some method that  
6 isn't real clear. It wasn't peer reviewed. There's  
7 no journal article I could pick up, because I asked  
8 you, is there a journal article or something I could  
9 look at, some scientific study that would help me to  
10 understand how this takes place, but you're issuing  
11 advisories to people based on, what, best guess? How  
12 does it happen? Maybe you could explain it later to  
13 me but it seems to me it is fuzzy and it seems to me  
14 as if, you know, there isn't really or hasn't been the  
15 kind of rigor --

16 KORY GROETSCH: I'm sorry, I need to respond  
17 to some of the questions. I need a moment to at least  
18 answer one question.

19 CHUCK NELSON: Can you let him respond?

20 AUDIENCE MEMBER: Is there a rigorous  
21 standard for human health? Go ahead.

22 KORY GROETSCH: Okay. So, first of all, you  
23 made a comment about my Department is either demanding  
24 some billion dollars of cleanup or something like  
25 that. The Department of Community Health as I

1 expressed earlier deals with the fish consumption  
2 advisory which is not born out of this off-site  
3 corrective action. It is a statewide process. Public  
4 health advisories, your notion of peer review, now  
5 that is the highest, I agree, you know, science -- if  
6 you can get things peer reviewed, wonderful, but  
7 here's the other problems with that is, peer review,  
8 you submit an article, you wait a year, and it comes  
9 out in publication, all sorts of things.

10 Public health has to be more much rapidly  
11 responsive. I mean, we're the same Health Department  
12 that tells people, don't smoke cigarettes. We're the  
13 same Health Department that, you know, we find -- we  
14 go out and we test somebody's house for lead and you  
15 find lead and you have lead chips and you have kids in  
16 the house. We're not going to go back and write a  
17 peer review journal article before we tell that person  
18 recommendations on how to clean that up. So when you  
19 say, put out there this, you need to have a peer  
20 review journal, and I'm sorry if I feel a little  
21 agitated, but you kind of stepped on a topic that came  
22 up at the last meeting, and it is -- it is somewhat of  
23 a spurious concept to say that everything has to go  
24 through peer review when you're working in public  
25 health. Okay. So that point made.

1           On your issue of, wouldn't it be great to do more  
2 science, amen, okay. I sign up. You know, I think  
3 everybody over here would love to see more science,  
4 but of course, as my boss pointed out, there is  
5 financial limitations, and so to what help you can  
6 need to bring that together and more clarify exposure  
7 issue relationships, if you can get that all the way  
8 to telling us whether or not people really truly are  
9 getting ill from this, I'd love to know that, because  
10 then I could really go out and answer with high  
11 definitive answers with regards to, how serious is  
12 this, and it doesn't have to be so uncertain, but  
13 there is a lot of uncertainty and that's a lot of what  
14 public health is.

15           CHUCK NELSON: Okay. Now we have other  
16 questions. Sir, you're next at the first microphone  
17 and then the other two gentlemen right after you.

18           JIM COLLINS: My name is Jim Collins. I'm  
19 the Epidemiology Director with Dow Chemical and we've  
20 heard a lot about there would be no community health  
21 studies done on people exposed to dioxins and furans  
22 in this community. That is true. However, it's also  
23 true that there's been a lot of studies done on  
24 workers in this area exposed to dioxins and furans, as  
25 well as workers and other people in other communities

1 exposed to dioxins and furans, and these studies,  
2 especially one that's important, there was actually a  
3 study done here in Midland, Michigan, at the Dow  
4 chemical plant. This looked at workers who were  
5 exposed to dioxins. These workers had dioxin levels  
6 that were many times above background. We estimate  
7 maybe 10,000 times greater than background and we  
8 looked at these workers for health effects, not only  
9 cancer but heart disease, reproductive outcomes, and  
10 diabetes, and we found no effect other than chloracne,  
11 an acute skin condition, related to dioxin exposures.  
12 All the other effects we've looked at we did not find  
13 any health effects.

14 Now if you put the study that Dow did where we  
15 measured serum dioxin levels and compare it to the  
16 study that MDCH did, as well as the study that the  
17 University of Michigan did, you'll find that the  
18 dioxin levels in our workers, who are, in fact,  
19 community members in this community, their levels are  
20 again much higher on average than anybody living in  
21 this community. I mentioned the figure about 10,000  
22 times higher in some cases, and this is not just the  
23 Dow study that finds these effects that had looked at  
24 these things. There's been studies done in several  
25 other countries. The Seveso study, for instance, had

1 people exposed to thousands of times of levels of  
2 dioxins greater than background and there's been a  
3 dispute whether or not there's health effects in these  
4 studies, but in general, there's not really health  
5 effects been seen in these studies.

