PUBLIC HEARING

SYDNEY TAR PONDS AND COKE OVENS SITES

REMEDIATION PROJECT

JOINT REVIEW PANEL

V O L U M E 10

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:	Tuesday, May 9, 2006
PRESENTERS:	Cape Breton Save Our Health Care Committee: Mr. Mary-Ruth MacLellan Mr. Ada Hearne Dr. James Argo Cape Breton Development Corporation: Mr. Merrill Buchanan Mr. Bob MacDonald Cement Association of Canada: Mr. Colin Dickson Mr. Wayne Adaska (Portland Cement - filling in for Mr. Conner) Portland Cement Association: Mr. Charles Wilk

---

Recorded by:
Drake Recording Services Limited
1592 Oxford Street
Halifax, NS B3H 3Z4
Per: Patricia Cantle, CCR

I N D E X   O F   P R O C E E D I N G S

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

--- Upon commencing at 1:34 p.m.

THE CHAIRPERSON: Ladies and gentlemen, we'll begin the afternoon session of the hearings.

This afternoon we have two presentations and two more presentations this evening. But before we move to our first presentation, I'm just going to ask if the Sydney Tar Ponds Agency has any undertakings they wish to present or, indeed, if any other participants have any other undertakings.

MR. POTTER: Thank you, Madam Chair.

We do have one undertaking today. It's unnumbered. It falls between No. 6 and No. 7 on your list, regarding further information on a decision not to permit residential uses on Mullins Bank. It's from April 29th, and I'll ask Mr. Kaiser to address it. Thank you.

MR. KAISER: Thank you, Mr. Potter, good afternoon, Panel.

The minutes of the Remedial Options Working Group of the Joint Action Group, dated Monday, December 4, 2000, reflect that two members of CBRN's planning department were in attendance, and those members stated that the area of the Muggah Creek watershed is zoned industrial, and that no other use is currently planned. And I believe that reflects some of the basis for the decision by government partners to determine that there wouldn't be no residential development on the Coke Oven Site. Thank you.

THE CHAIRPERSON: Thank you, Mr. Kaiser.

Are there any other undertakings that ---

MS. MACLELLAN: Thank you, Madam Chair. I don't know if you can hear me or not.

THE CHAIRPERSON: We haven't got you yet. So hang on a minute.

MS. MACLELLAN: Thank you, Madam Chair, last evening Sydney Tar Ponds Agency asked you if we did the undertaking regarding European dioxin monitors.

I wish to inform you that I have provided your Secretariat with one such procedure and I wish -- and I also told her that they're easily accessible on the internet. All you have to do is go on the dioxin home page, and type in "Dioxin Monitors in Europe," and it very quickly brings you up several pages, probably five or six, with different places to access the information.

I have also -- we have an undertaking to provide you with the petitions that we had with the Commissioner of Sustainable Development with the Auditor General.

They have been provided to the Secretariat. The Tar Ponds Agency also had an undertaking to provide us with a financial breakdown of the monies spent to date, and also their annual budget.

Is that undertaking complete? Thank you.

THE CHAIRPERSON: Thank you very much for the information you provided to the Secretariat.

Mr. Potter?

MR. POTTER: Yes, Madam Chair, we have a few more undertakings we're working on and should have in the next couple of days, some follow-up undertakings to present.

THE CHAIRPERSON: Thank you very much. I would now like to move to our first presentation of the day and this is Save Our Health Care Committee.

So, you have 50 minutes and I will let you know five minutes before the end of that, and I believe you're going to show us a video for part of that time, for 20 minutes of that time.

--- PRESENTATION BY CAPE BRETON SAVE OUR HEALTH CARE COMMITTEE (MARY-RUTH MACLELLAN)

MS. MACLELLAN: Thank you, Madam Chair. I wish to thank the Panel, all the members, for having shown a great deal of tolerance and patience with everybody in the room, from both sides of the fence.

I can tell you, coming from a community where there's very little trust in the powers that be, at least we feel that somebody is listening.

My name is Mary-Ruth MacLellan. To my right is Ada Hearne and Dr. Argo, again.

This video is nearly 20 minutes of excerpts from the whole video, which was provided to the Panel. It speaks for people who cannot be here. Some are ill, some will not speak in public. One has died since the making of this video.

Although the video may appear to fall -- may appear not to fall within the guidelines of the Panel's mandate, it reflects on a number of things that must be considered.

The people who have a long history in this area have a better knowledge of what we are dealing with when -- than what they are given credit for.

For example, skimming the surface or cleaning only the core area of the site will result in remediation of only part of the problem.

As reflected in the video, the attempts at remediation of properties adjacent to the Tar Ponds and Coke Ovens has shown that there is a much larger or widespread area affecting people that must be looked at, ie, first, the precautionary principle to protect people.

Incineration with its questionable release of even smaller amounts of contaminants, ie, dioxins can have a further devastating effect as shown in Dr. Argo's presentation. Encapsulation with its far reaching effects on water tables, even in the long term, is dangerous.

For these reasons we feel that the Panel must give an extremely serious look at other alternatives that may challenge the current proposed process of the Sydney Tar Ponds Agency.

We cannot allow history to repeat itself. We have to look at all the processes available. We cannot afford to leave a job half done for future generations to face.

Ada Hearne, who we first met in 1998 at Tent City, will give a brief outline of the video. We've cut that out because -- in the interest of time, but she will speak to the issue afterwards.

While we have worked on many issues with Ada, she was not a member of our Committee until about a year ago. She recently has become co-chair.

Ada was born and raised on Frederick Street.

After Ada's conclusion, Dr. Argo will continue with his slides and presentation.

Once again, we thank you for your extreme patience and understanding. Go ahead, Ada. The video.

Please bear in mind that the quality of

the video is not necessarily very good. It's actually about three years since either of us picked up a video camera, and last night when I went home, I edited that whole tape down to 20 minutes, thanks to my husband, who has shown remarkable patience the last couple of days.

--- PRESENTATION BY CAPE BRETON SAVE OUR HEALTH COMMITTEE (MS. ADA HEARNE)

(VIDEO BEING PLAYED)

MS. HEARNE: Thank you. It's kind of difficult to speak, especially after seeing that video. My stepfather, who just recently passed away, April 15th. Also, after reading our local newspaper yesterday, and seeing a friend I grew up with had passed away with cancer. She was the third woman from my community to die of cancer in only a few weeks.

The three were around the same age of 46 years, all mothers of young children. It is a frightening thing to carry in my heart, thinking I could be next, and fearful that my children, after losing their father, and my husband, Larry, only two years ago, could be in the same situation.

I was born and raised in Whitney Pier, less than a block from the Coke Ovens Site. I am one of eight children.

As I got older, I lived on Frederick

Street. The Coke Ovens was directly across the street. From my younger years, I recall the sickness, the death, and the dying and wondered what was going wrong.

While some may lead you to believe it was our lifestyle that caused all of the illness, we have to beg to differ. Our mothers and fathers worked hard to keep our home clean and to keep us fed properly.

There is no such thing as sitting in front of the television with its two channels. We were always outside summer and winter. We remained active, but not always healthy.

I have lost so many family members and friends to cancer, and many of them did not smoke cigarettes. I had my grandparents, that both died from cancer. My grandfather actually fell into the Tar Ponds on his way home from work one night, while walking the tracks.

He was found the next morning by fellow workers on their way to work, and I remember my grandmother talking of the difficult time to get the tar off that covered his whole body.

I lost uncles, aunts with cancer. They died as young as four years old to 48 years old.

My aunt's two sisters never seen their 50 birthday, and left behind 21 children between them. All of these children, and their children suffered from health problems today.

I had cousins die in their 30s. One cousin, Ronnie, who grew up in Curry's Lane, did not smoke. He moved to Ontario, had children of his own, his son was born with eye cancer, his daughter with eye cancer, and mentally challenged as well.

He died just a few years ago with cancer himself, leaving his wife with a plateful of financial difficulty and heavy hearts.

I visited him near his end, and all he wanted to do was to come home to Cape Breton. All he worried about was what would become of his children and his wife. They are doing okay, and Ronnie is home now buried at East Mount Cemetery.

My father, Thomas, worked at the Steel Plant. He was a veteran of World War II. He was diagnosed with lung disease from working on the Coke Ovens. The cancer ravaged his whole body. I nursed him at home in the makeshift bedroom we had set up in the livingroom until he took his last breath.

I remember so clearly that morning, of March 27, 1998, I looked out of the livingroom window and the view was the usual, the Coke Oven Site. The same view my dad had to his day of death.

I thought to myself, "He worked it, he lived it, he breathed it, all of his life to provide for his family." And then I cursed it for what it did to him and to us, and then sadly looking further past the site, I realized that that was where the funeral home was, and that's where he would go next.

I remember how oddly quiet it was, the dead silence in the house.

My mother, Mary, she's here with us today, had ovarian cancer in 1968. My father was told then that she would not make it. She had a breast removed from cancer in 1998, and in 2002 she had most of one lung removed and some of the lining of her heart.

It was then that the doctors told her that she had a cancer called "small cell cancer." It was real bad and she would have three to six months to live. Thanks to God, she is still here and the cancer has given her a rest.

My mother says that she has too much to live for, and she is not going anywhere but back home where she belongs. She, like my father, stands behind me and continuously tells me to keep fighting for our health and not to give up.

My whole family has had their share of health problems. Some more serious when we were younger, like excessive nose bleeds, stomach problems, air problems. Later in our age it turned into thyroid cysts, skin disease, and ulcers.

But our health problems are not just ours, most of our friends and their family had even worse. It was normal. No one was unique to sickness.

I have wondered why that in a two-block radius in my neighbourhood that we have up to 30 mentally and physically challenged people in our community.

My sister, Josie, being one of them afflicted with Cerebral Palsy. I have lived in many other communities in Canada, and have not seen such numbers in such small areas.

These are people I know. Then I think about the people who I don't know, who are afflicted, and it -- to me it just doesn't seem right. It's just not normal.

I really -- the fact that I moved back here in 1998, I ask myself if I did the right thing by bringing my children back home. While living on Frederick Street, they seem to always have nose bleeds and complained of headaches. Then one day my husband had come home and asked me, what was going on over at the Coke Ovens Site. I went outside to see men dressed in white suits and masked, and my family and I are just across the street wondering what was going on.

During the next short while, we started getting more information on what was going on and we started to be fearful. My husband and I started to leave our home on Frederick Street, and get our children to safety. We left before the buy-out was offered, but it was this time that we started to fight back alone with Mr. DeLeskie, Mary-Ruth and Debbie Ouelette, to name a few, and that is to protect the health of the children.

My husband and I were able to pack up and leave. My neighbours could not. Those poor souls had mortgages. They could not just pay -- they could not pay that, and then pay rent in another place of safety.

It was such a terrible sad time. But we fought endlessly together to move the people. Mary-Ruth MacLellan had pushed a motion through JAG calling on the government to move the people by June 30th, and that was approximately '99/2000. The government response to our fight was that they would move the people for compassionate reasons, which we did not agree, because there were more important reasons and they would not admit it.

While they moved residents on Frederick Street in the end -- we did get moved -- they failed to protect residents who were only a fence away.

Around this time, I, with the help of others did a protest camp as well, in front of -- the former city hospital site, directly across from our former premier's house, Russell MacLellan. Our goal was to encourage government to protect the help of our people. Our children being priority.

We needed to get our story out, and it was at that time that Steve MacInnis from the Post, dubbed us the name "Tent City," and then the heart of our city began to beat. I held my ground and literally slept on the ground for about a month, to show government how important our children were to us. Slowly, but surely, others came to the camp and at the site to support the cause.

Sadly to say, we got flack, not only from government, but from some of Russell's neighbours as well, and some of our own.

Some perceived us to be on a lunacy fringe and we wished -- that was pretty wild -- we wished to advised them that Jesus Christ was called a mad man, and looked what happened to him.

Government gave our community new names, like, the north of Coke Ovens and Tar Ponds' people, showing us that we were nameless and faceless inhabitants.

However, there were more neighbours that helped than hindered, like, Revered Doug Pilsfer (sp) in the First United Church and his parishioners who helped us get a portable toilet -- had no toilet up there -- and they put it in the church parking lot to find out that the government told him that they owned the property and we had to remove the port-a-potty.

So, we didn't want to cause any conflict, so we did just that. Something good did come out of the toilet disappointment, our Reverend Doug did informed us that after the incident the church had bought the property and now they are the rightful owners.

Travellers came to camp with us, visitors came every day. Like Ron DeLeskie, his brother, Donnie, and wife, Elsie, Peggy and Eric Brophy to name a few, who kept me company each and every day of the protest and actually -- kept me going, actually, and even the mail person, who delivered mail, it was simply addressed "Tent City."

People all over wanted to protect our children and they showed it. People like Dr. David Suzuki and many friends from Ontario would call my cell phone with virtual support.

Tent City went international with the help of media, who sent our story of the plight of our people living around the Sydney Tar Ponds and Coke Ovens Site out to the world.

I doubted it, myself, with the protest, more times than once.

My husband and I were racking up huge pocket expenses, out-of-pocket expenses, even with the wonderful support of food donations to feed our campers and a swimming pool for the children on those terribly hot days, I wondered if we really mattered to the rest of the world, if our children were just numbers, like they were to government. But Larry kept my spirits up, telling me what I truly felt in my heart, that we did matter; the children did matter, even if it's only with us in our community. Excuse me.

The government was finding so many ways to waste our taxpaying dollars, like the first failed cleanup; the wasted money to upkeep an incinerator that would never do the job they were so sure of.

Like the dredge that was built by my brothers for the company they were hired by. It was dubbed a Blue Heron. It's the name of a bird. I don't know if I'm saying it right.

But I remember my brothers saying, "It will never fly."

It was supposed to suck up sludge from the site and then be brought to the incinerator to be burned. My brothers said the first time they used it, it sucked up a lawn mower blade and jammed the auger. It had a very short shelf life.

In keeping with our fights to protect human health, we started to give our very own toxic tours.

We wanted people to come and see what the truth was, to see it with their own eyes and to show them what government did not want them to see. This was another task we did out of pocket expense.

Alarmed because we started to show people the truth, the powers that be, just like this coverup, started up a cleanup tour at the taxpayer's expense. That should be a cleanup tour of their own.

Our tours attracted people from Scotland, Germany, Holland, as well as off island college professors and their students. People were interested.

When we talked about the tunnels, the government denied that they were there, and somehow they seemed to appear all of a sudden. They're free to talk about them now.

I played in those tunnels as a child. I can take you to all of them. Mary-Ruth MacLellan actually drove her dad's car into them when she was a young girl, playing this tag game with the radios.

When we mentioned the benzene bales buried along with the after war dynamite that my parents would talk about that was buried, the governments just declined to listen. It was all in our head kind of thing.

We have intelligent toxic waste here. It stops at the fences, it chooses which house it will linger in, which house it will not. It knows what door to use, be it the front door or the back.

The government told us that while it is safe for our children to play outside, they were not allowed to touch the dirt. So what were we to do? Hang the children out on the clothesline with the morning wash?

Dr. Richard Lewis came and did a risk assessment using "Made in Sydney" standards, in the winter, with short term 60 day exposure, a time of year when most contaminants were frozen and not airborne.

When asked the question if he would move here with his family, his answer was simple. It was, "No."

However, he seemed to have disappeared, and even having his phone number in the past for his home phone, we were -- we are now unable to find him in the whole United States of America today.

If we, as a society, failed to protect our children, we would be up on child abuse charges with the Children's Aid Society. They would come and remove the children from our care. However, government has failed to protect our children, and to date have not been charged with the abuse of our children.

Katz and MacKay did a study in 1959, the year of my birth. It showed the emissions coming from the stacks were harmful and could cause cancer. This was reaffirmed in Hickman's letter to Norena (sp) in 1985. And these are documents that our government has.

Both of these reports -- most of these reports were buried, and the people were not informed. They told government to put emission controls -- I might have that a little odd. It might be that they told government to tell the owners of the steel plant, because it went through so many names, it's hard to keep track. But they were told to put emission controls on, and the government refused to do this because of the cost factor.

It's so sad.

In conclusion, let me say that we are not from an affluent society, but we were brought up with principles, and we do not tolerate lies, and we will not tolerate a cleanup before the people are moved safely from the site.

They have wasted so much money so far that this money could have been used to protect the people by moving them.

We are not experts; I haven't got a PhD, you know, just a Grade 12 education, a little bit of stuff after that, myself. But we do not profess to have a brain.

I'm sorry. I'm going to make myself look bad here.

We do profess -- I should have -- I should change that to government -- but we do profess to have a brain, and a good deal of common sense. We are not as stupid as we may look to the powers that be. We may sound a little bit stupid sometimes, but we're not.

We are tired of being used as lab rats. We are not brown rats, white rats, Scottish rats or Norwegian rats. We are people, and therefore people must be first in this process.

Although some people can be bought, there are those of us who refuse to abandon the principles we were brought up by.

Think about it. Have you ever seen a hearse pull a U-Haul?

I just learned this myself over the years, but did you know that there is a difference between a risk assessment and a health assessment? Many did not know, but Dr. Jim Argo will now speak to you on the health assessment, and I thank you very much for your time and putting up with my mistakes and my typos and all that stuff. Thanks.

--- PRESENTATION BY CAPE BRETON SAVE OUR HEALTH CARE COMMITTEE (DR. JAMES ARGO)

DR. ARGO: Madam Chair, I asked on Saturday, and you gave me permission to show my slides, but I didn't have -- well, on the basis of the time, we just gave you the text at that time.

I wouldn't mind showing you, if you don't mind, I'd like to show you some of the slides that I would have shown you then.

THE CHAIRPERSON: Yes, Dr. Argo, you have about ten minutes.

DR. ARGO: Thank you, Steve. Okay. Is there any possibility of getting the lights -- the top lights off? Okay. Thank you.

I'm prepared to accept any sort of comments -- whoops.

I was commenting about the size of my text -- the text and the difficulty to read on the earlier ones, and I'll accept any criticism that you wish to throw me.

This is from 1959. It's a report by Katz and MacKay from Health and -- Health Canada. Well, Health and Welfare Canada at the time. They wrote of:

"Air pollution in Sydney, but the airborne and solid waste pollution problems only worsened. By the late 1950s, Sydney was being covered by an immense reddish cloud of dust laden gas containing..."

And they -- I preface that:

"Tars, oils, naphthalene, ammonia, phenyl sulphide, diisocyanate..."

And there were about another 180 chemicals they included. And "They were all caused by emissions from the plant." That's their words. The Department of Health and Welfare described the effects as:

"The deposition and discolouration of buildings, walls, textiles, laundry, and any exposed surfaces, and the penetration of pollutants in the respiratory tracts and nasal passages and the lung of local citizens."

It doesn't sound very pleasant.

"The federal and provincial governments urged DOSCO to alleviate

> the environmental degradation and invest in a new cintering plant. DOSCO refused, claiming the $6 million dollar cost was prohibitive."

I would like -- there's a couple of slides here that will show you the kind of things that were coming out from -- they get progressively -- there we go.

In particular, I would like to raise this one up a bit. This is a 1995 knowledge, but there were -- this is a description of what was coming out, and include polychlorinated dioxins. And there are many -- there's octachloro and dioxins, many others. The dioxins then were known as -- to be a product from burning the fuel.

In 1972, there was a report by Choquette, and he reported this. He was telling the people:

> "In these different stages of the process, this is what was released."

And that's what he was telling people was coming out. Not very informative.

At the same time, he wrote an appendix, and that's what he included. The appendix is very hard to find, because I think a lot of people have -- maybe it might have been suppressed, I don't know.

But there's an awful lot of chemicals

there, and none of them are particularly healthy. One is -- rebutodianis (sp), is a carcinogen -- no, it isn't. Sorry. But there's a lot of sulphides up here -- hydrogen cyanide, an asphyxiant -- an awful lot of stuff that I wouldn't want to be breathing, or want anybody else to be breathing.

I'm trying to show these, because I want the -- I want to put sort of a face on the plant, because I want people to understand that there was -- the kind of soot that was coming out and affecting people. This seems to have been ignored.

People -- the slide -- the video we've heard today describes how people are being exposed, but not to what -- not descriptive of what they're being exposed to.

Now, this was from a report McMaster University, the -- to the Ontario Ministry of Labour, "Health Effects of Coal Tar Products and Bitumens" in 1986. They were looking at Hamilton.

These are metals, and the degree -- the number of stars refer to the -- that they are carcinogens. Benzoanthracene, these are all PAHs.

And the interesting thing about this particular study is that there are 45 more PAHs. There's an enormous range of PAHs. And these are all particular

-- are toxic. But there are an enormous range of all these PAHs.

Down here, I want to draw your attention -- from the -- from -- you're getting hydrogen sulphide.

Now, as a chemist, hydrogen sulphide forms under what's called reducing conditions. Sulphur dioxide, on the other hand, forms when you have oxidizing conditions.

But you're getting both coming out from the Coke Ovens.

That means that you have a condition of some sort of -- well, the stuff that comes out is going to be very active at the moment it comes out, because it's going to form either one or other of those.

Now, I've analyzed the coal. The coal from the current Lingan Mine has 18 parts per million of chloride. From the 26th Colliery, that was old coal, has 20 -- has 7 parts per million. The Lingan -- the old Lingan coal has 30, and a sample from Saskatchewan has 17. This would have been the coal that was probably going into the Coke Ovens.

You can see, there's a lot of metals, but in particular, I was interested to see if there was chloride. Because if there is chloride, that's -- if you are burning organic matter in the presence of chloride, that is a necessary and sufficient condition to ensure that dioxins form.

Now, this is a series of references that I've dug out. This is the first one. It shows -- it was a classic experiment.

He just -- he found that by combusting newspapers in the presence of sodium chloride or polyvinyl chloride, that he was producing dioxin. Very simple.

And all of these other people have done the same thing. They just continue to confirm it. And that means that -- that just confirms that by burning chloride -- burning organic matter in the presence of chloride, you get dioxins.

Now, dioxins, among other things -- one of the things that dioxins produce is a disease called chloracne. Chloracne is a skin disease. Oh, I was afraid of this.

Okay. I may not be able to show you too well. This -- on this poor gentlemen, there are a lot -- all of these little white spots that are not showed -- focused too well. Things like that.

They're down inside of -- inside of his ear, and they're down in the other side, just on the part of the skull that is opposite that. They are tiny little nodules, probably about a millimetre in diameter, incredibly itchy. Now, that is called -- those are one of the classic things for -- to describe chloracne. Another has disappeared on the table here, it's sort of -- they look sort of like blackheads. Sorry, I can't -- I've missed them.

Now, Phil O'Hearn, the person we heard on the slide, the artist who did the fiddle, consented to let me take pictures of him, and again in these black circles there's a spot, a spot, another one here and another one here, one there, several in this area, and here we have a very large cavity almost. There's other parts of his neck that show the blackheads that I described.

Phil O'Hearn has classic signs of chloracne. From this he should have had chloracne because he was working around the Coke Ovens, he was living around the Coke Ovens, he was constantly exposed to the dioxins and he certainly should have.

