PUBLIC HEARING

SYDNEY TAR PONDS AND COKE OVENS SITES

REMEDIATION PROJECT

JOINT REVIEW PANEL

V O L U M E 1

HELD BEFORE:	Ms. Lesley Griffiths, MCIP (Chair) Mr. William H.R. Charles, QC (Member) Dr. Louis LaPierre, Ph.D (Member)
PLACE HEARD:	Sydney, Nova Scotia
DATE HEARD:	Saturday, April 29, 2006
PRESENTERS:	Mr. Frank Potter (STPA) Mr. Gregory Gillis (AMEC)
APPEARANCES:	Mr. Shawn Duncan Dr. Brian Magee Mr. Donald Shosky Mr. Wilfred Kaiser

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L I S T O F U N D E R T A K I N G S

NO.	DESCRIPTION
U-1	To provide hard copies of the AMEC report by Mr. Greg Gillis
U-2	To provide more detail regarding the extent of bedrock and deep aquifers and how they affect contamination
U-3	Sydney Tar Ponds Agency to provide copies of its presentation
U-4	To provide an example of a similar project that involves containment waste in a salt water environment
U-5	To attempt to provide a higher level of comfort regarding the monitoring system of the existing design
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U-7	To advise whether SSTLs are similar to CCME guidelines either for residential soil or park land, whether they're more conservative or less conservative

--- Upon commencing at 9:06 a.m.

THE CHAIRPERSON: Ladies and gentlemen, I would like to get the hearing started, if you'd like to take a seat. Well, good morning. I would like to welcome you all here to the start of the public hearings that have been arranged by the Joint Environmental Assessment Review Panel. We are very pleased to be here in Sydney and to have this opportunity to meet with you, and I know that many of you have been participating, following this whole procedure and the project development.

Some of you have been participating very actively. We're very appreciative of the contributions that have been made to this process in terms of written submissions. I want to assure you that we have been reading them very carefully. They will be very valuable to us in our deliberations, and we look forward to more input from you in the days to come.

We've been appointed as an independent body by the federal and provincial governments to review the Sydney Tar Ponds Agency's proposal to remediate the Sydney Tar Ponds and coke oven sites.

I will start by introducing my fellow Panel Members, and then I'm going to take some time, if you'll bear with me -- not much -- to explain important details of the overall hearing process, and this will help all of you to participate fully in the proceedings, and participation means not only presenting information to the Panel and posing questions, but also observing the procedures from the public gallery. I'm going to explain how the Panel was formed and how we plan to gather important information and input and views from you over the next three weeks.

My name is Lesley Griffiths and I'm the Panel Chairperson. I'm an Environmental and Community Planning Consultant from Halifax, and I chair the -- another Federal/Provincial Review Panel for the Environmental Assessment of the Voisey's Bay Mine and Mill Project in Northern Labrador. I was also a Review Panel Member for the Environmental Assessment for the original Halifax Harbour Clean-up Project, and I also co-chaired the Minister's Task Force on Clean Air.

Now, to my left is Mr. William Charles. Mr. Charles is also from Halifax and has had a long and distinguished career as a lawyer, professor and chair of advisory boards within Nova Scotia. He is Queen's Council, former Dean of the Dalhousie University Law School, former Chair of the Nova Scotia Environment Assessment Board, former President of the Nova Scotia Environmental Control Council and former President of the

Law Reform Commission of Nova Scotia.

On my right is Dr. Louis LaPierre. Dr. LaPierre is originally from Chezzetcook and spent most of his working career in Atlantic Canada. He currently holds the K.C. Irving Chair in Sustainable Development at the University de Moncton. He has chaired the Environmental Council of New Brunswick and the Sustainable Development Task Force for the Premier's Round Table on Environment and Economy. And since 1997, Dr. LaPierre has co-chaired the round table with the New Brunswick Minister of Economic Development.

Now, the Panel, we're being assisted by a secretariat, and I would like to introduce them to you, because they -- as well as helping the Panel, they are also here to help you. Our Panel Advisors are Steve Chapman and Peter Geddes, who are sitting over at the table here. Our Panel Analyst is Adrian MacDonald, and Ms. Debbie Hendricksen is the Panel's Communications Advisor, and I know many of you will have been communicating with Debbie over the past weeks. If you have any problems or any questions related to these meetings or relating to information about this process, I would encourage you to speak to either Steve or Debbie at anytime, and they will help you out.

Here I'd just like to explain to you that we are not in the course of this process -- I'm sure you can understand that we cannot engage in any discussions with you about the project except through the public forum. Everything that we hear from you, or indeed from the proponent, from anyone involved in this process, needs to come in a public manner and be documented. So please bear with us if you -- if we -- if you come up to speak to us, I'm afraid we can't speak to you, and we would ask you to go to the -- this is privately -- we would ask you to go to the secretariat. We're not being standoffish or unfriendly. We would love to talk to you, but the process requires -- I'm sure you can understand why -- it requires everything that we hear come to us in a public fashion.

And therefore, these hearings are being recorded, and there will be a transcript of each day's proceedings prepared, and therefore I'm going to have to ask everybody to speak into a mic. when you wish to address the Panel or to ask a question. And this is -- it doesn't matter how loud your voice is -- this is because by speaking into the mic., it gets onto the transcript and we have a record of it. And when you do speak, please identify yourself. Our Court Reporter, who is responsible for producing the transcript, is sitting over on the -- high on the left.

The hearings will be conducted in both of Canada's official languages, and interpretation services are being provided for the duration of the hearings. I would now like to briefly explain this Panel and what the review process is about.

On July 14th, 2005, the Federal Minister of the Environment and the Nova Scotia Minister of Environment and Labour established a joint environmental assessment process to review the undertaking proposed by the Sydney Tar Ponds Agency. In this document, the two parties set out their agreement about how the Panel was to be formed, what our job would be, and how the public would be involved in the process. This agreement lays out how the assessment will proceed, the scope of the project under review, the factors to be taken into consideration by the review, and the time lines. This is the -- this Joint Panel Agreement is the central document that guides our process, and if you need a copy, please speak to Debbie Hendricksen.

The Panel has -- subsequent to that agreement, the Panel has prepared detailed proceedings for the public hearings to guide how the process will proceed in the next 21 days. Again, you can obtain a copy of those proceedings from Debbie Hendricksen. The purpose of the procedures is to ensure that the hearings take place in a fair and equitable manner with maximum cooperation and courtesy.

So many of you have been following the review, and as I mentioned earlier have been actively participating in it and contributing to it. There may be some people here who are getting involved for the first time, and this very briefly has been the process to date.

Based on the Joint Panel Agreement, the Minister has published draft guidelines for the Environmental Impact Statement on June the 30th of last year. Then there were public consultations on those draft guidelines, and they were finalized in August. Our panel was appointed after this in September of 2005. The Sydney Tar Ponds Agency responded to the guidelines by preparing a seven-volume Environmental Impact Statement, which was accompanied by a number of background documents. This was made available for public review in December of last year. The public requested additional -- I'm sorry, the Panel requested additional from the proponent, and there were many public comments and questions that were submitted to the Panel, and then we forwarded those to the proponent for the proponent's response.

After reviewing all of this material, the Panel determined that the proponent had provided sufficient information to support meaningful public discussion at public hearings and that the remaining questions were best pursued in open discussion, drawing on the knowledge and experience of the participants in the review, as well as of the proponent, and we issued notice of this intention on April the 7th.

Now, the schedule for the hearings. The Panel will be hearing presentations as outlined in the schedule provided, starting today with the Sydney Tar Ponds Agency. The Panel has reserved the balance of today, and also from 1:00 to 9:00 when we resume on Monday for our own questions for the proponent. I realize there'll be people here who are very keen to start questioning the proponent. I'm asking you to have patience and bear with us so that we can start this process off. We also have a number of questions that we would like to put to the proponent.

On Tuesday, May the 2nd, from 1:00 till 9:00, we will invite questions from the public to be placed to the proponent, and on that day, I will begin proceedings and give a little outline of just how the questioning process will proceed. If that time is not sufficient, then we will make arrangements to allot further time later in the hearings for the public to place questions before the proponent. We are committed to providing ample time, sufficient time for questions and input from the public during the three weeks of these hearings, so we will make arrangements for that.

Then on Wednesday, presentations will resume, beginning with representatives for the federal and provincial departments. And again, there will be time after each presentation for questions to be posed by the Panel, the proponent and the public, and the procedures for the hearings lay out the process we'll be using to guide the questioning process.

As is evident here this morning, we know that many people will participate as observers during the hearings, and we certainly welcome your interest and involvement. And we just -- we would ask you to give your attention to the presentations while in session so the Panel and others here today can listen without distraction.

The final session of the hearings is scheduled to take place on May the 19th, and then we have 55 days to prepare our report, which will contain a description of this review process, a summary of the concerns and the issues that the public, the presenters and the questioners have put before us, and then our conclusions and recommendations. This report will be submitted to the Federal Minister of Environment and the

Provincial Minister of Environment and Labour.

I must emphasize here that the Panel is not a decision-making body. We will be giving our advice to the federal and provincial governments, who will consider it in making their final decisions about the proposed project.

This concludes my opening remarks, and I would like to proceed to the operating presentation by the Sydney Tar Ponds Agency. All presentations, as laid out in the hearing's procedures, will have a time limit, and I will be pretty strict about that. The proponent is going to present this morning for 90 minutes, and I will give them -- as I will give all other presenters, I will indicate when they are within five minutes of their time limit. And I imagine that after the presentation, we'll probably all be ready to take a short break, and then we will resume and move to questions from the Panel to the proponent.

--- (STPA) PRESENTATION BY MR. FRANK POTTER

MR. POTTER: Thank you, Madame Chairperson, Dr. LaPierre and Mr. Charles. Now we might be a minute here just getting started up, but my name is -- my name is Frank Potter.

THE CHAIRPERSON: Excuse me. Is everybody able to hear in the back now? That's coming through now.

Okay. Sorry.

MR. POTTER: I'm acting CEO for the Sydney Tar Ponds Agency. Sydney is my home town. Like many of my friends, my father worked at the steel plant. Apart from attending university in Halifax and Ottawa and then 10 years with the Nova Scotia Department of Environment in Halifax, I've lived here all my life.

Being rooted in Sydney does not set me apart at the Sydney Tar Ponds Agency. Every one of our 18 employees lives and works in Cape Breton. Most of us were born here. All of us have spent most of our lives here. We are part of this community. Our children attend school here, they play with local soccer clubs and hockey teams, our staff serve as volunteers, they sit on service clubs, boards and local charitable organizations. I couldn't even begin to tell you how many times I've been participating in fund raising events in Cape Breton. We grew up with the tar ponds problem. We've witnessed firsthand Sydney's struggle to find acceptable solutions.

Last Tuesday night I was at a birthday celebration for my nephew. I sat across from a person I hadn't met before. When I explained where I worked, he asked me a question I've heard many many times before. "Is this clean-up really going to go ahead?" We are here today to answer that question. The clean-up will go ahead. We will carry it out safely and effectively. We will make Sydney a better place to live, work, play and invest, and we are ready to begin.

I understand the sentiment behind the question. Like most residents of Sydney, we believe the struggle has taken far far too long. It has taken too long, and too often it's been marked by exaggerated commentary about the nature of Sydney's environmental problems. In Sydney we are justly proud of our community's history as a steel-making town. In the plant's hay day, our fathers and grandfathers produced nearly half of Canada's steel.

Sydney Steel was the industrial engine of Nova Scotia. It contributed greatly to Canada's growth as a nation. It provided jobs and produced wealth to thousands of Canadians and their families. In the first half of the 20th Century, immigrants flocked to Sydney to participate in this industrial boom. From Italy, the Ukraine, Poland, the Bahamas and dozens of other countries, people settled here to find work and make a home. They joined with Aboriginal, Irish, Scots, English and Acadian residents. These steel workers gave our town a multicultural heritage and a tradition of tolerance that still sets Sydney apart.

Unfortunately, steel making also left

Sydney with significant environmental problems. The Tar Ponds and the Coke Ovens contain large quantities of coal-based waste that needs to be cleaned up. Meticulous research has documented the nature and scope of Sydney's problems with accurate precision. The federal and provincial governments, the Sydney Tar Ponds Agency and our consultants have produced more than 650 technical reports and scientific studies. It's doubtful whether any clean-up plan in Canadian history has rested on so firm a foundation.

But let's be clear about the nature of the problem. Sydney turned coal into coke. Virtually all of the environmental problems on our site arise from this process. Turning coal into coke produces a variety of byproducts from tars and oils to large amounts of polycyclic aromatic hydrocarbons, PAHs. In this respect, we are like many other steel-making communities. Turning coal into coke is one of the most common industrial processes of the 20th Century. Hundreds of communities turn coal into coke. Thousands more have manufactured gas plants.

As one of Canada's largest steel producers, Sydney made a lot of coke, but the contaminants we face here are the same as those faced by many other North American communities. In addition to coal-based contaminants, we face a small overlay of PCBs. There are no PCBs in the coke oven site, but about five percent of the Tar Ponds contain enough PCBs to meet the legal threshold to constitute PCB material. All this arises from an estimated 3.8 tonnes of PCBs.

So our environmental problems are not all that different from those of other communities. We have a bigger site and more contaminated material to deal with than most communities, but not as much as some. It's a serious problem and it needs to be cleaned up, but the technologies for cleaning it up are well established. They've worked in similar communities and they will work here.

But there's another problem facing Sydney. As clean-up efforts bogged down, debate about possible clean-up methods too often featured exaggerations and extreme overstatements. Inaccurate and unfair statements have made Sydney a national symbol of environmental despair.

The death of the steel industry has been hard on Sydney. At a time when Sydney's economy needed to cope with major change, we've seen negative comments about our environmental problems impede the economic development and professional recruitment our community so desperately needs. We have a real problem in Sydney and we have a problem with the problem. The clean-up is needed to solve both.

Prosperous communities are healthy communities. Unemployed people are not as healthy as employed people. Sydney is living proof of that connection and will remain so until we put this problem behind us.

I'm proud to be from Sydney, and that's why I moved back here 15 years ago, and I've never regretted my decision. Shortly after I did move back, I drove down Prince Street near the Tar Ponds and the news on the radio was talking about the planned clean up for the Tar Ponds. Now, this is 1991.

I looked across the water at the Tar Ponds and said to myself, "I'd like to some day get involved with that project." And I didn't realize then how involved I would be.

As the father of two teenage daughters, I can tell you Sydney is a wonderful place to raise a family. The fact that we've become a national symbol of environmental despair is unfair and inaccurate.

A lot of people in this community have worked really hard to change that. Hundreds of citizens devoted more than a hundred thousand volunteer hours to the JAG process for no other motive than the betterment of their own community.

Many other communities have turned similar environmental liabilities into real community assets. We can do that, too. One of Sydney's most striking features today is the availability for development of hundreds of acres of former industrial land awaiting clean-up. This presents an opportunity few communities ever get.

Some people will tell you there's only one way to clean-up this site. Well, it turns out there are many ways to clean up a former industrial property contaminated with coal tars.

The Remedial Action Evaluation Report, prepared by the consulting firm CBCL and ENSR, listed ten clean-up scenarios. Six for the Tar Ponds and four for the Coke Ovens.

In tours with technical staff and community members to numerous clean-up sites across North American, we've seen similar technologies put to work on clean-up sites with much higher concentration of contaminants than we have, and vastly greater volumes of materials.

One fundamental issue the community faced was whether to removed or destroy the contaminants on site, or to contain them in a way that blocked all pathways from potential receptors.

To some extent, nature has made that decision for us. Contaminants at the Coke Ovens have soaked deep into fractures in the bedrock. There's no acceptable technology for removing them, so that will have to be managed over the long term.

But the Tar Ponds, and in surface oils at the Coke Ovens there is a choice, and it is one that has generated much debate.

Some people wanted all the contaminants removed and destroyed. Others thought disturbing the contaminants might only make matters worse. They preferred to contain them in place.

After assessing the public response to its workbook sessions, JAG came down firmly on the side of removal and destruction options. The year since JAG made that recommendation has taught us a thing or two about removal options for the Sydney Tar Ponds.

The Domtar tank contained coal tar, a product you can buy in five gallon pails at Canadian Tire. There's also a product that is routinely disposed of every day in this country, yet our contractor could find no disposal site to take that material. Several facilities offered to take it, but as soon as people heard the magic words "Sydney Tar Ponds," an uproar ensued and plans were scuttled.

The notoriety that attaches to the Sydney Tar Ponds is such that any normal disposal options, routinely availed to other clean-up plans, are not available to us.

That is why federal and provincial politicians stood in this very room, two years ago, and said that we have to deal with this in Sydney. Governments looked carefully at all the options and they chose the current plan that is before you now.

So, how are we going to deal with it? Residents have told us loudly and clearly they do not want Sydney to be a lab for untried technologies. They want proven methods.

The community is right about this, Sydney needs this project to work safely and effectively.

We will succeed because we will rely on technologies that have been proven successful at similar sites throughout the world. We will deal safely with more than a million tonnes of contaminated material, because we chose not to rely on technologies that have only been treated -- ever treated a few thousand tonnes.

We will succeed because we have chosen not to assume that some distant facility will accept treated Tar Ponds material, when we have seen ill-informed protests scuttle similar plans half a dozen times before.

We've listened to the community. We've assessed the risks and various technologies, and we have a good plan, and we are confident that it will make Sydney a better place.

The tried and true technology for destroying PCBs is incineration. A properly designed, properly operated incinerator will, over the lifetime of its operation, destroy 99.9999 percent of the contaminants we put into it.

That's what the best scientific advice tells us. That's what experience in the US EPA Superfund Program tells us.

In deference to the JAG recommendation, we looked at removing and destroying all the contaminants in the Tar Ponds. We concluded that this cost roughly twice the current proposal. How could we justify spending another 400 million on top of the 400 million already we're spending, with no significant additional benefit.

We can, however, justify removing and destroying the Tar Ponds sludge that has a high enough proportion of PCBs to meet the threshold for defining PCB material. PCBs are persistent, organic pollutants, and compared to other contaminants in the Tar Ponds degrade only very slowly.

Removal and destruction of PCB

contaminated sediments is consistent with the federal government's Toxic Substance Management Policy. This policy calls for the virtual elimination of substances that are toxic, persistent and bio-accumulative. This includes removal from the environment when possible.

Removal and destruction of PCBs is consistent with the intent of international agreements, such as the Stockholm Convention on Persistent Organic Pollutants. This agrement recommends the removal of PCBs from the environment where practical.

So, when the Government of Canada and the Sydney Tar Ponds Agency sat down in August of 2003 to evaluate the JAG resolution, that is the solution we came up with. Remove and destroy the worst contaminants in the Tar Ponds by the best method currently available for doing so, incineration.

Treat the remaining materials in the Tar Ponds with stabilization and solidification, before containing them within an industry standard engineered containment system. Treat selected soil at the Coke Ovens with land farming, a form of bio-remediation, before containing a site within an engineer containment system. In short, we choose the middle ground.

Will it satisfy everyone? No, it will not. There are those who demand a clean-up, but for whom no actual clean-up method is ever good enough.

No clean-up solution will easily satisfy everyone, because even after 650 technical and scientific reports and 1000 public meetings, we know that some people will never agree on a clean-up plan.

But let me tell you something else, and here again I draw my own experience as a lifelong member of this community, in the next few weeks you will hear from some people who care passionately about the way the Tar Ponds will be cleaned up. Their sentiment is deep and heartfelt.

But do not confuse it with the sentiment of the community at large. I'm here to tell you that most people in Sydney do not care that much about how we clean up the Tar Ponds and Coke Ovens, as long as we pick a tried and true method that has proven safe and effective at other locations.

Most residents of Sydney are happy to have us rely on the best technical advice and experience that we can obtain, and then act on that advice. What do most residents care about when it comes to clean up? They want us to get on with the job, they want us to do it safely and effectively and they want us to do it now.

So, after years of consultation, governments have done what democracies elect them to do, is listen to the people. We've sought out the best advice we can find, and we have made hard decisions.

We have a sound plan in place. We thought it through carefully. It will get the job done safely and effectively, as our assessment has demonstrated it involves no significant adverse effects.

Our plan will enable our community to put the problem of the Tar Ponds and Coke Ovens behind us. It will let us begin to repair the unfair damage Sydney's reputation has suffered. It will enable Sydney to refocus its energies on creating a new economy based on our inherent strengths.

As a long-term member of this community, I share the community's impatience to get this job done.

Thank you.

Now, I would like to call upon Greg Gillis, our Senior Vice President of AMEC Earth and Environmental, the lead consultant on the EIS report to describe the results of that work.

Mr. Gillis?

--- (STPA) PRESENTATION BY MR. GREGORY GILLIS

Thank you very much, Frank.

I'd like to introduce a little bit about the project that we've done. I want to talk a little bit about the team that we've had involved with this, the team of companies, the team of individuals that have been involved in the assessment. Describe in some overview fashion the environmental assessment process. Talk a little bit about the proposed project, and get into some of the results of the environmental assessment, itself, and talk about the assessment conclusions and then a bit of a summary.

First the team. The team comprised of some of the larger consulting firms, some of them in the world, and the largest in Canada by far, of AMEC group and Environmental, Jacques Whitford and ADI, who have cooperated most directly with the environmental assessment itself. Earth Tech and CBCL were responsible for the engineering component of the work.

These companies have worked on projects of a worldwide scale. Examples include, cleaning up the World Trade Centre, and reconstruction of the Pentagon after the 9/11 tragedies.

We've worked on projects such as construction of the channel tunnel, clean-up of contaminated sites in the UK, dealt with contaminated sites in various parts of North America and the Middle East.

We've worked -- cleaned up sites, for example, the Moncton job sites, cleaned up by -- in association with some of the firms in this group. We've been involved in environmental impact assessments to some of the major capital projects in Atlantic Canada.

For example, the Confederation Bridge, the Offshore Sable Gas Development, and the Maritimes and Northeast Pipeline.

In addition to that, we've had offices located in Sydney for several decades now. And from these offices in Sydney we've developed local expertise, and we're using that local expertise on projects in various parts of the world, so that the team is solid and we've developed a pretty good working relationship.

The individuals represented on the team, I've been the project manager and have been fortunate enough to be able to work with a team like this. I got about 30 years experience in environmental assessment. I've been fortunate enough to have worked in about 30 countries around the world. I've been involved in fairly large capital projects in Atlantic Canada. I've been assisted very capably by Shawn Duncan, who is -- works -- lives in Halifax. He's been the EIS coordinator. Shawn has about 16 years experience in EIA, and has particular experience on construction projects.

Brian Magee is a Ph.D with AMEC from outside of Boston. He's a toxicologist, focuses on human health risk assessment.

Brian has been doing this kind of work for about 20 years.

John Walker has got his Ph.D in air quality assessment. He works with Jacques Whitford out of Halifax. He has -- John has about 25 years experience, in looking at the effects of emissions from various projects on the ambient air quality and air quality receptors.

Malcolm Stephenson with Jacques Whitford, as a doctor, as well, is focused on ecological risk assessment, and he has been doing this kind of work for about 25 years.

Don Shoski is an engineer with Earth Tech, and he has been involved with project engineering of remediation sites for about 27 years.

Don has worked around the world and involved, particularly, with clean-up and site remediation.

The goals that we have for the project are to reduce the current ecological and health risk from existing soil and water contamination, and to enhance the development potential and investment climate in the Cape Breton Regional Municipality and to provide social benefits for the CBR, as a whole.

So, now we're going to talk a little bit about the environmental assessment process.

The environmental process -- and here's a bit of a model which outlines the process itself -- starts off with an initial project concept. It starts off with an initial project concept, what you want to do, what the proponent wants to do.

It's important to understand the interaction between that project and the environmental setting. So, you need to develop a very clear understanding of the environmental setting.

As you can see the loops, the project environment interaction is what you're very key to understand. You need to understand that.

You need to understand the outputs from the project and their affect on the environmental setting as identified by the receptors in the environment.

So, what you do when you're doing an environmental assessment, you look at the kind of interplay between the project and the outputs from the project and the environmental setting, and you fine tune that project to make it work a bit better.