6 So while it's true there hasn't been any  
7 community studies done to measure the potential health  
8 effects of dioxins and furans, there have been many  
9 other studies both in this community and other  
10 communities that indicate that dioxins may not be the  
11 terrible chemicals that we think they are. Thank you.

12 CHUCK NELSON: Sir, at the back microphone.

13 AUDIENCE MEMBER: Yes. This has been quite  
14 a butchering session over here on the left side. I'm  
15 not a doctor. I'm not a geologist. I'm not a  
16 toxicologist. I'm just a resident that lives on the  
17 river and the last I knew dioxin is the most toxic  
18 substance known to man, but what I'm seeing here is  
19 you trying to find excuses to justify poisoning us.  
20 Somebody has a heart attack because there's more  
21 testing we do. That's all I got to say because you  
22 people aren't doing nothing but butchering us  
23 residents.

24 CHUCK NELSON: Sir.

25 AUDIENCE MEMBER: I'm Bill Egerer from

1 Midland, resident. Question probably for the EPA,  
2 this gentleman that I didn't get his name, Mark. I  
3 come to just about every one of these meetings, and at  
4 just about every one, I ask for something that I  
5 haven't gotten yet, and that is a publication of the  
6 risk assessment criteria, the factors that are going  
7 to be used when decisions are made for remediation  
8 plans to cleanup. For the past year or so, the answer  
9 has generally been something around, well, we're  
10 getting to that but right now we're just doing interim  
11 cleanup. It's not the final plan.

12 Then I asked Wendy Carney I believe from EPA at  
13 an earlier meeting about the dioxin reassessment which  
14 has been ongoing for over two decades. It's been two  
15 years since the National Academy of Science has  
16 provided you guys with guidance to finish it. It's  
17 not finished, and it's been a year since EPA in my  
18 opinion has consistently avoided stating that they'll  
19 use the U of M Dioxin Exposure Study in the criteria  
20 for risk assessment. So I asked Wendy if she would  
21 put that in writing, that EPA does not need to do  
22 their own dioxin reassessment to do good risk  
23 assessment and EPA doesn't need to use the U of M  
24 dioxin exposure study in order to do risk assessment.  
25 Will you provide me in writing that you don't need

1 those two things to do your job?

2 MARK DURNO: That we don't need those two  
3 things to do our job?

4 AUDIENCE MEMBER: That's right, or state  
5 that you're going to use that, because you said  
6 something that shocked me tonight, that you haven't  
7 even read the U of M study.

8 MARK DURNO: No. I don't think it's been  
9 made available in its entirety to anybody, has it?

10 AUDIENCE MEMBER: Yes. It's a peer reviewed  
11 document. It's been presented around the world.

12 KORY GROETSCH: It's on the website,  
13 correct.

14 MARK DURNO: The summary, that's all I've  
15 seen.

16 AUDIENCE MEMBER: It's a large study with  
17 multiple sections and there's at least one part that's  
18 been peer reviewed but it's been presented publicly.  
19 All of us who attend these meetings regularly are very  
20 familiar with it, but my point is this, I'm a  
21 resident. I want to rely on risk assessment that's  
22 based on science, I was talking about earlier, and  
23 what I'm hearing is a lot of remediation plans and  
24 cleanup being made based on some number but not risk  
25 assessment which considers a lot of other factors. We

1 got a lot of this other data out there that's  
2 scientific and I'm seeing resistance downright from  
3 EPA not to consider it. Either put it in writing  
4 you're not going to consider it or put it in writing  
5 you're going to consider it. That's what I'm asking  
6 for.

7 MARK DURNO: Well, I can't make that  
8 commitment to you tonight, obviously. However, at no  
9 point in this program that I described did we make any  
10 commitment to do anything other than continue the  
11 assessment work that we're doing right now. The  
12 assessment work is based on a trigger action level,  
13 which is EPA guidance, which we use, and again the  
14 team that I've described is going to review the data  
15 that we collect and make some exposure decisions based  
16 on that data. Again in terms of ultimate risk, you  
17 heard at the January 31st meeting, our speaker was  
18 very clear, that there is still and is a question  
19 about overall risk and what it means.