The physicians in Sydney diagnosed him with rosacea. I'm sorry ---

THE CHAIRPERSON: Dr. Argo, your time is just about up, so if you'd like to sum this up.

DR. ARGO: Okay. I will, certainly. Now, I've got two more slides. Will that be -- may I do that?

THE CHAIRPERSON: As briefly as possible, please.

DR. ARGO: Yes, ma'am. Yes, ma'am. Cancer in Nova Scotia in the same year, I think it was -- okay. There's an all cancer -- 365 was the rate in Nova Scotia for women, 317 for a comparable type of location -- environment in Alberta and 316 in BC. In the same environment for all cancers from Nova Scotia, men 505, 423 and 426.

I ask you, please, to look at the CT -- that is connective tissue -- that is the part of the joints. Connective tissue is a direct -- cancers are a direct result of exposure to dioxins. This -- the fact that there's any there indicates that there's dioxins. CT -- here we have a large number in males in Cape Breton, not so many in Alberta. The final slide, ma'am. Thank you very much for your tolerance, I appreciate that.

With the help of information that was provided by the Health Authorities in this area I was able to identify -- I'm comparing here the difference between the rate of a particular heart disease with and without dioxin present.

In Cape Breton -- this allows us to make a decision on if Cape Breton -- is dioxin a factor in disease in Cape Breton. In the case of coronary vascular disease, yes. In the case of acute myocardial infarction, no. Ischemic heart disease and strokes, yes. Hypertension, no. Heart failure, perhaps. Nephropathy, kidney disease, yes.

That will do. Thank you very much.

THE CHAIRPERSON: Thank you very much, Dr. Argo. And, Ms. MacLellen, Ms. Hearne, thank you very much for your presentation. I can see that you've put a great deal of work into your -- the video, interviewing, putting that together and then editing for today. We can really appreciate that.

We also appreciate the participation of the people that you interviewed on the video, and it was informative to hear their voices. So, thank you for that. I have just a question about the video. What -- who do you give the credit for the music?

MS. MACLELLAN: You'll have to give the credit to my husband, because he indeed was editing that whole tape while we were here last night. Thank you.

THE CHAIRPERSON: Oh, he added the music? I just meant who was singing the song at the beginning.

MS. MACLELLAN: Oh, it's just a tape that came out last year. It's an anniversary tape that's available in certain areas, in certain stores, of the old music that used to be played on a radio station here and it has excerpts from some of the people that used to do the talk shows and things.

THE CHAIRPERSON: Okay. Thank you.

CAPE BRETON SAVE OUR HEALTH COMMITTEE:

--- QUESTIONED BY THE JOINT REVIEW PANEL

THE CHAIRPERSON: I guess my question, perhaps to both Ms. MacLellan and Ms. Hearne, from what you've presented to us, is -- now you were talking, obviously, a lot about some of the recent history, some of the effects of -- health effects that you perceive of coke ovens operations.

I wonder what is your key conclusion and key message with respect to the proposed remediation, which is, of course, the thing that the Panel is having to assess. In terms of sort of effects on neighbouring residential areas, what is your sort of key conclusion?

MS. MACLELLAN: I worry for the people on a daily basis. I get calls on a daily basis from a lot of people around Ashby area that we haven't done on the video because they didn't want to talk about this to anybody, but they have taken us and shown their anecdotal history of them playing on the sites as children. And one particular person has told us and, in fact, even pointed out the spot where there are bales of benzene buried.

There's also stories -- I asked why those tunnels were there, having as an older teenager and young adult actually driven cars into them, which -- most of the people who I played that game with -- it was called Fox and Hound and it was played with CB radios and you had to hide and then the other people had to detect where you were by signals.

Most of the people who played that game and used the Coke Ovens because it was accessible, there were never any fences, we were never told there was any danger there, are no longer here to tell the tale. They're dead.

I also heard stories from residents that lived there. While I didn't live there, I had an aunt that lived two doors from the steel plant on Victoria Road, so I spent time here, and as I got older I probably spent more time in Sydney.

They've also said that there's big sticks of dynamite -- when the war was on they used the steel plant to make ammunition and they said -- they tell me that the tunnels were made then to carry the dynamite out to the boats in the ocean.

I have no idea if that's true. While I've been in the tunnels, I have never tried to drive to the ocean in them, and I don't know how wide or how big they are in certain areas. I know some areas underground are certainly as large as living rooms.

I worry about what's going to happen if they haven't found these things and don't know where they are and they start to dig. I have no idea what happens to dynamite when it's in the ground from the 1940s to now, if it is indeed there. But could it blow up the whole city? Could it blow up a neighbourhood block? Could it blow up a street?

And when they do start digging with people -- how can you work with protective clothing on this side of the fence and forget that there's children playing on the outside of the fence? In fact, I've got pictures home where kids are still walking across that Coke Ovens Site now.

THE CHAIRPERSON: Well, if I can just follow up to that. If remediation of the site, the Coke Ovens Site and the Tar Ponds -- if active remediation by any method involves some disturbance of the soils and the sediments, which seems inevitable, what is your conclusion, therefore?

I mean, you're obviously concerned about the effects of that no matter what method is used. Is there something that you want to see happen in terms of protection of neighbouring residents?

MS. MACLELLAN: As I said, I get calls on a daily basis and most of the residents keep saying, "What are you going to do about it?", "Well, I'm only one person. What can I do about it?"

I sincerely believe that before they start any operation they should move the people first, albeit if it's a temporary move or a permanent move. Moving from your home is certainly not an easy thing to do for many people, especially if you've lived there your whole life, but I think they have to be given the option. And if it proves that it's, you know, really a danger, then it should be made mandatory, I think.

You know, people's health has to be protected first. I don't see how you can dig in an area where there is so much contamination without moving the people away first. We've already seen what happened on Frederick Street when they tried to remediate the first time. Millions of dollars were wasted.

So far in the first failed cleanup we spent $52 million dollars on an incinerator that never worked, and I do have some newspaper clippings back to the day when it failed. If anybody wants to see them, I could probably dig them out. They're buried in a filing cabinet somewhere but I still have them.

Having said that, they are saying $52 million was wasted at that time. In actuality it's $104 million. They failed to protect the people's health when it happened on Frederick Street. Those people got very sick. I was there.

We have a very black eye in the rest of Canada because we get dubbed "stupid Cape Bretoners" for letting this happen. I get calls from across Canada, you know, "How could you let this happen?"

So, I really think that consideration has to be given. We've spent enough money already that we could have moved the whole city.

THE CHAIRPERSON: Okay. Thank you very much.

MR. CHARLES: Dr. Argo, you mentioned that Hamilton is also a steel-making city, and I don't know whether they have steel-making operations that are exactly the same as we've had in Sydney but I imagine they're fairly similar.

Have any studies been done about the health of people in the Hamilton area, and, you know, have you yourself done any comparisons between the health of the community there and the health in the Sydney area?

DR. ARGO: There's been quite a large number of studies that have been worked on for over --

about Hamilton. The technology is pretty much the same as we have here, though probably a steel maker would beg to differ, but they have coke ovens, they have blast furnaces and they have open hearths and they've got electric furnaces and the rest, and they're doing much the same kind of product.

They've got very high -- their rates are getting down. Part of the cleanup operations that they made was Hamilton Harbour, and Hamilton Harbour was -- is certainly springing back from an ecological -- in an ecological sense. There's -- it used to be a very smelly pool when you drove past it and now it's much more remediated.

I'm planning to do -- after I finish Sydney -- I'm here looking at Sydney because I've made a promise to people in this room that I would do it first. My intent is to be able to look in the same way at Hamilton, and I'll be glad to pass that to you when I get it done but I haven't got it done yet.

MR. CHARLES: So, off the top of your head you wouldn't know how the cancer rates for the two areas would compare?

DR. ARGO: I think the cancer rates here are much higher, which, I think, will be explained in terms -- part of the Hamilton physical location is that the steel mills are right against Lake Ontario and then there's a small amount of land relatively -- maybe a mile at -- no, it wouldn't be more than half a mile perhaps, and you're right against the Niagara Escarpment.

So that the city doesn't progress -- the winds are quite different in Hamilton, 185 feet for the Niagara Escarpment. That means that most of the winds are going to just catch the top of the stacks.

MR. CHARLES: Thanks, Dr. Argo.

DR. LAPIERRE: Good afternoon and thank you for the presentations. I'd like to ask a question regarding the bunkers or the underground tunnels. How deep do you think those are, and what were they used for?

MS. MACLELLAN: You mean how deep underground?

DR. LAPIERRE: Yes.

MS. MACLELLAN: Anecdotal history has it they were used during the war to store the dynamite and transport it underground as opposed to overland in through the city.

I can tell you they are more than six feet deep, but I don't know -- I've never actually measured it. They're certainly deep enough and large enough that they'd fit my father's big car in there when I was young.

DR. LAPIERRE: So there was a -- they were used for communication along the city, and they were used to store dynamite during the war.

MS. MACLELLAN: That's what I'm told. I have -- only from people in Ashby that have told me the story. I don't know anybody else that's alive that could tell you the story. My father would probably know, if he was still alive, because he -- when he was sent home from overseas, he was stationed in Sydney until the war was over, but I can't tell you. I could probably try and track down a veteran that might know, but most of those are dead, too.

DR. LAPIERRE: And to your knowledge they were never destroyed, never taken apart.

MS. MACLELLAN: Pardon me?

THE CHAIRPERSON: To your knowledge, they were never destroyed, taken apart, or ---

MS. MACLELLAN: Well, Ada might be able to answer more about it. I've been told that they've just buried the dynamite underground. Go ahead, Ada.

MS. HEARNE: Are you asking if the tunnels were taken apart?

DR. LAPIERRE: Yes.

MS. HEARNE: Okay. No, the tunnels -- a lot of them are grown over that you can't see because of fields, it's all grass and stuff, but there is some that are exposed.

There's one that's exposed directly across from my home that was formerly on Frederick Street, that we would literally walk right through it, you know. It's there, it's open. Well, they've got a fence there now, but it's open on -- when you come onto the new Starr Road, the children can still get in there because there's no fence blocking them from getting in the other side of it.

You'll have to see it, it's locked up on this side but completely open on that side, and there's one further, and there's a few that I know exactly where they are, but there's a lot you have to be very careful for, because, if you're walking out there, you could go down and not even -- nobody'd ever find you. They'd never -- if you're alone, you're just going to go down. There's holes over there completely covered with grass that we would use a big stick to feel our way as we walked so that we wouldn't fall in them.

DR. ARGO: Dr. LaPierre, Ada showed me last December the one that was near her house, and I would estimate that it looked, from what my -- from examination of it, that it was at least 10 feet deep.

DR. LAPIERRE: Okay. Thank you.

THE CHAIRPERSON: We'll now provide an

opportunity for other participants to ask questions.

I will turn first to the proponents. Now, Mr. McGrath (sic), you were -- I don't remember which day, but when the Save Our Healthcare Committee made their first presentation, you were beginning some questions to Dr. Argo and I cut you off because of time concerns. So I don't know whether you wish to -- you still wish to pursue those questions or if you have different questions, I'll leave that entirely up to you.

I'm going to say -- I'm going to ask you to start 5 minutes, please, if that's all right.

MR. POTTER: Sorry, I didn't ---

THE CHAIRPERSON: I'm just giving 5 minutes for questions at the moment, and then I will ask for other participants.

--- QUESTIONED BY THE SYDNEY TAR PONDS AGENCY:

MR. POTTER: Perhaps I'll just respond with some general comments.

We do share the concern that the panel members have for the health of people in Sydney, and that's something we are very much concerned about. That's the driving force behind the project we are here talking about today, to try to improve the situation in Sydney and make Sydney a better place for the future.

And it is why we do work with the health officials, John Malcolm's group at the District Health Authority, provincial and federal officials, as well.

I would encourage Dr. Argo to share his information with those health officials. We don't have the expertise to address some of the issues or points that he's raised, and it's not really our forte or our mandate, I guess, and, like I say, I would encourage Dr. Argo to share his information with those health officials.

I would like to talk just briefly a bit about the tunnels. They keep coming up and we've addressed underground infrastructure. For the most part, I think, the tunnels, as they're being described -- if you wish to use the proper engineering term, I guess, they're box culverts -- they're large concrete under-drains for carrying water across a site.

We do have -- going back to the old records within the Coke Oven property, have quite a good understanding of where they're at, what depth they are, what size they are.

I've walked in some of them myself, and yes, they are large because they did convey a large amount of water across the site at different times.

Yes, some of them do have screens on one end to contain debris so they don't get plugged up part way down, but they are just that, they are box culverts for the purposes of conveying drain water, storm water.

There are some deeper sumps in the property that go deeper than 10 feet. They were part of some of the building structures that had lower foundations and, you know, some of those probably go down -- perhaps 15 feet would be the deepest I can recall seeing, and perhaps even deeper than that. But we are aware of where they are at, and some have been filled -- as we became aware of them, if there were safety features, safety concerns with them, with open holes, we did make sure that those holes were filled.

The issue of dynamite came up quite a number of years ago on the site, and we did go back and consulted with the previous operators of the Coke Ovens Site, reviewed all of the drawings that we could avail ourselves of, and, as well, talked to regulators that would have dealt with dynamite storage.

The very clear message we got back was several things. One, there's no record of dynamite ever being on the site. The regulations going back a very long time would never allow you to store dynamite on a coking facility. Not hard to figure out why. With the amount of fires and coking operations going there, not a good place to store dynamite.

None of our investigation, whether it be soil sampling or geophysical work we've done, has detected any sign or any trace of dynamite or buried containers of benzene. I think that's come up as well.

We have investigated that site extensively and feel quite confident that those issues have been addressed. They've been raised in the past and we're quite confident that we do not have to worry about those issues as we proceed to the cleanup.

I do have one question for Dr. Argo. You made reference, Dr. Argo, to the Hamilton cleanup and you'd like to see our cleanup proceed in the same way as they're doing in Hamilton. Could you explain a bit of your understanding of what they're doing in Hamilton Harbour?

DR. ARGO: My knowledge of Hamilton Harbour -- that was perhaps misunderstood. I was trying to make a generality because I know that the Hamilton Harbour and the Hamilton cleanup has progressed considerably. I would like to see the cleanup progress in Sydney, as well. I would like to see the Sydney lands remediated, and I would like to see the harbour and all of the water remediated.

I'm very much in favour of cleaning it up. I'm not particularly in favour about the way it's being proposed.

MR. POTTER: If I could, I guess, provide information to Dr. Argo, Hamilton Harbour cleanup is under way, a portion of it, a small portion. They have a very, very large area, much -- somewhat like ours.

Their solution is to excavate the sediment and take it to one area of the harbour and it's called Randall Reef. The sludge is placed in one area near the shore and it's capped over and covered, and that is the cleanup plan for Hamilton Harbour that's been undertaken to date. So I just wanted to pass that information along.

That's it, thank you.

DR. ARGO: Mr. Potter, I think I made it clear on Saturday when I was testifying that I don't have the expertise to choose a method. I do have the expertise to look for -- to assess how a method will affect people. I do not have any -- the civil engineering expertise that you attest to. I just want it cleaned up for people.

THE CHAIRPERSON: Okay. Thank you, Mr. Potter.

Dr. LaPierre has a follow-up question.

DR. LAPIERRE: Just a question, Frank. On the Coke Ovens Site, these underground tunnels must have rebar and iron structure of some sort.

Did you conduct a scan of the area which would be -- in which you would be able to identify -- was the area scanned?

MR. POTTER: We have -- the Coke Oven operations had -- SYSCO had kept very good records of the SYSCO property, and it's quite easy to go back and see where the various drainage water courses or drainage structures that were installed.

We did do geophysical work on the site which would pick up some of those anomalies. We used electromagnetic resonance imaging, we used ground penetrating radar, and we're pretty confident that, you know, we've detected and are aware of where most of the infrastructure is on the site.

I know we've addressed it previously in questions that, you know, we don't feel it's going to -- our perimeter containment system is not going to be compromised by the on-site infrastructure that's underground.

We're quite confident that the containment system we've developed, as we've spoken about the other day, will adequately take into consideration all of the various structures that are on the site.

DR. LAPIERRE: So you did conduct an

electromagnetic scan of the entire area?

MR. POTTER: Yes, we did. We actually did a fair bit of experimenting to find out what was the best type of equipment to use, and once we found the optimum one, I think it was the ME61 model that we used on the site, and we used that extensively, as well as ground penetrating radar mainly looks for voids. It doesn't detect metal. It will detect a void space such as a tank or a drum. We used the GPR, ground penetrating radar, for that purpose.

So we have -- and certainly all of the reports are available on the geophysical work we've done there. It's quite extensive, and it did assist us quite a bit on the site in terms of understanding the problem we had to deal with.

DR. LAPIERRE: Thank you.

MS. HEARNE: Excuse me, can I say something to that? Okay. And it's kind of a little bit of a question, too, because I don't know if I heard you right.

You have said earlier that the tunnels were made of concrete and you took safety features, there's some kind of safety features there on the tunnels?

MR. POTTER: I was probably referring to

the screens that you mentioned. There are screens on the upstream end of the tunnel. It's primarily a structure to keep debris out. Better to catch the debris at the start of the tunnel, as opposed to something catching 3,000 feet down.

MS. HEARNE: So does it keep people out, too, as well? Does it keep children out of the tunnels, or just debris?

MR. POTTER: Some of the screens I've seen would keep children out, but it wouldn't be difficult to -- if somebody really wanted to get in there, there are -- you know, if you go onto the property, there are openings where it is possible to access the tunnel ---

MS. HEARNE: So you didn't do safety features on all of the tunnels then is what my question is. And especially the concrete ones, because what about the wooden ones, I think the safety feature I found last was a piece of concrete partially closing it off that I was able to move myself to get in.

I guess I'm a little puzzled, Frank, because, you know, you're always saying "No tunnels, there's no tunnels, there's never been any tunnels." And now you're sitting here telling us and the panel that you've actually scanned them and you've got all this information. And I'm wondering why that you didn't acknowledge that all these years that we've told you so many times about the tunnels, "Come and see them, we'll show you." And you always looked at us like we were a bunch of coots, you know, and now you're sitting here telling us that you've been scanning these all along, you have all this information.

And you still didn't do the job because there's tunnels down there that are not screened off, or do not have safety features on them. So I'm wondering where that money went. Thank you.

THE CHAIRPERSON: If you'd just -- just a brief reply, please, Mr. Potter, because I feel some of this is an issue that's possibly outside our scope of reference, though I understand your interest in pursuing this. But a brief reply, and then I must ask for questions from other people.

MR. POTTER: Certainly, thank you, Madam Chair.

We've never -- I've never denied the existence of underground infrastructure on the Coke Ovens Site.

The terminology "tunnel" is not the terminology we would use, as I've clarified today, and we've indicated in the past, there are numerous box culverts that crisscross the site for storm water drainage purposes, and some processed water. I think I should clarify that.

The information, the fiscal work we've done, we often refer to 950 Joint Action Group meetings that were held. I think I've probably gone to about 750 of those, and, I don't know, there's probably about 50 of those that would have involved discussions regarding, you know, the geophysical work we were doing through the Edgar, the Edgar Working Group and the Remedial Action Working Group.

There's been extensive discussion on everything else we've talked about today.

Thank you.

THE CHAIRPERSON: Okay. Thank you.

As most of you who have been sitting here for session after session know, the process we use for questioning is that I'm going to ask for an invitation as to how many people have questions.

I will then take the people who are registered participants, who are registered to make either -- either have made a presentation or have registered to make one in the next few days. I will take them first, and then I will invite an opportunity for questions from other people in the room.

I am going to ask you for one question and a follow-up since we're getting very close to when our next presenter has to come forward.

So could I first ask, perhaps, a show of hands how many people have a question for the Save Our Healthcare Committee. Ms. Ouelette. Ms. Ouelette, you can have a whole five minutes.

--- QUESTIONED BY MS. DEBBIE OUELETTE:

MS. OUELETTE: Hi, my name is Debbie Ouelette, and I have to say I did not know Ada when I first lived on Frederick Street, and we stood together, I would say it was April of 1999, and watched our homes tumble to the ground with big bulldozers. It was a very sad day for us. We both had many tears and we cried on each other's shoulder, eh, Ada? We just couldn't believe that in 1998 the property that we lived on came back highly contaminated. We had no idea what we were moving next to.

And, Ada, I don't know if you can remember why we got moved off Frederick Street. Can you -- do you know why?

MS. HEARNE: Oh, yeah, that was for compassionate reasons, if you can figure that one out.

MS. OUELETTE: Yeah. They didn't realize that the high levels of arsenic in my home was the reason why, they kept saying it was some compassionate reasons, and that was really hard to take from government when we took a whole year trying to prove to them -- every time we stepped into an area of concern we were pushed aside by Environment Canada.

I mean, they came and took results, it proved that the contamination was there and they really put us through a hard year of failure, I have to say. And I really appreciate Ada being here today telling her story, because I certainly have one -- to tell one also. Thank you.

THE CHAIRPERSON: Thank you very much, Ms. Ouelette. Is there anybody who is not a registered presenter who has a question? Well, if not, again I want to thank all three of you for your presentation.

Just a moment, please.

DR. LAPIERRE: I guess my question is to Mr Potter. I wonder if it would be possible to get a copy of the electromagnetic scan report, because I've just glanced through the documents and I just couldn't pick it up, so ---

THE CHAIRPERSON: So, we'll enter that in as an undertaking. [u]

I'm sorry, I was in full flight of thanking you and -- that's all right. So, thank you very much to the three of you. We appreciate you making this presentation, bringing in the video and giving us your personal perspective on the whole issue. So, the Panel is very appreciative of that. Thank you very much.

It is now 3 o'clock. We are going to take -- I think we're going to take a 15-minute break and then we will come back with our next presenter, who's the Cape Breton Development Corporation.

MS. MACLELLAN: Thank you very much, Madam Chair and Panel. I thank you for your patience and your tolerance once again.

--- RECESS: 3:04 P.M.

--- RESUME: 3:22 P.M.

THE CHAIRPERSON: Ladies and gentlemen, I'd like to begin the afternoon session with our next presenter. We have -- our presenters are from the Cape Breton Development Corporation.

If you need it, you have 40 minutes for your presentation and I'll give you an indication five minutes before the end.

--- PRESENTATION BY CAPE BRETON DEVELOPMENT CORPORATION (MR. MERRILL BUCHANAN)

MR. BUCHANAN: Thank you, Madam Chair. On behalf of the Cape Breton Development Corporation I wish to acknowledge the invitation of the Joint Review Panel to the Corporation to appear at this hearing. We hope that our participation will help in some way with your deliberations.

By way of introduction, my name is Merrill Buchanan, I am a chartered accountant and have worked for the Cape Breton Development Corporation for more than 30 years, and for the past six years I am the president of the Corporation.

With me is my colleague, Bob MacDonald, who also has an extensive background with the Corporation as a professional mining engineer, as a former colliery general manager and currently the director general of property and environment.

With the concurrence of the Panel, our approach today will be to provide a very brief overview of what Cape Breton Development Corporation was and what it is today, to explain the Victoria Junction land in terms of past and present activity, and to try to answer questions which may be posed by the Panel or others.