The other aspect as you can see in the bottom loop of that figure is the environment project interactions. You need to understand those. You need to understand the effects of climate, you need to understand the effects of storm surge, heavy rainfall events, those kinds of things, on the project itself.

So you make adjustments for the project on the basis of information such as that.

Most recently, and more and more, we're asked to look at ways to enhance the positive aspects of projects, and you do that again by understanding the environment and project interactions.

The next step having identified the initial project concept is to look at what kind of mitigation you must bring to the project, in order to have it fit into the environmental setting.

The kinds of mitigation we can think of would be silt fencings, that you can see along road construction, to control erosion, scheduling to make sure that you can avoid constructing things in sensitive time periods for migratory birds, for example.

The final element is to construct the monitoring program, and the final project includes both mitigation and monitoring. Monitoring is designed so that it checks for compliance, to make sure you're in compliance of regulatory rules, and that you meet the requirements of the environmental assessment that you've done, and finally you monitor to test the effect on this of the mitigated measures.

You got to make sure that the mitigated measures are working the way that you think they will, and you have to test that through the monitoring program.

Through the course of this presentation, you're going to hear the words "significant," and "adverse" and "effect" and "some element of likelihood."

The reasons that is there is the guidance we're given is to look at environmental assessment and look at environmental effects and put them in context. And the first thing that you try to determine is, is the effect adverse or positive? Is it going to cause harm, potentially, or is it a positive thing? So you look at that.

The next thing if you test, is that effect potentially significant? And the elements that you include in the significant's test are, the magnitude of the interaction -- well, the size of the interaction, the geographical extent of the interaction on the receiving environment, the duration of the effect on the receiving environment, how long does it last? The frequency of the effect on the environment.

For those two elements, one could think, for example, if half the people in the room here started lighting up cigars, and fill the room with smoke, that would be an effect. And I, for one, would leave the room because I would have a problem.

However, once that cleared you would be able to come back into the room. So, the duration would, hopefully, be short lasting and the effect would affect the reversible.

So, reversibility of the effects are key things which you have to look at. Are any effects that you've identified reversible? Can they be dealt with?

Finally, you identify residual effects and the likelihood of those -- of the effects and potential significant effects that you identify.

So that, in essence, is the environmental assessment process.

The guidance we get for environmental assessment comes from the Nova Scotia Environment Act, Canadian Environmental Assessment Act, Provincial and Federal Joint Agreement, and the EIS guidelines that were referred to a little bit earlier this morning.

When we use those as guidance, we have to make sure that the documents that we prepared and the assessment that we conducted have addressed the issues raised in the EIS guidelines.

The key process elements include, environmental baseline characterization. We need to characterize the environmental setting. We're very fortunate in this project, because there's been a whole lot of investigation done on the Sydney area, on the Sydney Tar Ponds, in particular. I believe Frank mentioned something like 650 reports.

We need an understanding of the project description. What is the project going to be? As you could see in the little model that we had up there.

We did some issue scoping. We wanted to make sure that the issues that we addressed are the ones that people are concerned about. You go to the public, talk to the regulators, "Are these issues the appropriate ones?"

We identify valued environmental components to allow you to focus on that. I'll talk a little bit more about valued environmental components later.

You identify temporal boundaries and spacial boundaries. How long is this interaction going to take place and how big in space will this effect occur. Then you conduct the assessment of impacts or effects along the lines of testing for significance that I discussed earlier.

Determine significance, look at mitigation, look at residual effects, identify cumulative effects. What are cumulative effects? They're effects that on a particular environmental component which may overlay one project -- the effect of one project or more on another.

We can think of a road construction project, for example. And if you have a road construction project next to another construction site, and you're generating dust from that road construction project and dust from the construction site, you may have an overlap with potentially cumulative effect on that.

And, finally, as I mentioned earlier, you look at the effects to the environment on the project.

Let's talk a little bit about the proposed project.

Project sites include the Tar Ponds, coke oven sites and a temporary incinerator location. the project phases include construction and operation and decommissioning.

And the phases in this project are a little bit different ---

THE CHAIRPERSON: Excuse me, Mr. Gillis, can I just interrupt you for a second.

We've had a request that is very hard to read, the size of type on the screen. It is quite small, it is a long way and -- I see some nods from people in the audience -- people in the front row, let alone the back row.

I would like to take a two minute break, and if we could, can we see what we can do to bring the screen further forward.

MR. GILLIS: Sure.

THE CHAIRPERSON: Thank you.

(RECESS: 9:47 A.M.)

(RESUME: 9:48 A.M.)

THE CHAIRPERSON: Well, I guess we've adapted as best we can in the circumstances right now so I hope that you can see it or you can move forward.

We may need to make some arrangements for other sessions to do something better. We had expected a larger screen I must say. So Mr. Gillis, you need exactly two minutes and if you'd like I will tack your two minutes on the end.

MR. GILLIS: One thing, we'll make paper copies of this presentation available to anybody who wants them so -- so talking a little bit about the difference of this project and other ones.

The construction phase of this project includes the remediation activities, the construction of the temporary incinerator and the effect of the remediation activities themselves. The actual operation of the final reclaimed project is fundamentally having the reclaim project work as a reclaimed site. The decommissioning that we have here on the screen relates to the elements of the construction aspect of the project primarily. So -- and the final thing there is to ensure that we have an understanding of all the project works and activities.

As you see the proposed project schedule is -- we are here in 2006 in the environmental assessment, we've done some preliminary design engineering. The design engineering contract to be awarded. The construction operation, the construction of the Tar Ponds, i.e., the remediation project itself will last from about 2007 to 2014 as will the construction of the Coke Ovens. The incinerator will be constructed over potentially a two year period, operate for about three years and be decommissioned at the end. And the operation of the Tar Ponds and the coke oven site including decommissioning will go on from 2015 and beyond.

The project site presents a few engineering challenges. Muggah Creek here is an estuary, the Tar Ponds themselves are in an estuary environment. You got sea water coming in. The bottom is below sea level. So you got tidal action coming in and out. The coke oven site is upstream, as most people are, I'm sure, aware. Water moves -- surface water and ground water moves downstream from the coke oven site to the various connectors into the Tar Ponds themselves.

So there's a pathway to bring material from the coke oven site downstream into the Tar Ponds and there are also pathways to bring material to the coke oven site and pathways to bring material to the tar pond site itself. So the engineering challenges have to do with the fact, again, you've got tidal exchange in addition to the surface and ground water that are moving up and down or in through the water shed. So the proposed project at a high level and the key works and activities include control of surface and ground water.

We need to make sure that we can control the contributions and the pathways that bring this material and any contaminants to the site. We want to destroy selected contaminants. We want to treat in place certain contaminants. Most importantly we want to contain the contaminants. Finally we want to move forward with site surface restoration and landscaping and then go into long term monitoring and maintenance.

The Tar Ponds project will involve excavation and destruction of PCB's, about a hundred and twenty thousand cubic litres of PCB material. We want to create, through stabilization and solidification, a low permeable solid monolith. And the monolith is going to be a large solid structure that has been created through stabilization and solidification.

Groundwater is going to be diverted around the monolith. We're going to control groundwater, both coming from the side and from the bottom. We're not going to allow any infiltration of surface water so in effect we're going to seal the stabilized and solidified materials off from the pathways of surface water and groundwater. And we're going to have a new creek channel to divert water and to allow surface water and groundwater effluent to move through the creek channel around the -- out into Sydney Harbour.

So here's the project in essence. We have an area contaminated with PCB's. It's going to be excavated and incinerated. Another area up here is going to be excavated and the material is going taken to the incinerator. Going to have new channel construction along here. Coke Ovens Brook connector is going to be redone and the railway is going to be used to take material up to the incinerator site.

One thing that's a little different here, what we're going to do or what the proposal is right now is to isolate areas about the size of a soccer field, burn them off using sheetpile and be able to work effectively in the dry. We're going to keep water out of that. And what that does is that helps us control exchange of potential materials out into Sydney Harbour. So any water pumped from this and if you can think of -- you got sea water this high and you're working here, then the pathway is actually to bring the water into the site. So we're going to be able to control materials that way. Any water that gets in is going to be pumped up to a settling pond area and treated prior to release to the harbour.

So you're going to have a series of these cells, as it were, throughout both the north and south tar pond. This material will be capped and sealed from both groundwater and surface water. Here is a picture of the cap design. And what you got, is you got liners here -- what you need to do when you're capping something is you need not only to control the water getting in but you need to give a pathway for any water that does get in and you can see the pathway here is granular fill so that you can get material out if water does get in. So you got a liner, topsoil, clay fill here which acts as a liner, another liner, some granular fill and then solidified treatment matrix. And down here at the bottom is a clay or till and bedrock.

Now one other element that you might notice on this screen -- and I realize it's a bit distant -- we have these interceptor trenches that go vertically down into the till itself. And what they are for, they are to release any pressure from groundwater that comes up from the bottom to make sure that that material can be controlled so it doesn't affect the monoliths themselves. So that's the cap design for the Tar Ponds.

In the coke oven, we're going to precontaminants using land farming, a form of bioremediation. We allow the materials to -- any kind of volatiles to release and break down some substances. Destruction of tar cell contaminants. There's about twenty-five thousand cubic metres of PEH contaminated materials in the tar cells. We're going to total containment of the contaminants.

We're going to cap them and seal them. We're going to have groundwater diversions, again, to make sure the groundwater, we don't take materials or contaminants off the site or bring contaminants to the site. We're not going to allow any infiltration of surface water. We're going to have a cap, again, over the Coke Ovens area to make sure that we can control surface water and deal with it. And to assist us with that, we're going to reroute surface water and drainage. We found that some of the existing surface water channels have contamination in their bottom and so what we're doing is we're rerouting some of the surface water drainage.

So this is a bit of an overview. The tar cell is going to be excavated, taken to the incinerator. Again, there's about twenty-five thousand cubic metres there. We're going to land farm and cap some of the areas. As you can see there's some groundwater interceptor systems here and rerouting of Coke Ovens Brook is proposed. So it's the kind of thing that's going to go on on the Coke Ovens.

We went through a site selection exercise, came up with a site -- a proposed site for the incinerator at Victoria Junction and as you can see it's got a really good rail connection up to the proposed incinerator site. And they're also -- the bulk of the material is going to be transmitted for incineration, transported back and forth. It's going to be transported there via rail. There are also truck routes available if we take to take equipment or other materials back and forth.

Here is the proposed project temporary incinerator site layout. And one of the keys here is we're going to be unloading contaminated material here. We have a material processing and storage area. And we want to keep that separated from the operation of the incinerator itself. We want to make sure that the people working here have appropriate protective gear and the protective gear that is required in the incinerator and the incinerator working area and the control area would probably be less than the kinds that they would be required at the materials handling. A settling pond to look at any kind of surface water that is -- comes off the material storage and processing.

One of the things that's going to happen here is that we have really good control over the nature of the material that's going to be incinerated. We can make sure that the elements in the -- or the composition of the material is very uniform which makes the incineration process much more straightforward.

Here's a schematic of the proposed temporary incinerator and what you'll notice here is, this area here is for the incineration. The rest of it is all emission control systems. You have a feed preparation area. It goes into a combustion chambers. This is the primary and the secondary combustion chamber. In the primary combustion chamber the key element that you're trying to achieve in incineration to make sure you get efficient incineration, there's three elements. Time, temperature and turbulence.

You need sufficient time at appropriate temperature. In the primary combustion chamber targeting a residence time of between 20 and 40 minutes at a temperature of about 800 degrees centigrade. So what happens is the materials initially burn here and the treated soil comes over and goes into the ash control area. The gassy submissions are then combusted again for several seconds in a secondary combustion unit. It goes through gas conditioning, first of all, to cool down the gas.

The reason you burn this is to make sure you can get rid of any organic contaminants that are still in the effluent, in the airstream going out, condition this primarily by cooling it so that no more reactions take place as much as possible. Then you add lime to bring the Ph up and carbon to act as -- take up the advantage of the similar capacity of carbon to pick up stuff.

Got to go through a baghouse filter and fly ash is collected here coming out of the baghouse filter. Finally it goes through a wet scrubber. A wet scrubber is there to deal with the potential emissions of sulphur dioxide and those kinds of things. And then finally the air is released into the atmosphere. Up here we have a monitoring station which will be a continuous emissions monitor, again to make sure that everything is up to the regulations that you're meeting before the -- in emitting the emissions to the atmosphere.

So the air emissions that we looked at include those from the incinerator stack, those associated with construction machinery, those associated with earth work so you can think of dust and what-have-you, land farming again, some potential dust generation. Truck and train engines and roads. So there are the sort of air emissions that we've considered. From waste water discharge, again another pathway, on site water treatment facility, dewatering of sediments, the incinerator operation itself and decontamination paths.

This is a clean up project and because it is a clean up project there are a lot of design features already embedded in the project itself to minimize adverse effects. We have a controlled work area of only the appropriate people are going to be allowed to go in appropriate places. Decontamination facilities, there's controlled dewatering or dewatering materials that are excavated from the tar cells and the Tar Ponds themselves. Again we have a groundwater collection system.

We have on site waste water treatment to make sure that anything that's treated or we have a potential to treat anything before it's released. We have a back up power supply for the incinerator. If you have a power failure you need to have a back up power supply and that will be provided in the incinerator. We have an air quality control system, the emissions control system which was outlined in the previous diagram. We have real time air monitoring and using the rail transport system for the contaminated materials minimizes adverse effects in itself.

The kinds of activities that we're looking at from the construction phase are excavation, dewatering, transport, land farming itself which is just harrowing up the area, incineration and the activity of solidification and stabilization, capping and then site rehabilitation. From the operations phase the primary factors are operation of the water treatment plant, maintenance of any of the elements there and then monitoring. We want to monitor to make sure that the site is behaving the way we think it should.

So from the output what we really want to do is we want to intercept the pathways. We want to stop moving in and off the site. We want to eliminate contaminants. In doing this we want to apply proven safe and reliable technology. We want to apply technologies that we have -- could go to a place and say, yes we've seen that. We've seen that here, we've seen that there. This is a long term solution. It's cost-effective and it's going to generate significant development opportunities.

In doing the environmental assessment we focused on valued environmental components. What this does the focus on valued environmental components, it allows you to focus on issues of concern. And they are issues of concern that you focus on, for example, air quality. And we want to make sure that these issues of concern be identified by regulatory agencies, members of the local residents, stakeholders, what-have-you, you want to make sure there's a pathway because it doesn't do you much good to study something that can never potentially be affected by a project. So you want to make sure there's a pathway.

And the reason that these valued environmental components are established is to focus the environmental assessment work. When environmental assessment first started a long, long time ago we used to produce huge volumes where we studied everything under the sun and then we looked for a relationship between that and the project. Well, now we look at the relationship first to make sure there is one and then spend our energies assessing those interactions.

So in developing a list of VECs again we looked at the guidelines, looked at the information from the -- that we received in the scoping sessions and here's a list of the VECs. Air quality, of course and the biophysical, human health is the top of course from the socio-economic component, acoustic environment, groundwater. The list is here. We assess property values, species at risk, marine habitat. So we have a pretty comprehensive list of valued environmental components that we considered in the conduct of the environmental assessment.

We produced a series of reports. The series of reports includes the biophysical effects assessment which is a fairly thick document. Socio-economic effects assessment. Air quality dispersion modelling, we did that for both the temporary incinerator location as well as the remediation activities themselves. We looked at human health risk assessment for both the incineration area and the clean up activities themselves.

We did an ecological risk assessment which included an assessment of both the incineration area and the potential sites -- or the sites for clean up activities. We conducted a contaminant fate modelling of Sydney Harbour. We did a property value effects assessment. We linked with the aboriginal community and looked at the Mic Mac Ecological Knowledge Study. We wanted to bring in the historical understanding of resource use by the aboriginal community in the area. We wanted to make sure we had an understanding of that.

So the key concerns from a pathway point of view are air quality. What's going to move through the atmosphere. Ground and surface water quality. What's going to move through the surface water and what potentially is going to move through the groundwater. The receptors we are most concerned about, of course, were human health, ecological health and finally the socio-economic environment, the economy, those elements.

Here's a bit of a diagram -- I hope you can see it -- which describes environmental assessment pathways. You've got a source, for example, here you got a car. It's not very well serviced and burning oil, I guess. So a little bit of cloud of exhaust here and there's a person breathing the air. And that's the receptor. So you've got a source and receptor and there's a pathway dispersion through the air.

The same car was repaired and spilled a little bit of oil. So you've got a source of contaminated soil that moves through the groundwater. The groundwater flow and comes up into the receptor into a surface water body, stream, lake, those kinds of things. And you have fish exposed to contaminated water, such the pathway receptor interaction in a bit of a schematic.

We're going to talk briefly about air quality. Environmental assessment for air quality, the key concerns were incinerator emissions, of course, vapours from excavation, material handling, dust from earth works and land farming, diesel emissions from machinery those kinds of things. Greenhouse gas emissions and odours. Odours generated from sediments and other activities.

So how do we analyze this. Well, we looked at existing conditions. Looked at existing air condition, existing conditions of air quality. There's been an ongoing air quality monitoring program in the Sydney area for the last few years. We looked at noise information. We did a noise survey actually. We also looked at odours in the environmental setting. We relied on information from local residents. We talked to the Sydney Tar Ponds Agency about odour. So we had an understanding about the odour, existing conditions from that point of view.

We then developed an understanding of potential emission sources. What kinds of things would emit residues into the atmosphere. We looked at the rates of those emissions, how -- what kind of rates in materials per cubic metre would be released. We're very fortunate to have a meteorological station here at Sydney Airport so we had a good record of meteorological data. The weather information. How often does it rain, where the wind area -- wind comes from. What wind intensities do we have, temperatures, those kinds of things.

We needed to understand that information. We wanted to make sure we understood receptor locations, i.e., where are people living, residential areas. Where are people working, ambient air monitoring locations. So we wanted to understand, given our emissions data, frequency of emissions, intensity of emissions, where are the receptors, potential receptors for these emissions. Finally we did dispersion modelling which is mathematical computer modelling using accepted models which have been accepted by the U.S.E.P.A., Environment Canada, others to make air quality predictions. We're looking at making air quality predictions of the air quality at various locations within the air shed.

Here's an example of the output from the air quality modelling exercise. The red dot is the proposed location of the incinerator. Here we're showing contours in micrograms per cubic metre of particulate matter. As you can see the highest concentration on the chart is 1.5 micrograms per cubic metre. It tails off fairly quickly to 0.2 or below. The standard is 120 micrograms per cubic metre so that's really what we do. We do a prediction and we say, all right, using this kind of output, the incinerator outputs, what-have-you, what could we predict for ambient air concentration and then we compare it to a standard.

The thresholds for significance that we use, again to test against our predictions against something, we used the Canadian Environmental Protection Act, Ambient Air Quality Objectives. Have objectives from the Nova Scotia Environment Act, Air Quality Regulations. We used Ontario Ambient Air Quality Criteria Objectives and we had odour detection thresholds. We have information primarily from the Ontario Government which talks about odour detection thresholds for a variety of compounds, some of which would be present on the site.

Key mitigation measures that we got to, use of enclosures and air filters, odour control equipment, covering and storing materials, speed restrictions, all of these things are things that we would -- we are suggesting that take place in order to minimize potential effects of air emissions on receptors. We want to monitor equipment performance. We want to continue to monitor air quality at receptor locations.

And most importantly of this thing, we want to implement a complaint policy and a response mechanism. If someone says I'm getting a lot of odour, we want to have a mechanism in place to make sure that we can respond to that and be able to deal with it in an effective manner. So what are the results? There's a short term increase in emissions, thus odour of volatile organic components. All the emissions are within applicable government standards. The effects are not significant, following implementation and mitigation measures, i.e., scheduled control, those kinds of things. And the model results are based on the worse case emission scenarios, i.e., the worst meteorological data year. So we wanted to make sure that we were conservative, use the worse case.

Talk a little bit about human health risk. The key concerns for workers and residents, the project pathway is very similar, inhalation, air emissions and dust emissions. Dermal contact, contact with the soil, ingestion, containment of -- or like material that's contained in food items. The human health effects we looked at were both carcinogenic and non-carcinogenic effects as well as nuisance effects from odours, dust and noise.

The analysis from the -- and the key considerations looked at existing conditions, potential pathways and again we had a lot of information and -- on the air quality to help us and we're guided by that. We looked at predicted conditions of air quality, soil quality, surface and groundwater quality. What we needed to understand was the potential for human exposure. And the potential had to be couched in terms of intensity and duration. How long and how high would that exposure be. And we applied that using the appropriate modelling information or models approved by Health Canada and USEPA and came up with a health risk.

Now when you're doing health risk assessments the goal here is to be conservative. You want to make sure that you're conservative and the guidance dictates that you be conservative. We wanted to make sure that we were conservative and this is the guidance that you're given by the regulators. I mean you got to do this at any rate. You got to look at the upper confidence intervals, for contaminants for potential concern. You have all residents for example breathing outdoor air all the time. It doesn't happen, at least in my case. All food from one location, like in effect, you're using all the food in your model that is produced on a farm. It's close by to the incinerator. Conservative toxicity reference values and again focusing on sensitive receptors. And example here, we have a toddler. You wanted to make sure that you had the most sensitive receptor identified and we wanted to focus on that.

Now in addition to those, as I said, they're built in, we have to do those things. We looked -- additional assumptions, the increase in conservatism. We understood that the emissions occurred continuously for eight full hours a day. Work occurs every day for a nine month construction period. Bang, bang, every day. We assume that the incinerator operated for 365 days a year for five years.

In effect, the incinerator is going to operate something like 240 or less for three years is the real thing. But we wanted to be conservative again. We assumed that volatile emissions from the land farming and the activity on the site occurred even on rainy days so we're generating dust and volatile emissions in those schemes even on rainy days which of course, won't happen.

We generated the worst year of weather data. What we did for that, we looked at the period of record and took the worse day for the 365 days and made our own year and said all right, that's our worst year of weather data. We took the worst year of the schedule. One is the highest amount of activity going on and we used that as our reference year. We looked at the potentially most affected location. We wanted to make sure that we were conservative in doing that.

And we looked at the worst year of background data because we took the background data and applied it to our predictions and at the most affected monitor locations. So we were conservative in that. The thresholds of significance we used from a health risk point of view, a significant effect would be an unacceptable high probability of Cancer and a Cancer probability scenario is one in a hundred thousand. And we used that as a reference. And the same thing, we used an unacceptably high probability of non-carcinogenic illness as a threshold for significant effect for non-Cancer.

Kinds of mitigation that we came up with, all mitigated measures related to air quality. The site workers to wear appropriate protective gear. That means, probably everybody that goes on the site's going to have a hardhat and steel-toed boots, those kinds of things. Place -- people working in other areas would use appropriate protective gear for the particular areas they're working.

Important that we implement a master health and safety plan which will be implemented and really key to that is that the workers be trained and as we go on to monitoring we want to make sure that we monitor the -- monitoring the effectiveness of the training. We want to monitor pathways, air surface water and groundwater. And monitor the implementation of the health and safety plan.

From the results at the remediation site, potential -- there is potential for unacceptable health risks to workers. The use of protective gear will reduce the risk to acceptable levels. And again, these are based on conservative elements.

There's no significant effects of health risks for residents, either carcinogenic or non-carcinogenic.

From the incinerator sites no significant effects on carcinogenic risks for residents, and the same for non-carcinogenic risks for residents.

We looked at ecological risk. The key concerns fish, wildlife, vegetation. Again, same project pathways, inhalation and emissions, dermal contact, ingestion, contaminant uptake and food items. Ecological effects, we looked at effects -- potential effects on individual organisms as well as effects on populations. The key considerations, existing conditions, we wanted to understand the fish, vegetation and wildlife. We wanted to get a good feeling for that.

We wanted to understand potential pathways to get from the project to these sensitive areas. Predicted conditions of air quality and the potential for exposure. And there we looked at habitat utilization for example, migratory birds, when are they going to use the habitat, how long, that kind of thing. And that allowed us to do some calculation of ecological health risk.