20 So again we're only in the first phase of this  
21 assessment program that we're doing right now. The  
22 direct answer to your question is, no, I can't give  
23 you an answer about the two pieces of information that  
24 you described, and again we're not far enough along in  
25 the process that we're working on, the residential

1 assessment process, to make any decisions about what  
2 types of cleanup actions may or may not happen.

3 AUDIENCE MEMBER: I don't want to put words  
4 in your mouth but what I thought I heard is you're  
5 going to proceed with some type of risk assessment and  
6 it's going to be based on your judgment but you can't  
7 put it in writing for us to see.

8 MARK DURNO: We are going to proceed with an  
9 assessment of the site, yes.

10 AUDIENCE MEMBER: Will you publish that?

11 MARK DURNO: Publish it as in a journal?

12 AUDIENCE MEMBER: Publish it so us residents  
13 who got a lot at stake can come into these meetings,  
14 it's our property, it's our health, it's our economic  
15 future. I believe -- this is something that Michelle  
16 and I agree on, that this stuff should be published  
17 and we're on opposite sides of this issue. We don't  
18 want this in closed rooms that you're saying in EPA's  
19 infinite wisdom this is what's going to happen. We  
20 expect it in writing where we can all scrutinize it.  
21 That's what I'm asking for.

22 MARK DURNO: What we're willing to provide,  
23 first of all, is the process, which we're doing, and  
24 what the product is out of that process is yet to be  
25 determined because we're not far enough along. So

1 again I can't commit to anything right now for what  
2 you're asking but I can tell you is we're in the  
3 second stage of a process that's about five steps  
4 long.

5 CHUCK NELSON: Okay. Deb, you had a comment  
6 you wanted to make. Why don't you come up and make  
7 it. I apologize, I missed you earlier when you were  
8 waving.

9 DEB MacKENZIE-TAYLOR: I just wanted to  
10 respond. I'm Deb MacKenzie-Taylor. I'm a  
11 toxicologist with the DEQ and I think some of the  
12 questions have been kind of more focused towards DEQ  
13 on the remediation stuff than to DCH on the fish  
14 advisory. So I wanted to address those a little bit  
15 and address a little bit of what Jim Collins said,  
16 too. There is a risk assessment process that does  
17 occur as part of the corrective action program and  
18 that is ongoing. It hasn't been completed yet, to  
19 answer Bill's question as well, and that will be  
20 ongoing, and the plan is for it to go into some sort  
21 of scientific peer review, science advisory panel,  
22 that's independent of both DEQ and of Dow. So that is  
23 a planned process. So you should be getting that peer  
24 review. We're hoping that will occur.

25 In addition, there are some things that have been

1 said that are a little bit of concern to us in that  
2 Jim talked about the workers study that Dow has done.  
3 My understanding is those are adult mortality studies  
4 and are predominantly men that are in those studies.  
5 There's only a handful of women that really weren't  
6 including in the --

7 JIM COLLINS: The spouses of some of the  
8 workers, too. Those are women mostly.

9 DEB MacKENZIE-TAYLOR: And there are some  
10 effects that have been seen. One of the recent  
11 studies that just was published earlier this year was  
12 seeing decreases in sperm and reproductive function in  
13 males that were exposed for or during puberty to that  
14 event, so there are some effects that are being seen.  
15 They weren't published early on but there are things  
16 we do need to look at that are being seen in human  
17 populations from dioxin exposures and those are things  
18 that we do need to be considering, and, yes, some of  
19 those are much higher levels but we do need to look at  
20 those.

21 Another thing, you've heard me say before, for  
22 some of the questions with U of M, we are looking at  
23 the U of M study. We are evaluating whether the  
24 U of M study is adequately representing -- remember,  
25 the U of M study is looking at a random sample of the

1 general population and we need to be concerned about  
2 protecting those high end exposures that we're talking  
3 about. That's what the requirements are for the  
4 corrective action. So we need to evaluate if the  
5 U of M study has captured those highly exposed -- the  
6 more highly exposed people in their study that we can  
7 really make judgments on those people with what U of M  
8 has done, and it's my understanding that U of M is  
9 still looking at the high end exposures. All the data  
10 they presented before was based on averages from the  
11 whole study population and they're looking at the high  
12 end stuff now and they haven't presented that  
13 information yet.