Dealing first with the Corporation, the Cape Breton Development Corporation -- "CBDC" I'll refer to it as, although it's also commonly referred to as "DEVCO" -- the Corporation was formed by an act of Parliament in 1967. The act established a federal crown corporation with a mandate, among other things, to operate the coal industry in the Sydney Coal Field of

Cape Breton.

Over the following 34 years to 2001, CBDC operate a fully-integrated coal mining activity involving several mines, a railway track and port transportation system, a coal preparation and storage facility, the Victoria Junction Site, and it also marketed its coal products both in Canada and internationally.

Between 1999 and 2001 the Government of Canada and the Corporation announced decisions to close certain of its mining operations and to sell those assets which could be marketed, such that by December of 2001 the operating activity of the Corporation had ceased.

The authority for this course of action was provided by Parliament enacting in June of 2000 the Cape Breton Development Corporation Divestiture Authorization and Dissolution Act.

Since the closure of operations in 2001 the focus has been -- and continues to be -- directed to addressing the liabilities and the residual activities, and those items fall under three broad categories.

They're the obligations to the former employees in terms of pensions and early retirement benefits and other benefits to the former employees; secondly, the obligations in respect of environmental remediation, requirements resulting from past mining activity in some of the land holdings of the Corporation; and, thirdly, the disposal of its remaining assets, such as used equipment and land holdings.

I will now ask Mr. MacDonald to provide an overview explanation of the -- in respect of the Victoria Junction site.

--- PRESENTATION BY THE CAPE BRETON DEVELOPMENT CORPORATION (MR. BOB MACDONALD)

MR. MACDONALD: Thank you, Merrill. I'll just give a brief overview, Madam Chair, of the site. You see an aerial photo of the site on the screen.

The construction of the Victoria Junction Site began in 1970. The site consists of approximately 550 acres of real estate and about 400 acres of that site actually consumed the activities that were considered to be the Victoria Junction Coal Preparation Plant activities.

The facility operated and processed various coal products for the domestic and international markets from 1976 to 1998. The site was maintained in a state of care and maintenance from 1998 to about 2003, and during that period site drainage was directed to collection ponds for storage and subsequent pumping to an on-site water treatment facility.

As part of a service agreement that CBDC, or DEVCO, has with Public Works and Government Services Canada we began the site assessment process back in, I guess, 2003/2004 and the site assessment or the phased environmental site assessment was done as per the CCME Guidelines.

Also in 2004 the majority of the site's physical plant infrastructure was removed through mechanical demolition and there were -- several of the buildings, as Mr. Buchanan indicated, were sold as part of our asset disposal program.

Also, I guess, in 2004 the portion of the site called the lifting and banking centre was also cleaned off. There was some coal remaining on that site following the activity that we had going on with Nova Scotia Power Corporation and all of that was removed from the site and that was cleaned and the site drainage was tested and now reports directly to the environment without treatment.

Currently there are four buildings remaining on the site and these house the staff -- these house our staff and are used in the water treatment and other remedial activities on the site.

In 2004/2005 consultants were engaged, again through Public Works and Government Services Canada, to develop a conceptual closure plan for the site. In early 2005 the final design for the closure of the large coarse waste pile was completed.

Later that year a contract was awarded for the installation of an engineered cover which included a high-density polyethylene liner on the coarse waste pile. The expected completion of that project is late fall of 2006.

Also, a contract was awarded in 2005 for the removal of contaminated material from two coal storage areas on the site, named "H" Track and "C" Track, so all the contaminated material -- following removal to another area of the property, the area was clean -- covered with clean fill and a vegetative cover was applied to the site. That was completed in January of 2006, so we expect to see some vegetative growth on that area this year.

The final design for the remediation of the remainder of the site is expected to be completed within the next few weeks, and again that is under the direction of Public Works and Government Services Canada, and contract for the remediation of the remainder of the site is expected to be awarded within the next four weeks and we're looking at a scheduled completion of activities on that site again by the fall of 2006, so that's this year.

The objective is to have the entire site remediated and all surface drainage separated from the contaminated waste, and that again would all be done by the fall of this year or early 2007.

The current water treatment system will continue to treat contaminated ground water and leachate from the large coarse waste pile, there will be a leachate collection system installed beneath or around the perimeter of that pile, and that water will continue to be treated until it's determined through further monitoring what the appropriate residual treatment requirements are going to be for the site.

A care and maintenance program will be developed to address the longer term performance of the cover as well as the monitoring of the receptors adjacent to the site.

With that, Madam Chair, I hand it over to Mr. Buchanan, and now he'll comment on what the possible disposal options are for the property.

MR. BUCHANAN: Just a couple of brief comments in regard to that. As you are aware, the Sydney Tar Ponds Agency has investigated the property as a possible location for a proposed incineration facility and CBDC has provided the Agency with information in respect of the conditions on this site.

In discussions with the Tar Ponds Agency officials we informed them about the remediation work being undertaken by the Corporation on the property over time, as Mr. MacDonald has described.

The Agency in 2005 gave CBDC formal notification of its interest in acquiring the VJ property, with that interest being subject to the site remaining a viable location for an incineration facility.

When the Agency indicated its interest, the timing was such that CBDC faced a couple of years of major remediation work on the site and concurrently the Agency expected about a similar amount of time before its requirement for the site would be finalized. So, to this point that's the situation regarding the VJ Site.

Obviously, as both parties move forward circumstances at the time will really determine if there is a land transaction to occur between CBDC and the Agency.

That really concludes, Madam Chairman, our remarks. We'd be willing to try to answer your questions.

CAPE BRETON DEVELOPMENT CORPORATION:

--- QUESTIONED FROM THE JOINT REVIEW PANEL

THE CHAIRPERSON: Mr. Buchanan, Mr. MacDonald, thank you very much for your presentation.

So, I understand that CBDC has received -- you've indicated that you've received a letter of intent, and we've been told by the Agency that they've sent you a letter of intent regarding the sale or transfer of the property.

Now, is that something that in fact you, in conjunction with the STPA, could share with the Panel?

MR. BUCHANAN: The letter came from the Agency, so I'd probably defer to them but ---

MR. POTTER: We can certainly provide that as an undertaking. We'll get a copy.

THE CHAIRPERSON: Thank you very much. We'll enter that on the record as an undertaking. [u]

And, again, maybe this question should be answered by Mr. Potter, but did the -- given that in the Environmental Assessment the Tar Ponds Agency has indicated that they consider that the Phalen property is also -- could be a viable location for the incinerator, the VJ Site was their preferred option but they have put forward Phalen as an alternative means of carrying out that portion of the project.

I just wondered, did the -- have they, in fact, been -- let me back up. My understanding is that the site at Phalen that was indicated in the Environmental Impact Statement as an alternative location, that is also CBDC's property. Is that correct?

MR. BUCHANAN: The Phalen site is a property that's owned by the Cape Breton Development Corporation, that's correct.

THE CHAIRPERSON: And did the letter -- are you talking with the Agency about the possibility of Phalen, or your discussions and the letter of intent is only referring to the VJ Site at the moment?

MR. BUCHANAN: The letter of interest was referring specifically to the VJ Site property.

THE CHAIRPERSON: Can you tell me -- oh, all right. Is the -- are you discussing the possibility of the transfer of the whole of the VJ Site or a portion of the VJ Site for this purpose?

MR. BUCHANAN: The discussions didn't -- haven't progressed to the point of how much of the site would be involved.

THE CHAIRPERSON: Can you tell me, or tell the Panel, a little bit more about what mechanisms there are in place that govern how CBDC disposes of surface assets, including the -- including real estate. Is there -- now you did mention -- I tried to write it down -- that you're governed in this regard by an act, a specific act.

Perhaps you could tell me a little bit

more about that and how and how might it affect your decision-making with respect to possibly transferring this site and what kinds of things would you need to accomplish in order to do that.

MR. BUCHANAN: The activities and mandate of the Corporation are primarily set by the Cape Breton Development Corporation Act, which still exists and has been amended a number of times, was amended in 2000 when the -- but had been amended before that as well during years of operation. So, that's the first item.

The second one I referred to was the Cape Breton Development Corporation Divestiture Authorization and Dissolution Act, and that one was put in place primarily to deal with the closure activity of the site.

There are also aspects of the Financial Adminstration Act, the Federal Government Financial Administration Act, that come into play particularly in terms of disposal of real property.

Those would be the primary -- and both the acts, the CBDC Act originally and the Dissolution Act, both provide for powers for the Corporation to acquire and dispose of property. We had the authority from the original act to purchase land and also to sell land.

As an example of that, in 2001 when the operations were closing down we did have a transaction that involved both land, structures on the land and equipment. Probably our most major transaction to date was in the disposal of the -- it involved the international pier and the railway and associated railway equipment, and there was land involved in that transaction as well.

That was by -- there had been a sale process going on and various parties made proposals regarding assets and we negotiated ultimately with the party that was selected on that.

We also have since 2001 been -- or I guess in 2002 we've been involved with a sister crown corporation, Enterprise Cape Breton, in respect of some of our property and -- as well as with other parties.

So, there's a variety of mechanisms that we would use to dispose of property and those are authorized by our act and policies that would be in place for disposal of assets.

THE CHAIRPERSON: Now, for example, are you required to get -- seek full market value for your properties, or have you got some leeway?

MR. BUCHANAN: Generally speaking the guideline that's there is to full market -- to seek market -- "fair market value" is the term that we refer to, and there's a number of ways that you can do that.

You can do it through a tendering process, you can do it through an appraisal process, but the general norm would be to seek fair market value for a property.

THE CHAIRPERSON: And this would be the case even if the property were transferring between governments?

MR. BUCHANAN: And certainly in the terms of the transaction that we might envisage with another agency of another level of government, that would be the basis for a transaction. I -- in terms of a transaction within the Federal Government, if we were talking another part of the Federal Government there's some room there for other processes, I would say.

THE CHAIRPERSON: In terms of the environmental liabilities associated with the VJ site or the remediation responsibilities, is there -- are there some requirements on CBDC in terms of completing remediation before land is -- title to the land is transferred? Or what about such things as requirements for ongoing monitoring and as you indicated, water treatments? That is likely to go on for a number of years to come, is that right Mr. MacDonald?

MR. MACDONALD: That's correct, Madam Chair, yes. We don't know the duration but again that can only be determined through further assessment and evaluation over the next number of years.

THE CHAIRPERSON: I'm sorry, I can't quite hear you.

MR. MACDONALD: That'll only be determined through further evaluation over the next number of years as we see what benefits that we are realizing from the capping initiative.

THE CHAIRPERSON: Um-hmm. Is that -- how do you deal with that issue when you are considering transferring a property or selling a property?

MR. BUCHANAN: Well, the -- in terms of the remediation itself I'll use the VJ property as the example. There the decision was made that we were going to undertake an appropriate level of remediation on the site before we would consider disposal of it.

If there was a property that had some aspect of remediation identified and there was a buyer that wanted that property, then we follow a full disclosure of the conditions on the site. It's not dictated to us that we have to do the remediation before transfer. There may be an opportunity where they -- where the party acquiring a property is willing to take the property in the state that it's in and in that case, we would disclose the assessment information that we would have in respect of the property.

THE CHAIRPERSON: So in the case of the VJ site, if you were to sell the entire site would the responsibilities for monitoring and for water treatment then be taken on by the new owner or would you retain those?

MR. BUCHANAN: It's difficult to speculate on what might be arranged at the time. We're not clear at this stage what degree of monitoring, care and maintenance will be required on this date, on that particular property. And we certainly haven't had that type of discussion with the agency at this stage as to what could be worked out in that regard.

THE CHAIRPERSON: I'll ask just one more question. I know my colleagues have got questions. Now, it's our understanding that because of revisions to the Canadian Environmental Assessment Act, Crown corporations such as CBDC are going to become subject to the Act in respect of potentially being able to be designated as a responsible authority under the Act. I understand that this has not been the case before. And our information says that in fact, this change would take place on June the 11th of this year. I'm sure you're thoroughly familiar with this.

Now, do you see this having any affect on the transaction? Do you -- are you anticipating that it was possible that the transaction might occur before June 11th? Or is that far too soon? And if so, are you expecting to become a responsible authority with respect to this environmental assessment at that point?

MR. BUCHANAN: Well, if I can, to a couple of points in your question. The -- your information is correct, the corporation as with a number of other Crown corporations effective June 11th of 2006 will be drawn under the umbrella of the Environmental Assessment Act.

The ramifications of that in terms of the possible transaction that we're talking about today, I think have -- there's certainly more investigative work that would have to be done to determine the ramifications of being brought under that Act and specific to this transaction. Certainly, there's no expectation on CBDC's part. I can't -- because we have at least a number of months to a year's work to do in terms of the remediation activity on the property. So we're not anticipating a transaction with the agency. And certainly not before June the 11th. And so it'll be post that if there is to be a transaction.

THE CHAIRPERSON: Thank you, Mr. Buchanan.

DR. LAPIERRE: Good afternoon. Thank you. A few questions related to -- that relate to Mullins

Bank. You own most of the property on Mullins Bank?

MR. BUCHANAN: We do own some of the Mullins Bank property. I don't know how much the acreage is off hand but we do own some of that.

DR. LAPIERRE: Do you have any idea of the condition of that property. Is it polluted -- is there any pollution? Is there any remnants of pollution on this site?

MR. MACDONALD: Yeah, that property has been assessed. Back in the early 2000 it's been assessed and it has been identified as having contaminants in regards to the coal laydown activities of the Cape Breton Development Corporation.

DR. LAPIERRE: So what kind of contaminants might be there?

MR. MACDONALD: We're talking metals and I believe some PAHs.

DR. LAPIERRE: And what's your liability and do you have any future use restriction on that site?

MR. MACDONALD: At this point in time, no, it's just vacant land that we monitor. But there's no intended future use. There's been some discussions with the Sydney Tar Ponds Agency about their interests in the property.

DR. LAPIERRE: So again you have some

liability associated with the land that you own?

MR. MACDONALD: That is correct.

DR. LAPIERRE: And if I understand correctly, your previous comment is you have the possibility to transfer your liability.

MR. MACDONALD: That is correct, yes.

DR. LAPIERRE: I guess just one question on the VJ site. How would you classify the VJ site? Is it a heavily polluted site, moderate polluted site?

MR. MACDONALD: The VJ site, I mean, the predominant contaminant concern at the site is actually mine drainage. I mean, we have a site, an extensive piece of real estate whereby there were coal handling activities carried out. And for the most part, the result of that is when water comes in contact with the pyritic base materials we end up with an acid mine drainage discharging off the property. So that is a predominant issue on that site.

DR. LAPIERRE: So the acid mine drainage or the acid drainage does migrate off site?

MR. MACDONALD: That is correct, yes.

DR. LAPIERRE: And then it transfers to wetlands or brooks or ---

MR. MACDONALD: To wetlands. I mean, currently on the site we do have a system of drainage collection that captures all of the surface runoff and brings it back to a water treatment facility on the site. There is groundwater contamination that exists on the site and continues to exist.

The effort that we are looking at to address that situation is basically to consolidate where possible all the acid mine drainage or acid generating material and cover that with a HDPE liner. And the two main areas, I mean as I talked about earlier in the presentation, is the large coarse waste pile. That would be the -- this area right here. It's about, I guess, a 46 hectare portion of the site.

And in the plant site are right here -- if you see where I'm moving around the cursor, there would be some material. All of that material in this area here is going to be consolidated right into an area here and that's where, as I talked about in my presentation, there were two laydown areas, C track and H track. All the contaminated soils from those two areas were brought to this portion of the site. They will all be taken there and again a HDPE liner will be placed over that.

The objective, again, is to create a barrier or separation between the precipitation runoff and the contaminated material or the acid generated material.

DR. LAPIERRE: Across the road, there's a lake. Is that a pond ---

MR. MACDONALD: Across -- oh, you're talking across Lingan Road or -- this is Grand Lake here.

DR. LAPIERRE: That big body of water, is that a pond or is it a lake?

MR. MACDONALD: That is Grand Lake that we're looking at here. That is upgrading at the site.

DR. LAPIERRE: So does the pond drain -- does the VJ site drain -- is the drainage towards the late or away from the lake?

MR. MACDONALD: The majority of the drainage is away from the site. There's a small portion of the site -- if you see where I'm moving the cursor, part of the LBC would drain in this direction here. Most of it drains off in this direction. Now we know that it's a clean portion of the site since we removed all the coal. And there's a small area right here that is a sort of a higher contour than the rest of the site, it drains in that direction into Northwest Brook. But the majority of the drainage from this, I guess, this area right across the site all goes in this direction kind of north, northeast towards the Northwest Brook wetland.

DR. LAPIERRE: And to the north that you would say, that looks like a swamp with a little brook there.

MR. MACDONALD: It's called the Northwest Brook wetland.

DR. LAPIERRE: And that brook drains to which area?

MR. MACDONALD: Well, that brook ultimately drains -- the Northwest Brook actually goes all the way to what they call Bridgeport Basin which is in River Ryan just outside of the Town of New Waterford, Scotstown area. So it has quite a lengthy path where it leaves the site and it migrates off to the north, northeast.

DR. LAPIERRE: So has there been any -- is there any acid drainage to that brook and marsh?

MR. MACDONALD: There is acid drainage to the wetland and the brook has a monitor. We have -- when we constructed this site, I mean we had an environmental approval from then, the Department of Environment, Provincial Department of Environment, there is a monitoring program in that wetland that we adhere to. We have to meet the -- in regards to any water treated on this site we have to meet the metal mine effluent regulations. Other than that -- and that was a volunteer obligation on the part of the corporation.

But other than that there is some

contamination going into the wetland through -- mostly through groundwater drainage. All the surface water is captured and taken back to our treatment facility. So the objective here is to just -- the surface water and by putting the substantial high density polyethylene liners over those areas where the acid mine drainage would originate. We expect to reduce significantly the contribution of acid mine drainage to the wetland. That is the overall objective.

DR. LAPIERRE: So you have some significant work for some time to clean up that site?

MR. MACDONALD: No, I mean, basically we -- again, we've been -- it's been characterized back in 2003/2004. We've had some aggressive design engineering to Public Works and Government Services Canada and the consultant that they've engaged on our behalf to come up with a strategy to remediate that site and the impacts on that site. We would expect again by late fall, early winter of this fiscal year, we will have -- essentially remediate that site and all service drainage will leave the site clean with the exception of having to manage the total suspended solids because you still will not have a strong vegetative cover on the property.

And the remaining component would be a leachate collection system around -- I'll go again to the

-- around this large course waste pile there'll be a leachate collection system, collecting the leachate, the residual leachate in the pile because the HDPE liner will now prevent any infiltration. So that will come to this point here and be taken back to the serge pond and be treated. There's also a nest of wells along this north side of the pile prior to the groundwater going into the wetland. We're capturing that deep groundwater and taking it back to our treatment facility.

Those will be the two residual sources of contamination that we will be managing, today, as we know it. That could change but again, today as we know it, based on, you know, our work with the consultants.

DR. LAPIERRE: Okay, thank you.

THE CHAIRPERSON: I'd just like to put in a little plea for a little more volume. I don't know who I have to ask or what -- I'm just finding it a little bit hard to -- and I don't know if people in the hall -- yes, I see some nodding so I don't know whether you have to move closer, somebody has to turn you up or ---

MR. MACDONALD: I've brought it closer. How does that sound?

THE CHAIRPERSON: That sounds good.

MR. MACDONALD: Sorry.

THE CHAIRPERSON: It's all right. I'm

told quite often that I'm quite -- I'm too loud so the other way.

MR. CHARLES: Mr. Buchanan, my -- Madam Chair has already asked you about the Letter of Intent and Mr. Potter has agreed we're going to get a copy of it. I guess my question is, when was the Letter of Intent signed for the VJ site transfer? Potential transfer of property?

MR. BUCHANAN: The letter is dated April, 2005 I believe.

MR. CHARLES: Besides the Letter of Intent itself, have you had any other discussions with the agency about the transfer of the property, either detailed or otherwise?

MR. BUCHANAN: No, we had discussions prior to the letter and they had discussed with us the -- their -- that they had identified the site. We had provided information regarding the Victoria Junction site as well and Phalen. You had mentioned earlier on Phalen. But the -- that was really the basis for the letter being ---

MR. CHARLES: Nothing since?

MR. BUCHANAN: No, because at that time we had indicated that we were going to undertake the work between 2005 and the end of this year on the site. And the agency was indicating that they were going to have to go through a process, partly what we're involved with right here to -- so that's why I referred to it as a "Subject to". And you'll see that in the letter that they're -- they were expressing an interest in the property subject to them having to do things and similarly for CBDC, subject to us having to do activity on the site as well because we had entered into the remediation activity at that time.

MR. CHARLES: Okay, thank you. Now, going to the Phalen site, does that site require extensive remediation and can you compare the VJ site and the Phalen site in terms of remediation difficulties?

MR. BUCHANAN: Perhaps I'll ask Mr. MacDonald to refer to that. The Phalen site was one of our mine sites. We still -- our offices are actually still there in the former administration building. There are a number of structures on that site in terms of buildings. But I'll get Bob to refer to actually the site conditions itself from a remediation point of view.

MR. MACDONALD: No, I mean that site has very little contamination. The was a very small coal laydown area on that site. Other than that, I mean, typical administration building, mine administration building. Bank heads that would support moving many material underground. And we had I guess what we would call a mechanical electrical shop facility on the site. We're doing some maintenance and overhauling equipment. Compared to VJ, insignificant as far as impacts.

MR. CHARLES: What about underground working. Do they pose any kind of a problem for a facility lie an incinerator.

MR. MACDONALD: In 2001 -- 2000/2001, with -- working with Public Works and Government Services Canada, all the openings to the underground workings were sealed so basically at Bodling (sp) and the Phalen site, so both sites had concrete portals leaving the surface and extending for about 300 feet below the surface and then from that point the underground mine workings actually were established. So those concrete portals are actually sealed with a concrete bulkhead and pushed in and back-filled. So there is no access to those.

MR. CHARLES: And you're not concerned about subsidence or anything like that?

MR. MACDONALD: I mean, there's always a concern about subsidence. I mean, when you think about the fact that once you created an underground opening at some point in time and depending on many factors, there will be, you know, some level of subsidence that develop. We know where those workings are. The infrastructure on the site as it exists today is nowhere near those workings, the remaining infrastructure.

MR. CHARLES: In terms of time frame, would you anticipate the remediation at Phalen to be -- to take less time than the VJ site? Or are they about the same -- would they take about the same time or can you tell?

MR. MACDONALD: We haven't progressed to the same level at the Phalen site as we have at the VJ site in regards to the removal of the infrastructure. There's still a significant component to the infrastructure on the site, some larger buildings that housed some of the coal mining facilities. Again, those if we wanted to be or needed to be, they could probably remove within a, you know, one year time frame. The other residual, you know, contaminants of concern, again they could probably be addressed in parallel. But I guess that's just my opinion based on what we've been able to achieve thus far in working with Public Works and Government Services Canada.