The threshold that we used, a significant effect has been defined as an unacceptably high probability of long-term health effects on terrestrial or aquatic biota, i.e., unacceptable increases in ecological risk. Again, conservative assumptions for the ecological assessment were intentionally conservative, over-estimating effects. We generated artificially high exposure to contaminants. High exposure point concentrations, lasting and frequent habitat utilization. We forced the animals in our modelling to stay there longer than they may normally. Frequency and quantity of consumption of contaminated food. We made sure that was fairly high. And again, high uptake factors in the root uptake for plants. Mitigation measures. All measures identified for pathways, same thing, control the pathways.

For terrestrial environment, we had a few things that were a bit more specific. We minimized the project footprint, like, minimized the area that you're going to disturb. Make sure you clear vegetation outside the nesting season for migratory birds. Migratory birds under the Migratory Bird Convention are very sensitive to -- if you disturb -- destroy their nests, you're violating the Migratory Bird Convention so you've got to be careful with that. Minimize temporarily bird nesting habitat. And what we want to do is, once we clear an area before it's finalized make sure that bird habitat is -- the nesting habitat is not generated.

Establish new high quality habitat both from a terrestrial point of view and from an aquatic point of view, from a fish habitat viewpoint and then make sure the habitat is maintained. When monitoring you want to monitor pathways, air surface water, groundwater and then monitor the effectiveness of habitat rehabilitation. Monitor the effectiveness of your stream rehabilitation. Monitor the effectiveness of the terrestrial habitat to see if it's being used.

Results from the remediation areas, some potential short risks sites -- or risks to birds from the land farming. There's a decrease in overall risk over the long term. Results from the incinerator site, there's negligible incremental risk for terrestrial and aquatic receptors.

I want to talk for a moment about the socio-economic environment. Two concerns. Same kind of pathways, air quality including noise, dust and odour. Health effects and this one, perceived environmental conditions. People react to perceptions as much as anything else. The effects we're looking at are property value and labour and economy. How we do the analysis from the property value viewpoint, we looked at existing conditions, real estate markets, what kind of municipal tax rates there were, predicted environmental conditions, what was going to happen, looked at a property value model which was really was application of experience from other areas. And came up with property value predictions.

From a labour and economy viewpoint, we again looked at existing conditions, local labour markets, the economy, employment, those kinds of things. We looked predicted project expenditures. We used what is termed as the provincial input/output model of two scenarios. We looked at expenditures, 65 percent of the expenditure for the project being made locally in Nova Scotia. And another one for 75 percent being made in Nova Scotia. And through that we calculated direct, indirect and induced impact.

Direct impact, economic impacts are those that are realized by expenditures to a worker. Indirect are expenditures associated with a company buying a piece of equipment to use on a project. Induced impacts are a worker going out and buying a new car or a new house based on the economic gain associated with the project. Thresholds for significance that we used, property values. Looking at a loss of property value greater than again following project completion.

Labour and economy, if we want to look at a potential for negative effects on employment income, local business and commercial activity that cannot be absorbed over the short term. What we wanted to make sure -- we wanted to avoid or to understand was the potential for this project generating labour, potential labour shortages. So project out -- this is the output from the input/output model. With 65 percent Nova Scotia sourcing the total full-time equivalent employment comes out to about six hundred and nineteen annual jobs, full-time equivalent. With 75 percent Nova Scotia sourcing it comes out to about 714 total.

From mitigation point of view, from property value there are no specific mitigation measures required other than those for human health air quality, noise and transportation, i.e., deal with the human health air quality and deal with the nuisance elements of noise and transportation.

From labour and economy the goal here is to enhance the potential for positive effects. Sydney Tar Ponds Agency has an intention regarding a local economic benefit. Going to make sure they communicate local labour requirements to unions and local suppliers to make sure the folks can get prepared to take part in this. In fact a study on services through the project through the local labour force and businesses. And again, to develop a strategy to enhance positive economic benefits.

The results on the property value, there's got to be some potential adverse effects on residential and commercial properties during construction. There's going to be likely an increase in value upon completion of the project tied to the nature of the site itself. The results from labour and economy, the employment income, no significant adverse effects. There's going to be an overall positive effect and the beneficial effects, of course, are greatest during that construction period which we talked about earlier.

Demographics, education and training, there's going to be some slow down and out migration likely, a beneficial effect. There will be required specialized skills to be developed among local labour dealing with the kinds of operations that we're going to be doing here. And there is training capacity available at local institutions so that we can take advantage of those kinds of training opportunities.

Environmental assessment conclusion, the beneficial effects include cleaning up or remediation of the project sites. There are new employment and training opportunities, new development opportunities and new habitat. From an adverse point of view, some small scale adverse effects during construction. For example, noise and potential for odours. Mitigation and follow-up measures include project inherent environmental management measures which I described earlier built into the project itself. Additional mitigative measures to further minimize adverse effects. We've identified a series of things, some of which we've gone through to minimize potential adverse effects. We've also identified potential measures, particularly from the economic viewpoint to maximize beneficial effects.

How are you going to make sure all this works? Well you develop an environmental management plan and you make sure people understand the environmental management plan and make sure it's in place and is working. It identifies clearly the roles and responsibilities, the environmental management plan does and there's a draft of that in the project description document.

It includes environmental protection plans. What plans are going to be in place, for example, the ones that include all the mitigation. Environmental effects and compliance monitoring. What are you going to do? What are your action levels and how are you going to do them? It talks about environmental inspections and audits. How frequently are we going to be audited and inspected to make sure this plan is, indeed, working? It talks about contingency and emergency response planning. What are we going to do in the event of various situations and how are we going to deal with those? It describes training and education. How are you going to do it? How are you going to make sure it's effective and how it's going to continue. Continuing education is a major component here.

And finally, communication and reporting. How is this plan going to be communicated to the workers, to the stakeholders, general public, those kinds of things? We need to understand that and have that clearly there.

The environmental assessment conclusion overall, residual effects are not significant. The disadvantages are short term, localized and reversible.

For example, construction related effects such as odours, noise and dust, and the advantages are short to long term, large scale and permanent. For example, reduced health risks, construction and operation related economic opportunities. Now I'll turn the discussion back over to Frank.

MR. POTTER: Thank you, Greg. As Mr. Gillis outlined in the schedule earlier, when we complete the conclusion of the assessment process, we will have a large number of mitigation measures to put in place, and the Sydney Tar Ponds Agency is committed to making sure that all those mitigation measures we've identified in the EIS document are carried out. We're currently in the process right now of completing the detailed engineering design work for the project, and the first step of that is selecting a detailed design engineering firm. We're about half way through that process right now.

Upon successfully moving on through that stage, we'd be preparing the permits and approvals once the detailed design is completed. We expect that the -- as we go through the permits and approvals and head into the tendering stage, we'll likely be breaking up this project into many projects or many size projects as opposed to one large one. The big benefit, of course, is the economic benefits we can accrue from that.

So the project will start with some smaller projects moving on into larger ones. The project realization is getting the project in place and getting it running.

There's going to be a lot of monitoring and checks and balances in the system. I suspect you're going to hear in the next few days from federal departments, some of the aspects of the MOA, which explains how we are -- how we are monitored and audited as we go through this process.

So as well, we have ongoing public involvement. We've had that continuously all along in this process. I think this project really leads the continent on public involvement, and we continue to -- expect to continue to do that.

On municipal land use planning process, we are currently engaged with the Municipality in some initial discussions on not just our property but the neighbouring properties alongside of us and some potential ideas that the Municipality has for future land use.

With that, I'm going to have to move this. Here we go. And I see our lights are coming back up, so I don't have to try to read in the dark.

On several occasions over the last few year, friends and neighbours in Sydney have said to me, "We can't be the only community like this with a problem like this. There must be other places where they have fixed similar environmental problems." They said, "Find people who have done this before and who know what they're doing and who can tell us the technologies that work." That's exactly what we did, and we hired Greg Gillis and AMEC and our assessment consultant.

Over the next few weeks, you will get to know Mr. Gillis and the rest of his team at AMEC. And Mr. Don Shosky from Earth Tech was introduced earlier as well. And he's our pre-design engineering consultant right now. These are two of the largest, most experienced environmental firms in the world. They've worked in hundreds of clean-ups. They've helped dozens of communities like Sydney turn their problems into community assets.

I also want to introduce Mr. Wilfred Kaiser. He's the Director of Environmental Services for the Sydney Tar Ponds Agency. Mr. Kaiser has managed the assessment process for the agency for the past year or so. I'm embarrassed to tell you how many nights, weekends and extended hours he has put into this project to see it through.

I have high hopes for these hearings. I hope this will be the turning point for Sydney when Sydney stops thinking about the tar ponds as a horrible problem that will never go away and starts thinking about the opportunities that lie ahead.

The clean-up itself is a tremendous opportunity. That's why so much of our time and energy over the last year is focused on ringing the greatest possible local economic benefit out of this project. That means employing Cape Breton labour and buying Cape Breton goods and services. It means developing local skills and capacity in the environmental industry that can be turned into export business once the clean-up is finally completed. It means finding new uses for these sites that draw on Sydney's strengths and the extraordinary beauty of our location.

We have 100 hectares in the middle of Sydney on the waterfront, along the waterway, that will soon include healthy fish habitat. Their future is limited only by our imagination, and no one is more creative than Cape Bretoners.

We will make Sydney a better place in which to live, work, play and invest. We will carry out this clean-up with the same exemplary openness and candour that has been characterized by our agency since inception in 2001.

Residents of Sydney, Cape Bretoners, and the rest of the world will be able to watch the clean-up take place in person on site tours, in person on public roads that will soon traverse the site as the clean-up proceeds, and detailed information about the air and water monitoring, every speck of which will be released to the public in a timely and easily accessible manner with the tar cam and coke cam at scanner sites 24 hours a day on the website.

Panel Members, you have a challenge ahead of you. We are here to help by answering every question to the best of our ability. We have a sound plan based on an exceptionally detailed understanding of our site. We have the right team in place to execute that plan safely and effectively. We are Cape Bretoners, and we are determined to see this project through. And that is our pledge to this community. We will get this job done safely and effectively. We are ready to do it now. Thank you.

THE CHAIRPERSON: Mr. Potter, thank you very much. And Mr. Gillis, thank you also for your presentation. I will just remind you of your undertaking to provide copies of the presentation. And thank you in the audience for your patience and squinting, whatever you had to do to make out what was on the screen, but you will get copies so that you can see that.

I think it's now high time we all got a chance to stand up and stretch. So it is now by my clock 10:33. I am going to propose that we take a 20-minute break, that we come back and resume at 10:53, and we will resume then with questions from the Panel to the proponent. Thank you.

(23-MINUTE BREAK)

THE CHAIRPERSON: Ladies and gentlemen, if you'd like to take your seats, we'll start up again in a minute. Mr. Potter, I gather that you wanted half a minute to make a statement with respect to the absence of one of your experts. Is that right?

MR. POTTER: That's correct, Madame Chair. Malcolm Stephenson is not available today because of a personal conflict, so he will be here on Monday with the panel, the witness panel. So we do apologize but we couldn't -- couldn't get over -- get around that, so ---

THE CHAIRPERSON: And could you just remind me -- Malcolm Stephenson, his area of speciality is?

MR. POTTER: Ecological risk assessment.

SYDNEY TAR PONDS AGENCY

--- QUESTIONED BY THE JOINT REVIEW PANEL

THE CHAIRPERSON: Well, thank you again to the representatives of the Agency for their presentation this morning. I would like to begin -- we're going to begin with some more general questions. And I guess my first question to you is do you characterize the proposed remediation project as being a permanent solution.

MR. GILLIS: I believe it is a permanent solution, and I'll ask Frank Potter to comment on that question as well.

MR. POTTER: Yes, we do. The clean-up is based on sound science and technology. The costing -- the MOA that provides the costing for the project includes a 25-year period for follow-up monitoring to make sure that all of the measures we've incorporated into design do include the long-term nature of it.

THE CHAIRPERSON: Is this remediation -- is it then -- is it permanent in the sense that no one will ever have to revisit the contamination problem on the site or to rework it in any way?

MR. POTTER: That would be correct. The only long-term action necessary would be to continue the long-term monitoring, ensuring that the planned remediation is meeting its objectives in terms of the performance.

THE CHAIRPERSON: And is the -- I mean, certainly not initially you can't -- you would not characterize this as being a walk-away solution, but do you anticipate that at some point in the -- that this -- that the project will be -- that the Agency will be able to simply walk away from the -- from the solutions that you're proposing -- walk away in terms of no more monitoring, no more mitigation?

MR. POTTER: The commitment in the MOA is to continue monitoring 10 years after completion of the remediation work. The agreement does not go beyond that point. I think at that point in time, it would have to be reassessment undertaken of what conditions we're finding at the site and appropriate action taken at that point in time, which you know, I couldn't speculate on 35 years out. So I'm not sure what might take place at that point in time, but certainly the intent is that at the end of that 25 years of monitoring, there'd be a reassessment of the success of the project and if there was any need for further action.

THE CHAIRPERSON: But as you've -- as you have designed the project, your assumption is that at the end of 25 years, there's a reasonable chance that you will in fact be able to -- excuse me emphasizing this walk away, but I think it's important -- that you will be able to walk away from the project in terms of monitoring mitigation -- and I should have added maintenance. I mean, will maintenance requirements of this project be -- largely be complete by the end of 25 years?

MR. POTTER: Yes.

THE CHAIRPERSON: Or is there a -- how much uncertainty do you have?

MR. POTTER: There is -- I guess it's hard to put a figure on the certainty. There's a high degree of probability that at the end of 25 years after extensive monitoring and reviewing the data, that the site will be no longer presenting a problem and we can, as you say, walk away. That's certainly the -- would be the desire. That's -- the design is based on that, that you know, we would hope that after 25 years, we would be in a position to say, "Yes, this -- you know, 25 years of confirmation monitoring and sampling is confirming that the work has been completed.

THE CHAIRPERSON: Now, how would you actually -- how do you think that would be accomplished?

Because in fact, setting aside the part of the project that's dealing with removal and destruction from which obviously you can walk away from that portion the moment that that is completed, but the rest of the project is an extensive containment encapsulation response. So there is an assumption that at the end of 25 years or something close to that, that -- that what, that the contaminants that are being contained and encapsulated will have done what?

MR. POTTER: We did address, I think, part of this question in IR No. 17, and we're actually just checking on the details of the response there.

THE CHAIRPERSON: This would be the response in which you talked about half life. Is that right? I don't have it in front of me. I'm just ---

MR. POTTER: That's correct.

THE CHAIRPERSON: Well, before we get into that -- because that's a level of detail perhaps we were going to deal with later, but perhaps we could -- perhaps it's time to move into that. I don't know. But in order for you to be able to walk away from an encapsulation and containment project, I assume that that's exactly what would need to have happened, that the contaminants would no longer be present in concentrations or levels that could potentially be a risk? I mean, typically maintenance of physical structures and works such as you're proposing doesn't go away after. In fact, the likelihood of needing to continue doing it increases with time.

MR. POTTER: There's some maintenance aspects that would be going on during that 25-year period. For example, you know, maintenance of grass or cover materials. Eventually at some point in time, in future uses of the site, those sorts of issues may change, but perhaps I'll refer to Mr. Shawn Duncan, who can respond perhaps more particular to the IR question from before.

THE CHAIRPERSON: All right. Before we get to that, though, I just want to make sure I'm getting it absolutely clear. So that around about 25 years, maybe before, maybe a little bit later, but around about that time, there would be no requirement to do any further maintenance to any of the containment structures or elements of the project. In other words, no more maintenance of the cap, no more maintenance of the ground water intercepting structures.

MR. POTTER: That's correct. Mr. Duncan.

MR. DUNCAN: Thanks, Frank. What we wanted to do, I think, in IR-17 was to -- in the context of the environmental assessment, was put some temporal boundaries around the specific environmental components that we assess. And the temporal boundary that we're, I guess, constrained by at this point is the -- certainly the time line that's envisioned in the Memorandum of Agreement, which is the 25-year life span that Mr. Potter referenced.

THE CHAIRPERSON: I'm sorry, Mr. Duncan, I'm just going to interrupt you just because I feel, for the purposes of the people who are listening, they need to know just what happened in IR-17. I've been handed the giant binder, and because of the way this was put together, it's not -- IR-17 is not popping out at me for a second. Can you just wait while we find that?

MR. DUNCAN: My apologies. Sorry.

THE CHAIRPERSON: So IR-17 was a request put forward by the Panel with respect to how the contaminants that remain at both the tar ponds and the coke oven sites are expected to change over the 25-year period following the completion of the project. Sorry to interrupt you.

MR. DUNCAN: My apologies for not being clear. The intention, I guess, in IR-17, the information request from the Panel, was to identify -- or I guess more clearly identify temporal boundaries around the specific valued environmental components that we discussed earlier and put them in the context of the 25-year time line that we described within the MOA. And what we've done is gone through each of the VECs -- sorry to use acronyms, but they're valued economic components -- or environmental components -- and put some time frames around the potential interactions with those environmental components with respect to pathways.

We also as a follow-up request within the IR was to identify potential half lives for some of the contaminants that are within -- that are still within the site, and we identify within that table a number of pathways over -- that will begin to naturally decay over a certain period of time.

Just to follow up on Mr. Potter's comment, the intention of the project again is -- from an overall perspective is the interception of pathways, and the design of the project is to intercept those pathways from potential receptors. What will occur in the future, as Mr. Potter suggested, there will be long-term monitoring out to the 25-year period as envisioned in the Memorandum of Agreement.

One of the things that needs to be contemplate for future land use, of course, is the development on that site. Some of the measures that are in place are measures in place to intercept those pathways. What you don't want to have happen is the site to be developed that will interfere with those measures that are essentially cutting off those pathways.

For example, if you're developing something on top of a cap or a capped site, what you want to do is to avoid, I guess, breaching the integrity of that capping system and thereby, I guess, causing, I guess, the pathway to be re-established.

THE CHAIRPERSON: I know Dr. LaPierre wishes -- has got a follow-up question, but I'm going to jump in before him on this. So you're saying -- I understand that the purpose of the project is to interrupt the pathways. If you're saying that at 25 years, thereabouts, you're able to walk away from the project, that is because -- that means you no longer have to intercept those pathways? I mean, are you -- are you thinking that the land use controls will take care of everything thereafter? You no longer have to maintain the integrity of the cap on the tar ponds solidification area? You no longer have to maintain the cap on the coke ovens. Is that what you mean by around 25 years, as long as everything is panning out, you should be able to walk away, or are there still -- after 25 years, are there still restrictions and concerns and then -- I'll let you take over there.

MR. DUNCAN: Yes. Thank you. And just to be clear, what we're referring to in the 25 years is of course the requirements of the monitoring. And what we would like, as Mr. Potter indicated, is to establish the fact that these contaminants have either decayed or are in a state that they're no longer a concern from a contaminant perspective. What we can't envision at this stage is what the potential land use will be and what the results of that monitoring will indicate at this point. If the monitoring indicates that there is still some contamination or potential contamination that could be reintroduced -- if those measures are -- the integrity of those measures are breached, then you would have to allow for that beyond that period. But as Mr. Potter indicated, the hope is, at that point, that those materials will be in such a state that those sites -- development restrictions would be lifted.

THE CHAIRPERSON: So -- this is my final point on this. So you say the hope is -- so is this a hope or is this a -- you're pretty confident about your prediction that in round about 25 years, the contaminants will have decayed to such an extent that in fact you will not longer need to either monitor or maintain those interception and containment encapsulation structures?

MR. SHOSKY: Madame Chairman, my name is

Don Shosky and I'm part of the engineering team. With confidence, the way that the design is contemplated at this point, I think you do have the walk-away solution that you're looking for.

The design itself is set up in such a fashion as that a contained -- engineered contained system will be in place to contain the contaminants that are solidified and designed to intercept any ground water that may be migrating towards the large -- basically large concrete monolith that's anticipated to be there.

The capping materials themselves are an extra added -- added protection. The monolith itself should be able to withstand many years of free spa events. Any of those sorts of problems associated with migration -- potential migration through the monolith are eliminated because of the low permeability of the monolith. The capping materials themselves are all natural types of materials contemplated at this point. They're not manmade in the sense that they would break down of themselves over a period of time. They're anticipated to be clays. The trenches themselves for the interception are all made out of natural materials as well -- just gravel, clay, and things of that nature that allow long-term durability.

THE CHAIRPERSON: But you only -- you only

-- am I saying this correctly? You would only walk away in terms of monitoring and maintenance from an encapsulation system, a containment system, at the point at which you are confident that what is containing is no longer a risk? You don't -- it's not a question of, "Well, this -- this cap and this monolith has lasted so far, 25 years, therefore -- you know, the contaminants are still there, but we can -- it's lasted this long, so we can be pretty confident it'll go on for another hundred years because..." Would that be a logical assumption? I'm not -- not sure it would.

What you're saying is when you walk away, you walk away because you are confident that the contaminants no longer represent a risk -- the contaminants that you've been containing and encapsulating. Is that correct?

MR. SHOSKY: That's correct. However, I think it's important to understand that you would have 25 years of operating understanding of that system, and we're not at this point yet to the detailed design phase where that monolith would be looked at for periods of time beyond 25 years and projecting the types of additional problems that may occur. But the way that it appears right now from the way the systems are laid out, I believe you'll have that walk-away solution that you're looking for in 25 years.

DR. LAPIERRE: Thank you very much, Madame Chair. And I'd like to say thank you for the presentations also. Just Greg, maybe I'd like to have seen in your project plan and table that you had for projection a line that would touch on monitoring and mitigation because I think it's an important aspect, and it's not in there, and it'd be interesting to see when that starts and when it ends, because I would think that you're going to do some pre-monitoring. If you're going to have any validity to your monitoring, you should have some pre-data or some continuing data as you structure through. So I would like to have seen a line in there touching on that.

MR. GILLIS: Thank you very much for that. We would certainly develop a baseline to monitor against. There's absolutely no question, so ---

DR. LAPIERRE: Now, my question just follows up on Madame Chair's question because I was kind of the instigator of that IR, and I guess what I'm interested in, these chemical products that you have -- chemicals that you have in -- at the present time -- and I'll use only two of them -- PCBs and PAHs -- are -- once they're encapsulated, they're going to stay as PCB and PAHs because your -- I think your structure of encapsulation of producing the monolith will be that they'll be kept intact and isolated.

The question is, for those that aren't -- for those that won't be encapsulated, what do -- what do -- the question was, how long will PAHs take to degrade, what will they degrade to, and what is the biological process in which they would be accumulated or degraded to in nature.

And I guess I -- while I was just listening to the previous answers, from what I can see -- and I may not understand it correctly -- it seems that that monolith is going to be bathing in water. Otherwise than that, you may not have put the holes in it for the water to come through the top. So as the -- and from what I understand, that could be salt water, but that's a question I want to come back at later. If that's the case, then is there a possibility that that monolith decays over time and that these chemicals are released to the environment through the ground water table?

MR. GILLIS: With respect to the decay of the monolith, I'd refer the question to Don Shosky. And then with respect to the half life of the chemicals, I'll ask Dr. Brian Magee to comment, if that's ---

MR. SHOSKY: With relationship to the decay of the monolith and the trenching system that you noticed that's installed inside the monolith, the primary reason that that trenching system was there was to relieve underground water pressure from below the monolith, so in order to ensure that there would be structural stability of the underlying materials that the monolith would be sitting on for that extended period of time.

As far as monitoring of the monolith over time as far as how well it solidifies the contaminants, it's been a commonly used technique for a number of years, particularly with manufactured gas plant sites with high tar concentrations. You are correct that the PAHs themselves, as a result of that process, do not break down, but they do become bounded up into the chemical matrix of the monolith.

DR. LAPIERRE: Am I right to surmise that that could be salt water?

MR. SHOSKY: Yes. And the testing that we provided to you as part of our technical memorandum on solidification, that material was sediments that were from the tar ponds that were with salt water. And the mixing process that we went through, the strength tests that were conducted, the leachability tests that were conducted, would have been conducted on sediments that did contain salt water in them, because they were from the natural -- you know, their natural setting.

MR. GILLIS: So I'd ask Dr. Brian Magee to comment on the half life question.

MR. MAGEE: Yes, thank you. If anyone would like to refer to the response, I believe it's the response to IR-17 in the re -- the re-response, the second round. We have a table that lists the half lives from the USEPA documents that we followed for the guidance for performing the risk work. And the half lives for the PAHs, the creosote materials, even the PCBs and the dioxins certainly are well within numbers that would have them degrading over the course of the 25 years.