14 They're also putting a report together and the  
15 problem, Bill, is that findings that they put out the  
16 first year after their study when they presented the  
17 information to the public, that doesn't give you  
18 anything about how the analyses were done, how the  
19 evaluations were done, and my understanding is they've  
20 re-evaluated a lot of that and some of those findings  
21 have changed, and so when we get that report that  
22 tells us how they did the evaluations, that will help  
23 us understand and help us make a determination on how  
24 we can use the information.

25 CHUCK NELSON: Ma'am.

1           AUDIENCE MEMBER: Speaking to the guy from  
2 Dow, has there been any further studies and when were  
3 the last studies done as far as exposure of employees  
4 to dioxin?

5           JIM COLLINS: We just finished -- we did a  
6 serum evaluation that ran that was collected with  
7 serum in 2003, 2004, and 2005. We just published  
8 those reports last year. We're actually presenting  
9 the results of the study at a dioxin conference in  
10 August. The vital status follow up, in other words,  
11 we followed these people from 1940 right up to the  
12 present 2005, so it's a very recent study, and the  
13 serum levels that I mentioned before are at about --  
14 we estimate are about 10,000 times greater in some of  
15 the workers than what would be considered background  
16 today.

17           AUDIENCE MEMBER: Did you do any  
18 epidemiology study to see if any of them died of soft  
19 tissue carcinomas or sarcomas?

20           JIM COLLINS: That's exactly correct. We  
21 did all causes of death. We looked at all causes of  
22 death, including things like soft tissue sarcoma,  
23 nonHodgkins lymphoma, lung cancer, heart disease,  
24 diabetes, and again we found no increasing risk of  
25 these diseases with increasing exposure to these

1 dioxins, but again keep in mind these dioxin levels  
2 are maybe 1,000, maybe 10,000 times higher than what  
3 would be seen at background levels in ordinary human  
4 populations, so these are very highly exposed workers.  
5 Deb is right, we didn't study children in this study.  
6 Obviously, these were all people that were workers.

7 AUDIENCE MEMBER: Yeah, workers that in the  
8 70's and 80's didn't really wash their hands like they  
9 were supposed to or wear gloves like they were  
10 supposed to.

11 JIM COLLINS: You're right, but we didn't  
12 study children. What we did study, as I mentioned  
13 earlier, among a large subset of these workers, we  
14 actually asked the wives about reproductive outcomes.  
15 We found, for instance, that --

16 AUDIENCE MEMBER: Birth deformities.

17 JIM COLLINS: -- workers with a high level  
18 of exposures to dioxins had reproductive rates, birth  
19 ratios that were just consistent with what would be  
20 considered background. We found no increased risk of  
21 birth defects among the wives of these workers when  
22 they delivered their children. So I mean we looked at  
23 many of the possible outcomes.

24 AUDIENCE MEMBER: Okay.

25 CHUCK NELSON: John.

1           AUDIENCE MEMBER: Thank you, Chuck. John  
2           Witzke. I'm with the Michigan United Conservation  
3           Club. Kory, Michigan Department of Public Health, I  
4           take your advisory to the bank compared to what Dow  
5           told me 35 years ago about vinyl chloride not causing  
6           any concern on my system. Eight years ago I had  
7           60 percent of my liver removed from vinyl chloride.  
8           My attorneys convinced Dow's attorneys that that's  
9           what the problem was and they settled out of court  
10          quietly. So hang in there. I appreciate that very,  
11          very much.  
12          Jim and your staff over there, my sympathies go  
13          out to you. Lansing sort of left you guys hanging  
14          with the dump site issue, and also last night at a  
15          District Ten meeting with MUCC, we had two folks from  
16          the DEQ lined up to show the work and the progress  
17          that was made by Dow in conjunction with you folks.  
18          It came down from Lansing that they put a gag rule on  
19          those two employees of yours not to appear in front of  
20          us. What caused all this is politics once again. A  
21          representative from Frankenmuth raised a bunch of hell  
22          in Lansing that somehow the public is taking a beating  
23          on learning what the issues are here. We had a very,  
24          very pro gun and fish group that all of a sudden was  
25          giving attention to health and human -- or health and

1 pollution issues here, and in one night, it's not  
2 saying much. The credibility that the higher echelon  
3 in DEQ has caused us the last two weeks, I'll tell  
4 you, I sympathize with you folks. This is starting to  
5 smell like the last administration. Basically, that's  
6 all I've got to say. Thanks. Thanks for what you  
7 guys have done.