MR. CHARLES: But you say that you've done more work sort of assessing the need for remediation at the VJ site than you have at the Phalen site?

MR. MACDONALD: Well, both sites -- I mean, basically we're assessed to a Phase 3 level of assessment. As far as looking forward to developing a remedial action plan we've gone much further on the VJ site because that was a priority site because ---

MR. CHARLES: A priority site, yes.

MR. MACDONALD: Yes.

MR. CHARLES: Okay, thank you very much.

MR. MACDONALD: You're welcome.

THE CHAIRPERSON: Just before I invite questions from other participants, I've just got a couple of more questions.

Just to follow up on Mr. Charles' questions about Phalen, I had forgotten that the CBDC's offices are at that site.

Now, how long is CBDC going to be in operation, or how long will those offices be in use? Do you have a time when you think that that building will be vacated and turned over?

MR. BUCHANAN: The -- specific to that site, we will have a requirement for certain aspects of our operation on there for -- in terms of use of the existing buildings for at least another year.

The -- some of the buildings that are on the site certainly offer some potential for future economic development activity, and that will have to be looked at in terms of our disposal.

To go the broader question of how long CBDC will be around ---

THE CHAIRPERSON: No, I don't really need to know that.

I was more interested in your use of that building and the fact that I don't know how big the -- I'm just trying to get a sense of the actual feasibility of Phalen's sites being potential alternative sites for the incinerator as it appears in the EIS.

Now, I mean, were the incinerator to be -- were you to negotiate -- I mean, are you interested in negotiating the transfer of the Phalen property for this purpose, or have you even considered this, at this stage?

MR. BUCHANAN: It's -- we're working on our entire property holdings in terms of disposal, because the corporation can't be dissolved until our properties are disposed of, and we have initiatives going on a number of fronts in that regard. So ---

THE CHAIRPERSON: But your office -- your use of that building as offices would have to finish before you'd want to transfer the property and have some other use, particularly an incinerator, located there, is that correct?

MR. BUCHANAN: Well, we really haven't looked at it in terms of whether -- you know, whether any of our people would be on the site at such time as other activity would be there, where -- some of our activity will be elsewhere and until we finish with those buildings, some of it will be there.

THE CHAIRPERSON: And then my other question relates to the VJ site and the potential for future use.

When I look at that -- well, when I look at the actual waste pile from the road and when I look at that aerial shot, I'm a little hard pressed to envisage some alternative use of that remediated waste pile.

But is there one, or is it going to be a big block with a green cover for a very long time to come?

MR. BUCHANAN: Well, I'd be getting into the realm of speculation regarding the future use of the waste pile itself, but it is a large -- there is a large acreage of land there. I think it would be safe to assume that some of that property does have potential future use.

If not the waste pile, there would be many acres outside of that that will be remediated and -- it -- you know, it's in an area where there's good road access to, there's rail access. The property is not without its features.

THE CHAIRPERSON: And the total area of the property is ---

MR. BUCHANAN: Total area is, I think, around 550 acres, and the area that you're looking at there right now is probably in the order of four ---

MR. MACDONALD: Total area?

MR. BUCHANAN: Total?

MR. MACDONALD: Yeah, that area right -- oh.

The area you're looking at in the aerial is probably about a little over 400 of that 550 acres.

There's some more acreage to the left here that -- between this -- the rail line and Grand Lake Road, or Sydney Glace Bay Highway. Yeah, it's probably about 420, 450 acres there.

THE CHAIRPERSON: But it's fair to say that that waste pile is likely to remain a very prominent feature and not likely to support some other use for quite some time to come?

Is that a -- I know you don't like to speculate, but I'm just really talking about the capacity to support future use, and I'm wondering if that's going to remain a sort of permanent feature for quite some time?

MR. MACDONALD: That is the plan. I mean, once the cover has been applied, I mean, that feature would, you know, sit on the landscape for many years to come. Yeah.

THE CHAIRPERSON: Thank you very much.

I would like to now provide opportunities for other people to put questions to CBDC, focusing on the -- particularly on the issues before the Panel. I will turn first to the Sydney Tar Ponds Agency. Do you have any questions for Mr. Buchanan or Mr. MacDonald?

MR. POTTER: Thank you, Madam Chair.

Not at this point.

Just to clarify, the -- I guess the status of the letter of intent.

As Mr. Buchanan indicated, there's been no discussion since the letter has been submitted.

We anticipate, pending the outcome of the assessment review and a final decision by government by some time late this fall, we will have a better appreciation for the final description of the project, and we would then be entertaining further discussions at that point in time if we were proceeding with the VJ site, or potentially the Phalen site, again, depending on the outcome, so we'd be at least a year from that point in time even entertaining an incinerator showing up on the site.

There's a substantial design period and tendering period to acquire an incinerator, so it would be well into 2008, 2009, based on our schedule, that we'd be looking at arriving on the property.

There would be some preparation work necessary, but it would be -- the schedule shows us around 2008, 2009 with the start of incineration.

THE CHAIRPERSON: Thank you, Mr. Potter.

So, can I get an indication, please, of the registered participants, who has questions for CBDC?

Just hold on, please. I've got Mr. Brophy at the back. I've got Mr. Marman. I've got Ms. Ouellette, Dr. Argo and Ms. MacLellan.

Let's start with a question, then a follow up question, and then we can go around for a second round as things go.

Let's start with Mr. Brophy.

--- QUESTIONED BY ERIC BROPHY

MR. BROPHY: Thank you, Madam Chair. Good afternoon, gentlemen.

At the start, we haven't -- at the start of your presentation -- I don't think -- testing, testing. It's not working, Madam. Thank you very much.

THE CHAIRPERSON: It's not that we don't want to hear from you, Mr. Brophy. It will get fixed in a minute.

MR. BROPHY: Coming from this area, Madam Chair, I thought maybe there was a conspiracy at foot.

At the start of your presentation, gentlemen, you mentioned you're following the CCME guidelines in remediating the site. I take it these guidelines are current and applicable?

MR. MACDONALD: Yeah, they would be 1997 version. Is that what you're talking about?

MR. BROPHY: I would take it, yeah.

MR. MACDONALD: Yes.

MR. BROPHY: In 1997, if that's the latest?

MR. MACDONALD: That's correct. We ---

MR. BROPHY: And the reason -- the reason I ask this question, last week there was some controversy over the validity of certain guidelines, and those were published also in the '90s, the early '90s.

I just hope that throughout this project, we're not selectively choosing which guidelines we'll follow.

Having said that, I thank you very much for the opportunity, Madam Chair.

THE CHAIRPERSON: Thank you, Mr. Brophy. Mr. Marman?

--- QUESTIONED BY GRAND LAKE ROAD RESIDENTS (RON MARMAN)

MR. MARMAN: Thank you, Madam Chair.

Through you, Madam Chair, to Mr. Buchanan and Mr. MacDonald, just so you know, I'm a resident that lives across the site from your VJ site, so I've taken a keen interest in that site since it was built, and I'm pretty well familiar with different things that happen down there.

But would you agree that the area around the VJ site is mostly wetlands, whether that be lakes or brooks or swamps?

MR. MACDONALD: Yes.

MR. MARMAN: And during your time of operation, just as a second part of that question, did you have any problem with flooding in that area with your operation, especially when the beavers dammed off the brook? Did you guys have to go down there and actually remove some of the dams and ---

MR. MACDONALD: In the brook itself?

MR. MARMAN: Yeah.

MR. MACDONALD: That was -- at that time, during the operation, those activities did take place, yes. And that was through discussions with, I believe, the Nova Scotia Department of Environment.

MR. MARMAN: Yes.

MR. MACDONALD: Yes.

MR. MARMAN: May I ask one more, Madam Chair?

When you talk about your continuous monitoring and, in particular, some concern with the runoff from your waste pile, and a concern about the waterways and what have you in the area, if, at a later date, this incinerator is put in that area, and there are problems, say we -- the monitor shows some problems or whatever, how would you be able to define if the problem is the incinerator or that particular waste pile on the site?

MR. MACDONALD: I guess all I could say is that we'd have to go back on historical data that existed prior to an incinerator being placed on the site. If there was a difference in that data, then we would have to look at is that difference, you know, a contributor to some other source, ie. the incinerator, if that's what you're indicating.

MR. MARMAN: But it would be very difficult. I mean, at some point in time, like -- I don't know if this is another question. It's just a continuation, so with your permission, Madam Chair.

Like, the houses around the area all rely on wells for water.

So if we ever did determine that we had a problem with our well, we're a bit concerned that, you know, we would look to you fellows and say, "It's your stone pile", and you would say, "Nope. Not us. You'd better go talk to the boys running the incinerator." And we would go to them and they would say, "Well, you know, you guys know there was problem with this site that goes back for years, so why are you blaming us now? We just started running here a year ago."

And I know you can't really, given the -- but would you believe that, you know, that would cause some difficulty, especially if, you know, the Province denies it, you fellows denies, you know, and everybody believes that they're right, it's not them.

How would it -- how would you ever manage to find the cause and be able to tell the people there, "Well, yes, here's what it's from"?

MR. MACDONALD: Madam Chair, I don't think I'm in a position to answer that.

I mean, basically we will be doing our monitoring, given, you know, our activities on the site and what would be required, you know, from a post-monitoring program.

This goes beyond what, I guess, I would be at liberty to discuss here today, I believe.

THE CHAIRPERSON: Well, I do see that Mr. Marman's question is pertinent to what the Panel is looking at, but I guess I will ask a kind of follow-up question, is that I assume that when, if you did negotiate a transfer of land, there would be some fairly detailed negotiations and agreements about the whole question of liabilities.

And given that you would, presumably, still hold some liability, would you, on that land? Especially if you were still -- well, I'm not sure who's going to be doing the monitoring, if you did sell the land.

It does seem like a very complicated matter where you have a piece of land that does have some environmental liabilities still attached to it. Maybe it's not complicated for the people who do it every day, but I'm curious.

MR. BUCHANAN: It's difficult for me to comment on.

There would -- as Mr. MacDonald indicates, there would be base line information as to what the circumstances were that -- that's -- and that's fairly common, in terms of having that for a buyer in terms of what the circumstances are at present.

What takes place beyond that, or what's

negotiated as part of a transaction, in terms of the ongoing requirements, it -- I'm really not in a position to comment or -- it would be speculating on what would be developed in terms of a negotiated arrangement on the property.

THE CHAIRPERSON: Thank you, Mr. Marman, for raising that question.

MR. MARMAN: Thank you, Madam Chair.

I'm just glad that the present owners acknowledge that it is a wetland all around that area.

THE CHAIRPERSON: Ms. Ouellette.

--- QUESTIONED BY MS. DEBBIE OUELETTE

MS. OUELLETTE: I thought I heard him say, and I'm not sure if this is right, that the Tar Ponds Agency, they are interested in property. Are you talking about the Mullins Creek or the Mullins Bank?

You mentioned some property. Which one would that be?

MR. BUCHANAN: There was -- there -- I think there's been reference ---

THE CHAIRPERSON: I believe -- do you mean at the beginning?

MS. OUELLETTE: Yeah, he ---

THE CHAIRPERSON: We were discussing at some length the fact that the Tar Ponds Agency has indicated by means of a letter of intent that they are interested in possibly negotiating the transfer of the VJ property.

MS. OUELLETTE: Oh, it's that property. Oh, I wasn't sure ---

THE CHAIRPERSON: But then we also -- Dr. LaPierre asked some questions about CBDC's ownership of Mullins Bank on the Coke Oven site.

MS. OUELLETTE: The V ---

THE CHAIRPERSON: Did you discuss the transfer of that? I can't remember.

MR. BUCHANAN: We indicated that ---

THE CHAIRPERSON: In that exchange?

MR. BUCHANAN: We indicated that there was activity on that with the Agency as well.

THE CHAIRPERSON: Yes.

MS. OUELLETTE: So the ST -- Tar Pond Agency wants that land, they tell you, for what -- or what use?

THE CHAIRPERSON: Which land are we talking about now?

MS. OUELLETTE: I'm not sure if it's the VJ site or the Mullins Bay.

THE CHAIRPERSON: The VJ site is being indicated in the EIS as a potential location for the incinerator.

MS. OUELLETTE: Right. But I'm just saying, is it the STPA that wants that site? Is it -- you know, like I'm not sure ---

THE CHAIRPERSON: Yes.

MS. OUELLETTE: Okay. That's good. Thank you.

THE CHAIRPERSON: Dr. Argo.

--- QUESTIONED BY CAPE BRETON SAVE OUR HEALTH CARE COMMITTEE (DR. JAMES ARGO)

DR. ARGO: Thank you, Madam Chair.

I was very interested in the presentation to hear them using the term acid mine drainage, and for the purposes of this room, I'm wondering if the gentlemen could describe what acid mine drainage is?

MR. MACDONALD: With regard to this particular site, what acid mine drainage is, is when we have the precipitation coming in contact with the pyretic rocks on the site, which is a byproduct of the coal processing activity, you end up with, you know, a low PH effluent, which is also high in metals.

DR. ARGO: What -- slightly afraid to touch it.

What sort of metals?

MR. MACDONALD: I mean, we're talking your typical arsenic, copper, lead, or getting selenium. There's a whole array of metals. I mean, I couldn't go down through the whole list.

DR. ARGO: That's fine. I showed -- okay. Then -- one short?

Would -- are these the metals that you're monitoring?

MR. MACDONALD: Yes, we do have a ---

DR. ARGO: You talk about monitoring ---

MR. MACDONALD: Yes, we do have a monitoring program around the site and the wetland itself. We also have a monitoring program that monitors -- there's the effluent that is leaving the water shoot of that facility, and that effluent has to meet the metal mine effluent guidelines.

DR. ARGO: And those, then -- have you detected any arsenic?

MR. MACDONALD: There has been some arsenic, yes.

DR. ARGO: Off -- away from the site?

MR. MACDONALD: Yes.

DR. ARGO: For instance, in the lakes or in the ponds?

MR. MACDONALD: I can't specifically say where, but there has been some detection, and it's that information that has lead to the decision to cap the site.

DR. ARGO: Do you know what those lakes eventually are used for? Are you aware that those eventually go to ---

MR. MACDONALD: This -- the -- I'm talking about the wetland, not into the lakes. It's into the wetland, basically, I guess, in this area right here.

DR. ARGO: Did you -- are you aware that those -- that runoff eventually gets into the lakes to become the watershed for -- the water supply for New Waterford?

MR. MACDONALD: Not that particular runoff. That does not go in that direction.

DR. ARGO: It doesn't go?

MR. MACDONALD: No, not to my knowledge.

DR. ARGO: Thank you.

MR. MACDONALD: Okay.

THE CHAIRPERSON: Thank you, Dr. Argo. Ms. MacLellan?

--- QUESTIONED BY CAPE BRETON SAVE OUR HEALTH CARE COMMITTEE (MARY-RUTH MACLELLAN)

MS. MACLELLAN: I just have a couple of quick questions but before I do, you talked about the environmental assessment that DEVCO had conducted itself.

Madam Chair, is there an undertaking for them to provide that environmental assessment?

THE CHAIRPERSON: This is the environmental assessment ---

MS. MACLELLAN: On the VJ site and the Mullins Coal Bank as well.

THE CHAIRPERSON: Could you before I -- Mr. MacDonald please clarify for me.

MR. MACDONALD: That information is with the Sydney Tar Ponds Agency. We provided all the information to them for their project.

MS. MACLELLAN: But I'm asking Madam Chair, could you ask DEVCO to provide it since the Sydney Tar Ponds Agency said they would not at a prior Panel discussion?

THE CHAIRPERSON: Mr. Potter, could you remind me. I'm finding it hard to keep track of everything that was said or not said.

MR. POTTER: You're asking the wrong person but having the same trouble but I believe the discussion was in relation to the DEVCO work that was done on -- around the VJ property that we indicated. In the EIS report we referenced all of their documents. Our consultant did review all the information that they had undertaken on the site. We've made reference to it.

I don't remember being asked to provide the actual reports. I don't recall that. Normally we wouldn't provide a third party report. We'd direct the person requesting it to go back to the -- you know, the holder or the originator of the report such -- normally the procedure we follow in a situation such as that.

THE CHAIRPERSON: Ms. MacLellan, I think what we'll do is the Panel will just give that some consideration. I'm going to ask the Secretariat to remind us that I've made that undertaking -- not a undertaking, not a capital "U" undertaking, no. That the Panel will consider that and will decide whether we feel that it's important to request those documents as an undertaking. I don't feel comfortable doing it right now.

MS. MACLELLAN: Well, then could DEVCO provide me with a name and an address where I can write for them for myself?

THE CHAIRPERSON: Sorry, where you can what? You want to get them yourself?

MS. MACLELLAN: Yes.

THE CHAIRPERSON: Well, I can relay that question to the CBDC. That's up to you and perhaps, in fact, that's something that you should speak with -- well, do you have any trouble doing that?

MR. BUCHANAN: We can provide the name and address to address the request to.

MS. MACLELLAN: Fine, thank you. I will talk to you after the questioning. The other question I have is the potential for the VJ site to be -- the ownership turned to Sydney Tar Ponds Agency. If the residents of indeed Grand Lake and New Waterford and Lingan and River Ryan, etc., etc. called a mass meeting and asked DEVCO not to turn that ownership over, what would you do?

MR. BUCHANAN: Well, it's -- it would be up to the corporation to consider what requests came forward. I don't have a position in regard to that at this time. It would have to be considered. Anything that comes in to the corporation has to be considered by them and responded to.

MS. MACLELLAN: So if we call such a meeting would you send a representative, at least to the meeting?

MR. BUCHANAN: I'd need to know more about it before I'd agree to have any representative participate.

MS. MACLELLAN: My other question is regarding the Phalen site. And why it hasn't been assessed. Is there a possibility that Phalen site will be -- the ownership turned over to the new corporation that's taking ahold of the Donkin mine because they expressed interest in possibly using some other old mine sites to reopen them. And is that why you haven't considered -- they haven't considered or you can't answer those questions the Panel asked about the Phalen site?

THE CHAIRPERSON: I think to clarify, my understanding from the questions that I asked CBDC, they have indicated that they have not received -- they've not had any indication from the Tar Ponds Agency of interest in that property. Is that right or am I not -- the Phalen property?

MR. BUCHANAN: That's correct. We -- the letter that I referred to from the Tar Ponds Agency expressing an interest was specific to the VJ site. There was no reference. I did also indicate that information regarding the conditions on the Phalen site, I believe have also been provided to the Tar Ponds Agency but specific to the letter there was no reference to any site other than the VJ site.

THE CHAIRPERSON: With reference to Ms. MacLellan's question, though, are there some other -- have you received some other expressions of interest in use of that site that you're also concurrently -- or sorry, Phalen site that you are maybe considering in the future.

MR. BUCHANAN: I do know that other parties have looked at the Phalen site. But there's -- that's the extent of it. There's parties have looked at many of our sites.

THE CHAIRPERSON: Okay, thank you. One more question.

MS. MACLELLAN: One more question and that's regarding the Mullins Coal Bank, are you planning to remediate the Mullins Coal Bank before it's turned over to -- or if it is turned over to the Tar Ponds Agency beforehand. We did some tests on the water there and they're pretty bad. The leachate from that bank. In fact, I've provided the testing to the Panel.

MR. BUCHANAN: There's no plan that we have currently for remediation activity on the Mullins Bank.

MS. MACLELLAN: I think the Panel -- when I asked the Panel to give consideration to what happens to the Mullins Coal Bank, specifically since it's not in the mandate but it impacts on the Tar -- Coke Oven site. Before ownership is assumed by the Tar Ponds Agency shouldn't it be cleaned up?

THE CHAIRPERSON: Thank you, Ms. MacLellan. Is there anybody who is not a registered presenter who has a question before we break? I don't see anyone so Mr. MacDonald, Mr. Buchanan, thank you very much for your presentation and for answering questions, our questions and others questions. We will now take a break and we will resume at 6:00. Thank you.

MR. BUCHANAN: Thank you, Madam Chair.

--- Upon recessing at 4:28 p.m.

--- Upon resuming at 6:02 p.m.

THE CHAIRPERSON: Well, good evening, ladies and gentlemen. I'd like to resume the evening session of the Environmental Assessment Hearing. We have two presenters this evening, we have the Cement Association of Canada seated already at the table, and we also have the Portland Cement Association.

Because of the connection between the two presentations, the fact they're addressing very similar issues, we've decided that in fact we will have the presentations back-to-back, we will then take a break and then when we come back we can begin questioning of both parties. I guess we'll have to fit you all in on the table at that point.

So, right now -- so as each association has 40 minutes maximum for their presentation, I'm going to make that an 80-minute allotment, because I understand one might be a little shorter and one might be a little longer.

I will -- unless you want me to give an indication towards the end of the first 40 minutes, I will basically let you use that 80 minutes and indicate as you come towards the end of the 80 minutes five minutes before that.

Sorry, that seems like a rather

complicated way of putting it but I'm sure you understand what I'm trying to say. So, we welcome you and look forward to your presentation.

--- PRESENTATION BY THE CEMENT ASSOCIATION OF CANADA (MR. COLIN DICKSON)

MR. DICKSON: Thank you, Madam Chair. My name is Colin Dickson and I'm with the Cement Association of Canada, the director of business development here in the Atlantic Region. I'd like to firstly introduce the folks to my left.

Mr. Wayne Adaska, to my immediate left, will be making the presentation on behalf of the Cement Association of Canada. He's the -- he's responsible for public works with respect to solidification and stabilization and other technologies on the public works side. And to his immediate left is Mr. Chuck Wilk, and he's the program manager responsible for waste treatment at the Portland Cement Association.

So, Mr. Adaska will be making the Cement Association of Canada's presentation on behalf of Mr. Conner, and Mr. Wilk will be making the Portland Cement Association's presentation.

Just our little bit of housekeeping business, Madam Chair. Mr. Conner, unfortunately, who was scheduled to make a presentation this evening, is ill, he's at the Delta Hotel and he sends his regrets, and we've entered into record his text on solidification and stabilization, a 700-plus page document written in 1990, and we had invited Mr. Conner to present as he is an authority on the subject.

So, I hope you enjoy his presentation, and we'll endeavour to respond to questions related to this presentation. If we can't, Mr. Conner will in writing respond to those questions.

So, just a brief piece of information on the Cement Association of Canada. We're a not-for-profit organization. We're not a vendor and we don't have a financial interest in the Sydney Tar Ponds/Coke Ovens Site project. We represent approximately a hundred percent of all the cement producers in Canada.

We regularly provide technical support to clients and owners of projects similar to the Sydney Tar Ponds Project, and when they're interested in technology similar to solidification and stabilization we respond by providing technical documentation and providing presentations, introducing them to folks who have had a similar experience or, in fact, contractors and engineers who are experts in the field.

Also a role of the Cement Association of Canada is to work with the universities and the community colleges to educate the youth on this technology and other technologies related to cement. And lastly, and important to this project, we regularly work with governments on large scale projects.

So, in the presentations this evening Mr. Adaska will discuss the science and engineering behind solidification and stabilization technology and Mr. Wilk will present projects of a similar nature to the Sydney Tar Ponds project. We note that these two particular issues have been of interest in the Panel hearings to date and we believe these presentations will respond to those issues.