DR. LAPIERRE: As long as they are not released continuously from the monolith.

MR. MAGEE: This would be -- I'm speaking primarily to the coke oven site where we will have done some -- according to the proposal, we will have done some bio-remediation, and then there will be capping at that point. Certainly there is ground water collection. Some of the material could leach, but that would be collected and treated. So I think even with that leaching pathway in effect, which certainly is true, still the statement holds.

MR. CHARLES: My question is a fairly

general one for someone who isn't as scientifically oriented as some of my colleagues here.

I'd like to get a sense of how this project sort of fits with other projects that you gentlemen have been involved in. There was reference, I think, in Mr. Potter's remarks to the effect that there are other projects around the world that are larger and have concentrations of PCBs and other chemicals that are higher, and the impression I got was that what we're dealing with here in the tar ponds is not one of the worst or largest examples of toxic sites.

Could you give me an idea of how you would place the tar ponds site in terms of size and concentration of materials? I know you said 3.8 tonnes of PCBs. In terms of -- would it be in the top 10 percent of large sites around the world? Would it be in the top five percent? Is it just a small site in your view?

MR. POTTER: I wouldn't characterize it as a small site. I think I certainly indicated in the presentation that we do have a large site here, and I think generally speaking, what we've heard from other people, the consultants that we've had working on this project for a number of years, that we do have a larger site. Now, I can't answer that percentage number, and perhaps I may -- perhaps one of the panel members might be able to assist.

But just to give you a flavour of some sites that we've actually gone and taken a look at in terms of how big and how bad, I guess if you wish, last October, we took a group of community members around to some clean-up sites in Canada and the U.S., and we were in Fox River, Wisconsin, taking a look at a site with PCB contamination. Their average numbers were lower than ours. Their peak numbers were higher than ours. But we have in the tar ponds, as we say, 3.8 tonnes of PCBs. They had similar contaminants, as well as the PCBs, but they had -- they have 7,000,000 tonnes of sediment to deal with compared to our 700,000 tonnes in the ponds. The Fox River system is 35 miles long, a very active waterway, much much larger than ours.

Our community members stood in the sediment processing yard where they were dredging the sediment from that area, and to stand in that processing yard was just amazing. They were removing so much sediment on a daily basis. And we're not certainly dealing with those kinds of numbers that they are. It was amazing to see that.

We went down to New Bedford, just south of Boston, to take a look at another harbour and river, somewhat similar to our situation, and again PCBs, PAHs, metals. I think they had some pesticides, I think, in Fox River and New Bedford as well, but the concentrations of PCBs there were much much higher than what we're talking about. You know, our numbers are -- you know, the averages are probably less than 200, most of the ponds. Their numbers were 49,000/50,000 parts per million of PCBs. I don't recall off the top of my head the volume of sediment, but it was a very large clean-up still ongoing down there.

You know, that's to put it in perspective. I will ask Don Shosky to speak to the percentage perhaps.

MR. SHOSKY: Thank you, Mr. Potter. I got into this business when rivers were still burning and things like that in the very early days of the environmental business, and we've seen great improvements all over the world since that time as far as contamination problems go.

It's hard when you say to come in and rank a project in the top five or 10 or 20 percent. Certainly in this case, there's a large volume of material that has to be dealt with, but I've worked on over 500 sites, and a number of them that I've worked on were very small sites but extremely toxic because of the chemicals involved. They were in situations where they were more mobile into the environment. So even though the size of the project may have been a lot smaller in area, the types of chemicals that we were dealing with were so toxic that it was a much greater problem than this particular situation is here.

Given my opinion of going around the world, eastern Europe, South America, North America, I would say -- I would put it within the top 20 percent. I think that there's a lot of sites out there that are a lot worse and pose a greater danger to human health and the environment than this particular location. But it is a very large site and it is a large earth-moving exercise largely, and the care that needs to be taken when that material gets moved around and stabilized and secured is critical for mitigation of those risks.

MR. CHARLES: Thank you. And just sort of a follow-up question. We've concentrated on the PCBs, and they tend to be fewer in number than the PAHs that you're going to have to deal with, as I understand it. Do the amount of PAHs constitute a large site in terms of other sites that you've worked on? And I realize that in some of the sites you've mentioned, there was salt water intrusion problems as well, but my -- when I looked at some of the tables of comparative sites, as you've, you know, provided us with, I got the impression that there weren't too many that had salt water intrusion as an element. There were some, but most of them were dry land stuff, were they not?

MR. SHOSKY: A number of the cases that we gave you were that way. Personally I worked on one of the largest redevelopment projects that was from a large tar site down in Melbourne, Australia, called the Docklands, and it was a very large site where once it was redeveloped on the waterfront -- it was a large manufactured gas plant site -- they put about a billion dollars worth of high residential development right on top of it once it was cleaned up and corrected.

So in the past year, I've worked on four or five different sites of different orders of magnitude where there is salt water infiltration into -- you know, they're harbour or river types of environments where there is salt water intrusion.

MR. CHARLES: Thank you. Lest you think that I'm just, you know, asking questions for the sake of it, I was interested in the size of the site because when there's discussion about alternate technologies, the amount of material to be dealt with comes up as a factor, and I wanted to try and establish just how large this operation was, and I think you've answered those questions. Thanks very much.

MR. POTTER: If I could add just one little bit there, the New Bedford site I was referring to is on the coast, east coast, a salt water site.

As well, the federal government is responsible for sites in Canada that they have responsibility for, and if you recall, in the last federal budget, there was, I believe, 3.5 billion dollars allocated to the remediation and clean-up of federal properties. Some of those properties -- predominantly are up north, but they are very very large sites. We've not personally seen any of them, but I understand that they are quite large.

We actually have a meeting set up with the federal departments that are going to be involved with some of those remediation projects. We're meeting with them next week to -- or the week after next to learn from -- they're coming down to learn from some our lessons on our project, and I'll probably get a better feedback from them then in terms of the details of their site. But I understand that they have a number of -- quite a number of sites that are very very large.

DR. LAPIERRE: I guess this is a question in general nature again. I certainly have some more specific questions on the salt water. We'll get back to that later on, particularly as it relates to cement.

The question I would like to ask now is general in nature on the technologies that you are proposing. If you look at cutting edge technologies, where would you place the technologies that you are proposing, on a global scale?

MR. POTTER: Perhaps I'll back up a little.

The whole question of technology selection was one that was -- had involved a huge amount of public consultation during the Joint Action Group process.

The Remedial Action Evaluation Report, the RAER Report, did take a look at a very wide cast of technologies and there was an assessment taking a look at the technologies and that report narrowed it down to the ones that were deemed to be most appropriate for this project and ultimately were the ones, you know, that arrived at the current selection.

Perhaps I'll ask Don Shosky if he could add a bit to that.

MR. SHOSKY: It's an interesting question that you asked us as far as cutting edge technology and where the technologies that are recommended fit in the greater scheme of thing, and when evaluating this site originally when we were first tasked to take a look at it from an engineering standpoint to implement a technology, we went through an analysis of our own for determining, you know, is this an appropriate technology.

As far as cutting edge technologies, none of the technologies that we're offering right now, I would say, are cutting edge technologies. The term "cutting edge" has been kind of a misnomer a lot in the environmental business for quite a number of years.

Once in a while a real good idea comes up, but basically because of the cost of implementation of that new idea, the unproven track record of that new idea, sometimes these technologies just aren't practical.

When we were tasked to take a look at this particular situation, we needed to find something that was realistic and implementable in the environment that you're given to work in, and the selection of the technologies presented were a result of that sort of analysis.

DR. LAPIERRE: Could I ask, in the EPA funds that are presently being cleaned up what percentage of projects would be similar to this one, that is having the two processes included or ---

MR. SHOSKY: The -- I would have to research that to give you the exact number, but approximately 19 percent of the US EPA projects are done using stabilization.

DR. LAPIERRE: Was that 90 or 19?

MR. SHOSKY: Nineteen, sorry.

DR. LAPIERRE: Nineteen?

MR. SHOSKY: Yes.

DR. LAPIERRE: And the other 81 percent would be a variety of ---

MR. SHOSKY: A variety of different technologies. Some of them are removal and disposal at another site, some of them are commercial incineration, some of them are bioremediation.

The key when you look at these problems is to understand what the contaminants are and be able have a tool chest, so to speak, of technologies that are applicable to that particular problem. And I think, as Mr. Potter said, an analysis has been done over the last several years. We looked at it again when we undertook the preliminary predesign work and were able to draw the conclusions that these technologies would be applicable at this particular location.

DR. LAPIERRE: Thank you.

THE CHAIRPERSON: I'd like to just ask a couple of questions to kind of give you an opportunity to update us on the status of things.

And my first question would be, can you give -- tell us what the current status of the project design is right now in terms of what has happened since the EIS was put out. Have you got some progress to report?

MR. POTTER: Certainly. I'll have Mr. Kaiser address the question.

MR. KAISER: Thank you. Currently the predesign engineering of the project is being completed. That report is in draft stage and is being completed at this time.

As well, we are moving forward with the selection of the design engineering firm and we will be doing that over the coming months. The RFP has been issued, the Request For Proposal has been issued, and the firms will be responding in June to that request.

THE CHAIRPERSON: Can you give us an update on the status of the preventative works?

MR. KAISER: Certainly. The Victoria Road Water Line Project has been completed. The Coke Ovens Brook Realignment Project is in its second and final year and will be completed by the end of this year. The Cooling Pond Project has -- the tenders have been issued, response will be in June as well, and that project will be completed by the end of this year, should be complete by November. As well, the Battery Point Barrier tenders are out. That project should get underway in the summer and should be complete by early fall.

THE CHAIRPERSON: Thank you. And last in this sort of sequence -- this is particularly, I think, for community members -- I believe I'm correct in saying that the video that you produced giving an overview of the project is -- you're still carrying that on your website, is that right?

MR. POTTER: That's correct, starring Mr. Kaiser.

THE CHAIRPERSON: Yes. And I guess my question is, to what extent does that video accurately represent the project as it is now proposed today? Have there been some changes that -- if somebody had seen that video, are there some thing that you would like to point out to them that, in fact, the video no longer accurately represents?

MR. POTTER: One of the difficulties of producing a video is the day you produce it it's dated, of course, and one of the -- there is -- I guess, one major change in the direction that the project has taken since the point when that video was produced was -- relates to the methodology for how we're going to do -- how to do the solidification in the ponds.

Partly for simplicity's sake in terms of how to represent it in the video, we at the time chose to look at using or demonstrate an auguring approach to applying the cement into the sediment, and that's not the approach we're taking now.

There is probably a few things -- other details that perhaps in the video are getting somewhat dated. The exact routing of the brook, the two brooks, Coke Oven Brook and Wash Brook, we suspect that'll be a little bit different from what's in the video.

We've discussed already when should we go back to the video and essentially redo it. I suspect what we're going to look at is when we complete the assessment stage and get firm direction on any changes to the project, we'll update and revise the video.

THE CHAIRPERSON: And the examples of possible future land uses shown in the video, you still think -- would you make any changes for those?

MR. POTTER: The future uses? I think there was three, I believe, we show in the video and, you know, I think all three are appropriate. None have been ruled out certainly and they all potentially could be developed.

As I mentioned in my presentation, we are in discussions right now with the Municipality taking a look at what their vision is for that site, or next to our site and some of the adjacent lands, but at this point in time there wouldn't be any of those options ruled out.

THE CHAIRPERSON: Well, I know we will be talking further about future uses later on, but were those trees on the video? What's the green? Was some of that green -- was it trees, on the Tar Pond site in particular? And I guess you know where I'm going. Can you, in fact, grow tree on the -- or were those ---

MR. POTTER: Yes. They were presumed to be low-lying shrubs or trees, nothing that would involve deep roots that would interfere with any potential capping. Again, appreciate it was a graphical representation of potential images.

THE CHAIRPERSON: Well, I think we can -- we'll come back to how you do maintenance where you're not, you know -- and you have a green environment with low shrubs but you're not going to have -- allow trees to grow, so -- okay. Thank you.

DR. LAPIERRE: I would like to ask a question relating to a comment that was made in the presentation this morning regarding the fractured bedrock. I understand that part of the project was led by the decision -- so it was led by -- particularly in the Coke Ovens site, with the fractured bedrock having been contaminated. I would like to ask two questions.

First of all, does that -- how fractured is the bedrock, and where -- do they have -- do you have pathways from that bedrock that could lead to deep, underground aquifers?

And the second one -- question is, are there deep aquifers in this area?

MR. GILLIS: With respect to the movement in the bedrock aquifers, I'll refer that question to Don Shosky.

MR. SHOSKY: Yes, there are fractures in the bedrock and there are deep aquifers in the area. It's our understanding, though, that the two are not hydraulically connected. I'll need to verify that, and I can take it as an undertaking to be more explicit on that, but that's my understanding.

DR. LAPIERRE: I would certainly be interested to know if there were any connections in the deep aquifers.

MR. SHOSKY: I'll take that as an undertaking to come back and illustrate that to you in a bit more detail.

DR. LAPIERRE: And I guess this question -- but it may come back later on -- I'm trying to get my head around how much of the groundwater table is going to be diverted by your pilings and how much is still going to be infiltrate into that Coke Ovens site. You're reducing it but there'll still be some groundwater.

And I guess the question that I have is, how -- for how long will these chemicals that are in place -- you're capping the top to ensure the water doesn't get in, but you still have water infiltrating at the bottom and moving through that groundwater. Now, will your sheet piling increase the pressure, will it increase the conductivity to the fractured bedrock?

MR. SHOSKY: Again, depending on how much detail you want on this answer, I can give you a brief answer now and would have to take a more detailed quantitative presentation for you as an undertaking, but you are correct in assuming that there is water, it's a dynamic system, it's not one where it's going to be totally cut off and isolated in that sense, but there will be water moving into the area which we anticipate through our modelling to be collected and monitored over time. And the water that comes up from the bottom, we've also included some provisions for monitoring that as well.

So, it is a dynamic system, it's not one that will be -- I don't want to use the word "stale" or "stagnant." That's the way that the design is contemplated at this point.

I'm happy to provide additional information on that in a quantitative form as an undertaking, because perhaps a graphic depiction or something like that would be more useful to explain it.

DR. LAPIERRE: I think it's an issue that I would want more information on. I think it's a very important one, because as the bottom of the site is not going to be capped, it's not a landfill ---

MR. SHOSKY: That's correct.

DR. LAPIERRE: --- and what you have is your passage to the natural or the -- you know, these deep underground aquifers are going to be through the bottom of your system.

MR. SHOSKY: Yes, and we would have -- we would like to have the opportunity to be able to present this to you graphically and we're willing to take that as an undertaking.

It's difficult sometimes to -- as a hydrogeologist by training I think I'm used to waving my arms more than just about anybody else and it's hard to portray some thoughts without having a good diagram to look at, and I would be pleased to present that perhaps Monday or Tuesday.

DR. LAPIERRE: Madam Chair will decide when but I would appreciate getting it.

MR. SHOSKY: Thank you.

THE CHAIRPERSON: Okay. Thank you very much. We will accept that as an undertaking. I've got to say that I wasn't aware that hydrogeologists were prone to waving their arms a lot but that's ---

MR. SHOSKY: Excuse me, Madam Chairman. That's why you only hire a one-armed hydrogeologist, so that you don't have opposite opinions.

THE CHAIRPERSON: I would just like to finish up with one more question before I let Mr. Charles take over here, but it relates to this.

I was -- I must say in your presentation this morning I was surprised -- and perhaps I shouldn't have been -- I was surprised that one of the key factors that you cited in your eventual selection of partial containment encapsulation -- you made the statement in the presentation that this was this -- I think what you said was this decision was partly made for you by the fact that there was contamination in the bedrock for which there were no viable cleanup technologies.

Am I correct in saying -- I don't think I had read that in the EIS, that statement before. Is it there somewhere? And, if so, could you point me to it? This is particularly in reference to it being a factor in the selection of the containment, partial containment.

MR. POTTER: If I may, Madam Chair, the reference in the presentation I gave -- I'm trying to remember the exact words, but the issue was that there's no technology available today for extraction or removal of the contaminants in the bedrock, therefore the design had to accommodate the fact that we could not remove it. That was the reference to technology, that there is no known technology for removing the material from the fractured bedrock.

THE CHAIRPERSON: Yes, that's what I had just said, and I guess my question is -- it's not that it took me by surprise that you'd made the statement but that I don't recall -- and I don't think my colleagues recalled -- reading it in the EIS as part of your rationale for the selection -- has it always been one of the major reasons for going with containment? It's just I didn't find that statement made in the EIS.

MR. POTTER: The focus has been on the Coke Ovens site the shallow aquifer, the shallow groundwater in that site, and that's been the focus of the design of the project as we move along.

THE CHAIRPERSON: I'm sorry, I don't think I understand the question -- or the answer. Your focus has been on the -- I mean, I'm not -- it's not that I'm right now querying your use of that rationale, I just --

all I want to know is, in fact, does it appear in the EIS, because it came sort of -- we hadn't heard that statement, that as -- when you were selecting the containment that it was because -- in part because you had to do some containment because you had contaminants in the bedrock.

MR. GILLIS: I believe it's outlined in Chapter 5 in the environmental setting. We talk there about the deep aquifer, the Lower Morien Aquifer, and the movement through the bedrock there, but I for one will certainly make sure that that's -- I don't have that information directly in front of me, so -- but that's what I recall, so ---

THE CHAIRPERSON: I'm sorry, I'm not going to belabour this any further, but I think the context in which I was asking the question is it was presented to us as one of the factors, an important factor, in your selection of this approach and, you know, I think later on we will need to talk about alternatives.

I know there'll be interest from the public in talking about alternatives and, you know, having a very clear idea of what the rationale is for the selection of the technologies will be important, and you've put one forward this morning we hadn't heard before, so -- I think.

MR. CHARLES: I'd just like to concur that I hadn't heard it before either.

I have a couple of specific questions about the Tar Ponds, and these will probably be very easy ones to be answered.

I heard this morning -- and it appears in the EIS -- that there's about 120,000 tonnes of sediment to be extracted from the ponds, and you may have already provided this question, but is that as wet -- is that weighed as wet or as dry material? I assumed it was wet but I could be wrong.

MR. KAISER: Yes, that's correct, those are wet tonnes.

MR. CHARLES: Wet tonnes?

MR. KAISER: Yes.

MR. CHARLES: And there are about 710,000 tonnes of material in the ponds, not necessarily going to be excavated?

MR. KAISER: That is correct.

MR. CHARLES: Okay. Could you tell me what the approximate moisture content of the sediment is? Is it around 40 to 50 percent?

MR. KAISER: We will answer that in one second. I would rather not misspeak.

MR. CHARLES: No, that's fine. That's

fine. While you're at it, are you able to describe the organic carbon content of the sediments? Because that seems to have a bearing on the type of technology that you use to deal with it.

MR. POTTER: Perhaps, while we're looking I should mention that one of the challenges we're going to face over the next 21 days is this very problem.

MR. CHARLES: Finding information?

MR. POTTER: 3,000 pages in the reports and another 1,000 pages in follow-up answers, and that's -- it's going to be a problem for us.

MR. CHARLES: Well, I can compete with that, because I'll have problems remembering everything that was in the 3,000 pages. So, I'll probably be asking questions I should know the answers to but you'll have to bear with me on that one.

MR. POTTER: Don't worry, we'll get better on the second answer anyway, so ---

MR. CHARLES: Well, I think we'll both get better as we go along, I hope.

Do you have any idea what the grain size would be of the sediments?

MR. SHOSKY: This is why I wave my arms.

MR. CHARLES: You're not shaking your fist. That's good.

MR. SHOSKY: We have analysis from the stabilization testing that was performed and sent as part of one of the IRs and it has -- shows the in-place moisture content of the sediments to be between 20 and 30 percent moisture.

The grain size of the material is typically of a sand size particle.

MR. CHARLES: So, it's fairly fine?

MR. SHOSKY: It's fairly fine. There are some big pieces which would -- in the process of taking the material out and blending it for incineration, for example, would be screened out.

MR. CHARLES: Okay.

MR. SHOSKY: And I'm sorry but I forgot what the second question was that you had.

MR. CHARLES: Organic content.

MR. SHOSKY: Organic content. Just a moment.

MR. CHARLES: "Organic carbon" was the term I used.

MR. SHOSKY: I do not have total organic content. I have detailed chemical analysis of the sludges. It would take me some time to calculate out the total organic content, because I would have to combine all the detailed analysis to give you that larger number.

MR. CHARLES: But it's possible to do it, is it?

MR. SHOSKY: It's possible to do it, yes, and it wouldn't take us that long to do it either, so ---

MR. CHARLES: My colleague has his finger on the button over there. I don't know whether he wants to ask a question or not.

MR. SHOSKY: Okay.

DR. LAPIERRE: It's just a follow-up comment on that. I think there was some sewage that emptied in these ponds at one time for quite some time.

MR. KAISER: That's correct.

DR. LAPIERRE: So, there has to be an important carbon content within that sewer?

MR. KAISER: That's correct.

DR. LAPIERRE: Thank you.

MR. KAISER: Further, I'd like to add that some of the other samples that we've collected have higher moisture contents but not, you know, extreme. They get up more into the 40 percent range and slightly above, just a little higher than the range that Mr. Shosky quoted.

MR. CHARLES: And that would -- in terms of how much of the sediment would be in that upper range have you any idea? Is half of it higher than the other half?

MR. KAISER: I don't have that information at my fingertips.

MR. CHARLES: Okay. Can you tell me what the average concentration of PAHs in the sediment is, either in the Tar Ponds or in the Coke Ovens if you want to break it down?

MR. GILLIS: We have that information. If you'd just give us a moment, we can turn it up for you.

MR. CHARLES: I'm sorry, I couldn't hear.

MR. GILLIS: We have that information. We're just -- if you'd just give us a moment, we'll turn it up for you.

MR. CHARLES: Sure, that's fine. And while you're at it could you look at the average concentration of PCBs, in the Tar Ponds only I take it.

MR. GILLIS: I'll ask Dr. Magee to give you that information.

MR. CHARLES: Thank you.

DR. MAGEE: Yes, I'm referring to Table 4.11 from our Human Health Risk Assessment. It's just one of many places where the numbers are calculated. And we have, for the purposes of the risk assessment, divided the North and South Pond into four datasets, the north area to be excavated, north to be stabilized, same/same for the south.

The PCB concentration upper 95th competence interval for the North Pond PCB area is 39 migs per kilogram -- that's the same as parts per million -- the North Pond non-PCB area, the area to be stabilized, 35 -- sorry, 14 migs per kilogram, the South Pond PCB area is 167 migs/k, and the South Pond non-PCB area 28 milligrams per kilogram. Those are upper 95th competence intervals on the mean of all the data.

Now, for the PAHs I have them ,sadly, listed separately for each of the 17 PAHs but they all seem to be between 100 and 200 parts per million. So, let's make just a quick estimate. If it's 150 and there's 17 of them, then that's about 2,000 parts per million would be the upper 95th competence interval for the PAHs.

MR. CHARLES: Thank you very much. My last question is, can you tell me what the average concentration of PCBs in the sediments would be following remediation? In other words, once you've done your treatment what's left in terms of concentration?

DR. MAGEE: May I go ahead on that one.

Well, the two areas that are going to be removed are the 39 and the 167, that would leave 14 parts per million in the North Pond portion that's not going to be removed. In the North Pond section that will be removed that will be zero, because the material will go up to the incinerator, be burned and come back with no PCBs in it.

On the South Pond the area that will be stabilized will be 28 parts per million and again the area that will be taken out, excavated and brought back as clean soil will be zero.

So, if you gave us a few minutes we could do some sort of an average, but maybe that answers the question adequately.

MR. CHARLES: No, that's fine. Thank you very much.

DR. MAGEE: We also have the total organic carbon now, if you'd like those data.

MR. CHARLES: Lots of data.

DR. MAGEE: Yes. The South Pond PCB area, 24 percent total organic carbon, the South Pond non-PCB area, 68 percent total organic carbon; North Pond PCB area, 13 percent, North Pond non-PCB area, 20 percent.

Again, we've broken the data into these four areas, but I think that probably will answer your question sufficiently.