8 CHUCK NELSON: Sir.

9 AUDIENCE MEMBER: Good evening. My name is  
10 Al Franzblau. I'm a physician at the University of  
11 Michigan and I'm here to represent the University of  
12 Michigan Dioxin Exposure Study. I'm one of the  
13 co-investigators, and I just want to clarify -- first  
14 of all, I want to say, thank you, Deb, you were pretty  
15 much on in terms of what our publications have been  
16 but I thought I should say something. Over the last  
17 two years, we've made presentations of a wide spectrum  
18 of our results at numerous national and international  
19 scientific conferences. There are close to 75 or 100  
20 abstracts, papers, posters, whatever. They're all on  
21 our website if you want to see them. We are furiously  
22 writing up our results for peer review publication  
23 standard scientific journals. The first paper  
24 appeared in February of this year. There's about a  
25 half dozen others which have been accepted and are

1 available on-line and there are many more which are  
2 either about to go out in various stages of  
3 development. All told there are going to be a few  
4 dozen papers at least that we anticipate coming out of  
5 this.

6 And I also just want to make a comment. I  
7 realize EPA is a huge agency and I certainly don't  
8 know a lot of people at EPA or anybody practically at  
9 the EPA. However, I realize the left hand sometimes  
10 doesn't know what the right hand is doing because it's  
11 such a large agency and there are many different  
12 legislative mandates under which the EPA operates.  
13 One part of the agency is under one part of the law  
14 and the other under another part of the law. In any  
15 event, in January, we spent a full day with  
16 representatives of EPA Region Five at the University  
17 in Ann Arbor presenting the results of our study to  
18 them and it was a very exciting meeting. We were very  
19 happy to do that. We have offered on numerous  
20 occasions to go to Chicago to further present our  
21 results and we're happy to do that. I'd like to  
22 reiterate that now.

23 CHUCK NELSON: Michelle.

24 AUDIENCE MEMBER: I was just wondering if  
25 there are any Township government bodies that are

1 refusing access for the testing? I think Al alluded  
2 to Dow not being given access on some properties and I  
3 understood in the past that there were residential.  
4 I'm more concerned if there are any Township  
5 governments that are prohibiting Dow going on to test?

6 AL TAYLOR: The site access issue for  
7 sampling this year is currently underway. We're  
8 re-evaluating and there's a number of requests that  
9 have gone out for sampling access. In terms of  
10 municipalities, last year the only instance that I  
11 know of was Tittabawassee Township, Freeland area. We  
12 had originally had sampling access and about a day  
13 into the sampling they actually revoked their sampling  
14 access.

15 AUDIENCE MEMBER: And is that still the  
16 case?

17 AL TAYLOR: That is still the case as of  
18 right now.

19 AUDIENCE MEMBER: So for the record,  
20 Tittabawassee Township is denying Dow access to test  
21 properties?

22 AL TAYLOR: I'm not a property access  
23 expert. I believe it's the Freeland area.  
24 Specifically, we were going to be sampling on Freeland  
25 Festival Park. I believe that's Tittabawassee

1 Township.

2 AUDIENCE MEMBER: It is. The other question  
3 I wanted to ask was, there was just limited discussion  
4 tonight about the sediment traps, and again the  
5 migration of the bed load of contaminated sediments to  
6 Lake Huron is a big deal. It's one of the Great  
7 Lakes. Al, again, I always direct my questions to  
8 you, Al, because you know so much, you alluded to a  
9 pilot being done for that sediment trap as part of the  
10 2008 IRA, and I'm just wondering, are we looking at a  
11 date specific, a time, what's that look like?

12 AL TAYLOR: Well, as part of the IRA  
13 process, Dow has 60 days to respond, and in our  
14 April 16th letter to Dow, we asked, and actually  
15 referred to the February 1st Saginaw River and Bay  
16 scope of work approval with modifications as well,  
17 that as part of the IRA process to get a pilot  
18 sediment trap up and running to see, you know, how it  
19 works out, to optimize it, and to, you know, begin  
20 this process to see if it's an effective way to  
21 prevent downstream migration. There are some studies  
22 that are going on and we're in discussion with Dow  
23 over that, but the IRA request or demand or whatever  
24 you want to call it is for a sediment trap to begin to  
25 get operational as soon as possible and we would hope

1 that would be in 2008, and of course, that takes  
2 coordination with other agencies, like the Army Corps  
3 of Engineers, and it's not -- it's not a small  
4 request. It's a big deal but we think it's important.