Thank you very much, and we look forward to your questions following these presentations.

--- PRESENTATION BY THE CEMENT ASSOCIATION OF CANADA (MR. WAYNE ADASKA)

MR. ADASKA: Good evening, Madam Chair, distinguished Members of the Panel. I appreciate the opportunity to present this information to you this evening. As Mr. Dickson said, Mr. Conner is not available. I will take the role of making that presentation.

A little about my background. I am a professional engineer with the Portland Cement Association. I've been with the Association for 28 years and prior to that I was a geotechnical engineer for two consulting firms, so a little there.

The information I'm going to present is basically information on the basics of solidification and stabilization with some of the chemicals and engineering properties, and again as Mr. Dickson said, Mr. Wilk will follow up with particular information on projects.

What we'd like to address this evening in the presentation is several items. First off, what is solidification and stabilization, how is solidification and stabilization designed and implemented, when and where has SS been employed, and, finally, why is SS a viable solution for the Sydney Tar Ponds Project.

The first thing I'd like to do is to define some the terms we'll be using this evening. The first one is "stabilization." Stabilization is defined as reducing the hazardous potential of the hazardous waste by converting the contaminants into a less soluble form, meaning it chemically stabilizes the material.

Solidification is the area where we talk about taking and covering sludges and liquids and other types of media into a physical -- non-stable hazardous waste into the stable situation. So, in other words, we're talking about a mass or some sort of a friable material that is more solidified, not a liquid but a solidified material.

What is solidification and stabilization? It basically involves the mixing of Portland cement into the contaminated media, such a soil, sludges, liquids. The treatment is done to protect, of course, human environment. We're looking at these hazardous constituents to be treated.

Cement, of course, is one of the most widely used materials for this and can treat a variety of wastes. It is an established treatment technology, and that's very important because there are a lot of technologies that have been developed.

This particular technology of solidification and stabilization has been around in the industry for over 50 years with the nuclear industry and over 35, as I'll point out, with some of the commercial work. So, it is an established technology.

It has been selected by the United States Environmental Protection Agency for 24 percent of the Superfund sites, and Mr. Wilk will go into detail as to that application and how it's used for the Superfund sites. Again, it's a proven technology.

One of the areas in the US is something known as brownfields where we remediate industrial sites and make them usable for industrial use, and we will show where at a particular brownfield site this application has been used quite successfully. And because it's a non-proprietary application in the case of cement, it is a cost-effective way of treating these types of materials.

This pie chart was developed by the Environmental Protection Agency and it basically will give you information on the applications on Superfund sites, the different types of remediation techniques that have been used. I will briefly discuss this item, but again Mr. Wilk in his presentation will talk in more detail about these particular remediation projects as far as where SS has been used.

But just briefly on material ex-situ, which is a type of treatment where you mix the material and then you mix it not in place but basically mix it and move it through a pug mill of some sort and then either dispose of it on site or off site.

That is one way, and we'll discuss the definition of that in a bit, but in that case we have about 18 percent of the cement -- or solidification and stabilization is used for that type of technology.

In-situ, which we will be talking about a great deal, is use of this material where it's mixed in place, and again we're looking at about six percent of the Superfund sites for that type of application.

Okay. I want to briefly go over some of the basics with regards to cement and concrete, how we relate that to the solidification and stabilization aspect.

Of course, in concrete what we have in our raw materials are the cement, water, fine aggregate and coarse aggregate. The water and the cement, of course, are the glue that holds these materials together. Depending on the mix design will depend on the type of properties you get from your concrete.

In solidification and stabilization waste what we have is a very similar type of approach but what we're doing here is we're mixing the water and the cement with a contaminated sediment. What we're doing here is making sure that the binder converts that material into somewhat of a relatively immobile type of a species. In a sense it encapsulates the material and makes the material less viable to any type of waste streams. It's a physical change as well as a chemical change.

Some of the basics of SS of cement -- or solidification and stabilization, is there are a multitude of reagents that can be used in this process, cement being one of them. But as you can see, there is a number of different types of reagents that can be used and each one is dependent upon the uniqueness of the project.

You will do bench sketch, as we will talk about, to determine that optimum mix for your particular site. Why use cement, however? And this is a case where cement has been found to be the most widely used type of material only because of the fact it can relate to a lot of different contaminants.

So, we have an opportunity here to look at a particular reagent that may be used for a wide variety of materials, but again the process, the mix design, is definitely dependent upon your waste constituents and what you have and what your final results want to be.

But basically the solidification and stabilization process ties up the water, it supplies the alkali for pH control for your heavy metals, it forms a low-soluble metal species and the matrix is -- end result is durable, long-performance type material.

One of the things to keep in mind is it's readily available. One thing we want to be careful about is we want to make that it's an available material, a reagent is a process that can be used by everyone, and that's something that we have here, is something that is used by everyone.

Okay. As far as the constituents that the

SS treats, what we have is two types we're looking at. One is inorganic, and what we have here is we can make the inorganic, which would be the metals in many cases -- we can form a stabilization, we make them less soluble, we actually encapsulate them as well, and the final property that we achieve is a hydraulic conductivity, lowering the hydraulic conductivity of that stabilized waste.

On the organic side what we are looking at is principally to physically bond the material, encapsulate the material, again looking at lowering the hydraulic conductivity or permeability of that stabilized material -- waste.

Looking at the mechanisms, when we look at the inorganics, the metals, what we're looking at here is looking at controlling the pH to minimize the solubility of that waste, the metals, the leads, arsenic and so on, the reactions become less soluble in form and, therefore, become less toxic.

We also control the oxidation reduction potential of those wastes, the materials are absorbed into the binder surface, become less soluble, less mobile within that system. The coating of the cement and paste will coat the waste particles, reduce the water infiltration to the waste so the water cannot react with the waste material. And, finally, as we keep speaking, it solidifies and causes the material to have a lower permeability.

On the organic side what we find is there are species where the cement can actually have some chemical reaction that will cause a chemical stabilization, and in those cases we're looking at certain processes, hydrolysis, oxidation reduction. These are some of the areas that some of the organics may be stabilized, but in most cases of organics we're looking at physical processes such as encapsulation for our organics.

This table was developed by the Environmental Protection Agency in 1993 and again pointing out that we're looking at various types of waste streams that can be effectively stabilized with cement and in the stabilization process with other types of reagents. So, we're looking at organics as well as inorganics.

In summary, what we want to look at in this area, just to briefly go over what the stabilization system can provide, is it's a relatively low cost, being an established technology, this has been used quite widely throughout the US as well as Canada and all over the world, it provides good long-term stability, as will be pointed out by Mr. Wilk with some of the examples he gives.

We have entered into the record a number of documented cases where this has been used. It has the ability to treat hazardous waste, incinerator waste, other types of waste as part of the waste stream. We also have increases as far as the volume of increase on the waste itself so that putting cement in you will or will not -- there might be an increase in the material with the weight -- or with the additive.

We look at it is resistant to biodegradation, it has a low water-solubility, so low permeability, and also we'll talk a little bit about those physical characteristics and how they will be enhanced by the use of stabilization.

We go to the implementation, we look at several things in this process. First of all we want to look at treatability studies, what we will do as far as developing the mix design. We have engineering design which we want to -- which has to be done on a project to ensure that we get the right mix design, right testing during construction, and then finally we have the actual construction of the project.

This gives you an idea of just some of the basic tests that you would do in a bench scale study, looking at the materials, mixing the materials, taking tests, getting the samples ready for testing. These are all standardized test procedures that are done during bench scale and during mix design processes.

As far as the types of tests that you would run, we usually look at two types, the chemical or leachability tests and also the physical tests that are run on the particular waste, stabilized waste. And here I want to just go over briefly what the definitions of some of these terms we will be referring to are.

Leaching is the removal of soluble constituents from the waste by contact with liquid, especially rain, surface or ground water. This process is called leaching, the water is the leachant and the contaminated water that has been contacted with the waste is the leachate. The capacity, of course, of the waste to leach is called the leachability.

And leachability is measured by exposing the waste to a leachant and then how it simulates itself to the disposal of the material, and also the tests that are run are standardized materials under controlled conditions that are used to simulate or look at what would happen over a long-term situation. So, we're trying to make some sort of an evaluation of the waste and the stabilized waste over a long term based on these tests.

There are a number of tests that are used for the leaching. The tests that might be used during construction or during the design stage would be the extraction test -- just a few of them are listed here -- the synthetic precipitation leaching procedure, the SPLP, is one such test, the toxicity characteristic leaching procedure, TCLP, which is used down in the United States, is another type of test, and again still another is a multiple extraction procedure.

These tests can be run during the design stage and also during the construction stage to monitor the material and see if it's being properly treated.

Another type of testing is more of a modelling testing and these types of tests again are standardized tests that are listed here. So, we do have two types of tests. One might be more towards the control and the other might be more towards modelling your studies and seeing how a long-term effect might be, and it depends on the design which ones you would be running.

As far as the test procedures, this gives you a schematic of some of the testing that would be done in this area. Basically it's taking the material, mixing it and putting the leachant through there and then testing whatever leachate comes out of the test.

Some of the equipment, just to show you what it looks like. These are all standardized equipment that is being used for the standardized test procedures.

Okay. The second phase of the testing might be in the area of physical testing, what type of physical tests we might be running on this material to show its competency, and some of those tests might include the hydraulic conductivity, the permeability of the material, unconfined compressive strength.

We have tests for freeze/thaw, wet/dry durability, if that be the case, if the engineer wants to test that those are available. The paint filter test which tests for free liquids and during the field testing we might look at also moisture content and density of the material.

So, these are all tests -- just a number of tests that you might test for your contaminants so that you have a good quality control of the material as it's being produced.

Again just briefly to look at some of the testing equipment, all standardized equipment. These are tests that have been done before under standardized conditions.

Okay. What about long-term durability?

This is a question that comes up and it's something that needs to be addressed. There are a number of ways we evaluate the long-term durability, one of which is to look at the actual performance and experience on actual sites, and Mr. Wilk will address that in his presentation with regards to one such case where we have some long-term durability.

It is an established technology, we have a number of examples in the record that show the evidence of its use. Physical testing, again we're looking at things like compressive strength test, permeability test. Those types of tests can be used to evaluate whether the integrity of the material is still in place.

The mathematical modelling, this had to do with some of the tests I mentioned earlier on the leaching tests. And the structural determination, some of the things we can actually look at, if necessary, from a concrete perspective where we actually look at some microscopic look at the material, and if that be the case we can actually go into that phase of testing.

Again to repeat, this is a long experience, this is an established technology with 35 years of experience in the industrial world and 50 years of experience in treating nuclear waste. So, we are looking at an established technology with standards in which we can control the use and application.

Again repeating, some of the physical tests we would look at is the unconfined compressive strength test, hydraulic conductivity, permeability and in cases if the engineer wishes he can actually look at freeze/thaw, wet/dry tests as well.

As far as mathematical modelling goes, one of the things that we're looking at is some of the standardized tests that can be used to look to the future and make some predictions as to what we would expect in forms of future leaching of the material.

And some of the models that are listed there are the sourced term model and the remedial options assessment modelling, and in that last one Mr. Wilk again -- I defer to him. He has a particular publication he'll refer to in his presentation that will look at that as far as modelling goes. So, I will defer that to Mr. Wilk's presentation.

Under durability we're looking at the ability to test our material in a more microscopic structure where we're looking at microscopy or scanning electron microscopy, something of the nature that we might use with concrete, and if that be the case we can actually evaluate our waste, stabilized waste with these types of tests.

This gives you an idea of what we're looking at as far as mixing goes. This would be considered an ex-situ type of application, both of them, and what I mean by "ex-situ" -- now, I'll go a little bit over that -- is basically taking the waste stream, placing it through a pug mill or some sort of a mixing chamber, mixing device, and in this case it's placed, and actually placed after it's been solidified, into a disposal area either on site or it could be shipped and taken off site. So, this would be an ex-situ type operation.

The same with this one over here, which is a schematic of a pug mill type of mixing where material is placed into a pug mill and then mixed. And so these are types of ex-situ type applications.

Here's a good example of both types of applications, and what we have here is in terms of ex-situ where we -- and this is a site in Massachusetts where we took our waste, we put it through a portable pug mill, treated the waste, it then had a holding period and then that waste, once it was treated, was then used as a base material for pavement. So, we actually used it but it was ex-situ because it was used within the system, and basically we used -- conveyors are used to do this type of work.

In-situ is basically using the material but it's in place, so the mixing and all is in place and the material, the contaminated material, the treated material, is then left in place, so there is no movement of that material.

With in-situ stabilization there's no excavation required, the original use -- originally used for liquid pits, this type of material is not critical. You can control a lot of the vapours that are emitted very easily with the in-situ stabilization technique.

The techniques are proven and the auger -- some of the systems that have been actually developed can go as far as 25 metres. As I mentioned, the fugitive emissions can be controlled in this type of process very easily.

This gives you an idea of some of the methods that have been used as far as equipment for mixing this, and I'll just point out a few here. Mr. Wilk again in his presentation will discuss this in more detail. But we have augers, we have a rotary -- rototill type operation, jetting into the waste material, so there's a whole assortment of machinery out there that can do this very -- this type of work.

As far as labour goes, what we expect to see on a project is that we'd have environmental engineers preparing the testing, optimizing the mix design, materials engineers doing that type of work, civil engineers laying the material out, obviously geotechnical engineers checking out the physical properties of the material.

From the contractors' perspective, we will have many contractors that are equipped to do this. As far as that goes, it's a generally equipment-oriented type operation. You will have QC/QA people out there doing the testing during construction as well.

I'd like to finish on one project, and this is something that has related to the Sydney Tar Ponds Project. It's a project, Pepper Steel Mill and Allied Company, in Medley, Florida. It was constructed in 1998, treated in 1998. The site is a contaminated soil that extends to the Biscayne Aquifer, a very -- this is a drinking water aquifer for the community in southeastern Florida. The contaminant levels are, with PCBs, up to 116 parts per million, lead up to 17,000 parts per million and arsenic up to 76 parts per million.

This shows you the location of this project, and as you can see by the photo here you have an aquifer and you have a layer of soil, contaminated soil, and then the aquifer. So, this was a very crucial area that they needed to stabilize.

The project consisted of excavating the contaminated soil, treating it and then returning it to the excavated area as a structural fill. The material, as I mentioned, is contaminated with heavy metals and PCBs, the quantity of waste treated was 85,000 cubic yards and the depth was from two to eight feet, and cement based SS was used on this project.

This would be an example of ex-situ operation where the material was excavated from the location, placed in a mixing area where the cement was added and then in this case it was more of a fluid type material that was brought back to the excavated area and placed back into the area.

And these are test results. These results are in the record. Basically what we have is materials that, once we did the testing according to this particular requirement, that the EP toxicity test was below detectible limits and that the leach test or leach index was greater than 14. In this case the higher the number the more beneficial the treatment, and again this would mean that it was non-detectible. The physical properties were specified at 50 psi and, in fact, received 700 psi.

And let me just stop here to mention in terms of relative terms the 50 psi is something -- 50 to

100 psi is something you could probably dig with a shovel, if you need some relative terms as to how to identify this, because we're always interested in concrete and concrete is 3,000, 20 MPA, something of that order.

So, we're talking about something that is less than one MPA to actually be able to dig. Somewhere between 100 and maybe 250 psi you can probably get in there with a backhoe and dig it.

When you get above 300 psi it gets much more difficult, you might need some sort of a jackhammer or something else to get through it. So that just gives you a relative term of what kind of a consistency those type of straints would evaluate to.

And once it was placed, this is what it looks like at the end. Basically we have a site that is relatively clean. It has no detectable limits of PCBs or lead, and it has straints that can be used quite adequately for a base material or a foundation.

These are the references that we've -- just some of the references we've put on the record. It gives you an idea of what type of materials that you have available to you to look at.

Again, these have a whole assortment of different types of treatments. We see here organic waste being treated. Some of the things that we have, and again, this is something if you're looking at this, you see water in some of the other areas that we have, that we have not addressed here in this presentation, but we have materials available to address those issues.

And with that, I will turn this over to Mr. Wilk, and let him ---

--- PRESENTATION BY THE PORTLAND CEMENT ASSOCIATION (MR. CHARLES WILK)

MR. WILK: Madam Chair and distinguished panel members, I'd like to thank you for the opportunity to present to you some information on solidification and stabilization.

My name is Charles Wilk, I'm with the Portland Cement Association, again a non-profit industry association. What we do for the industry is to provide technical information on a variety of cement uses. My specialty is in the use of cement for waste management applications.

And I mentioned technical assistance. What PCA does is provide opportunities for touring active sites. We do seminars on the use of cement in waste applications. We even have worked on technology transfer with the UK Government on the use of solidification and stabilization.

We've also reviewed and contributed to publications, US Environmental Protection Agency publications, on the subject of solidification and stabilization.

I'm here today to present information on projects. This is actually a good publication to take a review at. We entered it into the docket earlier on the hearing. It's a publication that EPA published in 2004. It's an accounting of treatment technologies and a selection rate for different treatment technologies for different kinds of projects within the Superfund programme.

Mr. Adaska had presented information about this pie chart earlier, and we can see the selection rate. Now, these are selection rates for projects where the source of contamination have been addressed at Superfund sites. So these are taking care of where contamination is coming from at a site, and you can see the combined -- the selection rate here for solidification and stabilization, both in ex situ and in situ is 24 percent.

This is actually a better and perhaps more illustrative pie chart of that. You can see here on the left solidification and stabilization, and some of the other established treatment technologies that we've heard about, including incineration.

On the right side, the 20 percent selected pie slice, are the technologies that EPA considers to be innovative technologies, and half of those sites are made up by bio-remediation, and a 5 percent slice made up of the other technologies that are used to control these sorts of contamination. So again, solidification and stabilization is an established treatment technology and with quite a few projects under -- that have been successfully completed.

This is, I'm sure, very difficult for everyone to see, and perhaps the best way to see this is to later refer to what we presented into the docket, but what I wanted to point out here is this is a number -- these are actually groups of hazardous contaminants that have been treated using the variety of technologies, and solidification and stabilization has been used, it's the second one here, for really all of those. And that's actually a testament to the versatility of the treatment technology for different -- for sites.

Usually at a Superfund site, you're going to come across more than just one kind of contaminate, and the reason why S/S is selected so often is that it can treat this wide variety of hazardous constituents.

This, again I apologise, but we didn't

want to change the tables as they were actually published by the US Environmental Protection Agency, but here is the area where we look at in situ and in solidification and stabilization.

You can see some of the average sizes of sites that have been done. The average size of the solidification and stabilization site in situ is almost 100,000 cubic yards, and the largest one is almost 2,000,000 cubic yards. So again, it's taken on projects of a similar scale as here at Sydney.

In preparation for this presentation, what we tried to do is pull out example projects that again have similar conditions as we find here in Sydney, and I think you have to bear in mind that every remediation project is unique.

Each project that I've seen requires the use -- the development of mixed designs that are specific to the contaminates that are there, the contaminated media that are there, the environmental conditions for the disposal area of where the final treated material will come to rest, the marine environments, and also I was interested in pulling out projects where there was in-situ treatment conducted at the site.

So the first one I want to present is the site that occurred in Whiting, Indiana. Now, this is a closure of a refinery sludge basin, and if you want to read more about this project there's two papers that we submitted into the record that describe this project in greater detail.

So a little bit about the sludge basin. It was the collection and settling basin for a refinery, storm water and oily sludge. The area was 2.4 hectares. The amount of material that was treated was over 80,000 cubic meters.

We had -- we keep saying "we". We're not contractors. The contractor solidified over 3 meters of oily sludge in depth that had a fluid over it of 1 to 2 meters in depth. The hazardous contaminants or hazardous constituents at this site included heavy metals, which include arsenic and lead, a number of different organic compounds including volatiles, and semi-volatiles, and very interesting that the oil and grease concentration of these oily sludges were, on average, 12 percent.

So here again we see this photo, I can describe to you the actual closure of the site. We have here -- this is Lake Michigan. This is the actual -- the basin was encompassed here.

The basin was surrounded by a cement bentonite wall. In the area by the lake we actually see a parallel row of sheet piling, and in between that parallel row is insulation of cement bentonite grout.

And we see this train standing there, and it's actually treating the contaminated sludge while the sludge remains in place.

Now, this was an interesting schematic on how that is done. We have here the business end of this device is an auger system that has a jet on it which has the ability to push cement grout into the contaminated media that's being treated. So you have mixing devices on this side. On this side of the schematic what we see are air pollution control devices that are used to capture any fugitive dust or volatiles that result from the actual mixing of the -- in place of the material.

Well, how do they make sure that they treat the entire mass? They use an overlapping pattern of borings to make sure they do complete treatment.

Now, this is actually a closure of a hazardous waste management unit under the US EPA regulation of the Research Conservation & Recovery Act. So that -- those regulations actually require a period of post-closure monitoring.

This is a good photograph to actually show you what some of the conditions are for treatment. So this is untreated material, and the crane is standing on treated material, and the hood is actually lifted here to be able to expose the auger to view of the camera.

So the treatment performance standards at this site were set at 35 psi. For an understanding of what psi is, that's pounds per square inch, that's as if you took a 1-inch cube and set a 35-lb weight on that cube, and if it can support that weight then you have at least 35 psi of compressive strength. And that converts to the metric of 240 kPa.

Now, at this site, the standard was set at 35, and you can see that after the confirmatory tests or after the treatment, they exceeded those, that performance standard.

And this is the grading of the capped material after it's been solidified and there's going to be a cap placed on top of this area.

I mentioned post-closure monitoring. In this case, the closure was completed in 1992. Groundwater monitoring has been going on for 14 years. That monitoring includes groundwater sampling, but also taking a look at the capped material and the sheet pile and cement bentonite wall to make sure that it continues to perform.

Now, that is undertaken by the owner of the facility, but the oversight is from the Indiana Department of Environmental Management, and they report no known issues on the post closure so far.

Some of the benefits of doing the work in situ. Well, the biggest benefit, first of all, it's protective of human health and the environment. Under US EPA regulations, a generator of a waste is always responsible for that waste, whether it remains on his property or is taken off site, so he continues to have liability. So many generators prefer to keep hold of their waste and manage it on site.

In-place closure minimizes the risk to workers there doing the closure, and also the community, because you can imagine trucking over 80,000 cubic meters of material through a neighbourhood and then having to replace it with new fill. This minimizes the hazards from that.

Also, in place closure can often times be less expensive than off-site disposal. In this particular case, off-site disposal was $40 million, and in place was $9 million, and the S/S treatment portion of that came out to be $46 US per cubic meter.

This is an interesting site in that it's treating marine sediments. The NY/NJ Harbour system is continually silting in. To maintain the economic engine of that port the harbour needs to be drudged to allow ocean-going vessels. So what happens at the site, we can no longer ocean dispose of these sediments because of the contamination that exists in them.

You can see this is actually treatment occurring inside this barge, and so the cement is being mixed into the material in the barge by an in-situ blender, and I'll show you the business end of that piece of equipment. We're looking at marine sediments, 8 percent addition of portland cement is what's typically used on this to form an engineered fill.