MR. CHARLES: Thank you very much for the quick work.

DR. LAPIERRE: Could you tell me which volume number you got those numbers from.

DR. MAGEE: It is Volume 5, Table 4.11.

DR. LAPIERRE: Thank you. I guess I would like to ask a question on -- once you remove your PCB-contaminated material from the Tar Ponds you are going to batch this material. If I understand correctly, PCB material removed which is higher than 50 parts per million will be destined to be incinerated.

And I guess my question relates -- does that include all of the material which you'll remove that is over 50 parts per million or will you do batching, mixing, and then retest and then decide which part is 50 parts per million and send it to the incinerator and return the other material to the Tar Ponds because they are under 50 parts per million?

MR. SHOSKY: Let me try and make sure I understand your question by rephrasing it.

At the point we go in to excavate materials that are over 50 parts per million PCBs, that material will be taken out of the Tar Ponds and conditioned prior to incineration. That conditioning is designed to take away residual water that's in the sediment. There will be some blending that occurs.

So, part of your question I think was,

will the concentrations be tested after we do that blending exercise, and if it were to be tested at that point and it were under 50 parts per million is it our intention to put it back into the pond and dispose of it as a material that's under 50 parts per million?

DR. LAPIERRE: Yes.

MR. SHOSKY: That's correct. All right. We thought through that process and have made the decision to go ahead and move all that material that would be preconditioned up to the incinerator for treatment. So, in effect, by going in and taking the material out of the Tar Pond, blending it to below 50 parts per million and putting it back into the Tar Pond after blending without incineration is not going to happen.

THE CHAIRPERSON: Just so that I've got this absolutely clear, you've delineated the areas that you're going to excavate of PCB-contaminated sediments, you've delineated those, you're going to excavate them including the overlying sediments and all of that material will then go to the incineration?

MR. SHOSKY: The current thought on the project is that is the case, that it would all to go the incinerator, and the reason for that is because it's difficult to not bring the material out and have some blending that occurs, and the decision was made by the Tar Ponds Agency to eliminate any questions on how well that material gets treated or anything else like that or short-circuiting this treatment process, is to take the material up to the incinerator.

THE CHAIRPERSON: But you will do some sampling of that material at the excavation site after it's come out? At what point do you do the sampling that tells you the concentration of the PCBs in a given quantity that is going to go to the incinerator?

MR. SHOSKY: That level of detail has not been completed yet in the design process as far as what particular steps or if it's necessary to test the material prior to it going to the incinerator.

The material, once it's in the pond, is tested and you know by that testing process where it is in the pond, exactly where it's at and exactly where it is. Once that's excavation occurs and blending stops it loses its identity from that original location and it becomes what I call a feed stock for the incinerator.

The feed stock for the incinerator has to meet certain criteria in order for the various technologies -- the several technologies that have been recommended for treatment of that material can only accept a certain type of material.

The PCB concentrations are not a critical component of that feed stock as far as evaluation of the treatment efficiency of the incinerator prior to treatment. After treatment of course it must be tested, but prior to being treated thermally there's a few other parameters, we believe, are a little bit more critical than that and would be tested prior to going into the incinerator, but the actual concentrations of PCBs would not necessarily need to be tested prior to being burned, only because it's not a critical operating parameter for the incinerators.

THE CHAIRPERSON: So, you only need to test the PCB concentration of the feed stock during -- prior to a stack test, is that what I understand, that would be the only time that you'd be interested in what it was that went into the incinerator compared to what it was that came out?

I mean, how do you determine the destruction removal efficiency? You need to know what went in in the first place.

MR. SHOSKY: Of course.

THE CHAIRPERSON: But is that only during stack testing?

MR. SHOSKY: The most rigour that goes onto a testing process like that is during the stack testing and shakedown period when the incinerator first starts up its operation.

We know what the concentrations were in the pond prior to blending and I think, as alluded to by the questions, that there would be some blending to occur which would cause the PCB contaminant levels to go down as a result of having blending occur. So, we've based our design on the highest concentrations that have been identified in the Tar Ponds themselves and that's the process that we've looked at so far.

It doesn't mean that there can't be additional testing steps, it's that right now the thought process has not gone beyond that. Of course there would be testing for the shakedown periods and things of that nature.

MR. POTTER: If I could just add slightly to that, I just want to make sure there isn't any confusion. We're not trying to blend away any of the PCB's. We have them targeted, we know where they're at, they're coming out. The blending happens afterwards. So, just so there's no confusion on that I just wanted to make that clear.

DR. LAPIERRE: I just have another question, two questions really.

Would the PCB concentration for -- will

the PCB concentration for each batch be used in the calculation of the DRE? And are there any documented approaches for calculation of DRE?

MR. SHOSKY: Currently the thought process is to focus those -- that intensive analysis during the stack testing program and we're -- under normal operating conditions we would probably then do that level of testing at least probably four times during the course of this project, but that level of detail has not been included into the design program at this point.

DR. LAPIERRE: But I guess my second question is, are there documents that that specify the calculation of DREs?

MR. SHOSKY: The short answer is yes, there are.

DR. LAPIERRE: And would it be possible to see some of those documents? Would it be possible to have ---

MR. SHOSKY: Yes. We would like to take that as an undertaking.

DR. LAPIERRE: Thank you.

MR. CHARLES: I have just one final question and I think we'll probably have lunch, or maybe.

The EIS talks about excavating 120,000 tonnes of material, and I take it in light of our discussion about excavating everything and sending everything to the incinerator and not sending anything back once it's blended or watered down, if you want to look at it that way, that 120,000 tonne figure is still -- still stands. That was based on the assumption that PCB plus the overlay would go to the incinerator, is that correct?

MR. SHOSKY: That's correct.

THE CHAIRPERSON: Well, I can take a hint from my colleague. So, thank you very much for answering those questions. It is now almost 10 minutes past 12:00. And thank you, too, for the patience of the -- all the people sitting in the hall here.

We will resume at 10 minutes past 1:00. Thank you very much.

--- Upon recessing at 12:10 p.m.

--- Upon commencing at 1:12 p.m.

THE CHAIRPERSON: Well, good afternoon. I think we will get started again. Just a couple of things. We were made aware and, in fact, were aware ourselves, that we're all going to have to be careful about using acronyms.

So I'm going to ask the proponents, I'm going to remind the Panel, and later on when we have other presenters and people asking questions, that we'll try to avoid using acronyms, or if we need to use them to make sure that they're very clear to everybody. So we will do that.

There was a lot of talk of DRE this morning, DRE being destruction and removal efficiency, being a measure of how efficiently incineration destroys and removes contaminants. I'm sorry about that one.

And the second thing that I was going to tell you is, I consider it good news, the schedule does have us sitting here from 1 o'clock till 5 o'clock, it is Saturday, it has been a long day, I don't know for sure yet but we may well try to finish earlier than that, around 4 o'clock. So if we can do that we will have a break in the middle of the afternoon, as well.

And so to resume the panel questioning, I would like to begin this with just a couple of -- basically a couple of clarification points from questions that were asked this morning, so that we've got everything clear.

You know how it is, you go back, you have lunch, you talk to your colleagues and you realize, "Oops, don't know if I really did understand that after all."

And the first point goes back to the discussion that we were having with respect to the permanence of the remediation project, and particularly with respect to monitoring, and I may have started off an inaccuracy because I was referring to 25 years on a number of occasions in terms of what was going on.

Could you please clarify when it is, in the scope -- and this is where Dr. LaPierre was saying that in the diagram really monitoring should appear in that project timeline so it's very clear -- but can you explain, start from the beginning, when the project construction begins, when monitoring begins, when you predict that the monitoring will end, and therefore, right now, with what you're planning, what are you anticipating will be the length of time that monitoring will occur, because I was saying 25 years and I believe, in fact, that Mr. Potter said 10 years' worth of monitoring, at some point.

So we need to get that very clear.

MR. GILLIS: First of all, base line monitoring has already begun. We've been monitoring, for example, air quality in the region for a number of years already. We've got a pretty good base line of information on that and other parameters. The follow-up monitoring and monitoring will continue through the course of the construction activity, and monitoring will go on for 25 years following cessation of that construction activity.

THE CHAIRPERSON: So the total length of time that monitoring would occur -- so performance monitoring and effects monitoring will take place for 25 years after the construction is complete.

MR. GILLIS: That is correct. If it takes 10 years to construct the project, then from start to finish will be a 35-year period.

THE CHAIRPERSON: Thank you.

My second point of clarification is -- I mean, I think you were very clear and unequivocal, I don't -- that's not a problem, so I just want to make absolutely certain we're all clear about this, the question being what you were going to do with respect to the excavated sediments in terms of what was going to the incinerator, and the whole question of sampling.

So what we heard you say this morning is that you -- that you're still working on what kind of sampling protocols you're going to develop when it comes out, but, in fact, those are not going to be critical or important or decisive in terms of what will go to the incinerator.

That you have delineated the contaminated sediments, you will dig those up, you will excavate -- in the course of doing that, you will excavate any overlying sediments, and the whole lot will go to the incinerator. I heard you say that, that's right?

MR. GILLIS: That is correct. Yes.

THE CHAIRPERSON: Well, where I just want to clarify this is I want to go to Public Comment 49, and actually I'm working from your response to Public Comment 49.

I'm sorry, I should have made that clear -- and let me know when you've -- maybe I can start to read this because all the rest of you haven't got Public Comment 49 in front of you.

And this is just -- I'm looking at the response and what the Agency did when there was a fairly lengthy submission is that they summarized the key question and then gave a response, so I can't vouch, at this moment, as to whether it totally reflects the original wording, but Comment No. 1 of -- so Public Comment 49.1:

> "Please describe the sampling protocol for PCBs and the excavated sediments, including the size of sediment lots to be sampled and type of sampling, that is composite or, for example, composite, to be used."

And the response is that:

"The frequency of PCB testing will be every 1000 cubic meters. The composite sampling technique will be developed during the detailed design phase of the project."

So was that answer given -- what is the significance of that answer in light of what you said this morning?

MR. SHOSKY: Let me make sure, Madam Chairman, that I've accurately looked at our response here:

"The frequency of PCB testing will be every 1000 cubic meters. The composite sampling...will be developed during the detailed design phase."

THE CHAIRPERSON: Yes. Do you want to get back to us on that?

MR. SHOSKY: No, I think the original testing frequency for PCBs was to be after the treatment process as we discussed earlier, and I believe that that's what this is in reference to, would be after the incinerator had treated the material.

So treated material would be stockpiled and then tested every 1000 cubic meters for PCBs to ensure that treatment had accurately been accomplished.

THE CHAIRPERSON: Okay. So then if we move on to Comment 4 -- sorry, still Public Comment 49, 49.4 in your numbering system in your response:

"As the plan clearly states that only sediments containing PCB material greater than 50 ppm from the Tar Ponds will be incinerated, what will be done with the excavated sediments which, after testing, are not classified as a PCB material because they contain less than 50 parts per million."

And this is where I may just table this question because, you know, I don't want to have people waiting here while -- I realize there's more parts to this. Your response was that to refer us to responses you'd already made to two questions that the panel had asked, IR-27 and Ir-29, and, you know, I could end up going on at great length and reading those out to you, but the problem was we didn't see any answer to that question. And you get where my drift is going, I heard you say this morning very clearly "We're going to dig up everything, and if it falls within that delineated area, we're not -- the results of any sampling we do is not going to determine whether it goes to incinerator." You've got -- basically, I guess, you've kind of made a commitment that that's the policy, that's what you're going to do.

MR. SHOSKY: That's correct, yes.

THE CHAIRPERSON: That's fine. That's clear. So, what I'm saying is we've got some responses here that are less than -- I'm not quite sure what they're about, so I would be happy to table my question and then you can have a look at those earlier responses and just perhaps come back. Would that be the simplest way to do it?

MR. POTTER: It seems clear to me, Madam Chair, and the question's asking about, you know, anything over -- that's less than -- what would be done with the excavated sediments after the testing which are not classified as PCB material.

I think the question was that if we were sampling before it went into the incinerator -- if I'm correctly interpreting the question, because we won't be doing that. If we dig it up, it's going to the incinerator. We're not worried about if we happen to find a little batch that's 49.2 or 37.9. If it's dug up, it's going to the incinerator, and I think that's what the question was asking. I think we've been clear on that.

THE CHAIRPERSON: I think from -- maybe we'll have to go back to the original Public Comment because from the way it's been summarized here, I certainly don't think that's clear at all, but your commitments on what you're going to incinerate is clear.

So maybe we'll have another look at this, and if there's anything more we'll come back. All right. Thank you very much.

DR. LAPIERRE: Thank you, Madam Chairman.

I would like to pursue the questioning -- I'm being told -- I've been chastised at noon, so -- I wasn't using my mic -- so I have to be very diligent this afternoon.

So I want to go back to questioning on the proposed channel that you're digging to remove water from the site.

I have a few questions relating to that channel. A lot of them relate to the biological activities associated with it, and I guess it wasn't clear to me in the information provided if, during the process of designing that channel, the biological activities had been included.

For example, if I'm a small fish moving up there, and the velocity of water moving through that channel in the spring, how am I going to migrate up that channel? If I'm a fish who migrates in August, and there hasn't been rain for a while, I might find a dry brook, so how do I get to the breeding area.

I also know that there's been some work done, the head ponds, there has been a citizen's committee who has worked at enhancing the fish habitat in the area.

There has also been some issues associated with the fisheries habitat, and I heard this morning that you might enhance habitat, and certainly -- but I'm wondering, this morning when I looked at your last slide, it looked like a nice meandering brook, but I see that's an artist's rendering.

When I look at the engineering design, it looked like a straight pipe tunnel, and I have some experience in seeing how we remove water off sites, we tend to go to these straight pipes. They're cheaper, they're straightforward, and they get the water away.

However, if you're a fish, and you're moving up there, there is -- could be some problems. I'd be anxious to know what part of the design phase biological activities played in designing the channel.

MR. GILLIS: There's an agreement, first of all, to make sure that we have fish habitat in place both for migratory purposes as well as resident fish populations, but I'll turn this over to Shawn Duncan who has got more detailed information on it.

MR. DUNCAN: Thanks, Mr. Gillis. The channel design, as you correctly pointed out, a lot of times, it does get into this concept of a straight pipe. Engineers like to push water away as much as possible, and us biologists like to hold it back a bit.

Certainly, the two aspects that were looked at from the perspective of the channel design was to ensure that there is fish passage up to the head waters where there is some high quality habitat, but also habitat restoration then is ongoing.

The second component that needs to be taken into consideration, and has been taken into consideration of the design, is to ensure that there's no upstream flooding caused by the remediation activities and design of the channel itself, and the opening.

So, within the context of the detailed design, certainly components of fish passage will be incorporated into the channel design for sure to address both high flow situations and low flow.

DR. LAPIERRE: So what you're saying is that there'll be no time in the year when there's no water in that channel.

MR. DUNCAN: Well, there won't be a time where fish passage will be impeded by water flow through that channel.

There may be times where there is low flow conditions, and we've dealt with those types of scenarios in other fish passage related projects whereby you provide areas where fish are able to access water upstream through a channel, even during low-flow conditions.

And certainly our aim and our objective is to work closely with DFO to ensure the design of the channel does accomplish those low flow conditions for fish passage.

DR. LAPIERRE: So there'll be no dry period in the brook.

MR. DUNCAN: That's my understanding, there will be no period where that channel will be devoid of water.

DR. LAPIERRE: And in the high flow spring runoffs, when fish might migrate, have you calculated the energetics of the fish species in the area, and how the channel might impede on these fish?

MR. DUNCAN: We haven't done the specific calculations, and again we intend to work very closely with DFO on designing those certain aspects.

As I mentioned we deal with kind of fish passage issues on a number of other projects, and we're familiar with the design requirements for those high velocity situations that will allow fish to, whether it's meander patterns or, in extreme situations where you require fish ladder -- I don't anticipate the channel will require that type of design feature -- but it's those type of design features that will go into the detailed design when we work with DFO to certainly work out those type of requirements.

DR. LAPIERRE: But you already have decided the width of the channel.

MR. DUNCAN: The width has been -- there has been approximate width -- there's, I guess, conceptual design based on ensuring that there is enough retention and water storage in that channel to avoid upstream flooding in a dynamic estuarine environment.

DR. LAPIERRE: So that's really what concerns me, because if you're concerned with the upstream flooding, your capacity -- you've ensured capacity to take the water away but that capacity might increase the velocity and impede fish passage.

MR. DUNCAN: Yeah, just to clarify, we're talking about conveyance capacity for the water, for surplus water.

We're definitely ensuring that the detailed design will accommodate upstream fish passage in the configuration of the channel.

MR. CHARLES: I have a question about the unconfined compressive strength of your cap, I guess, or at least the solidification process. In one of the responses to panel's question, it's IR-54, you indicate that an unconfined compressive strength target of at least 0.12 to 0.14 mpa, which means megapascals, and I'm not sure what megapascals means but that's the term used. I take it it's a strength test or numerical number.

MR. SHOSKY: Yes, it is.

MR. DUNCAN: I guess you also go on to say:

> "This is consistent with industry standards for strength testing on solidification projects, and was adopted as the relevant strength criteria for this project and was met by the cement additives."

And I guess my question, first question is, what are these industry standards? Are they Canadian standards? Are they American standards? I noticed in many of the projects in the United States quoted in the EPA tables that they were trying to achieve psis of 40 to

50, and I don't know how this .12 to .14 megapascals equates to that, although I did figure it out once. But my question is what are the industry standards you're trying to achieve here?

MR. SHOSKY: Okay.

There is site specific information that you use when you calculate those numbers, and the minimum unconfined compressive strength test that you want is one that would prevent subsidence of soil of its own weight.

So the simple way to look at it is is that your worst case condition is the weight of a column of soil for the thickness of the monolith that you're building.

The reason that there's differences in the different case examples is because of the different depths of monolithic fill that's created with the stabilized material.

Based on the calculations we did, the unconfined compressive strength that would prevent subsidence at the tar ponds is approximately 17 psi.

MR. CHARLES: And when you say "that would prevent subsidence" does that mean on its own without anybody walking on it, or without any buildings on it, or anything happening on top?

MR. SHOSKY: With walking or running heavy equipment, or things of that nature, that strength would hold for those activities.

If there was a higher use that was to be anticipated for that site, then there may have to be some changes made with the strength of that monolith.

For example, if you were going to develop a building on there, you would have to go through another geotechnical analysis to ensure that you brought the soils up to a high enough unconfined compressive strength so that they would support that structure.

MR. CHARLES: So you'd only be dealing with the soils, you wouldn't be dealing with the solidified material?

MR. SHOSKY: I'm sorry, it's -- I call it soils because the solidified material really is like a wet clay type of soil type of material.

MR. CHARLES: Okay. So that if you wanted to put up commercial buildings or light industry, these are mentioned in the EISs, the possibilities, further work would have to be done?

MR. SHOSKY: Yes.

And just as a point of note, I know that you have a copy of our stabilization technical memorandum that was given to you, and just as an idea of relevance, at the 10 percent cement level that we had in there, the strength that you're seeing there are about 1/3 of what you would see as normal sidewalk concrete.

MR. CHARLES: Right.

MR. SHOSKY: So it's very hard material, probably very much harder than where our desired strength would want to be because it is more like a clay material once it's treated and not like a large concrete block.

MR. CHARLES: But if it's 1/3rd the strength of concrete, what would it support then?

MR. SHOSKY: Well, under these conditions, it would support a variety of uses if that were maintained.

We're not proposing that at this point in time that that high of strength be maintained, but it would support a variety of uses at that strength.

MR. CHARLES: I see, okay. What's the relationship between 17 psi, which I think is the target you mentioned ---

MR. SHOSKY: Yes.

MR. CHARLES: --- and 1/3rd the strength for concrete, how far apart are they?

MR. SHOSKY: It's like saying 17 psi versus 700.

MR. CHARLES: Quite a difference.

MR. SHOSKY: There is a huge difference.

MR. CHARLES: Okay. Thank you very much.

THE CHAIRPERSON: Well, might I follow up there. I don't want to get heavily into future uses right now, because I think we'll want do that as a block, but is that -- now, I understand that the Agency has indicated recently, fairly recently -- no, all right, let me ask the question. What are your plans with respect to developing a future use plan? And my reference to that is something that I believe Mr. Potter said in the Minutes of the Community Liaison Committee meeting, December 2005.

I'm not -- no, I'm looking around for anyone who can verify that reference, but anyway, I'm pretty sure the reference is in Community Liaison Committee Minutes which recently got posted to your website.

MR. POTTER: Who was the comment attributed to, I'm sorry?

THE CHAIRPERSON: You.

MR. POTTER: Oh, I know him!

THE CHAIRPERSON: I think. And if my memory is wrong, I apologise, but someone from the Agency.

MR. POTTER: And maybe just to clarify your question, are you asking about how we were determining the future land use?

THE CHAIRPERSON: Well, I guess you've been talking about the capacity of the solidification project to support different uses of the land, and were you saying that -- is that fixed? Is that determined?

You've determined what the bearing capacity will be, because you're going to use a certain cement mix or whatever, and the circumstances will allow you to attain the bearing capacity of "X." Is that fixed or were you saying that depending on future use decisions that could change? Perhaps -- that's my first question.

MR. POTTER: IR-47 does refer to part of that question.

I think the responses, I'm not sure if we can say we've fixed a specific technical component of the mix in the sense.

What we can say is we've determined, I guess, what we anticipate some of those uses could be, recognizing we don't have a final end use for that site.

As I indicated before, we are working with the Municipality towards that end, but at this point in time what we can say is that we anticipate it could be used for passive uses, any kind of recreational or normal access on the property, any type of light commercial use.

A smaller lighter commercial building

could be built on the material. I wouldn't recommend an 8-storey office tower but, you know, a light commercial industrial institutional building. Does that help? I can't recall the CLC meeting but ---

THE CHAIRPERSON: But there is -- there are some -- I believe you were Minuted as saying something that the development of a future land use plan was going to be a public process.

MR. POTTER: Yes.

THE CHAIRPERSON: And that it was going to happen sort of in the summer this year, around the summer this year, is that the plan?

MR. POTTER: Yes.

THE CHAIRPERSON: I'm just trying to get a sense of how -- whether or not the exact nature of the solidification is still a bit of a moving target with respect to what you are going to -- what targets you're going to reach for what proposed future use.

MR. POTTER: Let's try it this way.

Do you have the Minutes for the CLC meeting? We're getting pretty good at this. I'll respond to that part.

Maybe I'll ask Mr. Shosky to think for a minute while I'm talking, but I'm not sure how that's going to relate to your other question about the specifics -- design of the mix.

But it was my predecessor on December 5th, I believe, of the CLC meeting, Mr. David Darrow, was answering a question about CBRM and the master development plan, and it contemplated light industrial uses for the coke ovens but did not address the tar ponds.

The cleanup is not designed to accommodate construction of big structures on that site. Mr. Darrow said he hopes the determination of future site use will be a public process. So that is the response that came back at that time.

I think I probably mentioned that, that, you know, the structures that we anticipate being on the site would be lighter industrial shell type of buildings.

Now, I'll turn that over to Mr. Shosky and see if we can nail down that in relation to the mixture.

MR. SHOSKY: Thank you, Mr. Potter.

On the final use determination, since right now the final use could be varied, we were looking for an unconfined compressive strength that would support a variety of applications, and we felt, at this point, that 17 psi or the other numbers that were referenced in our document would be satisfactory for a variety of uses.

DR. LAPIERRE: I'd like to get back to

that issue because I think the structure that you're putting in place is going to limit somewhat the possible future uses.

If I look at the -- and listen to what you said this morning, and look at the barriers that you're going to put in place, particularly in the tar ponds, you've got a cement monolith, you've got a tar drainage structure in that system which you indicated was essential to reduce pressure.

Then you have, on top of that, a barrier which you say is important to stop water from going in. It's quite an extensive system, you have a meter or so.

Now, I fail to see how you're going to put a road in there. You talk about buildings, how are you going to -- if that structure needs to be intact, how are you going to put water drainage along a road without drilling into your monolith and destroying the integrity of the system that you propose to put in place?

MR. SHOSKY: That's a very good question.