5 AUDIENCE MEMBER: Great. Thank you. And if  
6 I could just have one more really quick comment,  
7 piggybacking on what Mr. Egerer had to say, I agree  
8 with Bill. This process needs to be open. It needs  
9 to stay transparent. It has no business at any point  
10 in time being placed behind closed doors for  
11 discussions among anybody, but I would like to know  
12 with regards to the risk assessment what the status of  
13 the human health risk assessment is? That's been  
14 bogged down and I think it's part of the bigger  
15 equation and the final picture here, but that human  
16 health risk assessment has been debated between you  
17 folks back and forth for three years, and so I'd just  
18 like a little clarification on what's going on with  
19 the human health risk assessment.

20 AL TAYLOR: I think Deb pretty much  
21 identified that, you know, we need to get to a point  
22 with the human health risk assessment that we get it  
23 in front of that independent science advisory panel,  
24 you know, to try to resolve some of these, you know,  
25 very diverse issues, and I don't know if you want

1 to --

2 DEB MacKENZIE-TAYLOR: As I said before, we  
3 do need to have that human health risk assessment go  
4 before. Now Lisa is part of the human health risk  
5 assessment team for Dow. When they came to talk to us  
6 about the Saginaw River and Bay remedial investigation  
7 workplan, they're going to work that into the human  
8 health risk. They want us to look at it all together.  
9 We're going to get that as part of the Saginaw River  
10 remedial investigation workplan. We'll take a look at  
11 it then. We'll see if we can move forward as is or if  
12 we need to go through -- we do want to go through an  
13 independent science advisory panel. We need to figure  
14 out whether we can both support what they propose or  
15 not, and that's where we got to get to, okay.

16 CHUCK NELSON: Victor, you want to provide a  
17 little more information about sediment traps.

18 VICTOR MAGAR: I did want to confirm that we  
19 have a mutual interest in seeing that this sediment  
20 trap is moving forward and I think we have a design  
21 process underway. The IRA letter came as a bit of a  
22 surprise, but we do have a process in which we're  
23 looking at the sediment trap pilot study. The report  
24 is being completed very soon. It's just gone under  
25 review by the agency, so that will be released, and

1 then based on that report we're seeing good success of  
2 the sediment trap and that will then go to a design  
3 phase.

4 AUDIENCE MEMBER: Thank you. That's very  
5 good to hear.

6 CHUCK NELSON: In the back, you were first.  
7 Go ahead.

8 AUDIENCE MEMBER: I'm Ruth Averill. I'm the  
9 Chairman of the Saginaw County Parks Commission and I  
10 want you to know that Saginaw County takes this very  
11 seriously and we have let them have access to Imerman  
12 Park whenever they want and any of our parks in  
13 Saginaw County. So we do service Saginaw County  
14 residents, and also I'm a resident of Tittabawassee  
15 Township and so that really irks me. So I will be  
16 doing a drive to get people to call up Tittabawassee  
17 Township.

18 CHUCK NELSON: Thank you.

19 AUDIENCE MEMBER: I just wanted to make one  
20 clarification on the risk assessment. To do a site  
21 specific risk assessment, you need to have your data,  
22 too, and I fully agree we need the process in place  
23 and the reviews in place so that we can all feel  
24 confident that what we have is accurate and  
25 appropriate but we need the data and we heard a lot

1 about data tonight. We have most of the data but  
2 we're not there yet. That's the last piece that we'll  
3 need.