Now, an engineered fill is actually used in upland locations in order to be able to reuse brown-filled property and rehabilitate those. And actually, there's millions of cubic meters that are treated in this fashion from the New York/New Jersey Harbour system.

So this is the business end of that kind of mixing equipment, and here we can see it's actually being used inside the barge where the material is being treated.

So what you have here is something that looks like a rototiller on the end of an excavator stick. It's actually the adaption of a stump grinder. So that head turns, and if you look closely there's actually a jet of cement grout being streamed in right here.

So the operator moves that through the material. This material has actually already been mixed.

You can see it's starting to harden, and as it cures it hardens to a state where that material can be excavated from the barge and then reused at different locations.

One location where treated sediment has been used in the area is to create this Links Golf Course in Bayonne. You know, golfers want to golf, and they'll golf on anything. So, in this case, they're golfing on material that has been treated and set up.

This is another interesting site in that it has contaminates close to what we see -- what we're seeing here. This is the Columbus Georgia site. This is historic photograph of a manufactured gas plant.

What a manufactured gas plant is, is before the advent of distribution of natural gas, localities would produce their own gas from heating coal, and in that process they'd heat the coal in the absence of oxygen, they'd drive off a gas which became known as town gas, and that was used for light and cooking.

In that process, you'd also create this material called coal tar. Now, coal tar is just a real collection of polycyclic aromatic hydrocarbons, and they weren't necessarily managed in the best way possible for the time.

So this is actually along the Chattahoochee River in Columbus, Georgia, and this area was actually remediated. Now, let's see what that looks like today. This is actually a park that's built on the site, on the treated material, and it's part of the river walk for the city.

And how did we get there. Well, let's see, we used -- not we, the contractor used in-situ treatment to treat the material. The hazardous constituents were coal tar, as it's adjacent to a body of water, and it was reused as a park.

This is a schematic that actually we took from a public presentation that was made by Georgia Power, which was the owner of this property.

What we have here is you can see a schematic of the solidification in the material. They actually use the contaminated soil to form a containment wall around the site by an addition of 25 percent portland cement. So that's a richer blend of cement to create more of a structural-type wall. And on the interior or the upland side of this was -- 10 percent cement addition was added, and as we've seen before, using an auger system, overlapping patterns, complete treatment of the mass.

So these are photographs of the actual construction phase of the site. This is an interesting photograph in that you can see this is the 25 percent portland cement columns, very structurally sound, and I think you need to look at these sites, and point out there are engineering controls that are used to take care of the unique aspects of any kind of site. In this case, there's actually booms here in the river to prevent releases of any contaminates into the river while the construction was going on.

This is a nice photograph to give you an idea of the relative scale of an auger standing, you can see the river in the background. This site is quite interesting in that there was a long-term study that was conducted on the site, going back and excavating material from the site after 10 years of installation, to get an idea of what that -- how that remedy is performing.

We've entered this, we've entered the report of this. We've actually given you an original copy of the printed report from the Electric Power Research Institute.

So this is some slides that were developed by Emilia that she presented at an Air and Waste Management Association meeting.

Some of the advantages of using in-situ solidification, we've gone over this before, the treatment of contaminant in place, minimization of occupational hazards and vapour exposure, cost savings, and the goal is really to prevent the leaching of contaminants, in this case leaching of contaminants into the groundwater at the site.

Here's a photograph again of the completed area, completed project. As I mentioned, this was a study that was taken on after 10 years of -- since the material was treated. They investigated the structural integrity of the mass, the immobilization of the hazardous constituents within the mass, and used modelling to predict the future effectiveness, as far as protection of human health and the environment as a result of this treatment.

And this is the approach they took. They took samples actually out of the treated material, and they subjected those samples to a battery of laboratory tests, including some geochemical solid phase work, leachability, and from that leachability they were able to run it through a model to get some idea of what would be the -- what, if any, releases would happen from the site in the long term.

This is actually a plan view of the sampling locations, and is sort of illustrative and you can see where the 25 percent material -- 25 percent portland cement addition material is compared to the 10 percent.

This is a good photograph to show you what a core sample from the site looked like. Now, this is actually material taken from the area that had been treated with a 10 percent addition of portland cement, and you can see inclusions of bricks, some other wastes that were at the site, slags, coal tar. You can see they're quite competent cores that were able to be removed from the treated material.

One thing about cement, when you work with cement it actually gets stronger with age. So the cement continues to harden and gain strength over time, especially when it's in a below-grade situation, because actually cement really likes -- hydrated cement likes that environment because it can continue to hydrate and gain strength.

These are the -- some of the permeability results that were done. Now, the performance standards for the site at the 10 percent cement mixture for 1x10 to the minus 5 centimetres per second, and with the 25 percent mixture, an even more stringent standard of 1x10 to the minus 6 centimetres per second. And what we see is they're -- actually the samples that they pulled out 8 years later are actually well exceeding the performance standards.

Same is true of the unconfined compressive strength. This is where I talked to you about what pounds per square inch means. The performance standards at this were 60 psi and they were achieving ranges between 280 and 900 psi strength.

They did some modelling to predict what would be the situation after 10,000 years of exposure, and these are some of the -- these are the technical conclusions that the investigators came to.

The groundwater has not penetrated the solidified mass, the samples surpass the geotechnical performance standard set, the solid phase geochemistry did not show any physical or chemical deterioration, and groundwater monitoring, and modelling as a result of that monitoring demonstrated leaching is not occurring.

Another interesting part of this report is they also looked at the synthetic liner -- actually, synthetic material that was placed as a cover, I understand, and that might be of some interest to the panel as to how well that synthetic membrane holds up over the course of time.

So, through the use of leachability testing, groundwater monitoring and then modelling of that, the investigators concluded that solidification and stabilization continues to be an effective long-term solution for this coal tar contaminated site.

I have a couple more public sites here. A former wood preserving site in Renton, Washington. Now, a lot of these sites that I'll be talking about from here are included in the project information section of the binder that we've entered into the record, so there's quite a bit of detail in those, as well.

This is a nice panoramic view. Again, we can see -- this is Renton, Washington State. This is a marine environment. Here was have the in-situ treatment of the material.

It's an interesting site, in that the soils themselves had a very -- were quite organic. They had a lot of peat in them, a lot of plant matter. The contaminants were polycyclic aromatic hydrocarbons, and, as you would expect, also, certain wood preservatives have penta chlorophenal in them. In-situ treatment, there was not a cap placed on this treated material when it was finished.

This is a nice aerial view of solidification and stabilization in situ. Now, this was -- I believe it's 24-feet of depth that was treated, and you can see some of the volume increase that you'd get from that, and we'll get back to that in a moment.

This is the mobile plant that was brought to the site to be able to mix the portland cement, and that portland cement is then pumped with a hose to the business end of this piece of equipment, which is this auger system.

You might notice that this auger looks a little different than what we've seen at the other manufactured gas plants sites, that has this broader face to it, and that's because it was running through this very soft peaty soil, so they could get a better mixing or production rate with that. And again, here you can see that -- the overcharge by the addition of portland cement to the material.

Here is another manufactured gas plant. Why do we look at these so often. Well, because they are organic sites, the hazardous constituents are organics, and they're coal tars and they're a collection of a number of different compounds.

So this is a historical photograph from Augusta, George. This site's interesting. It was contaminated cleanup within a residential neighbourhood, and, as we'll see here in a moment, the solidification and stabilization occurred within the water table. The reason -- I'll give you the reason for that in a minute.

The coal tars were the hazardous constituents of concern. It used two technologies. One of them was in-situ S/S treatment, and another was the excavation with off-site disposal of the material on tap.

This is an aerial view of the project. You see this triangle area -- this is actually a canal that runs along here through Augusta, George, and you can, if you have great eyes, see the crane was working right there doing the mixing. Well, here's a better shot of that.

I want you to notice that this is a grade level, and what you can see has been excavated. At this site, what the owner wished to do, they looked at doing an off-site removal, taking all the -- excavating all the material and shipping it off site, but they quickly realized that they would be looking at digging 20 feet down into a water table. And to do that kind of excavation takes some specialized work, like trying to keep the area dry and not caving in.

So they elected to just take the top material off, have that off-site disposal, and then do in-situ solidification/stabilization through the contaminated soil into -- down into the aquiclude that was beneath the site.

For the material that was excavated, they were concerned with volatile emissions which occur whenever you do excavation in material that's contaminated with volatiles. They tend to drive off into the great landfill in the sky. So, what they did here to prevent that, was to manage it within a negative pressure building.

Obviously, it's not under negative pressure right now, because the doors are open, but that's one of the engineering controls that were used to deal with that -- those huge emissions.

This is another wood preserving site, again in a port area, soils that were contaminated with creosote and arsenic. It's interesting because the property was reused at the port facility with the material remaining at the site.

This is the business end of the device that was used to treat the contaminated soil. You can see it operating here in the soils.

How this is actually conducted was there was 15 feet of depth of contaminated soil. They took that 15 feet and excavated it and staged it at the site of the excavation. They put five feet back in, then ran this tool through it, put the next five feet back in and then the subsequent five feet.

We did withhold some of the contaminated soil, because they ran that through a pugmill, which is another way of doing a material that we know is soil cement, which is a mixture of soil and cement, and it's used with engineering properties of that.

So this material here that was treated in place, treated and put back in place is about 50 psi material. This material, this layer up here, is about 300 psi material, and it forms a very competent layer for the construction of pavement, at this harbour facility.

And they use that, actually, for container storage.

This is a manufactured gas plant site. Again, a coal tar organic contaminated property in downtown Cambridge, Massachusetts. And, again, using an auger system to do the mixing we are -- it's in-situ treatment downtown reuse of the property and coal tars are the contaminants.

It's very interesting because this site is now the site of a LEED Platinum Building for people who know what that is.

It's a green building. It's very a high standard to meet for occupancy and health of occupancy and such. Yes, madam? No.

So, again a auger system, and you can see a hood system placed to be able to collect any dust, and this is the LEED Platinum Building constructed at the site, and it's actually used -- it's actually the cornerstone of a pedestrian mall, that's used in

Cambridge.

You've got your Starbucks here, you got your Subway. What more do you want? Another site, Marine Sediments New Bedford Harbour. This is a Superfund site. The Agency wished to construct a waste water treatment plant in this area, and they needed some more bulkhead area, so they put in the sheet piles and the material that they pulled out from within these sheet piles were treated.

Obviously marine sediments were treated in a pugmill system. You can see the clamshell here delivering untreated sediment into the hopper, the mixture comes out, here it is treated, and actually that material is placed here in the foreground and compacted on site. They're doing nuclear density testing of the material right there.

This is a US EPA, US Environmental Protection Agency, emergency response to two brothers who decided to go into the transformer recycling business and managed to contaminated this area, the soil area with PCBs.

The material was removed, scraped up and it was staged under this tarp. The contractor brought a mobile mixing system onto the site, using Portland cement in a pugmill. The material is a difficult one to see, but this is actually the treated material placed back down at the site.

This a very recent project, the Naval Construction Battalion Centre in Gulf Port, Louisiana. Golf Port -- the battalion centre was -- they do storage here of strategic materials, everything from bauxite to sisal, and in this case a herbicide know as Herbicide Orange.

During the storage of that material some of the Herbicide Orange got away from the storage area and contaminated some of the sediments both on base and off base in these drainage ditches with dioxin, and what would happen is with every storm event that dioxin sediment would continue to migrate away from the base.

So the military decided, "That's not a good thing. Let's collect it all up and bring it back to the site." So that's what they did, and we see the installation here or actually the treatment of the dioxin contaminated sediments. They were put down in lifts at this -- in this area, and this is actually what we know in our industry as a road claimer. What it looks like it is a big rototiller mounted on a truck chassis. It has the ability to mix down to 18 inches, 20 inches of depth.

And so they put the material they wish to treat down in lifts and they run this device over it, and they mix cement in, and there you can see that it actually goes back and forth over the area and -- mixing cement into the dioxin contaminated sediments and this, in turn, is covered with a concrete material and then it's actually now a parking lot for military vehicles.

This was actually 80 percent complete when Katrina, the Hurricane Katrina hit the area. So, they were very fortunate to have been able to take and secure that material before they'd have to deal with chasing it around again.

And so after they were able to clean up the area and get started, they found that the Hurricane hadn't really moved -- hadn't moved the material that had already been treated in place and they were able to start the project back up again.

And Madam Chairman, that concludes my presentation. Thank you.

MR. DICKSON: Thank you very much. That concludes both presentations on -- from the Cement Association of Canada and the Portland Cement Association.

THE CHAIRPERSON: Well, thank you very much to all three of you for your presentations.

We will -- as I indicated before we will take a short break before we come back and then we will begin with questions from the Panel, and then we'll have questions from other participants.

So, it is now about 10 past 7:00. We'll take a 15-minute break and start again at 7:25. Thank you.

--- RECESS AT 7:11 P.M.

--- RESUME AT 7:30 P.M.

THE CEMENT ASSOCIATION OF CANADA/PORTLAND CEMENT ASSOCIATION

--- QUESTIONED BY THE JOINT REVIEW PANEL

THE CHAIRPERSON: We'll get started again if you would like to take your seats.

Well, Mr. Dickson, Mr. Adaska and Mr. Wilk, thank you very much again for the two presentations, much appreciated and for all the materials that you have filed with the Secretariat. I guess we've got some reading ahead of us.

I think I'd like to start by asking you to give us a little bit more information or expand for us on -- well, first of all, what would you say are the critical parameters in selecting stabilization/solidification against selecting other methods of dealing with -- given a set of contaminants, a certain -- a given contaminated situation? Especially -- obviously -- I don't know how much -- how familiar you are with the Sydney Tar Ponds and Coke Ovens Project, but, you know, if you wish to reflect on that.

How do you choose the technology for a given ---

MR. WILK: Thank you, Madam Chair.

I have some familiarity with this Project, in that I came and visited the Project back in 1999, during a presentation that I made in Halifax and we did -- there was a site tour here, and I've been here several times since then to look at the Project.

Your question, as I understand it, is, how does one select solidification/stabilization against other technologies, or how do you -- what are the critical factors as to what go in the decision making train?

Sites that are solidified and stabilized have some similarities in that they're usually quite a blend of contaminants. And that's again why the selection rate is so high in the Superfund Program, because most contaminated sites have quite a variety of contaminants in them, and we try to -- you'd like to be able to use one technology in one fell swoop to take care of the variety.

It's not applicable to a site that's just volatile organics. You can see from the pie chart that we presented before, soil vapour extraction is used for contaminated sites where the contaminants are easily volatilized and pushed out of the contaminated media.

But for, really, the great majority of other contaminants, solidification/stabilization has been effective as an application.

THE CHAIRPERSON: Now, for example, the -- I think it was the final example you presented, which was -- the small site, I guess, in New Orleans, was that -- where the PCB contamination had occurred. I presume that the -- it was a small site, but a fairly high level of contamination, is that right, with PCBs?

MR. WILK: Madam Chair, the last project I presented was the Naval Construction Battalion Centre. That was a dioxin contaminated site.

The one that preceded that was the Yellow Water Road Site. Is that the one you're referring to?

THE CHAIRPERSON: Well, I am referring to the one that was -- yes, I'm getting the two confused, that's right.

But the PCB contamination, the site that was operated by the two brothers, that was my point of reference.

Now, if you take that site, for an example, where you have a site with a fairly high -- with a high level of contamination by PCBs, so what would -- what is it -- I mean, I'll be looking at a different situation in the US or in -- does it vary State by State in terms of what policies and procedures are with respect to the disposal or remediation of high levels of PCBs?

MR. WILK: Okay. My recollection of that site, the levels of PCBs were in the order of 600 parts per million.

That was a US Environmental Protection Agency emergency response, and the EPA under its statutes, the Comprehensive Environmental Response Compensation Liability Act has very strong authority.

They can go in and take care of a site and use what they believe to be the best treatment technology for that site.

So, in this case, although the contamination was greater than the usual 50 parts per million, that would generally be required to be taken to a landfill that's licensed under the Toxicity -- our Toxic Substances Control Act, a licensed facility for PCBs, under their emergency response authority, they were able to treat that material and place it back at the site, because they understood that solidification/stabilization use at this site would be protective of human health and the environment.

THE CHAIRPERSON: Could I ask you now to perhaps give us a little more information about similar, sort of, criteria used to choose between in-situ and ex-situ applications of this technology?

Now, I see in the pie charts, US EPA -- the Superfund treatment choices pie chart that the -- ex-situ applications were approximately three times the number of in-situ applications.

Now, I presume that some of those ex-situ applications, the contaminated material was treated and then taken somewhere else, and in some cases it would be replaced. I don't know whether you have any knowledge about how that divided, but why -- would, in fact, that account for most of the applications of ex-situ of the material that was treated and taken somewhere else?

MR. WILK: I can't tell you the exact numbers. You're right. What we tried to show -- what Mr. Adaska showed in the beginning was trying to make a distinction between ex-situ and in-situ.

Ex-situ involved treatment of material after it's been excavated, and that material is often either placed back where it came from or it goes for off-site disposal.

In-situ means that the material is not excavated at all, and the cement is blended into that material while it exists in place.

The -- many wastes under our regulations in the United States have to be treated before they're land disposed, and the idea there is that materials that are going to be placed in an engineered landfill -- you want to minimize the risk posed by those materials, and that relies solely on the engineered barrier of the landfill.

So under our land disposal restrictions, they need to be treated prior to placement. It's an approach that adds a comfort level, say, a belt and suspenders approach to the disposal of that material.

And so that's why you likely see that high incidents of ex-situ treatment, because that material, if it was disposed of off site would have to be treated to some extent before it could be placed in an engineered landfill.

So, again, it's minimizing the risk posed by that material should the engineered barrier of the landfill fail.

THE CHAIRPERSON: And typically, would you think that where you had sediments or soils with concentrations of PCBs over 50 parts per million in most cases solidification and stabilization, a technology would be applied -- if it were applied, it would then involve off-site disposal.

MR. WILK: Madam Chair, I don't really know an accurate answer to that. That would just be my opinion.

I could say that from the projects that I've seen and provided technical assistance on, there's sort of -- there's kind of a -- say a spectrum. The 50 parts per million is a number.

What -- the influence of a higher concentration of PCBs is, on the setting properties of cement, the cement likely is able to tolerate higher amounts of PCBs, and where that cut-off is really very dependent on the actual project site and the contaminated media, and the final resting place, the final disposal of the material and site conditions, what the closure is like, what other engineering controls are placed on the area after it's been closed.

That's the best answer I can give you.

THE CHAIRPERSON: Thank you. So, PCBs, in fact, do have an actual -- will have an effect on the sitting -- on how the technology -- the results of the technology. You have to adapt the mix for a high level of PCBs? A higher concentration, sorry.

MR. WILK: At every waste site, if you're going to do a solidification/stabilization project correctly, you take a look to see whether it's first feasible to treat the material with SS.

After you determine that it's feasible to do some bench-scale studies, then you begin to fine tune the mixed design for what you're trying to achieve.

And what Mr. Adaska had presented, cement isn't the only binding reagent that's used in this technology. There are very skilled treatability laboratories with a lot of experience that can develop mixed designs to achieve performance standards.

If they can't, well then it's not a good site. But it's a very good indication, if in the feasibility study you've been able to get your performance standards met, and then it's just a matter of, in the design phase, of fine tuning that mixed design to really -- the idea is to economize on the reagents that you add, and also make sure that the final material is treated in a way that's protective of human health and the environment.

THE CHAIRPERSON: I want to get back to the ex-situ and in-situ for a minute.

But just while I think of it, two things arising out of what you just said. One is, did I -- which example was it? I think it was the Columbus Manufactured Gas Plant Site. You had a plan view. This was the one where you had the -- the containment walls were made from the sediments, but with a higher strength, a higher mix of cement.

But did I also notice in that plan view that, in fact, there were some -- that you treated some hotspots differently within that, so that there -- was that kind of fine tuning, or was that a misinterpretation?

There was a reference to a cyanide hotspot. So, does that happen in some cases, that you have areas that you adapt the mix within the site, as opposed to having one mix for the whole site?

MR. WILK: Madam Chair, that is correct. Part of this is science, a lot of it is experience from a contractor that does the work.

You'll see at jobs that they will be looking at and sampling and changing a mix design as they encounter different areas that have different constituents and different levels of hazardous constituents within an area that's being treated.

That goes to, again, the experience of a contractor and the sampling frequency that's done during quality control, quality assessment. You're correct. They do adapt, as they go along through the site.

THE CHAIRPERSON: Well, then, if that's

right, my next question which was, with respect to the use of field testing -- I mean the slide -- now, Mr. Adaska I think this was your presentation, there was kind of a three-step process or a three-and-a-half-step process.

Do you know what I'm referring to?

MR. DICKSON: Madam Chair, should we bring that slide up?

THE CHAIRPERSON: You know the one I'm talking about? Treatability studies. If you wish to, yeah. It's Slide 15.

MR. ADASKA: Is this the one, Madam Chair?

THE CHAIRPERSON: Yeah.

MR. ADASKA: Madam Chari, if you would oblige me. I am not in the chemistry end of this, and I'd ask that Mr. Wilk respond to that question, if possible.

THE CHAIRPERSON: Oh, I don't think it's a chemistry question.

MR. ADASKA: Okay. Then go ahead. What was the question, please?

THE CHAIRPERSON: I don't ask too many chemistry questions.

MR. ADASKA: Good. Then we're both in the same boat. Sorry about that.

THE CHAIRPERSON: No, this is a simple question of math. This would suggest when we look at it, the three stages here, which is -- one is that you do -- the treatability studies refer to -- it looks to me like it's bench-scaled.

MR. ADASKA: Correct.

THE CHAIRPERSON: And then you go -- the next step is engineering design and then the next step is implementation.

Now, I don't see a -- so, generally speaking it's not deemed necessary to put some kind of a field test or a pilot study in that phase or is it in some circumstances.

This has been discussed in relation to this project, where the bench-scale treatability studies are, in fact, sufficient to know whether this would work, and then Mr. Wilk's comments that there is a fair amount of skilled contractors, there's a fair amount of adapting and decision making right out there with the auger, whatever you're using, I presume.

So, I'm curious about that.

MR. ADASKA: Yes, Madam Chair. I think this oversimplifies this slide, what has to be done.

Again, all cases are unique. Obviously in a case this size, a project this large, you have to take the necessary steps to do the sampling, the technique, as Mr. Wilk pointed out. There may be changes within the site, so you make sure that you identify all those site changes in the treatability study, so you get an array of information.

Obviously, during the engineering stage you want to make sure you have the necessary control test during the work. Again, I'm not involved, particularly with the project, but a site -- this Project you would look at -- in my experience you would look at a test site, some area where you would test the equipment, test the quality control, test the contractor, make sure that you are comfortable that the procedure will work before you go into full scale production, so that you have a good idea of what to expect before you actually go into production.

So, this would be something, from our experience, on some of the other types of civil engineering projects, I've been on. Large projects like this, they do test sections, they do test cells to not only help the engineer in his analysis, but help the contractor in his analysis in how he does the work.