And I worked on a number of redevelopment sites, and what happens is you may have a remediation program that takes place, and it's got a design like we have in place right now, which is -- let's make it a real simple, big open field right now with grass on it, something of that nature -- where I've gone in, particularly in recreational areas and had to put in parking lots, roadways, infrastructure for grasses or improvements when you're expanding a golf course or something like that onto another piece of land, that's been capped and contained, the idea is to do a number of things.

One is, make sure that there's something in the deed to the land that explains that certain precautions need to be taken when dealing with that land.

And what happens then is that design of the new structure or facility needs to be complementary to the capping situation and the remediation in place.

So, for example, if you were going to put a road in and the unconfined compressive strengths that are presented right now in the design are not strong enough to allow that road from subsiding, then you would have to go into that area and buff up that area, or beef up that area with additional, perhaps, aggragrate or cement or something like that, and take possibly a portion of the cap out and replace it with an engineered system that still gives you the same level of safety that you started with with the original cap design.

DR. LAPIERRE: But it seems like a significant increase to do this type of work.

MR. SHOSKY: There ---

DR. LAPIERRE: A funding increase.

MR. SHOSKY: Well, it depends again -- there are a number of these redevelements sites that are occurring on currently contaminated sites, and the real estate, in a lot of those areas, is worth more than the infrastructure that -- you know the price of the real estate is so high and the future use is so much better that it pays for those upgrades.

Now, if it's a Public Works program, I can't -- there would be a cost that would probably be beared back to the government on whatever type of infrastructure that they wanted to put in.

But if it goes -- on a redevelopment site often it can be an upgrade that pays for itself during the redevelopment process.

DR. LAPIERRE: And that upgrade wouldn't compromise the drainage structure that you've put through your monolith?

MR. SHOSKY: Done properly the engineer that would be putting together the redevelopment building or structure or something like that would have to take that into account, so that it would not compromise the plan.

We've tried to maintain quite a bit of flexibility in coming up with the capping system here, so that if there were to be upgrades in the future, it would be possible to do it, which is another reason why it's better in a certain extent not to have unconfined compressive strengths as high as the tests that we had performed in our Tech memo.

Because you don't want us to dig through something that's necessarily one-third strength of sidewalk concrete, when you can dig through something that is more like a clay soil.

MR. POTTER: I might add as well, in relation to our interaction with the municipality, there is a committee set up looking at the future site use. I did mention this earlier.

But if early enough in the process we do get some indication from the municipality in relation to perhaps a road, perhaps, that they would like to have installed somewhere on any part of the site, we can incorporate that into the design early on, as best we could, if we do know in advance.

So, no doubt there will be issues where we'll be done, and the work will be complete and there'll be a decision to do something on the property that may require going back and beefing up, I guess, if you wish some of the remediation of the solidification.

THE CHAIRPPERSON: Sorry, we're just

trying to get our order of questions here.

So, I'd like to stay with the stablization and the solidification part of the project.

And we put in -- the panel put in a request to the proponent with respect to -- yes, okay. Sorry, I'm just trying to figure out what I should read in.

The -- we reference the fact that the agency made the following comment in response to somebody's request. The design of the remediation project includes the use of technology that have been established and that have established successful track records for the remediation of similar sites around the world. All right?

So, this is the proven technology which was determined to be a key criterion selection, both from public input and from what the agency decided they needed to do.

So, we were interested and are still interested in the extent to which stabilization and solidification is a proven remediation technology.

So, we asked for information -- we actually asked for information regarding the combined use of containment and stablization and solildification since the tar ponds element involves both of those, at a minimum of three remediation projects with particular reference to certain aspects, such as the nature of materials to be treated, particularly -- and we cited that for this project primarily organically enriched estuarine sediments.

So, we wanted to know are there some examples -- is this a proven technology for treating organically enriched estuarine sediments. Similarly to contaimants, performance expectations with respect to longevity and so on. There were a few more other things -- a few other things.

So -- and we got a response from the Tar Ponds Agency, and I would just like to talk about the response.

So, now I'm looking at your response to IR-42.

I should have said that straight off, shouldn't I? So, then you could -- sorry, I'll learn.

I should tell you that within the panel we have a slight paper/electronic division here, and Dr. LaPierre is on top in an instant with his search capacity, while the other two members are flipping through papers madly trying to find things.

However, we're confident that when the power goes out, we'll be.

MR. STOSKY: I've located that IR, Madam Chairman.

MR. CHAIRPERSON: Okay. And what you've provided in response was two tables.

The first table, I think, was the direct response. We asked for the minimum of three remediation projects, and you've given us some information on that.

And then you provided an additional table with a number of other remediation projects. But I think I'll just stick with the shorter table, and you provided six examples.

And I guess the question still is, from the examples that you gave, I wasn't too sure -- I guess New Bedford Harbour is the one that would have marine sediments. Is that right?

Would those marine sediments have been organically enriched?

MR. SHOSKY: Yes. Yes, they would have.

THE CHAIRPERSON: However, the treatment was ex situ, not in situ.

MR. SHOSKY: In my opinion, the technology difference, whether it's in situ or ex situ, as long as the blending takes place, are equivalent.

THE CHAIRPERSON: Right. And these other -- the other examples that you gave, that -- am I right in saying that's the only one that would have been marine sediments, or are some of the others marine sediments as well?

MR. SHOSKY: Let me take one look through here again.

THE CHAIRPERSON: While you're doing that, perhaps -- oh sorry, you've got an answer?

MR. SHOSKY: Well, based on -- based on a brief review, it looks that that's probably the case.

THE CHAIRPERSON: Yes. Well, my overall question was that, you know, is solidification stabilization -- is that the right order -- I'm never quite sure which comes first, but anyway -- for, well, what I'm calling kind of tarry sediments -- is that fair to call these tarry sediments?

MR. SHOSKY: Yes.

THE CHAIRPERSON: Anyway, tarry sediments or organically enriched in an estuarine location where you've got ground water, penetrable ground water intrusion which you had to keep out, and also you have tidal effects coming underneath, and we've now learned -- well we didn't know this when we saw the EIS, but subsequently after -- when you responded to one of our requests, we know that the design has to involve this internal drainage system. I don't know if that's a fair description of it. So it's got all of those elements going for it. I know there's a lot of -- you've given lots of examples, and we know that the USEPA, the super fund clean-ups, are using solidification stabilization quite a bit. So obviously it's used then to -- and must be proven in certain circumstances. And I guess the question is can you make a really good case that it really is a proven technology for this instance.

And I think one of the things that really -- and apart -- well, we've received public comments, and we may get some presentations on this later on with respect to the constituents of these sediments and the likelihood of the solidification being long lasting and effective and so on, but -- but also, I mean, we were a little -- a little surprised when we got the reply from you including a diagram that showed this drainage thing, because up until that point, we thought that you just made a -- you just made one big pile of solidified sediments, and I am a little curious to know why that did not -- were you planning to do that all along? You just didn't make any mention of that in the IS. Was that just a -- you felt that was too detailed to mention in the IS?

But anyway, never mind. You can answer that in a second. I guess so my general question is is there anything about the specific -- is this a proven technology is this example? Is the whole thing a proven technology or are there some elements that you would say is perhaps less than proven and that you may need to get some more confidence about?

MR. SHOSKY: Stabilization as a technology? Okay. Stabilization as a technology, I have a lot of confidence that it would work in this instance. I personally have stabilized almost a million tonnes worth of material, mostly at manufactured gas plant sites throughout the United States.

Often when you go to references for stabilization projects, particularly with organics, they fall into more of a private sector situation where the literature is just not out there. Regulatory agencies support that technology, particularly in context of how that material may be left in place long term. And decisions get made all along that process as to how many -- I hate to use this term, "safety valves," but how many safety valves do you put around your particular design and how much redundancy in design effort do you put into something. And when you look at each one of these sites, and in this design in particular, we did include a number of these redundancy items of which would be this drainage system which allows the potential for upward migration of water to be directed in one direction and also relieves the -- relieves whatever underlying pressure they might have there in order to make it a more stable situation. But each one is different. I have done a number of stabilization projects. None of them are just stabilized by themselves. There's usually some sort of engineered contained system surrounding it. Technically, often, the results that you have will show that the stabilized mass would be fine without those additional controls, but typically there are additional safety features, redundancies in the design that occur that help to give people an added level of security that it's being handled properly.

THE CHAIRPERSON: Well, two things arise from that. One is -- so in this instance, you could in fact conceive of proceeding without that internal drainage system. I know you're not going to, but you're saying it's kind of an extra, it's an extra, you know, belt and braces kind of thing? And then let me give you a second question, and you can answer both at the same time perhaps. Have you yourself then worked on a project that's had this -- in an estuarine -- in a marine estuarine situation that has this kind of drainage system to relieve the pressure?

MR. SHOSKY: I'll answer the first question first. And I know that we took this on as an undertaking was to come back and explain in more detail the hydrology out there. And why we added the drains in this point was to try and give the ground water that would potentially come up underneath the monolith a preferred pathway so we would have control over the discharge of where that water would go as opposed to having it hit the bottom and -- the bottom of the monolith and to seep in a direction that we had not gone through and fully investigated yet at this point.

Second, each one of the -- each one of the situations that I've dealt with has been a little bit different. Unfortunately there's not any categorical black box or perfect design out there that fixes every hazardous waste site or any type of -- every type of clean-up. So each one's a little different. There are a number of them that I've worked on that have had conditions where there's been at -- in the ground water, ground water interfaces with the bottom of the design. Some of it has been near salt water estuarine areas. Some have had greater concentrations of pure tar.

So while no two remediations are the same, I believe I've worked on enough similar ones that I understand how this process works with the design in this instance.

THE CHAIRPERSON: Well, and are some of

these where you've had ground water -- are you familiar -- I mean, whether you work on them or not, are you familiar with any designs that have something similar to this design with some kind of internal drainage system that permits preferential flow of ground water or tidal waters or whatever?

MR. SHOSKY: Yes, but not exactly the same.

DR. LAPIERRE: I'd like to get back to the line of questioning particularly on the salt water. That's concerning me for two issues.

First of all, I'd like to know -- I know we talked this morning about the fractured ground water in the tar pond. Now, I'd like to have some indication on the exchange of water -- salt water, because the salt water there is coming from the harbour -- on the exchange of water in and under the tar pond. And I look to the slag-heaped side, and you know, I would guess that some of that water is coming through that way. And after the water comes in, there must also be an exchange. So I would surmise that once the project's over, that exchange is still going to take place. Water is going to come in, salt water, it's going to go back. If you remove some of the fresh water, it's more than likely going to raise higher, because you know salt water floats on -- on salt water, and if you remove it, just salt water moves down. So you're going to have a larger influx of salt water. And I can understand your drainage system. It's, to me, a very expensive, you know, security valve, so there must be a good reason to place it in there.

The other question -- the other question -- my first question is the exchange of salt water, and is it going to continue.

The next question is the reaction of cement to salt water. Now, you indicated that your cement structure was going to be a crumbly type cement. It's not going to be a high tensile strength of your 800 psi. And I'd like to know -- there are some -- there is some information on salt water reaction with cement. There are impurities in cement. There are factors -- that cement can deteriorate.

I guess my question is wouldn't crumbly cement, or the cement that you're proposing, would it deteriorate faster than high tensile cement. I mean, we have good examples of bridges that are in salt water, but the cement structure is very solid.

So I guess my two questions are -- one relates to salt water, the other one relates to the cement, because that relates back to the integrity of the matrix that you're putting in place and the release of these chemicals that you're proposing to stabilize. Because if the matrix does break down, and you've got an exchange with the open sea water, you're going to have possibly a drift of these chemicals back to the ocean.

MR. SHOSKY: In answer to your first question on whether or not there would still be some sea water exchange back and forth and have we changed those natural processes that would have occurred in any way with our design, I think if we look at the stabilized mass in context with where it's going to be placed inside the tar pond area, it starts out now with a barrier -- a barrier wall that has been -- that is currently part of the Battery Point Barrier Project, which is basically putting a -- a large coffer dam across the -- or almost across the harbour.

The reason for that and why it's complementary with the stabilized mass behind it is that that will take the brunt of any environmental actions from the ocean in general. It will not stop the situation you were talking about, but it does stop the extreme changes in conditions that you would have from wave action and things like that.

The big point of what will be changing once the material gets stabilized, we did run hydraulic conductivity tests on the stabilized material as part of the technical memorandum that we submitted to the Panel as part of our responses, and while we had a criteria of 10 to the minus six centimetres per second, I think most of our test results were much lower permeability than that.

So even though the same action would occur, we've changed the permeability of the tar ponds sludges from something that I think is around 10 to the minus five to something that's 10 to the minus seven on average. It means that there's been a two order of magnitude change in permeability, which in most layman's terms is, quote, unquote, "impermeable," or a very low amount of movement would occur through that -- through that monolith with the design specifications that we currently have for it.

On the second question of salt water and cement, there's an interesting thing about tar that makes cement a particularly good binding agent. There are other agents that are very good as well, but not quite as good as cement. One of the advantages of using cement in a tar application is that you have basically what we call a heat of reaction. The cement will heat up as it comes in contact with water, and as a result of that, makes it easier to blend in with the tar and actually breaks down some of the tarry components so that they're not a pure liquid tar any more, but has a consistency more of a stained soil, is what it would look like.

So there won't -- would not through this process be free -- free tar flowing or anything like that. So how does that relate now with sea water is that on most bridges, buildings and things like that that are made out of concrete and salt water, you'll get rusting of other infrastructure components, rebar and things of that nature that will help in aiding in the collapse of those structures. The type of concrete -- not -- the type of stabilized soil that we will have at the end will not be like a concrete, but it won't be crumbly either. It will be a very -- like a very hard clay material, which as long as it's in mass and as long as all the precautions are taken with the engineered containment system, I don't see a problem with the salt water intrusion at this point with this particular design.

DR. LAPIERRE: Can I ask another question?

MR. POTTER: Could I just add a bit to that as well to -- I think you're focusing on the -- it's called solidification stabilization for a reason. We're mainly interested in the solidification component. The stabilization component really doesn't matter that much to us. And the reason for that is because the sediment that we have already is already pretty stabilized. It does not leach. It tends not to -- it passes all of the -- you know, the required tests for testing sediment. It doesn't leach out. We're mainly looking at the solidification side of it, making it a harder mass for bearing capacity so you can put something on it, whether that's a tractor for mowing a lawn or putting a light building on it. That's the main focus.

Even if it were to break down, if there was that situation happening -- and I think we're saying that's not likely to happen with the salt -- it's not going to affect the leaching because it does not leach in its native state today where it's sitting. Our sediment does not leach out into the harbour. The sediment does move out into the harbour, and that's one of the things that the Battery Point barrier is going to do is physically stop the movement of sediment. But the -- there's very little indication from our extensive sampling that there's actually a leaching problem coming from our -- from the tar ponds.

DR. LAPIERRE: So I want to be sure I understand what you just said is that even if the matrix did crumble and some of the products that you did solidify moved away from the matrix, that there would be no problem in having those chemicals that you now have move out to the water because you have (a) a coffer dam, and there's no way that they could get into the water column and move through -- I mean, your slag heap is still going to be there and water is going to flow to it on the side.

MR. POTTER: That would be -- with a minor correction, I guess, that would be -- that would be right. It's not going to crumble. And Don can correct me here, but we wouldn't -- may have a bearing problem if something happens and we start to lose our bearing capacity in a certain area. That could be something we'd have to deal with from a geo-technical point of view. But it's not going to be crumbling off and moving out into the harbour. That won't happen.

DR. LAPIERRE: I understand that, but by crumbling, you could release some of the chemicals that you have solidified. I guess what you're doing, you're chelating the chemicals. You're just immobilizing what's left in the soil to a depth of till, if I understand correctly, hard till, and that will be solidified into a mass. My concerns are -- and I'm sure you understand them -- is with this material, that is, a crumbly type, with salt water, if it does crumble with time, releases some of these chemicals into the water, that with the coffer dam and the system -- your coffer dam -- that none of this will reach the -- or a limited amount will reach the ocean -- the harbour.

MR. SHOSKY: I think we'll -- we can -- if I could direct you to that technical memorandum again that we wrote on stabilization. And realize, of course, there'll be additional testing done during the design phase on this issue. But when the testing -- we did two tests, one before stabilization and one after stabilization. The testing before -- the chemical analysis before stabilization had indicated that, as Mr. Potter had said, that no chemicals were leaching out of the tar ponds as they exist today. The testing method that's used for the leachability test after stabilization requires that sample to be broken up and crumbled and run through an acidic solution which is probably more aggressive than the salt water, although you could possibly debate that -- debate that issue a bit. But that testing showed that we still did not have any changes in the leaching characteristics after stabilization, which meant that it in effect did its job of binding the -- binding the material together, which was already non-leaching, and it maintained that same characteristic after -- after blending and stabilizing.

DR. LAPIERRE: Cement itself, does it have any impurities? Would the cement that you use have some impurities? Something such as chromium, for example.

And could that leach into the water?

MR. SHOSKY: The testing that we performed on the technical memorandum has shown that not to be the case. And with some metals -- you're correct, there are some metals that will migrate under different pH environments, and by adding cement, you change the pH of the particular soil that you have or that you're stabilizing, and there is a possibility that if the pH is too high, that you could get re-leaching of various metals. The key with a 10-percent mixture, for example, is that it -- in all my experience, that takes you well within the range of non-leaching of most metals.

DR. LAPIERRE: And my last question is, in the process that you're putting in place, will you be able to monitor the underside of the monolith for degradation over time?

MR. SHOSKY: Just one moment. Unfortunately the answer to the direct question that you asked, could I monitor the underside of the monolith, the answer is no. When it was installed -- when it would be installed, it would need to be -- go through very rigorous QA/QC to make sure that it was installed in the fashion that it was designed to be installed as. To my knowledge right now -- and I can research this if you'd like -- I don't see a technology that would be able to validate the underside of the monolith once it was in.

DR. LAPIERRE: So you would have to go on your faith and your knowledge today that the monolith will stay intact.

MR. SHOSKY: That's correct. And we would also, of course, have these other design features, these redundant design features that would ensure that we would not see any movement from that monolith.

THE CHAIRPERSON: If I can chip in here, though, isn't this the point at which you would be -- we might all be more confident if there was an example of something that was pretty similar in terms of its location, in terms of being an estuarine location with salt water tidal flows coming in -- potentially coming in underneath, or movement of sea water underneath, but that had something similar by way of an internal drainage system that you could say, you know, "Here is something..." And I've got to say, you did say -- you made the point -- valid, I'm sure -- that a lot of the applications of this technology are in private projects and that they tend not to get into the literature. You can't find them. I can't help feeling -- maybe I'm wrong -- I can't help feeling that something that would be similar -- if there were something that would be similar to this, it would probably have a public element, you know, something with an estuarine -- that solidifying an estuary would almost by definition have some kind of public element.

So we're kind of looking at the application of a technology that's certainly proven in certain circumstances, but we're a little bit uncertain in this circumstance, but then you've just said that it's going to be -- I mean, when you have a technology that there might possibly be some questions -- even if the questions are not in your head but they're in other people's heads -- about, you know, will this absolutely hold good for all the number of years it has to, you have a greater level of confidence if you know that there's a way to monitor the performance and that there's a way to do something about it if something seems to be going wrong.

And so at the moment, it seems that we haven't got anything that's that close, but maybe you can find something over the course of the, you know, next 21 days -- some examples of something that has this kind of circumstance and ---

MR. SHOSKY: We'll go ahead, Madame Chairman, and take that as an undertaking. I would like to add, though, that on one of the comments that you had made about also re-looking at the monitoring system of the existing design that is currently contemplated to see if there's any other ways to monitor that situation that would give a higher level of comfort, we will look into that as well.

THE CHAIRPERSON: Thank you very much. So that's two undertakings that you're -- thank you.

MR. CHARLES: My next question, I guess, will involved transportation. As my father was an old railroad man, I was pleased to see that the material is going to be hauled to the incinerator by railroad rather than truck, but there will be still a lot of trucking going on. I realize that there's only one truck load of fly ash coming back from the incinerator, but there'll be lots of fill and other things coming onto the site and possibly going off the site as well. Could you give me -- and I think this is a concern about the traffic volume that's been expressed, and I know it's covered in the EIS, and you've done traffic studies and so on, but there are a limited number of roads that can be used. I mean, it not like a large metropolitan area where you have a fairly large choice of roads. Am I correct when I remember reading the table that you would have about 150 truck loads a day going -- and I don't know whether that's going one way or going two ways. If it's just a one-way trip, it means you've got 300 back and forths.

And I'm just wondering if I've got the volume correct.

MR. DUNCAN: We're just confirming that, but in Section 7.10.5 of the EIS, I think is the table you're referring to -- Table 7.10-1 -- there is a reference to 150 daily vehicles -- that's daily volumes of vehicles.

MR. CHARLES: And they would go on what roads? Grand Lake Road and something else?

MR. DUNCAN: Yeah, there is a specific reference there to the spar and regional roads in relation to the source of the capping materials.

MR. CHARLES: Right. And I take it having concluded that there wouldn't be any problems, no significant adverse environmental affects, that you're confident that the highway system can take that volume of traffic. I think you did mention maybe the possibility of putting in one new set of lights at an intersection to deal with the increased traffic.

MR. DUNCAN: Sorry, I'm just having trouble finding that specific reference, but my recollection is, yes, one of the mitigation measures was the addition of, yeah, additional lighting and traffic mechanisms to address the additional volume.

MR. CHARLES: Right. And so if you weren't able to send your material to the incinerator by rail, you'd have a higher volume of truck traffic, wouldn't you, if you had to do it by truck?

MR. DUNCAN: Certainly if you had to do it ---

MR. CHARLES: That sounds fairly simple.

MR. DUNCAN: That's correct, yes.

MR. CHARLES: Yeah. But you're planning to do it by rail.

MR. DUNCAN: Correct.

MR. CHARLES: Right. As an old railroad man again, I was interested in things railroading, and I noticed in your EIS, in Volume 1, Section 5, page 173, it says that you will send the stuff -- the material to be incinerated via the Sydney coal railroad which has five locomotives, with four used on a daily basis, one held in reserve, but they don't have any flat cars that would be suitable for transporting containers of material. I guess that struck me, and I said, "Well how are they going to get the stuff to the incinerator?" Are you going to lease cars from somebody else?

MR. DUNCAN: Certainly those issues have been identified as part of -- in the IS and certainly will be documented and developed further when we get into the project, but probably specifically either Mr. Potter or Mr. Shosky could speak to the provision for flat cars because it certainly has been a component that we've discussed.

MR. CHARLES: And that would increase the costs, eh, if you had to lease them?

MR. SHOSKY: We, over the course of recently, have been looking at the very issue you're talking about in a lot more detail, and we're still in the process of evaluating a more efficient way of moving materials. So we would like to take that as an undertaking to get a response back to you on that.

MR. CHARLES: When you say you're looking at more efficient ways, you mean other than by rail?

MR. SHOSKY: No, it would still be by rail. It's the question that you raised over where the cars would come from and that sort of ---

MR. CHARLES: Yeah.

MR. SHOSKY: --- that sort of thing.

MR. CHARLES: Because the EIS talks about putting the material in sealed containers and then putting the sealed containers ---

MR. SHOSKY: Right.

MR. CHARLES: So if you put it by conveyor belt into open cars, or something like that, which is another option, you get a dust problem and so on -- that would be another way to do it, and I think it may be mentioned, but I think you've opted for the sealed containers.

MR. SHOSKY: Right.

MR. CHARLES: But you're reviewing all of that, are you?

MR. SHOSKY: We are reviewing that right now, and it's -- it's -- it's at a point where we can -- we reviewed it, but I don't have a direct answer for you right now. We're in the process of sorting that out, but would welcome it as an undertaking if you'd like for us to do that.

MR. CHARLES: Well I welcome you welcoming it as an undertaking, because I'd be interested to know where you're going to get the flat cars. But thanks. Thank you for the undertaking.

MR. SHOSKY: I would just like to add, just to reinforce, we -- the intent is fully to use rail to take the material to the site. You know, the box -- the safe configuration of the boxes will be determined, but ---

MR. CHARLES: Or how you get it there.

MR. SHOSKY: It'll be how to get it there, but it will be on the rail bed.

MR. CHARLES: Thank you.