4 AUDIENCE MEMBER: Thank you.

5 CHUCK NELSON: Sir.

6 PAUL PRICE: First off, I'm Paul Price. I  
7 work for Dow Chemical. I'm a risk assessor. I've  
8 just recently been hired by Dow. Before I worked for  
9 Dow, I worked for nonprofits. I worked for consulting  
10 firms. I worked for EPA and I love numbers. I just  
11 say that up front. I'm one of those guys who enjoys a  
12 good spreadsheet. So I've been looking over how the  
13 fish consumption guidelines are put together, and as I  
14 understand them, and if I got them wrong, I apologize  
15 and willing to accept correction, is that you go out,  
16 and you got your number for dioxins and furans I guess  
17 is ten, and if you take a bunch of fish samples and  
18 none of the fish samples are above ten, eat the fish,  
19 and if a couple of them are above ten, a certain  
20 fraction of them, then you warn women who might be  
21 expecting and so forth should not consume the fish but  
22 the general public can eat them. Then if the average  
23 is above ten, then nobody should eat the fish. Is  
24 that how it's done? Did I get that right?

25 CHUCK NELSON: Kory or Linda.

1           KORY GROETSCH: Yes. That's a screening  
2 process that DEQ goes through to make recommendations  
3 to the Department of Community Health and then as I  
4 said we take -- it's not just dioxins and furans as  
5 was presented on the slide earlier but there's also a  
6 greater data set involved and there are other  
7 chemicals involved and we put a totality and we issue  
8 the advisories based on that, but, yeah, you're  
9 describing that screening process correctly.

10           It's also -- you know, you want to realize that  
11 you can go to the next step when you have site  
12 specific information, which we do. There's a report  
13 on our website about fish consumers in the Saginaw Bay  
14 watershed, people who are -- we talked to people who  
15 were fishing the Saginaw River, the Tittabawassee  
16 River, the Saginaw Bay, and I think it's worth  
17 reiterating that we did find, yeah, some populations  
18 there that preferentially were eating the catfish,  
19 primarily minorities, primarily African-Americans. So  
20 we try to provide some of that further clarification  
21 in our Saginaw River Health Consultation, which is  
22 also on-line, and you folks can come and talk to me  
23 about that. So we're learning more and I think as  
24 Linda said, you know, as we get new data, and we'll  
25 appreciate that new data when we get it, that will go

1 in. Particularly, with more data, we can give more  
2 precise advise saying, yeah, you can eat more of these  
3 fish, eat less of those fish, depending upon what we  
4 find in them.

5 PAUL PRICE: Kory, thanks for the additional  
6 information, but what I was really leading up to was  
7 the question, from a risk assessment perspective, that  
8 process really makes sense for something like metal  
9 mercury where you're trying to make sure that  
10 people -- there's kind of a sharp line where you don't  
11 want a person who's expecting or likely to be pregnant  
12 to get above the safe level for metal mercury because  
13 that's a reproductive toxicity and you want to control  
14 that one closely. That's important.

15 When you talk about dioxins and PCBs and other  
16 accumulated ones, it's driven -- it's long-term  
17 average. I mean, the fact that you got a couple of  
18 fish that are above the magic cutoff line, whatever it  
19 is, however it's set, it's really the average above  
20 it, and so my question is, have you looked into  
21 changing how you do this thing and dividing it up and  
22 doing it one way for things that have really clear  
23 thresholds, like metal mercury, and other things like  
24 PCBs and dioxins where it's not so clear? It really  
25 doesn't matter if there's an occasional hot fish

1 because that's not what drives the risk. What drives  
2 the risk is your average exposure over long periods of  
3 time, and in that case, you ought to really look at  
4 that kind of upper part of the mean as a criteria for  
5 determining your fish advisories.

6 KORY GROETSCH: Yes. I think you made a  
7 good point, and so the fish advisory process started  
8 back in 1970. A lot of it was developed in the 80's,  
9 particularly the trigger values. There was some  
10 changes in the 90's, and I agree with your concept,  
11 and again we come back to this fundamental problem  
12 which was back in about 2000 all the money for running  
13 the fish advisory from the Health Department -- and so  
14 the Health Department is responsible for issuing the  
15 fish advisory. We're responsible for the toxicology.  
16 That money went from about \$300,000 to zero. So none  
17 of my salary is -- you know, nothing is paid for on  
18 that.

19 Now the reason we were available to update the  
20 fish advisory ever year is for the work from the DEQ.  
21 They have some funding to test the fish. They provide  
22 the people. That's why this process now is where the  
23 DEQ provides that initial screening process where they  
24 manage all the data, and so I've been saying -- you  
25 know, we've been talking in turn, we'd love to go back

1 and make this more of a risk based -- more risk based  
2 with the more modern science of risk analysis, risk  
3 assessment, okay. So what you're pointing to would be  
4 great to go to, but in our case, everything cost some  
5 money, and right now zero doesn't get you very far.