So these are just practical things in construction that you would do.

THE CHAIRPERSON: Well, it certainly

sounds like you really want a very skilled and experienced contractor. Is that a fair assumption? Not -- someone with a lot of experience in this work, not simply someone who can operate an auger or whatever device you're using.

MR. DICKSON: In my experience in touring sites, that I've been made aware of through sort of technology transfer and, in particular, for the Sydney Tar Ponds Project, is to identify certainly project managers who -- from these contracting companies that have performed solidification/stabilization who would partner with local, heavy civil contractors here in Sydney, in Nova Scotia, that would be interested in bidding this work.

So, it's a project management and direction for the experience, but the mechanics, the work that's done on site is something that is -- can be easily trained of heavy civil contractors in the area.

THE CHAIRPERSON: Well, then, I just have one more question and then I'll let my colleagues ask questions, but -- and it's just coming back to the ex-situ/in-situ issue.

And I guess now I'm referring to -- assuming that the ends -- the end point is on site -- there's no off-site disposal, so it's going to remain on site, and in some cases the sediments of soil and cement is mixed ex-situ, in some cases in-situ.

In situ, presumably is always cheaper than ex-situ? Usually -- never mind -- it's usually cheaper than ex-situ. I assume that's fair to say.

So, under what circumstances would you do ex-situ and for what reasons -- why would ex-situ be better than in-situ in some cases?

MR. WILK: To answer that question, I want to make it clear that we are not environmental contractors. But from what I've seen of projects that have been done by others, the decision to do in-situ/ex-situ is very specific to the site.

Mobilizing and ex-situ mixing machine, like we see, a pugmill, which is actually -- I don't want to say "common" -- but it is an available piece of mixing equipment that's used in the construction industry.

They're mounted on trailers and they can be brought to a site. So depending on the scale of the site, that actually might be more cost effective than mobilizing an auger or something that does the in-situ treatment.

One of the reasons why we see in-situ treatment is that you're not doing the excavation, so you don't have those costs and oftentimes it just -- from an application sense it makes sense to leave the material in place, if you can mix it in place, and you don't -- you may not have some of the hazards posed into excavating it.

But -- I'd like to end there. Thank you.

THE CHAIRPERSON: Thank you.

DR. LAPIERRE: Thank you. I have a few questions I'd like to explore with you regarding cement and the stabilization and containment process.

The first one I would like to ask is, does cement have any contaminants, itself? For example, could you find chromium in cement?

MR. WILK: Dr. LaPierre, cement is used in concrete and construction. We walk on it every day in sidewalks. It's in foundations. It's in pipe that convey drinking water.

Does cement have contaminates? Does it have trace levels of metals? It can.

But as you see, in actual use, those do not have -- they don't pose an endangerment by that. And part of that has to do with when cement hydrates, that reaction actually can address any of the trace metals that are in there.

We have -- actually, the Portland Cement Association has done work on analysis of cements, both the total concentration of metal constituents in the cement and the leachable levels of those. And they have been -- all been below PCLP or drinking water standards for that.

So I guess my short answer to your question is, do they have elements in there that are heavy metals? Yes, they may. Do they pose a problem? No, they don't.

DR. LAPIERRE: Okay. Even -- when the cement is -- comes in contact with the -- with water during your mixing process, are there any opportunities for these contaminants in cement to create either gases and escape, or escape at that time?

MR. WILK: No.

DR. LAPIERRE: Okay. The next question I have is -- relates to the stability of your mix.

And I guess I'd refer back to our EIS here, which gives a compressive strength target of at least 012 to 014 MPA.

And the EIS indicates that this is consistent with industry standards for strength testing on solidification projects.

If I look at the data that you had in your presentation, it seems to be quite a bit -- your strength seems to be a bit higher.

I guess the question -- I have two questions related to it.

Could you relate to the industry standard is one?

And secondly, you indicated that at 50 psi, it's something that you could shovel if you put great, you know -- it's shovelable. At 14 or 19 psi, is it like putting a shovel in sand?

MR. ADASKA: Dr. LaPierre, yes, I'll answer that question.

First off, on the 50 psi, this is something that is, as I understand it, it's the Environmental Protection Agency for the solidified waste.

It's a standard that they use in many applications. It has a relationship to, as I mentioned before, like a bearing capacity of a soil which would be -- again, I apologize. In my language, it's about 4 tonnes per cubic -- or per square foot.

So it's a type of support that would provide enough support for a foundation of a building or a mat foundation at even a 50 psi range.

However, as I mentioned before, when you're looking at diggability, I was trying to give some relationship between what the consistency of a 50 psi would be versus a higher strain.

And yes, to answer your question, at 50 psi, yes, you could dig it with a shovel, but at lower psis, you would still get some material, but it would be more like a clay. It would be like a very soft clay, and that would be the consistency you would have as you get lower in strength.

You'd always have some cohesion in that material, as long as you have a psi. Because keep in mind, when you're doing that, it's an unconfined compressive strength, where you're putting that sample, without any confinement, in a testing apparatus.

So as long as there is some confinement to stand on its own, there is a psi strength there when you put the load on there. So that would be the case.

A sand -- in another case, they'd use what they call a triaxial apparatus where you'd put a membrane there and you support it in that fashion. You have confining pressures before you put the load on. So ---

DR. LAPIERRE: I -- okay. I guess the other part of my question was, the EIS gives us the 0.12 to 14 MPA, which is consistent with industry standard.

Would you have a comment to that?

MR. WILK: I'm sorry, could you repeat the question?

DR. LAPIERRE: The question is, from the

EIS, and I'll just read it in quotation:

"An unconfined compressive strength target of at least 0.12 to 014 MPA, which is consistent with industry standard for strength testing and solidification projects."

I guess the question I ask is can you comment on that, in relation to the data that you provided seems to be above that.

MR. WILK: Thank you. Yes.

Wayne Adaska calculated that out in the terms we understand, which is 17 psi, the -- it's important, I think, to understand where that 50 psi comes from.

That comes from the U.S. EPA. It's a policy under the Research Conservation Recovery Act. And it came from -- and the -- when Congress told the EPA, "We want you to make sure that we're not disposing of liquid wastes into a landfill. We want you to regulate that."

And how the EPA addressed that was, "Okay. We'll make sure that all materials that go into a landfill are solids."

Now, if that material before had a liquid component to it, a free liquid, that material would have to be solidified.

And in past practices, people would use things like corn husks, rice hulls, or sawdust to deal with taking care of the liquid portion of that. And so, those free liquids were merely absorbed.

So what EPA said, "We don't want mere absorbtion. We want there to be chemical solidification. We want that free liquid to be chemically bound within the contaminated -- within the material that's going into the landfill. And how we want you to demonstrate that a liquid -- a material with free liquids has been -- the liquids have been chemically bound, is we want you to achieve 50 psi." That's where that comes from, from Recra policy.

We've seen, actually, in my presentation, projects where the performance standards were less than 50 psi.

Again, in a lot of the work we do in this treatment technologies, we're adapting procedures, testing and regulations into this technology.

So, it's -- it is likely that you can see projects with less than a 50 psi standard.

DR. LAPIERRE: Okay. The slide that you showed that was the last one that you had with that LEED's Building Platinum, what psi would you have had when that stabilization?

MR. DICKSON: We're just going to refer to the project sheet that's in the binder that was submitted for the details for that answer.

DR. LAPIERRE: While you're looking for the project sheet, that -- because it's a very -- I have another question.

And the other question relates to if you have a large amount of organic content in the material that you're solidifying, does it make a difference in the process that you're applying? Does organic content pose a challenge?

MR. WILK: Do you want me to take that? Okay.

DR. LAPIERRE: I would say organic content of say 50 plus.

MR. WILK: All right. Does organic content pose a problem in solidification, is that the question?

DR. LAPIERRE: A challenge.

MR. WILK: Yes.

DR. LAPIERRE: Does it pose a problem or a challenge in ---

MR. WILK: When you go through the literature on solidification stabilization, you'll often see passages that say that for organic contaminated materials, that this technology does not work.

And what we're actually finding in actually the slides that I've shown here, these are heavily organic contaminated sites. They do pose a challenge, and one of the challenges is, take for example, a puddle of oil, and you were to drop cement powder through that puddle of oil. What happens is the particles -- the cement particles become coated with the oil.

Now, cement, you know -- not what most people think. Cement doesn't just dry, it actually has a chemical reaction with water. So, that cement particle has to see water in order for it to go through the reaction.

If it's coated with an oil or a grease, it won't react with the water because it doesn't see the water.

And how that's addressed in a site that has organic contamination is simply introducing the cement powder to water before it sees those organics.

So, to answer your question more briefly, through engineering controls and techniques that are done in the field, you can get over those -- hassle is not a good word -- those problems that you might see with an organic contaminated site.

And as I tried to show, that it's now in the United States quite routinely done in a site that's being remediated with this technology.

DR. LAPIERRE: Okay, so it's a challenge, but its doable, is that it?

MR. WILK: It's a challenge, but it's not insurmountable.

DR. LAPIERRE: But it's still a challenge?

Okay. I'll move on to my next question.

The next question I have is -- and I'll come back to the one I asked you awhile ago, because I think it's a very simple answer.

The next one has to do with salt water.

If you're -- if you have a monolith that's solidified and it's in contact with salt water, would you have chloride ingestion? Could you have salt water moving in?

Because there is a permeability of the monolith, and I would imagine that the less tensile strength it has, the more permeable it is. If it's putty versus sidewalk cement, to me, it should be different.

Now, does salt water in contact over time have any effect on leachability of the contaminants that might be contained, or the breakdown of the monolith?

And can it be enhanced using geopolymers, for example?

MR. WILK: One of the publications that we submitted for the Panel is a copy of Cement Association of Canada's publication called, "Design and Control of Concrete Mixtures." And when you read through the chapters, and I certainly don't expect the Panel to read them all, but in that, it's everything you wanted to know about concrete.

In there, there's a discussion of mix water. And salt water is actually -- can be used in mixing up concrete. So you're sort of saying, "Well, how can that be? Why -- you know, everyone knows that salt is terrible on concrete."

Well, actually, it's not terrible on concrete, it's terrible on reinforcing steel that might be in the concrete.

And since we don't use reinforcing steel in a solidified and stabilized monolith or a treatment area, the chloride is not -- does not pose a problem with the cement.

In fact, the cement could have been mixed with sea water to begin with, as the mix water in the mix design.

DR. LAPIERRE: So you're saying sea water has no corrosive action on cement?

MR. WILK: Correct. Sea water does not corrode cement. Nor does -- it doesn't corrode concrete either.

DR. LAPIERRE: Does the pH of the mass that you're solidifying matter? Do you have to achieve a certain pH to get optimum setting?

MR. WILK: I get all the fun.

The pH matters when we're treating heavy metals. Because one of the phenomenons of when we treat -- use this technology to treat heavy metals is we're controlling the pH.

Take, for example, a site that is a lead contaminated site. It has elemental lead in it.

What you do is you mix Portland cement into that contaminant -- contaminated media. It will convert the elemental lead to lead hydroxide. Lead hydroxide has a lower solubility than elemental lead. And you're controlling the solubility of the lead, preventing it from migrating out of the material and endangering human health and the environment by controlling the pH of the solidified mass.

In the case of organics, that pH phenomenon is of lower importance.

And so, the hydration of the cement creates some calcium hydroxide. It can elevate the pH, and that elevation is addressed by other components of the remedy to keep any problems that might result from that elevation of pH within the solidified mass.

DR. LAPIERRE: So, two questions.

The first one is, if you were to change the pH, would you add lime? Is lime a process? Is lime a process to balance the pH?

And the other question is, if you're treating bottom ash from an incinerator, would metals not be a -- one of the issues that you'd want to treat?

MR. WILK: All right. You've got a couple of questions there. Let me answer the one on incinerator ash first.

Solidification stabilization is actually best demonstrated available technology for management of incinerator ash prior to placement into a landfill.

Yes, by incinerating something, if there are metals in the material that you're incinerating, they're either volatile metals and they end up -- they end up being collected in the air pollution control devices, or they're refractory metals, and they end up in the ash.

Either way, it's important to understand that incineration does not treat a contaminated material for metals content. They don't get destroyed. They still need to be managed.

Solidification stabilization is actually used to manage that metals component in the ash so that it can be safely land disposed.

I think your first question, which I've lost sight of now ---

DR. LAPIERRE: The pH would be -- pH -- managing your pH would be important when you're doing the stabilization of a ---

MR. WILK: Yes. Part -- managing the pH, and there are some other reactions that the cement hydration takes care of.

When cement hydrates, it produces a collection of cement hydration products.

Some of those metals can actually substitute into the alumina that's in those cement hydration products, so they are more tightly bound within that solidified -- that treated mass, rather than merely controlled with pH.

So you can actually see a neutralization, if you will, of the pH, and you'll still see those metals tightly bound in the solidified stabilized mass.

So at the beginning, yeah, you want to do pH control, but it's a very robust system, and it's able to hold onto the metals after any neutralization of the pH has occurred.

DR. LAPIERRE: I guess the other question I had, that you didn't answer, was would you use lime to -- is lime a product that you could use to adjust the pH?

MR. WILK: Okay, I think -- we were here last night, and I think it's important to clarify what lime is, and what limestone is.

There are different grades of lime.

When -- in the cement industry, when we talk about lime, we're talking about calcium oxide, okay?

There's also slaked lime, which are hydrated lime, so calcium hydroxides.

And then there's limestone, which is calcium carbonates.

All right, so -- actually, in my -- in the project information sheets that we've provided, you'll -- there's actually a site that's spoken about there that was a lead contaminated site, that limestone -- calcium carbonate -- fines were mixed in as a buffer for the system. And they found in certain practices that that works in the field to do a better -- to do an additional job of buffering with the addition of Portland cement.

And so, it's a good way, an inexpensive additive to add, that in certain situations, can do a good job in minimizing the leaching of certain heavy metals.

DR. LAPIERRE: In the solidifying of -- and containment of bottom ash with metals, would it be prudent to increase your psi in order to get a better containment over time?

MR. WILK: If we look at psi as an indication of treatment, and that might not be entirely accurate, in that there is certainly some relationship in the durability of a material that has a higher compressive strength.

But you also have to look at perhaps hydraulic conductivities -- and Wayne, you can correct me on this if I'm wrong, but the hydraulic conductivities aren't necessarily dictated by the compressive strength of a material. For example, a clay can have a very low compressive strength, but it can have a very, very low hydraulic conductivity to it.

MR. ADASKA: Right. I think -- and one of the comments -- and I didn't want to interrupt Mr. Wilk, but you mentioned about the higher the strength, the lower the conductivity or hydraulic conductivity. As Mr. Wilk points out, very soft clays that have very little strength have very low permeabilities.

We talk about the slurry wall that Mr. Wilk talked about on one of the sites, the cement bentonite slurry wall.

That had requirements of pi compressive strengths in the order of what you're talking about, the .12, yet the permeabilities were 10 to the minus 6 and lower. So again, the strength and the permeabilities can -- are not always relative, directly related. So you could have very low strengths and have low permeabilities, and at the same time you can have high strengths and low permeabilities.

DR. LAPIERRE: Yeah, I understand that, but if you're looking at mixing, you know, your slurry and leaving it solidify to a certain strength level versus using a -- you know, a very high grade clay, there would be a difference, wouldn't there?

MR. WILK: Well, you have to look at all aspects of permeability as well as the shrinkage and the cracking and some of the other things that have to be looked at.

To answer your question is -- again, the mix design would dictate just what kind of permeabilities you're looking at. If you have a very -- if you have a clay material, and it's compacted in place as you would with most clay liners, you would have relatively low permeability.

But you could also have a low permeability with a stabilized waste, as long as you provide enough imperviousness to the material so you don't have flow channels developed.

DR. LAPIERRE: So, am I to understand from that, that leachability -- it doesn't matter on the tensile strength that you might have? It would be just as effective at 20 psi as it is at 400 psi?

MR. ADASKA: Well, I think a couple of things on leachability.

Obviously you're talking about whether it's stabilized or solidified. And in that case, you want to make sure that the material, if you're just counting on the solidification aspect of it, you have to look at the material and the amount of gradient that you're pushing through.

Once you have a criteria of a 10 and a minus 6 and a minus 7, that is your criteria that you would work with.

I'm not sure if that answers your question, but there would be a criteria -- an engineering criteria on your material that would -- if you're looking strictly for stabilization -- or solidification purposes, that you'd want to maintain some sort of a permeability requirement.

DR. LAPIERRE: But if you have PCBs and

you don't want them to go anywheres, if you were to err on the side of prudence, how would you do it? Would you increase your psi, or would it matter?

MR. WILK: I'd like to refer the Panel to an EPA publication on -- I believe the title is Solidification Stabilization, the Physical and Chemical -- where is it?

DR. LAPIERRE: Has a document been filed?

MR. WILK: Yes, it has. It's an EPA publication. It goes into the chemical and physical testing of solidifying stabilized wastes.

And as you go through that, you'll see some numbers that are typically used for performance standards for a material that's being solidified and stabilized.

And one of those is, it's typically used -- there's one times 10 to the minus 5th as usually what you're looking at as a performance standard for solidified and stabilized waste.

If these materials are not being used to create liners, they're being used to lessen the permeability of the material in an environment where the surrounding area has a higher permeability.

So, the water likes to take the easiest route, and it will go around the treated material rather than through it.

That's one way in which the leaching of a hazardous constituent from a treated material is dealt with. There's a preferential path around the material rather than through it.

I've been told that a rule of thumb is a two order of magnitude difference between the surrounding material and the treated material.

So, I think you're asking what are the performance standards that are set? What's the preferred performance standard that's set?

What we're trying to say is that unconfined compressive strength and permeability, they do have some relationship, but it's not one for one, and it's different.

We tried to make the demonstration about clay. Again, clay is material that's very soft and yet has a very low hydraulic conductivity.

Usually what we see as far as performance standards is pounds per square inch in the order of 50.

And as -- what I've tried to present here is the EPA logic into how that came about, and the dealing with liquids that are being placed in a landfill, and the 10 to the minus 5th, which is the hydraulic conductivity that's a performance standard for most of the sites that EPA has written about in that publication.

Again, that's an EPA publication. It's not -- I didn't write it, the EPA did, and it's based on their experience on setting performance standards for these kinds of sites.

DR. LAPIERRE: Okay. I just have a few more questions and then I'll be finished.

But one of them relates to your slide -- I'll just bring you back to your slides on the cores that you had, that you identified. Things were nice and solid. I think those are pretty solid cores that you showed up there. So, that's just a comment.

The other one is clay does absorb -- and depending on the quality of the clay -- a pretty -- a good volume of water before it does solidify and then becomes impermeable, but it has the capacity to absorb that water, and then it becomes impermeable, as you've indicated. You may comment on that.

But I guess the last question I have is -- goes back to the strength of the building that you had, in that Leeds platinum building?

MR. WILK: Yes. We reviewed that project sheet, and that project sheet was written more about the actual mix designs and such, and that performance standard is not written about in that -- at the -- in that publication.

But Mr. Adaska is actually -- he's a professional engineer, and he's a soils engineer who worked on siting and soil location, and locating nuclear facilities. He knows his stuff.

And so, that building is actually constructed on material that's been treated. It's a multi-storey building.

Would you -- would -- Wayne, would you hazard a guess on what something like that might require as far as compressive strength?

MR. ADASKA: Not in oil loads. What I'd prefer to do at this time is not to give you an opinion, but possibly, if you would like, we could get that information for you, and we could move on. [u]

DR. LAPIERRE: Okay. That would be fine. I'd like to get it, but I'll ask you the final question is, if you were going to build buildings on a site, or prepare a site, you know, for future use, would you not want to move beyond 14 to 19 psi as a load bearing structure?

MR. ADASKA: It depends on the design, of course.

I mean, basically if you're putting a parking lot on it, you can get by with it.

You're putting on a three storey building, this is definitely something -- the frost susceptibility.

There's a lot of factors going, but yes, I mean, there's no question that you're looking at the design of it and what you want.

I just gave you a general rule of thumb that most slabs on grade might fit that requirement.

But if you're looking at footings and some other types of designs, piling, foundations, there's all types of different designs. So, yeah, depending on what you're looking at, if you had a future use for this, that would go into the design. You'd design for that, so that you wouldn't have to do this twice.

So you'd make sure that if you had plans to put some sort of a building on it, then either -- you'd take that in consideration in your feasibility design.

DR. LAPIERRE: You would take that into consideration during the solidification process?

MR. ADASKA: I think it would depend on whether you wanted to do something there, or if you put something on a foundation there.

Obviously, if you go back in and have to put some sort of other footings there, you might have to do some more treatment, either grout it -- there's other types of methods you could do to solidify that type of foundation.

You can actually go in there and basically densify it. You could do some other things, if necessary.

There are other types of foundation treatments you could do to make that work for whatever structure you want to put on there.

But you would treat it more or less like a regular soil.

DR. LAPIERRE: I thank you very much. Madam Chair, that's it for me.

MR. CHARLES: You gentlemen ready to proceed with -- or do you want a break. Okay.

MR. ADASKA: We look forward to the next question.

MR. CHARLES: Well, my questions won't be quite as technical as my colleagues because I don't know as much about the technical side of things. So -- but I would like to draw your attention to Slide No. 36. This is the Pepper Steel and Alloy site. My question is what's the date when the remediation was done. I thought somebody said it was 1998 and the slide says 1988. Is that just a ---

MR. ADASKA: I apologize. That was a

senior moment on my part. I have -- I correct myself. The slide is correct. It's 1988.

MR. CHARLES: 1988. When was the photo of the site taken? Shortly after remediation or sometime later? The reason I'm asking is it looks as if it's just a flat site with not much on it except the material that's been remediated and stabilized and so on. I'm not sure what they were going to use it for. And I wondered if -- you know, they done the remediation and then nobody wanted to do anything with it.

MR. DICKSON: This project was added into Mr. Conner's presentation and he was very familiar with the actual remediation but it's not a project that we've returned to since it was completed so we're not aware of the reuse of the site at the present time.

MR. CHARLES: Well, I guess it ties into another question I have about capping, which is, when you're doing solidification and stabilization is it always a requirement of the process that there be a cap? What I got from some of your references to other sites was that you didn't have a cap on some of them. They just, you know, flattened the stuff out and left it. When would a cap be needed for the process? Or is a cap needed for the process? That is, stabilization and solidification. Is there any reason to have a cap?

MR. DICKSON: Sir, I can't answer that very well for you.

MR. CHARLES: Because the cap isn't ---

MR. WILK: Why is the cap necessary and why is it not? I really couldn't give you the criteria as to why the EPA requires a cap on some and not on others.

MR. CHARLES: I'm just wondering, is -- and if you don't know, that's fine, but is there any reason for having a cap over material that's been solidified and stabilized? Do you want to keep the surface water, the rain water from coming in contact with the stabilized material? Or does it make any difference?