MR. SHOSKY: Okay.

DR. LAPIERRE: I would like to ask another question in regard to the SSTLs. And by the way, the acronym for SSTLs is state specific target levels -- site specific target levels, SSTLs. I find them quite interesting. I have a problem identifying why you use to sets of SSTLs, and I would like to know where you're going to use them other than the -- maybe land farming and the waste water.

MR. KAISER: Just to restate your question and clarify it in my mind, you're asking why we are using two different sets of SSTLs?

DR. LAPIERRE: Why did you develop two different sets?

MR. KAISER: Why did we develop two different sets? Okay. Thank you. The SSTLs, the site specific target levels, were derived based on the Phase 2/3 site assessment work that was conducted by JDAC. And in conjunction with that, the Human Health and Ecological Risk Assessments. So putting all the information together that we had on our sites, we came up with the SSTLs. Now, because we have slightly different conditions at the coke ovens and slightly different conditions at the tar ponds, we took the approach where the specific numbers that fall out, or the drivers for concern, are carried forward and become what we'd base the remedy on. In other words, as a specific example, in the coke ovens, we know that the site specific target levels there can be controlled by cutting off the pathway, and we can cut off the pathway by installing a cap. So the numbers are different because they are derived from the risk that exists in both locations, the tar ponds and the coke ovens.

DR. LAPIERRE: So if I understand correctly, the reasons for the two sets is that you have two different standards to clean up to?

MR. KAISER: No. Sorry. The different numbers are based on different chemicals being the highest risk at the two different locations. In other words, the chemicals in the tar ponds that pose the most risk to the ecology of that area are different than the chemicals at the coke ovens that pose the risk to the ecology there.

DR. LAPIERRE: Okay. Let's take an example so I understand. PAHs are at both places?

MR. KAISER: Correct.

DR. LAPIERRE: PAHs are at both places?

MR. KAISER: Correct.

DR. LAPIERRE: Would you have the same SSTL obligations to clean up at both places -- both being to the same level SSTL?

MR. KAISER: No, because the individual PAH becomes the driver of the risk, not PAHs in general.

DR. LAPIERRE: Okay.

MR. KAISER: For example, naphthalene becomes the driver at the tar ponds and benzene becomes the driver at the coke ovens.

DR. LAPIERRE: So do you have a specific PAH that is specific to both sites? And if you did, would it have the same SSTL?

MR. KAISER: I would have to check the numbers at this point. I'm not -- I'm not as up to date with those numbers as I should be perhaps. I don't believe we have a situation where we have the same number.

DR. LAPIERRE: Well, I guess then ---

MR. KAISER: We -- sorry, we can -- I can ask Mr. Duncan to help me out if he's more familiar with the numbers.

MR. DUNCAN: Certainly not more familiar with the numbers, but maybe I'll just provide some clarification on the SSTLs again in the context of the project that we're discussing here.

The SSTLs, as Mr. Kaiser referenced, were done as a baseline characterization of the risk of the sites as they currently exist. That characterization from the SSTLs established where there were unacceptable risks to human health and the ecological receptors. Through the derivation or identification of those areas, the project design configurations were more developed. Essentially where do you need to cap certain areas because you're in excess of those SSTL levels?

The SSTLs are essentially a management tool for screening sites from a risk perspective. If you're going to leave a site, are the materials you're leaving behind acceptable from a risk perspective or do you need to do additional remediation. The numbers that were developed through the SSTLs and the Human Health Risk Assessment on the baseline did help develop the project that you see before you that's being assessed.

In that context, the SSTLs -- now that the site is being remediated and capped, the SSTLs are in some way a bit irrelevant. So essentially what you're doing is covering up these contaminated soils and cutting off that pathway. So an SSTL that was derived for baseline conditions, if you're covering it up, it doesn't apply so much in terms of the objective that's being adhered to or attempted here as well.

DR. LAPIERRE: I understand that, and that's why I said there was two conditions, since you might use them. Now, are you going to use them as baseline for ground water pumping?

MR. DUNCAN: Mr. Kaiser obviously will jump in and correct me where I start to stray a little bit, but in terms of the SSTLs, there was no ground water SSTLs that were developed as part of the Phase 2/3 program. It was for surface water. And we do have criteria that are going to be developed for the discharge from the water treatment plant for surface water, and we are evaluating the SSTLs as they currently exist, as well as the CCME guidelines for the protection of aquatic life.

DR. LAPIERRE: So what are your guidelines to stop pumping ground water? When would you decide that you've pumped to the limits -- you don't need to pump any more? You wouldn't use SSTL as a baseline? Once you arrive at a certain level, you could stop pumping? Or are you going to continue pumping and to use your SSTL at the waste treatment site but ---

MR. DUNCAN: We may have answered that in the IR, but I don't know what the number would be right off. But my understanding is that we -- what we're -- the next stage of the project after the assessment is we're going to work with the local regulators to determine what those specific discharge criteria will be, and they will be, as we suggested, either the SSTLs that were developed for the surface water, in the case of the water treatment plant, or the CCME guidelines. And when the treatment facilities -- the objective is to make sure that the water that is discharged meets those criteria for -- before it's discharged from the water treatment plant. And to go down the road is -- I think is where you're going -- is does the water treatment plant need to continue -- at what point can we stop treating the water, I guess. And I'm not -- to be honest, I'm not sure if that was one of the objectives. The management is of the contaminated ground water to ensure it's treated before it's discharged. At some time, if the monitoring, as we discussed earlier, demonstrates that there is no need for further treatment, then the Province would have to, I guess, essentially evaluate whether the treatment -- the further treatment of that ground water is warranted.

DR. LAPIERRE: I guess my question was more related to are you setting SSTLs for your pumping guidelines, and once you achieved them, then you could stop and you wouldn't need treatment any more.

MR. DUNCAN: I don't want to speak on behalf of the tar ponds, but I guess I am in a way. But I mean, certainly the objective is to get to a point where the treatment can be suspended. And we'll be in the process of dealing with local regulators to determine what is that end point? What would be more -- what would be the best criteria to use? Is it the SSTLs that were developed for a contaminated site, for the baseline, or are they perhaps the CCME requirements for aquatic life, fresh water aquatic life? And those are the type of discussions we need to have with local regulators to determine what is our end point to say we can stop treating this material because it meets those criteria.

I think the SSTLs were a good tool. The question would be, on future use, do you want to keep adhering to criteria that were developed for a contaminated industrial site as your end point. And a lot of it will depend on where you're discharging to for your surface water, but also your end use of the site. At the end of the day, are you looking at a recreational facility or a light industrial commercial. So that's where specific criteria have to be developed with the regulators.

DR. LAPIERRE: Thank you.

THE CHAIRPERSON: Related to that, then, the role that SSDLs play in the project, or don't play, could you just reflect on Mullens Bank, or any other parts of the Coke Oven Site that are not going to be caps or land farms, that means what, that those areas meet the SSTLs for certain uses? Because that's one of the aspects of the SSTLs is there were some decisions made about the human receptors that you were going to set these levels for, and they did not include, you did not set SSTLs for residential use, for example. Presumably someone made a decision, at some point, that there was not going to be residential use, and you could reflect on that. Anyway, moving ahead, Mullens Bank, have SSTLs applied to Mullens Bank and what do we know about Mullens Bank and its future? I'm sorry, just to clarify, Mullens Bank is not -- is an area -- I'm sure you all know this, but Mullens Bank is not scheduled in the project description to have any remediation take place in that part of the site.

MR. KAISER: Yes, thank you. The Mullens Bank question, there is no risk driver there, there's no SSTL being exceeded so that's why we're not capping the Mullens Bank area.

THE CHAIRPERSON: Yes, but the SSTLs, you're not contemplating that you could have residential use there, and if not, why not.

MR. KAISER: We've never had the intention of bringing the site back to residential use. That was a decision that was made early on, and all of our decisions have been predicated on that early decision, and for that reason we haven't -- we haven't considered developing

SSTLs for residential use on the Mullens Bank area.

THE CHAIRPERSON: Well, you know, I have to ask how was that -- who made the decision, and on what grounds was it made?

MR. KAISER: This was a decision that was made by the government partners in conjunction with the Joint Action Group in the previous years. There was really no, I guess, feeling or expectation that there's a requirement for that area to be developed as a residential area.

THE CHAIRPERSON: Is there some reference to it? I mean, not off the top of your head but would you be able to provide a reference to that in terms of JAG's -- was there a formal decision or a formal recommendation that came out of a JAG process that could be referenced? I know you'd have to go look for it, but -- or would you like to go look for it and ---

MR. KAISER: That's certainly something that we could look for and bring back to the panel. That was, you know, sort of a decision made during the consultative period that took place at that time. We should be able to find reference certainly in some meeting Minutes and ---

THE CHAIRPERSON: Um-hmm. It's particularly of interest, I would have thought, if you have a part of the site where you're not planning to do any remediation now. It may well be that that site would not meet SSTLs for residential use, I have no idea, but I guess none of us know, do we, because there were no SSTLs prepared for residential use.

MR. POTTER: And part of the issue, too, I believe, was that going back from 6 years maybe, by memory, and my memory's getting like other folks, but we had input back from the municipality that they didn't see that land area being part of their future land use plans. It's currently zoned as industrial right now, and the long-term planning strategy from the municipality doesn't envision that land become part of a residential area, and I think that's where -- we'll go back and check, but from vague memory or recollection I think that's what it was, that we did have feedback from the municipality at the time that the long-range Municipal Planning Strategy did not see that property coming back into a residential development possibility.

THE CHAIRPERSON: And that's the whole property of the Mullens Bank area.

MR. POTTER: Yes.

THE CHAIRPERSON: The whole property.

MR. POTTER: Yes.

THE CHAIRPERSON: Okay, thank you.

DR. LAPIERRE: I would like to ask a question relating -- which relates to the current landfill. My understanding that the landfill has been capped. It does not have -- it has a barrier, and I guess the question is, is there leachate expected from that landfill over time? And, if so, where is it going?

MR. POTTER: There is currently leachate coming from the landfill. There was a substantial improvement made at the landfill. That work became part of the earlier cost-share agreement with the federal and provincial government and the municipality. Most of the remediation, as you indicate, was a capping. There was also venting, methane venting installed there. There was a shallow leachate collector installed as well as some brook realignment and some cutoff barrier walls to divert some groundwater flow.

The remaining component of the landfill remediation work was to deal with or address the leachate. In the course of our project below the site, we incorporated into our new coke oven brook realignment, a design for the eventual leachate collection system. We designed it. The responsibility for it is with the -- lies with the municipality. The municipality, I understand, is now advancing that project. I believe it's probably just heading into the design stage right now. They have identified it in their capital programme for funding purposes, but the leachate collection component is being looked after by the municipality and is outside of the mandate of our project right now, but it will be getting addressed.

DR. LAPIERRE: So you have no concerns with leachate moving onto the Tar Ponds through the groundwater.

MR. POTTER: There would be deep leachate, probably some deep leachate coming up onto the Coke Oven Site, but that was all considered during the design of our system and we'll have the groundwater being addressed at the bottom end of our Coke Oven Site. That was part of the consideration when the design was being looked at.

DR. LAPIERRE: So could you just give me an indication how you're going to treat that leachate? Is it just going to go into groundwater and is it below your -- you're going to put these pilings in, can it go underneath those pilings?

MR. POTTER: The design -- just let me check for a second here, make sure I'm certain. Yeah, the groundwater flow on the Coke Oven Site is a recharge area or discharge area, it's coming back up, it's not going deeper, and we'll deal with that shallow water at the lower end of the Coke Oven Site. It won't be bypassing or going down deep into the aquifer and somehow getting by our system. Our system will catch -- if there is any leachate of concern making its way down to the lower end of the Coke Oven Site, the system will deal with it.

DR. LAPIERRE: It won't get into the fractured bedrock.

MR. POTTER: It may very well be in some shallow fractured bedrock but that will be addressed when it gets down to the lower end of the site.

THE CHAIRPERSON: We will now take a break. It is almost quarter to 3:00 and we'll resume at 3 o'clock. Thank you.

(18-MINUTE BREAK)

THE CHAIRPERSON: We would like to get started again, and our undertaking is to finish around about 4 o'clock.

Now, the other thing I'd like to say is it's incredibly warm in here, so I would just like to say that if anybody feels that they have to remain formally dressed for the -- to make a good impression on the panel, you've made your impression, now feel free to take your jackets off and cool off.

MR. POTTER: Madam Chair, we do have copies now of the presentation, the written presentation and the slide presentation. Would you like that as an exhibit, or just simply it can be handed out? We have copies at the back of the room?

THE CHAIRPERSON: Well, we'll have -- you distribute them as you will, we'll let you distribute them and we'll obviously take copies ourselves.

I would like to start as I did last time with two follow-up questions to previous questions, short, I hope, and the first question is back yet again on the monitoring issue.

In response to my question at the start after lunch, I asked could you clarify how much monitoring would take place, and your reply was 25 years' worth of monitoring after 10 years of construction. It seems like that might push you outside the boundaries of the memorandum agreement which was for 25 years in total, was it not? Anyway, that is my question of clarification. If you are outside the funding of the agreement, I guess the question would be how would the additional period of monitoring be funded?

MR. POTTER: I have a copy of the memorandum here. It is 25 years after completion of the project.

THE CHAIRPERSON: In the memorandum it's 25 years.

MR. POTTER: Yes.

THE CHAIRPERSON: So the funding can continue through to that.

MR. POTTER: Yes, so it's 33 years, I guess, if you wish, for the length of the agreement.

THE CHAIRPERSON: All right. Well, thank you for that.

And I'd just like to go back to the SSTLs discussion. Dr. LaPierre asked this question, and he made reference to the fact that there are two reports, two separate reports that developed SSTLs, site specific target levels, as for the purposes of screening issue explained. The references that I have here are JDAC 2002 and CRA 2003. This is -- and so the question -- and these are apparently not -- I understand these are not reports -- you know, one report doesn't deal with the Tar Ponds and one report deal with the Coke Oven Site, so we'd just like some clarity why two reports on SSTLs were prepared, or perhaps -- and which are you using.

MR. KAISER: Actually, there are two separate reports. They were produced by CRA based on the work of JDAC, and one report is for the coke ovens, one report is for the Tar Ponds. I'm not certain what reference you have there.

THE CHAIRPERSON: So you're saying that

JDAC did the first work and then derivative from that CRA did two more reports on SSTLs but using JDAC's information?

MR. KAISER: That is correct. The risk assessment work was done by JDAC. The risk assessment work was then compiled into SSTL and RAL reports by CRA.

THE CHAIRPERSON: All right. Thank you very much. That's fine, thank you.

DR. LAPIERRE: I would like to ask a question that relates to IR-17, IR-17(f). I guess it indicates that terrestrial and wildlife and vegetation -- and what I'm interested in is the comment that says -- indicates succession will occur and be established up to 15 to 20 years. I'd be interested to know what succession that might be. My understanding is that you would -- my limited knowledge of ecology in Nova Scotia would be that you'd have something more than just grass. So what is that equilibrium, and how would you propose to define it?

MR. DUNCAN: Just very briefly, as we had indicated earlier Dr. Malcolm Stephenson isn't here, and some of the information that he provided in his responses is information that he generated, and if he is able to provide a more fulsome response when he's here in attendance on Monday, that would be -- hopefully that's helpful. I will attempt to respond to that.

Certainly we expect to see successional species start to establish themselves in these areas much earlier than that. What we're anticipating from an early successional stage is that we had anticipated coming to some level of equilibrium within 15 to 20 years. Beyond that, I'm not -- I'd probably want to wait till Dr. Stephenson is here to respond more fully if you have further questions on that.

DR. LAPIERRE: I guess my concern relates back to the integrity of your cap.

MR. DUNCAN: I think the areas that we're referring to are in areas that will be designated for habitat restoration, and there are specific areas, certainly the areas along the established channels. If the final end use is recreational and, you know, it doesn't anticipate habitat areas, certainly there will be happier management of those successional stages of revegetation to ensure that the cap integrity is maintained.

With respect to root -- I assume you're talking about root intrusion and breaching of the capping materials, I suspect that's -- I'm not sure if Mr. Shosky can expand on that a bit more with respect to the thickness of the cap and how that may have been contemplated in the design of the capping.

MR. SHOSKY: Thanks, Mr. Duncan.

Typically, when you install a cap, you put a soil cover over the cap that would accommodate a certain type of vegetative cover. At this point in time, I would think that we are not contemplating any deep-rooted systems out, they're all shallow-root systems. In a maintenance programme, those deep-rooted species would need to be removed in order to maintain the integrity of the cap.

Now, if one were to want deep-rooted trees in certain locations, there are ways to accommodate that, but it would take a modification of the basic concept we have right now for the cap design by either making a thicker soil cover above the cap or putting in pockets of container, so to speak, so that a tree or a bush could live within that designated area.

DR. LAPIERRE: So it's more a managed than an equilibrium ecosystem.

MR. SHOSKY: Yes.

DR. LAPIERRE: The next question I have is on underground infrastructure that presently exists. Do you have a site characterization of the underground infrastructure, and do you know if, in any way, it will impede groundwater flow across the -- particularly, I guess, the Coke Oven?

MR. KAISER: Yes. At this point in time, we have a fairly good understanding of the infrastructure that exists underground at the Coke Oven Site. We know that it does certainly have an impact on groundwater flow in that area. However, due to the anticipated design of the collection and treatment system for groundwater at the Coke Ovens, we don't expect that there is any particular issues or problems with the infrastructure, and most of it will stay in place.

DR. LAPIERRE: So you will have segmented collection areas?

MR. KAISER: No, sorry, the groundwater flows from east to west across the site and will be collected at the western side of the Coke Oven Site.

DR. LAPIERRE: And the infrastructure won't impede any of that water flow.

MR. KAISER: From what we understand, at this point in time, and we have a lot of confidence in what we understand now, we don't see or anticipate any problems.

DR. LAPIERRE: Okay.

THE CHAIRPERSON: Dr. LaPierre brought my attention right now to this Table IR-17.1. The question that we asked, and he asked a question about it, but the question that we asked was indicate how the -- "In a table, indicate which valid ecosystem components have a temporal boundary of 25 years or less, and explain how the persistence of the anticipated environmental effects of each valid ecosystem component relate to the identified temporal boundary", which is kind of environmental assessment speak, but we were basically asking well, after -- 25 years after you finish construction of the project, what are you predicting -- which cases are you predicting that there will continue to be interaction between the project and valid ecosystem component. So we asked for you to provide that to us in a table form, which you did, and interesting, I think the majority of the ones that you've -- of ecosystem components, in fact, are shown as interacting for -- past a temporal boundary of 25 years, and this is apropos of a discussion this morning about permanence and walk away and all the rest of it, but I -- one of them is groundwater resources, and you state in the answer here that:

> "The containment system that is designed to isolate the contaminated groundwater quality on the site will operate in perpetuity."

So, sorry to keep flogging a dead horse

but does that mean -- if something is designed to operate in perpetuity, does it mean it's designed to operate in perpetuity but won't require any ongoing maintenance? And you've checked the block for "over 25 years" here. Are you just being super conservative and you actually think that -- well, you said this morning that your prediction is that the contaminants will, in fact, have decayed sufficiently that they're not going to be a problem past 25 years.

MR. SHOSKY: Madam Chairman, in looking at this, there is a couple of things that are important to understand. One is that the collection systems that are envisioned to be installed out there are natural systems made of trenching using materials like rocks, and things like that, to enhance the drainage to collection areas. Those will be there in perpetuity because they will not be removed at the end of 25 years.

Now, there will be a monitoring programme that will go through that 25-year period along with a water treatment programme, if needed. There is a possibility that, at the end of 25 years, water treatment will not be needed beyond 25 years. At this point, I think we erred on the side of being too conservative and checked the box that it would last longer. It is something that would be looked into over the course of the performance of the project for 25 years.

MR. DUNCAN: Just to add to Mr. Shosky, I guess just in the interest of prudence the perpetuity speaks to the design of the treatment facility. We have to ensure that the facility can be designed to have ongoing treatment beyond that timeframe. The subsequent part of the response does speak to the fact that whether that needs to be continued will be dependent on the monitoring or, I guess, the results of evaluating the requirement for that system at that time, and I think it's just the necessity of the system that, as we spoke earlier, may be a belt and suspenders a little bit, but in terms of prudence it should be designed to carry on beyond the 25-year period.

THE CHAIRPERSON: Now, the statement is the containment system not the treatment system.

MR. DUNCAN: Thank you, you're correct, and as Mr. Shosky pointed out, the materials that are in place such as clay, bedonite clay walls and stuff, will not be removed upon that 25-year period.

THE CHAIRPERSON: Um-hmm. Well, I think this is going to be, I think, of big interest to the panel, and an important factor to explore later on, not right now, and I know there'll be other people who'll want to ask questions or have opinions on exactly the length of time that the containment system must operate effectively, and so I imagine we may be pursuing that, but thank you.

MR. POTTER: If I may, Madam Chairperson, you know, we are sort of struggling a little bit on this 25 or 33-year timeframe, and we have to keep in mind that, you know, the proponent, Sydney Tar Pond Agency, has a project that, you know, we are carrying out, implementing. There will be opportunity, I think -- when other departments come before the panel to speak, some of the funding partners who are participants in the MOA, I think they can perhaps address, as well, the intent that was written into the MOA as for what will happen at the end of that 25-year period. We have a limitation on exactly what we can say is going to happen in 33-years' time but I'd certainly encourage the panel, when other departments come up before you, to bring that topic up again, as well.

MR. CHARLES: I have one or two questions about the Coke Ovens and the bioremediation or land farming that's going to take place there.

Am I correct in assuming that only roughly one third of the Coke Oven area will be capped and/or land farmed and two thirds will not be touched? The reason I'm asking the question, I'll elaborate a little bit, in IR-23, one of our requests for information, you advised us that Figure 2.3-2 illustrates the capping areas and the areas within which land farming would be conducted, and Figure 2.3-2 shows three areas in green, okay. Are we there?

MR. KAISER: Sorry, one moment, please.

MR. SHOSKY: We actually have a blow-up of that diagram we'd like to present.

MR. CHARLES: A blow-up of the diagram, in large print, everybody can see it?

MR. SHOSKY: Perhaps only the first row.

MR. CHARLES: Well, we'll pass the word.

MR. DUNCAN: Just for the record, this is a representation of the figure that you referenced in the EIS, it's essentially the same figure just blown up for presentation purposes.

MR. CHARLES: All right. Here comes my specific question. When you look at that and you read what the text says, it says that these areas are to be land farmed and/or capped. Now, does that mean that all of those areas will not be both land farmed and capped, that there were some areas that will be only capped but not land farmed, some that will be land farmed and not capped?

MR. SHOSKY: Realistically, all the areas that are identified to be land farmed will be capped. We left "and/or" there just in case the clean-up levels that were previously discussed were attained, but in reality if that doesn't happen, which I seriously doubt, those areas will be capped.

MR. CHARLES: And the areas that are not land farmed and capped, how would you describe the risk that they represent? Is there any way numerically to assess the risk for human health or for ecological purposes, is it low, high, medium?

MR. SHOSKY: Yes, I'd like to defer that question over to Dr. Magee.

DR. MAGEE: The risk assessment assumed that all of those areas are going to be capped, not just the areas that are in colour for you. The areas in colour are to be land farmed and capped. All of the other areas will be capped with the same capping material as would be applied to the land farmed areas.

MR. CHARLES: So the entire Coke Oven area will be capped.

DR. MAGEE: Not the entire Coke Oven area, but the entire area -- is there a big line on this figure? I can't see it. I can refer you to a figure in the Risk Assessment Report, which is Figure 4.3, Volume 5, and it shows not the far east and not the Mullens Bank but all of the other area, including where the tar cell is, including the three land farmed areas, including the area around the tank and where the waste water treatment plant will be, and including the area to the north of the big land farmed area, that is all assumed in the risk assessment to be capped, and I will double check with my colleagues that that is, in fact, what the current proposal is, but it is certainly how I performed the risk assessment. So not the entire coke ovens, but that entire central area.

MR. CHARLES: That's the assumption for risk assessment.

DR. MAGEE: Yes. So I will now defer to my colleagues.