6 PAUL PRICE: Speaking as a citizen, I'm very  
7 sorry to hear that the budget was cut.

8 CHUCK NELSON: Okay. We're down to about  
9 two minutes. Final comment or two. Time to go to the  
10 next phase. Sir.

11 AUDIENCE MEMBER: I have a comment on the  
12 U of M study that, you know, it's like comparing  
13 apples to oranges, when you have like the Kalamazoo  
14 River which is a clean river, people can enjoy it, and  
15 use it, where you have the Tittabawassee where people  
16 have known contamination for years and they stay away.  
17 So you're not going to end up with the results I think  
18 that are scientific.

19 Another question on bank stabilization, is there  
20 any consideration of controlling the flow of the  
21 river, to limit the flow of the river instead of high  
22 water, low water, and how about like no wake rules on  
23 the river to, you know, help keep the banks  
24 stabilized?

25 CHUCK NELSON: AI, you want to field some of

1 those?

2 AL TAYLOR: I don't think anything is really  
3 off the table right now because it's -- if you're  
4 familiar with the Tittabawassee River, you know that  
5 it's got large areas of eroding banks and probably a  
6 part of that solution is trying to control the channel  
7 flow within the river. Obviously, you can't do  
8 something in one part upstream of the river that's  
9 going to cause more problems downstream. I think all  
10 of the things that you just suggested are things that  
11 will probably be considered at least at some level in  
12 trying to get to the stabilization issue, which is  
13 pretty substantial.

14 AUDIENCE MEMBER: Those seem like they  
15 should have been one of the first things that should  
16 be done, pretty simple. I don't know about  
17 controlling the damn in Sanford, might be pretty  
18 expensive.

19 AL TAYLOR: Well, I mean, one of the  
20 problems with this river, and I don't know if it's a  
21 problem or not, it's just the way the river is,  
22 there's a very large watershed upstream that feeds the  
23 branch of the Tittabawassee River between Midland and  
24 the Saginaw River. It kind of almost looks like a  
25 leaf and then the stem is that part of the

1 Tittabawassee River that we're working in. So any  
2 precipitation, especially substantial precipitation,  
3 in the leaf part of that watershed puts a  
4 tremendous -- you know, funnels a whole lot of water  
5 down there. So you can get a really -- you know, I  
6 guess you could go from maybe like 600 cubic feet per  
7 second on the low side up to maybe 20,000, maybe  
8 30,000 cubic feet per second. It's a very flashy  
9 river.

10 AUDIENCE MEMBER: Compared to like the  
11 Manistee, they run the flow of that river, where it  
12 used to be high water, low water?

13 AL TAYLOR: I'm not familiar with the  
14 Manistee.

15 AUDIENCE MEMBER: Manistee like a leaf.

16 AL TAYLOR: You say it's fairly similar to  
17 that. You know, I think that's worth looking into.  
18 There's -- you know, there's going to be not just one  
19 solution for a problem of this size. It's going to  
20 take some, you know, flexible thinking on this, and  
21 what works in one part of the river system is probably  
22 not going to be applicable in other parts of the river  
23 system. So it's -- I think all the things that you  
24 mentioned are something that is going to need to be  
25 considered.

1           CHUCK NELSON: Thank you. We've reached the  
2           9:00 time. I know there are some additional questions  
3           and comments folks want to make. These folks will be  
4           here for the next half hour to talk to. I encourage  
5           you to make good use of that time. Our next meeting  
6           will be August the 7th at 6:30 and then the meeting  
7           following that will be November the 6th. Thank you  
8           all for coming. Have a good evening. Safe trip home.

9                           (Meeting concluded)

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1 STATE OF MICHIGAN)  
2 )  
3 COUNTY OF SAGINAW)

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6 I certify that this transcript, consisting of 110  
7 pages, is a complete, true, and correct transcript of  
8 the proceedings and testimony taken in this case on  
9 May 7, 2008.

10

11 I also certify that I am not a relative or  
12 employee of or an attorney for a party; or a relative  
13 or employee of an attorney for a party; or financially  
14 interested in the action.

15

16 May 13, 2008

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\_\_\_\_\_  
Natalie A. Gilbert, CSR-4607, RPR

18

Notary Public, Saginaw County, MI

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My Commission Expires: 8-10-2013

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