THE CHAIRPERSON: Could I just ask, I know that if you're speaking you need to speak into the mic, but is there somebody who's not speaking who could just come and show us on this map that area you've described, roughly.

Perhaps while that's getting organized, is there a difference between -- when you say that the assumption that was made, the areas to be capped for the risk assessment, is that something different from the areas that will be capped? In other words, I mean, in all matters to do with risk assessment you assure us that everything's very conservative. If you've got -- this area that Dr. Shosky is about to show us, is it the area that was assumed that was going to be capped for the risk assessment, but is it also the area that will be capped?

DR. MAGEE: Well, let me first state that the areas that were slated for land farming were certainly the areas that the Phase II-III risk assessments showed were -- had the high risk that exceeded the risk criteria and required some action.

MR. DUNCAN: Perhaps just for clarification, I just want to make sure we're clear, the EIS shows areas from the initial project design that were designated for capping, for land farm and capping based on the SSTLs as we discussed earlier.

Dr. Magee described a process where there may have been some contemplation of capping the entire site, so in the interest of being conservative and to ensure that we captured those types of activities for the whole site, he ran his human health risk assessment on a very conservative assumption that the whole site will be capped, and therefore you would have increased traffic, dust, those types of things. So we just want to ensure, just to be clear, what's presented in the EISs, which is the project as conceptualized based on the risk assessments that were previously done, the work that Dr.

Magee did to ensure that the human health risk assessment was conservative, and included all the additional components.

Now I think Mr. Shosky is going to explain to you what actually is being contemplated for implementation during some of the pre-design information that he's been working on.

THE CHAIRPERSON: But, in a nutshell -- I mean, you kind of caught us by surprise there, I think, and in a nutshell we're back to the green blobs.

MR. DUNCAN: I believe we are, but we're going to probably expand those. The difficulty is drawing the line on the map where the green blob stops and starts. And if it's based on soil quality data, again you want to be somewhat conservative in ensuring that your capturing area is adjacent to those. A bulldozer isn't that refined in terms of identifying that line on the map. So, of course, there have been decisions made during the pre-design stage to ensure that -- from a logistics perspective what makes sense. I mean, we're targeting specific areas, but let's be realistic from a large earth-moving project what will realistically be applied in the field.

MR. SHOSKY: Thank you. Generally speaking, it will be this entire area will be capped, some topographic nuances and things of that nature that come into play, but generally speaking it's this area. This, as it states here, is a possible landfill location for non-hazardous clean debris. That will also have a small cap on it as well, depending on what the footprint of that landfill is. But, for example, this area here would not necessarily be capped unless it was associated with the footprint of that landfill. So the cap really encompasses the green blobs and a bit of a distance around them.

MR. CHARLES: What was the criteria that was used to decide what would be capped and landfilled? Was it SS -- site specific target levels? Or something else?

MR. DUNCAN: Yeah, that's correct. The green blobs were derived from the site specific target levels from the preliminary risk assessment work. That provided the conceptual basis for the project as defined.

MR. CHARLES: So anything that's outside the green blobs that's not been treated, land farmed, capped, would be considered from a risk assessment point of view both for human and ecological purposes to be safe?

MR. DUNCAN: Everybody's nodding at me, so I guess that means yes. You're quite correct, the risk assessment, if it didn't identify those areas specifically for remediation, they were below those SST levels that were established for the risk assessment work.

MR. CHARLES: So when I used the term "safe" and you all nodded, that meant that the PAHs or anything else that might prove harmful are below a level that's acceptable.

MR. DUNCAN: Certainly I can't speak to the previous work, and this is -- what we're talking about here is some historic work that was done to base the project on. Mr. Kaiser referenced a couple of reports by JDAC and CRA, but the premise of those reports is yes, if those areas are below the thresholds of the SST levels, they don't require any further -- they don't, I guess, provide an inherent risk or risk to human health or the ecology, and therefore do not need additional remediation.

MR. CHARLES: And would those SSTLs be anywhere near similar to CCME guidelines for either residential soil or parkland or something like that? Would they be more conservative or less conservative?

MR. DUNCAN: We don't have those reports in front of us in terms of the basis of them, but certainly they are site -- as they indicate, the title indicates, they're site specific and are derived for the baseline soil conditions that currently exist, and specifics of that site. We have to check in relation to how they match up to CCME criteria for different land uses.

MR. CHARLES: Is that a difficult job?

MR. DUNCAN: For someone I'm sure it's not, no. We will certainly undertake to have that provided for you.

MR. CHARLES: Just as an uninformed law professor, I'd be interested in just doing, you know, the comparison.

MR. DUNCAN: We certainly will do that, sir, yes.

MR. CHARLES: Thanks. I have another question. I think, at some point in the discussions with public comments, it was suggested that engineered cells might be more effective from a fire remediation point of view and land farming point of view than not. And, as I recall, the response was that engineered cells would be 30 to 50 percent more costly than just tilling the soil and going at it that way but also the response said that it would be less effective, and that's what I wondered about. Why would engineered cells be less effective than tilling? Is there any particular reason that you know of?

MR. SHOSKY: That's a good question, and it's a question that comes up a lot related to bioremediation, and there's a couple of schools of thought on that.

If you look at research, I recently completed a large composting project on Cape Breton in Port Hawkesbury at an oil terminal there, and it was a very, very successful bioremediation operation, but the types of materials that we were bioremediating were TPH compounds, a regular thing that you would find at a terminal operation, and we chose not to land farm that material but, instead, to use a composting operation, and ultimately kind of a combination of both, but primarily the majority of the contaminants were knocked down by composting. In that instance, it was extremely more cost effective to do that because of the fact that we were limited on available land that we could till the material into, and there were other cost constraints that just made the biopiling or composting more economically feasible.

When I took that same analysis to the Coke Oven Site and reviewed it, there's a couple of things that you rely on with bioremediation activities, particularly in a land farming application using --

looking at PAHs. With PAHs they're a much more difficult material to biodegrade. There is some evidence that shows that bioremediation of some PAHs does occur, it's not very -- it's not very fast and a lot of the data is pretty sketchy, but one thing that we do know is that there are PAHs also that degrade under ultraviolet degradation, sunlight, sunny days and things of that nature.

So, in this case, I believed it was much better a treatment method to go ahead and utilize land farming here because you would have more of the elements that would cause the PAH compounds to break down just besides bioremediation by relying on the availability of UV light, and also we had a lot of land available here. It was already laid out in an area, we didn't have to go in and construct a new land treatment area, we were just going to treat the materials in place. So under those conditions was why I made that decision.

MR. CHARLES: And that's the distinction between regular tilling and an engineered cell is that the engineered cell you take the material out and you process it in some way, right?

MR. SHOSKY: That is correct. Now, I would like to add, though, and we are going to go through the tilling process here and we will be adding fertilizer at a specific rate, we will not be inoculating that area with any bacteria or anything like that because there's also two different schools of bioremediation technology, those that believe in inoculation and those that believe in utilizing the natural bacteria, and I come from the school of thought of using the natural bacteria and trying to enhance that before inoculation. So it's a pretty straightforward land farming/tilling operation. Of course, we'll have to take controls with odour and dust control and things of that nature, and that's all contemplated as part of the plan.

MR. CHARLES: Thank you. My final question has to do with tar on the Coke Oven Sites. I've seen references that indicate that the tar that's in there can be sort of identified in specific areas or pools. I've seen other comments suggesting that it's widely dispersed throughout the Coke Ovens in sort of very small quantities but nevertheless dispersed throughout. And the fear is that in the hot weather this tar will come up to the surface. I take it you've considered this as a problem, and I guess my question is which is the correct view of it, are the tars in discreet areas or pools, or are they dispersed widely?

MR. SHOSKY: The answer is that it's a combination of both. There are pockets of tar and those pockets of tar are distributed widely within the area that they've been investigated. It's not a major pool in the sense that all those pockets are together. It's like truckloads of tar that may have been dumped inside a bunch of debris periodically in different areas, but it's not a big pool, so to speak, of tar. So there's these spots of tar that are dispersed in a wider area but they're not continuous.

MR. CHARLES: Is this a real risk that in warm weather the tars will percolate up, or not?

MR. SHOSKY: It's the natural nature of tar that it will.

MR. CHARLES: So the answer is yes.

MR. SHOSKY: Yes. And we've compensated for that in our thought process of dealing with it in that we know there is going to be certain of those areas that will need to be removed and treated.

MR. CHARLES: Removed and treated, is that what you said, I'm sorry?

MR. SHOSKY: Thermally. Yes, removed and treated thermally.

MR. CHARLES: Have you any idea what the volume might be of that?

MR. POTTER: If I could try to help, those pockets or small pools were identified way back in our very first Phase I work that was done on the site, and it was during the initial phase of doing that work we identified that there was some very discreet, very small little, I'd call them puddles as opposed to a pocket, but very discreet small amounts of tar that would likely -- just during the process of cleanup of more than likely the tar cell where there's, you know, a significant volume of tar there, we'll probably just go and scoop up those small identified puddles. We know exactly where they're at from that first Phase I report, so we'll pick those up at that point in time, more than likely.

MR. CHARLES: What about the widely dispersed material which you don't know about, that you don't know the exact location of it, too small?

MR. POTTER: The short answer is is that these pockets would be picked up and taken up to the thermal treatment plant and treated.

This morning we talked an awful lot about the Tar Pond cells and incineration process with the Tar Pond cells, but there's also a process in place right now for us to burn/thermally treat the tars in the tar cell area, as well, where these various pockets of tar that we've been discussing are, and that's the intention would be to pick up those as they're encountered and treat them.

MR. CHARLES: But are you confident that you can pick up all the tar that's in the Coke Oven Sites? I'm concerned not about the pockets that you know about, the discreet pockets that you can identify, but the lot more widely dispersed stuff that doesn't appear as a nice neat little pocket but which may, nevertheless, come up in the hot weather.

MR. POTTER: Well, as we've put together the estimate for the volume of material that needs to be treated from that area, we believe we've been very conservative in that and that we would be able to pick up some of these other outliers during the process of doing the remediation work.

MR. CHARLES: All right. Well, I wish you lots of luck with that.

MR. POTTER: Thank you. Perhaps I'll just try to clarify a little bit.

We don't believe there are widespread areas of tar. We have areas in the coke oven site where we have to do some bio-remediation landfarming, and we have the tar cell, actually two discreet areas by the tar cell that have to be dealt with. The little -- what I refer to as -- puddles that we'll pick up, but we -- I don't believe we have any areas where we've identified there being widespread tar on the site that would require any remediation or action.

MR. CHARLES: And do you have a difference of opinion on -- between yourself and the other gentleman who spoke?

MR. SHOSKY: I'll answer that.

No, I think it's just a difference of scale of viewing, viewing a particular situation and not having the luxury of putting it -- our two views on paper. We're on the same page and the same -- the same scale.

Thank you.

MR. CHARLES: Thank you.

MR. POTTER: The overriding point is that we have sampled the coke oven site extensively. There's barely a rock that hasn't been turned over or a hole punched in the ground somewhere on that site. And we have a very, very good understanding of what's there, and -- we're on the same page.

THE CHAIRPERSON: Turning to the caps. Two different caps, two different locations, two different purposes, I presume.

Could you tell me a little bit more about -- maybe just run over again -- I know you've provided the information in the EIS -- but run over again how the two different caps -- the components of the two different caps, perhaps you could explain what functions each has to serve and so why the different design?

MR. SHOSKY: Each one of the caps has a similar purpose and is basically to limit infiltration into the underlying materials.

In general, in working in many different locations, many different climates all over the world a typical cap -- a capping strategy is typically one metre of clay material at 10 to the minus 6 or lower hydraulic conductivity.

In the coke oven site, it's a more traditional application of a cap where we are looking at limiting the amount of infiltration over a period of time.

Both that cap and the cap on top of the tar ponds both share that same characteristic. Both share the same characteristic that they need to support some sort of vegetative cover.

Both caps have a few differences with them that we're currently in the process of evaluating, but in general the biggest difference is the fact that the -- that in the coke oven site we don't feel that we're going to have a lot of up pressure of water through that -- groundwater through that system, as we feel that we're going to have with the tar pond area, which is why we have the infiltration trenches.

THE CHAIRPERSON: But there are other differences aren't there in the caps, and then you have -- what you call it -- a synthetic -- a geosynthetic clay layer in the tar ponds.

Could you just specify what the different layers are in the two different caps?

MR. SHOSKY: Yes, I can. Just give me a moment.

We actually have -- we have a picture of one for the slide presentation and we, I think, have a -- do we have a hard copy? We don't have a hard copy of it.

Would you like us to put it back on the screen or ---

THE CHAIRPERSON: I remember that one. I got to say we had trouble with that, understanding it. It wasn't the clearest one, you know, even when it was in front of us, let alone on a screen. I just wonder if you could perhaps produce on a single piece of paper, just a clear drawing that show the different layers, even -- but anyway verbally. Just provide sort of verbally from the bottom.

MR. SHOSKY: I'll verbally describe it from the ---

THE CHAIRPERSON: From the top?

MR. SHOSKY: Yeah, from the top down, and -- just give me a moment here.

Hold that one open. Well, Madam Chairman, I'll go ahead and start with the tar cell. I'm sorry, the tar ponds.

At the top of the tar ponds, we roughly have .1 meter of topsoil. Something that would support some sort of vegetative growth.

The next layer ---

THE CHAIRPERSON: I'm sorry. Let me ask. Which sort of vegetation growth? I mean, what could you grow in that?

MR. SHOSKY: Grasses. Small shallow root system shrugs. Things of that nature.

THE CHAIRPERSON: There's no tree that ---

MR. SHOSKY: This would not be -- this is a very basic design.

It's not designed to have deep rooted tree systems.

The next layer we have some variability in, which is .5 to 1 metre, and the reason -- and that is a clay material that has a characteristic of at least 10 to the minus 6 centimeters per second.

That ---

THE CHAIRPERSON: And that's a natural material.

MR. SHOSKY: And that's a natural material. The reason that it varies in length is because the final grading plan isn't finalized yet, and it's such a large area that the rise overrun is considerable.

The next layer is what we call a GCL, which is -- basically it's a geosynthetic liner, and what it is is clay that is sandwiched between a fabric, and the fabric is like a felt type of material. So, you'll have a felt, a clay and then a felt again. And it comes on a roll and it gets installed in that fashion, like -- kind of like carpet.

That material -- the clay that's in there and the way that that material is designed it has a permeability of at least 10 to the minus 9 centimeters per second.

Now, below that we have some granular material, where these drains come in.

So, when the water comes up through the stabilized material it gets stopped at this 10 to the minus 9 material and goes the directed way we'd like it to go towards the channel.

That's the basic design for the tar ponds cap.

THE CHAIRPERSON: The water is coming -- these vertical channels ---

MR. SHOSKY: Yes.

THE CHAIRPERSON: The water is coming up from below ---

MR. SHOSKY: That's right.

THE CHAIRPERSON: That's the pressure of water coming up from below, it would come up -- potentially it could meet -- if it got right to the top it would meet this granular material layer ---

MR. SHOSKY: Yes ---

THE CHAIRPERSON: --- and then it would flow that way?

MR. SHOSKY: Yeah, and we have a drainage system that is part of that water management system.

THE CHAIRPERSON: And the reason why you have to -- no, you tell me about the coke ovens cell -- cap.

MR. SHOSKY: Currently right now we are anticipating having a -- again a very indepth -- a topsoil layer and then a .3 meter of clay, and then direct contact with the material we intended to cover.

THE CHAIRPERSON: So, no drainage layer, no grandular material.

MR. SHOSKY: No, ma'am.

THE CHAIRPERSON: And you don't need that because ---

MR. SHOSKY: Not in this instance because we feel that that design would be adequate enough to inhibit downward mitigation of water that's infiltrating into the system.

MR. CHAIRPERSON: So, it's just the stakes are higher in the tar ponds? Is that the idea?

You got to have a more expansive, more elaborate cap on there, because you cannot -- you can afford to have a certain amount of infiltration on the coke oven site, because you are collecting and treating?

MR. SHOSKY: Yeah, that's partially true, and also it's just a different type of material.

A lot of the material from the coke oven site will be removed or the shallow material treated and then capped.

So, it's a different -- there's different environmental conditions in each one of them.

THE CHAIRPERSON: Is there any chance that in the tar ponds case, where you have the grandular material layer, drainage layer there, that if water goes into that, is there any chance that that could freeze?

MR. SHOSKY: Having spent a couple of winters here it -- it gets pretty cold, that's for sure, and I believe with what we have for the design right now we would be not concerned with freezing of that -- with that particular -- in that particular condition.

Although I will say that that has been something that has come up recently that we are going to do more detailed investigations on.

THE CHAIRPERSON: And you didn't specify -- well, I think you have -- I know you have -- but you didn't specify this time about the depths, the minimum depths of topsoil on the coke oven sites. Of the same order as the ---

MR. SHOSKY: That's correct. It will be anywhere ---

THE CHAIRPERSON: Actually, my notes here were -- prepared from EIS, I believe, indicated that you're anticipating a thicker -- a minimum topsoil layer on the coke oven side.

MR. SHOSKY: Yes.

THE CHAIRPERSON: 0.2 meters, as opposed to 0.1 meters?

MR. SHOSKY: Yes.

THE CHAIRPERSON: Can you put more on -- with 0.2 meters?

MR. SHOSKY: Not much more. It would still be shallow rooted systems.

It's just an added protection on the clay liner. In reality when this goes to final design it will probably have a thicker cover soil over that clay liner in order to accommodate for grading changes and things like that in that area.

THE CHAIRPERSON: What do you need for trees?

MR. SHOSKY: Well, it depends on the type of tree or -- but we would need probably at least a meter for some species or most of the species that we would possibly want out there.

THE CHAIRPERSON: And would a meter give you a decent size tree?

MR. SHOSKY: Not a real big one.

THE CHAIRPERSON: Okay. So, in other words any trees would have to be carefully chosen. These are not trees that can ---

MR. SHOSKY: Carefully chosen or the -- or let's say for example the land was contoured instead of having a pancake flat site it was contoured with some rolling hills or something like that, where some fill was brought in that would allow full development of a root system and items like that.

Currently, with just a flat service with the minimal thickness that we have, it would not support trees. In order to support larger trees, you would have to add additional soil into those areas.

You know, maybe not over the entire site, but at least over those areas that you wanted to have the trees.

For example, I worked on a sports complex in Massachusetts that we did a site which became a soccer field and kind of a sporting area where we had grass over the cap that we had, and it was also the soccer field. We had a parking lot and then we had on the periphery of the capped area some trees and things like that.

Where those were planted we had to take special care in making that area deeper and conditioning the soil so that it did not impact the capping material.

So, again, once final contouring and uses is found there it will be possible to support a variety of different growths. But the design has just not progressed to that stage yet.

THE CHAIRPERSON: And the -- if there were to be a landfill, how likely is that? The purple -- anyway my question is, if there were to be a landfill there, you referred to -- that it would need to have some kind of a cap. Now, is that a cap for infiltration, and would you have the same kind of restrictions or not?

Why would you need to have an impermeable cap for a non-hazardous -- just debris.

MR. SHOSKY: I might have gotten confused with the terminology.

What we're really looking for is a cover of material there to make sure that -- you know void spaces over the pieces of debris and things like that that we put in there are supported.

But it does not necessarily need to be a sophisticated engineered cap.

THE CHAIRPERSON: So, in terms of restrictions on the tree growth, we can more or less, generally, say that when we look at that that any areas that are white or purple would be -- there would have been no particular restrictions in terms of trees.

MR. SHOSKY: That's correct.

MR. POTTER: If I could just add to that, too, that it's important to recognize in the MOA that we're taking the project of the site to the point where the cover material is suitable for future use, potential future use, whatever that may be.

We're going to put a, if you wish, a minimum in to make sure that it's safe and properly designed and will last to the term of the design.

But it doesn't mean that somebody can't come in later on and say, "Well, we're going to put a golf course on this property." If that's going to be decided they would necessarily have to add additional contouring and trees and whatever else.

So, it certainly could be added in, but the design that we're dealing with only takes it to the point where it's compatible with future land use, whatever that might be. And the land user would have to decide if it's parkland, then it's got some trees. If it's light industrial land, presumably there might be a lot of pavement.

THE CHAIRPERSON: We're getting very close to 4:00 and I'm sure everybody is very tried and would like to stop, but just on that question in terms of the -- oh, yes, I lost my train of thought there for a second.

What will be -- realistically what will be the situation if there is a hiatus between you finishing -- and I'm sure you would prefer that there wasn't -- but a hiatus between you finishing the construction and permanent land use being established.

In other words, you've taken the site, you put the cap on, you've got it grassed, hydro-seeded, nice and green, can you just -- would you have to restrict entrance for that? Would that then be a publicly accessible site straight away, or does the --

maybe I shouldn't ask this question at the end of the afternoon, but -- or does the integrity of the containment system and the caps, in particular -- the integrity of the caps depends on there being a properly managed land use on that site, be it recreational or commercial?

For example, if you have grass -- you finished it, you kept it, you grassed it, you got no -- there's no funding to put a park on it or whatever, if there was some problem for a few years, then I presume you wouldn't want people running over that with ATVs or with motorbikes or whatever ---

MR. POTTER: The simple answer is no. We're not depended on an identified future land use.

We'll take the site to a condition where it can be maintained and it would be kept in a safe condition.

If there's -- more than likely if there's no identified use we'll have a grass cover on for -- simply for erosion purposes, and the provincial government will be the owner of the land, and we'll maintain that.

If at some point in time there is a determination of what that future use will be then perhaps the grass gets pulled off and something else comes in.

But we'll make sure it's always in a safe condition where the integrity of the management system is always maintained.

THE CHAIRPERSON: Well, I think the question -- my question is though is, does that integrity depend upon that site being managed in some way?

I mean, could you simply leave -- cap it, put the grass on it and let that be unrestricted and unmanaged public access?

MR. POTTER: That would be another no. We'll maintain that site. That's the commitment that's in the MOA right now that -- you know, along with the monitoring and the long-term care and maintenance of that site, I will remain with the provincial government.

THE CHAIRPERSON: But I'm still asking, can integrity of the cap withstand unlimited public access, if you don't have a, sort of, finished land use in place.

I mean, generally, a -- did he answer? No. No, I didn't get the answer to that.

If you got a large grassed, open area, you know what that -- the kind of uses that invites. I mean, great fun to take your motorbike there. I don't know.

Would you have to restrict those kind of uses and ---

MR. POTTER: We're back to the yes question -- answer now. Yes, we would.

A good example of that is a landfill. We did complete the landfill site, and actually it's being maintained by the municipality, but a fence was constructed around that, so that the cover would not be damaged by that very thing. The ATVs really liked that hill when we were doing the work and -- so, they are restricted from it, presumably there will be restrictions on the use of that land after our remediation project is done.

The important thing would be to maintain the site in its integrity as a management system.

THE CHAIRPERSON: All right. Thank you.

Well, I'd like to thank the proponent very much. It's -- I realize -- both for your presentation and for your fortitude in being the target of all our questions for a full day.

I know that that's not necessarily fun, and thank you for your answers and your diligence in trying to -- and your patience in dealing with some of our questions.

So, thank you to all of the participants as well for your patients and for being so attentive. We really appreciate that.

So this finishes this session for today. We will be resuming on Monday at 1 o'clock in the afternoon, and we look forward to seeing as many of you as -- who don't have day jobs or -- as many of you who are able to be present, or we'll see you in the evening perhaps.

So thank you all very much, and enjoy the rest of what's left of the weekend.

Thank you.

(ADJOURNED TO MONDAY, MAY 1, 2006 AT 1:00 P.M.)

CERTIFICATE OF COURT REPORTERS

We, Janine Seymour, Philomena Drake, Sandy Adam, Gwen Smith-Dockrill and Ruth Bigio, Court Reporters, hereby certify that we have transcribed the foregoing and that it is a true and accurate transcript of the evidence given in this Public Hearing, SYDNEY TAR PONDS AND COKE OVENS SITES REMEDIATION PROJECT, taken by way of digital recording pursuant to Section 15 of the Court Reporters Act.

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Janine Seymour, CCR
Philomena Drake, CCR
Sandy Adam, CCR
Ruth Bigio, CCR

Saturday, April 30, 2005 at Halifax, Nova Scotia