MR. WILK: It does make a difference. Again, an engineered barrier like a cap is again, just a belt and suspenders approach to keeping -- to minimizing leaching. Leaching as we pointed out is a process where a liquid moves through or against a contaminated media and then moves the contaminants from that. If you can add an engineered barrier to minimize that that adds some comfort level to the remedy.

MR. CHARLES: So in some cases you're not worried about a comfort level. You just leave the material there?

MR. DICKSON: In some cases by the

engineering design the immediate reuse of the site might be a parking lot for instance, so the cap may not visually appear in the slides at present. It may be in asphalt pavement for instance that will appear in a year later. It's part of the engineering plan. But for the design it's entirely up to the engineers discretion as to whether or not there is a cap requirement.

MR. CHARLES: So the asphalt in essence would be the cap?

MR. DICKSON: That's correct.

MR. CHARLES: Yeah.

MR. DICKSON: In that instance.

MR. CHARLES: In that situation. I also noticed that in a lot of your Superfund site references there were either augers used or pug mills that sort of thing but not too many excavators. Our particular project started off with augers being used in the Tar Ponds and then it was decided to use an excavator and in your experience is there any difference in the performance of -- or in the efficiency or the effect that you get using augers rather than excavators or the other way around?

MR. DICKSON: I think there's probably -- there's a two part response to that question. The first part of the response has to do with the availability of equipment in the geographic area. So in instances in the United States where augers are readily available and therefore the most economical means of mixing. The augers become the evident solution. And other areas where augers aren't as readily available or there might be increased mobilization costs based on the scale of the project, it's more appropriate to bring in the excavator with a mixing tool fixed to the stick of the excavator.

So on the first instance or the first part of the response it has to do with economics. The quality of the blending is regularly tested so auger or excavator should be able to give you the same quality of mixing as long as you have the engineering controls in place and perform the QA on the mixing.

MR. CHARLES: Okay, thank you. I'd like to draw your attention now to Slide 29.

MR. DICKSON: I'm sorry, which presentation please.

MR. CHARLES: That's a good question. I think it was the first one.

MR. DICKSON: Thank you.

MR. CHARLES: This has to do with long term durability and mathematical modelling. And there's reference in some of the text in relation to models. It says:

"Based on the worst case hydrology for a monolithic landfill immersed in moving groundwater."

Now we've had our site described as one involving a lot of groundwater underneath so there is some similarities. And I just wonder is this test, particularly the dynamic leach test of Environment Canada directed towards modelling for the effects of groundwater moving underneath. Or is it a more general test of leachability.

MR. WILK: I think I can best answer your question by referring to some of the slides that were -- that preceded that slide. Let's see if I can do this here. All right. And this is the slide I wanted to present. I wanted to talk about. When we talk about leaching tests or leaching and extraction tests in the realm of solidification and stabilization, it's important to understand what we're trying to do here. Extraction tests are aimed at literally trying to extract everything you can out of a contaminated media. And that's where the Toxicity Characteristic Leaching Procedure come from. And the Synthetic Precipitation Leaching Procedure come from.

And if you look here, this is what we're trying to do in this -- what Jesse Conner was trying to do in this schematic -- is show that -- you started out with a solidified mass and then it was ground up. And you ran it through tests to extract what you could out of that. And Mr. Conner's point here is let's look at a different kind of test where the material remains as a monolith and is run through leaching tests. In the example above, you're trying to extract everything.

This material doesn't represent the solidified material but it's really sort of an adaption again from rec or regulation as to why Toxicity Characteristic Leaching Procedure is used to begin with. Most people in the field of solidification and stabilization don't find that as the actual situation. We're looking at a monolithic -- in many cases, a monolithic waste. And if this is closer to what you're doing, what you're doing is putting it through aggressive baths to try to leach material out of that material.

So when we go -- when we look at this, the extraction tests are quick tests. These can be run on the order of days. And so they're appropriate for use for quality assurance and quality control. But the actual -- when you go to model groundwater conditions worst case scenarios is you're actually modelling -- you want to model the batch leaching -- the leaching tests. So when we get to the slide that you referred to here, we see for the mathematical modelling you're seeing the leachability tests that treat -- that are leaching tests. These are monolith tests. You have ANSI 16.1 that actually comes from the nuclear field which is a very stringent field in the use of solidification and stabilization.

So again, we're looking at leachability tests rather than extraction tests and it's from those leachability tests that do you get the data to be able to enter into a model that can then give you some prediction about worst case scenario placement in the moving ground water.

MR. CHARLES: When you're talking about worst case scenario -- I'm looking at the heading right at the top of the slide which says "Long term durability". Now I gather that leachability and leaching characteristics and leaching in general is a question that goes to the durability of the mix that you've come up with. You don't want leaching, I take it, to take place, right? Is that right.

MR. WILK: Sorry.

MR. CHARLES: You don't want leaching to take place because it affects the durability of the material. So you're trying to provide a mixture and conditions that will prevent leaching from taking place. And these models are a way of predicting the extent of the leaching that might take place and consequently any effect on the material itself.

MR. WILK: I -- when we look at any given site, we use these tests to predict the long term durability because what we're doing is we're exposing the treated material to an aggressive environment. That which we think is the worst that it can see. In the earlier slide to this, the idea is you're trying to simulate the most aggressive situation and accelerate leaching in the laboratory because that's the only way you can really test it.

You can't do it in real time because by the time you're done with your leaching tests you -- the endangerment that an untreated has posed to people, it doesn't make sense. You can't wait that long. You got to do something. It's -- I think Mr. Conner is liking that to having a heart attack. Well, you got to get treated. You can't refuse it, right? I mean, you might have to undergo surgery to get it done. And so the accelerated tests in the laboratory are a way to do it in accelerated situation. The leaching tests are used to get the data to be able to put into models to simulate the worst case scenario for the site.

MR. CHARLES: Good. Thank you very much.

MR. WILK: Thank you. I know it was a

long-winded question and ---

MR. CHARLES: Oh, no, that's fine. I'm happy to have it.

MR. WILK: Not a long-winded question. A long-winded answer.

DR. LAPIERRE: Could I have ---

MR. CHARLES: I guess you were right the first time. That was a freudian slip was it.

DR. LAPIERRE: Could I have a short question and a short answer. If you're doing the dynamic leach test and you're trying to do exactly what you said you wanted to do, you take material, you're trying to give it the worst case scenario, would you get the same results from a material that has a 500 psi or one that has 19 psi? Would the leachability test give you the same results?

MR. ADASKA: Again, I'm not saying this in terms of chemistry but the analogy I would make is if you have a pervious concrete that you make with 500 psi and the water went right though it. Versus a tight material that would be a clay material much lower strength and you'd have less material go through there so I think -- again as we pointed out earlier that the compressive strength aspect of it is just one aspect to deal with and they may or may not be related to the permeability of the material.

DR. LAPIERRE: But that's not really the answer I was looking for.

MR. ADASKA: No, no. And it's longer, yeah, but I'm not sure if ---

DR. LAPIERRE: Why would you waste time and money putting 500 psi material in place then, if you could do just as good with 19?

MR. WILK: You would definitely look at this as what you want to do, optimize your mix. We get back to the mix design if your criteria is to deal with the leach test and it comes out at a certain strength requirement and it meets that strength requirement that's needed to get that leach test available then that would be your criteria. And we can't really predict what that strength would be until we do the testing.

DR. LAPIERRE: So if I ran the dynamic leach test from Environment Canada on a monolith at 19 psi or one at 500 psi I would get the exact same leachability result over time?

MR. WILK: I think you could look at unconfined compressive strength. In some materials perhaps the hydraulic conductivity of the finished treated material has to do with the physical form and -- of the material. And unconfined compressive strength could give you an idea of how durable that waste form is. And so if that material, for example, in a clay, the clay itself doesn't depend that much on the its ability to maintain its shape.

Obviously clays usually occur in nature. They're confined in some way so they maintain their shape that way. In the case of solidified and stabilized material, it could be said that the hydraulic conductivity is dependent on the material holding its shape. And usually when we look at an in situ site that material is contained. And it is -- there's compression around it and so it maintains its shape on its own. I think the unconfined compressive strength gives you an idea of its durability to see if it holds its shape.

DR. LAPIERRE: So the answer that you're giving me is it makes no difference. It would get the same results from your tests.

MR. DICKSON: Dr. LaPierre, with your indulgence we would like to refer this question to Mr. Conner and we'll provide a written response to your question, sir.[u]

DR. LAPIERRE: Thank you.

MR. DICKSON: You're welcome.

THE CHAIRPERSON: I would just like to note, I'm sorry, you made an earlier undertaking and I had my finger on the button and I was about to say, you know, enter that into the record that you've made that undertaking and I don't know, I got swept away by the questions and answers and I didn't do that. But I just wanted to make that note. And now I can't tell you what your earlier undertaking was but I hope you have the note. Otherwise it will appear in the transcript.

MR. DICKSON: I believe, Madam Chair, the earlier undertaking was the compressive strength in the Cambridge site.

THE CHAIRPERSON: Sounds good. So we now have two undertakings.

MR. DICKSON: We have two undertakings. No problem, Madam Chair.

THE CHAIRPERSON: All right. Thank you.

MR. CHARLES: I just have one question and I think it's an easy one to answer. In your Slide 10, you say that contaminants are physically bound in the cement mix. And I guess that's one of the reasons for doing the cement mix. I guess my question is, contaminants are already bound are they not to organic compounds and are relatively immobile. Will the stabilization change that mix and in so doing will it lessen their mobility, increase their mobility or make no change whatsoever? And I know what you hope will happen that it will lessen their mobility. But is it possible that something else will happen because you're changing the matrix?

MR. WILK: Mr. Charles, I believe your -- I would like to get to that slide so I can follow your question a little bit better.

MR. CHARLES: Slide 10.

MR. WILK: Here we are. So sir, you're asking what's the difference really in the solidification and stabilization treatment of inorganic hazardous constituents and organic hazardous constituents. It's been used for both of those broad chemical groups that we know of from taking organic chemistry. In the case of inorganic hazardous constituents the treatment includes using chemistry to make the material less soluble. In the case of organic -- a treatment of organic hazardous constituent -- I'm sorry, let me back up there.

In the case of inorganic hazardous constituents, you're relying on the changes to the chemistry of the treated material and also changes to the physical chemistry -- the physical properties of the material. In organic hazardous constituents you are relying on mostly the physical changes to the contaminated material. And I think what you're referring to is certain hazardous constituents that are organic have an affinity for other particles. Is that where you're going sir?

MR. CHARLES: Yeah, I mean if they're already sort of bound and immobile in that sense, why do you have to do more.

MR. WILK: Well, a couple of reasons. You actually capitalize on that phenomenon. You can -- they are bound -- say you have a particle that has an affinity for a certain organic compound. It binds. It attaches itself to that particle. And so it's happy there as long as the particle doesn't move. But if that particle then begins to move around the environment, there -- I guess that's not really leaching. That's actual physical movement of that contaminant attached to that particle. And so we use solidification to fix that particle that has this constituent attached to it in place. And that's what prevents it from moving around the environment and that's what protects human health and the environment. It's breaking the chain or breaking the migration or a potential of that contaminant that has attached itself to another particle.

MR. CHARLES: And do all contaminants behave the same way?

MR. WILK: No.

MR. CHARLES: So you'd have to know what

you're dealing with in order to determine how effective the process is going to be?

MR. WILK: Yes.

MR. CHARLES: And this is my last question. It's been said that solidification and stabilization is a passe technique. It's yesterday's child. Now other techniques are overtaking it. Yes, it's -- history shows it's got 24 percent of use in Superfund sites that have been remediated but if you're looking at trends it's not the trend of the future. It's the past that we're talking about. You got any -- I should be -- you know, I know the answer I'm going to get but -- I mean you can shoot yourself in the foot if you like but an honest answer regardless of self-interest you know, might be useful.

MR. WILK: I'm sorry.

MR. DICKSON: I'll take a run at this one for you, Mr. Charles.

MR. CHARLES: Have you got armoured shoes on.

MR. DICKSON: No, no I'm good. They're not concrete shoes yet. The question as I understand it is, from the pie chart that we presented in both presentations in fact, do we anticipate that 24 percent becoming 23, 22 and so on. In earlier publications before technologies were advanced and the environmental remediation industry was what it is today, fairly mature, solidification and stabilization was like 30 percent.

Therefore, obviously from 30 to 24 we've seen a six percent decrease. At that time, there were no where near the number of technologies introduced developed by proprietary companies, developed through research with National Research Council for instance in Canada. And therefore, the market share so to speak was much higher. As you saw from the slide in both presentations there are many, many more defined remediation technologies now. And they carve up that percentage ever more. But it's highly likely that will maintain certainly 20ish percentage over a period of time because it's an effective technology to treat those combined wastes both inorganic, organic, combined waste.

MR. CHARLES: Thank you very much and I think your feet are still in tact.

THE CHAIRPERSON: I'm awfully sorry because that was a grand finale question that Mr. Charles asked you and of course I've got one more question and it's not a grand finale one. But -- and I'm trying to find the reference and can't but it really doesn't matter. I have a memory that somewhere in the presentation there was a rather rapid reference to the fact that fugitive emissions can be easily or readily controlled. Did I imagine that but it doesn't matter if I imagined it or not. How do you control fugitive emissions in this process?

MR. WILK: As I said before, we're not remediation contractors. But from my observation of sites that are active and completed and talking with solidification and stabilization contractors, I'm always impressed by the creativity of contractors enable to surmount challenges if you will of different aspects of this site. And there are engineering controls and as I've tried to point out in the examples that I've given of the ability to deal with fugitive emissions. And that comes from a wide range of different methods.

So everything from using plastic sheeting to reduce the surface area and increase the vapour pressure beneath a treated -- on top of a treated material to keep down on any emissions. It's using air pollution control treatment terrain attached to the mixing devices to deal with those. There's even suppressive foams that can be applied to keep down the fugitive emissions. So there's a lot of techniques out there and it's pretty amazing the creativity that we see and contractors to be able to achieve those -- to be able to achieve that.

THE CHAIRPERSON: Okay, thank you. What I'm going to do because you've been sitting there a long time and so has everybody else, I'm going to suggest we take five minute break. We're not going to go anywhere but just so people can stand up. Five minutes and then we will resume and I will provide opportunities for other people who have been sitting there so patiently to ask you questions.

--- RECESS: 8:52 P.M.

--- RESUME: 8:57 P.M.

THE CHAIRPERSON: If you'd like to take your seats, we'll begin again. Once again, thank you so much for sitting there patiently. I know the Panel questioning was somewhat longer than we have been in other cases, but thank you for your patience.

I will now ask the Proponent, do you have any questions for the presenters?

MR. POTTER: Yes, thank you, Madam Chair. Just a general comment first of all. We seem to find ourselves back into the topic of bearing strength and capping and future use again, and I think we've talked about this a number of times.

That's why we did request the additional time that we've had for Thursday, May 11th, at 3 o'clock.

We're going to revisit that topic. Mr. Shosky is going to be giving about an hour presentation on that with some time for some questions, because I think it's important, it's come up over and over again.

So, I'm going to ask Mr. Shosky just very briefly to touch on the issue of the unconfined compressive strength, and I'm also going to ask him to just, as well briefly, talk about the difference between why you would pick ex-situ versus in-situ.

One of the reasons we do have Earth Tech on our team as one of our consultants is because they do have extensive experience with solidification and stabilization both as a designer and as a contractor.

So, I'll ask Don to just briefly, not take too long -- I know it's getting very late and everybody is getting a little tired right now, so -- I know I am. Don?

MR. SHOSKY: Thank you, Mr. Potter. And I just want to add that I personally have stabilized about a million tonnes of material, anything from radioactive material in Denver, PCBs in Alaska and tars in about ten different states.

So, when we make a decision between in-situ and ex-situ technologies we typically, and in this case, went through a risk assessment and that risk assessment included what's the potential for generating odour, dust, emissions, and how does the handling of the cement take place with the different sorts of technologies, and then we did a cost model associated with that. So, as a result of all those factors we ended up with the in-situ technology using excavation.

Just so that the Panel may have a better understanding of where the cost break point, based on my experience, has been as the difference between excavations and augers, is anything over a depth of about eight metres the auger becomes a bit more cost-effective than an excavator.

Since the majority of our material is well -- well, all of our material is well under eight metres in depth, we felt that the excavation -- traditional excavation equipment for blending tools would suffice in this project, as well as meeting the other analyses that I had just mentioned.

The ex-situ technology using pug mills and things like that in this case I felt was not cost-effective because of the material handling problems with the sediments, as evidenced by some of the handling problems that had happened with the previous incineration job where material was having difficulty getting to the plant, and there are additional dust issues associated with the amount of infrastructure involved with putting in a pug mill.

Another question that came up frequently was the unconfined compressive strength. Again, I worked at EPA for nine years during the time when most of the hazardous waste regulations and PCB regs were out. I was an enforcement officer. It was my job to enforce those laws. 50 psi is pretty much a landfill criteria for a hazardous waste landfill.

The tactic we took when we designed our unconfined compressive strength was the minimum amount necessary to ensure that subsidence would not occur.

I'd like to answer very quickly a couple of Dr. LaPierre's questions. There was a question that came in to clarify the range of pH in relationship to this project. We took a look at that.

One of the reasons our cement concentrations are near 10 percent are because we were hoping to achieve a pH between 9 and 10.5 in order to make sure that our heavy metal concentrations within the sediments maintained within that pH control so that leaching would be minimized.

And as an added benefit -- we talked a lot about mercury over the last couple days. Because of the sulphur, mercury and cement content that we were proposing, it also changes the mercury from more of an elemental mercury to more like a mercury salt.

When would lime be used was another question that was asked. Currently right now the only time we would use lime, in my opinion, would be if we were to try and do some sort of stabilization with the tar cell. That right now is destined to be off for incineration, but we would have some formulations in mind if we were asked to go that direction.

pH control again for metals from the fly ash, in my opinion -- and I think it's shared by the witness -- the pH controls from the metal in the fly ash is going to be the important characteristic there, to make sure that it's immobile. We could add extra cements to it but it's a delicate balance trying to maintain a pH between 9 and 10 to immobilize that material.

Lastly, the question of PCBs came up again. For those of you that don't know, it is illegal to ship any levels of PCBs between the United States and Canada. I had a job in Alaska two years ago where we had to stabilize PCBs in lead material. From Alaska we could not take it to the nearest spot, which was in Canada, we couldn't ship it out of Alaska because of international issues going over water with PCBs.

We were allowed and got a waiver from

USEPA to stabilize that material there and contain it in a "Toskit (sp) type of facility" that was later turned over into a large storage shed area for storage sheds in Fairbanks.

So, there are some flexibility on the amount of PCBs that you can stabilize and put in place and it's based on a case-by-case condition with the ability to have an engineered contained system around it that would contain it.

Lastly, Dr. Charles asked a question about whether or not a cap is necessary in order to maintain durability of the stabilized monolith over time. From our perspective a cap would be necessary for the extreme climatic conditions in Cape Breton because of the freeze and thawing that takes place.

All we have to do is look around at a lot of rocks and mountains that are there that, because of freeze/thaw, break and crack and things of that nature. So, it was the opinion of myself and the Tar Ponds Agency that having an adequate cap on top of the monolith would protect it and add a buffer for those types of issues.

And with that, unless you have any questions, that's the clarification we would like to make.

MR. POTTER: I hope that was quick enough.

THE CHAIRPERSON: I think any questions for you we will hold. Thank you very much, Mr. Shosky and Mr. Potter.

All right. After long last I'm going to ask -- first of all, I would like a show of hands how many people have questions. Mr. Ignasiak, Ms. MacLellan. Just the two. Mr. Ignasiak, would you like to come forward, and I think 10 minutes for your questions.

MR. IGNASIAK: Ten minutes?

THE CHAIRPERSON: I know, unbelievable.

MR. IGNASIAK: Thank you very much. No, that's much more than I thought.

THE CHAIRPERSON: Well, I feel that we only have two questioners and we do have two presentations, so I think that is reasonable.

MR. IGNASIAK: Thank you very much.

--- QUESTIONED BY MR. LES IGNASIAK

MR. IGNASIAK: My first question to the presenters is, do you know what is the organic content -- average organic content of the Tar Ponds sediment? If not, perhaps I can supply an answer.

MR. DICKSON: Please, sir.

MR. IGNASIAK: Yes. It is about 56 percent. Now, can I ask you a question.

You state -- in my opinion, a very

perfectly well and balanced prepared bulletin of the Portland Cement Association, you state, page 12, "Wastes Containing Organic Compounds":

> "For hazardous organic wastes and aqueous wastes with greater than one percent hazardous organics, the land ban regulations effectively prohibits treatment by SS technique."

Do you know roughly what is the concentration of hazardous organics in Tar Ponds?

Maybe I can come to next question. You state in your bulletin:

> "For non-hazardous oil wastes techniques have been developed to solidify these materials when the organic content is below approximately 25 percent."

And then you state:

> "There is no concern about leaching standards since these are non-hazardous, and once solidified there is no problem."

Well, I understand based on what Mr. Shosky just said a few minutes ago that the pH will be roughly between 9 - 10. Is that correct? What is happening when the pH comes to about 9 - 10 with the phenols? And the phenols are the major components of coal tar. Could you tell me what is happening?

MR. DICKSON: Madam Chair, could I have that question rephrased? There was about seven questions perhaps in the statement. I wasn't sure what question exactly we were being asked to address.

MR. IGNASIAK: I would be happy to repeat this question. Could you tell me what is happening with the phenols? And phenols are the major component of coal tar when the pH comes to about 9 - 10.

THE CHAIRPERSON: Mr. Ignasiak, you're asking questions about statements in which document? Is that what your question ---

MR. IGNASIAK: I'm taking -- the questions that I have been asking so far are taken based on Portland Cement Association brochure entitled "Solidification and Stabilization of Wastes Using Portland Cement," Page 12.

This question that I'm asking right now is related to the content of tar and phenols in the sediment.

THE CHAIRPERSON: Are these questions ---

MR. IGNASIAK: Can I go to next question?

THE CHAIRPERSON: No, I think I need to

ask our presenters, first of all, do you understand the question? You don't understand the question?

MR. DICKSON: No, Madam Chair, it is not clear to us. We have the reference document that Mr. -- that the speaker is referring to, but we're not clear on the question that he's asking about the brochure, unfortunately. And this document has been entered into the record.

THE CHAIRPERSON: Yes. Mr. Ignasiak, can you -- you obviously want to -- this is a difficult line of questioning, obviously.

MR. IGNASIAK: Madam Chair, I ask a simple question. Do the presenters know what is the content of phenols in the sediment that is supposed to be solidified?

MR. DICKSON: No, Madam Chair, we do not know the answer to that question.

MR. IGNASIAK: If they don't know, so please tell me that.

THE CHAIRPERSON: Mr. Ignasiak, I wonder if you could perhaps -- I feel the tone of the questioning is getting a little ---

MR. IGNASIAK: I'm sorry. I'm sorry, I will try to tone it down.

THE CHAIRPERSON: Yes, if you could just

take a breath.

MR. IGNASIAK: I will try to tone it down.

THE CHAIRPERSON: It's late in the evening and I think ---

MR. IGNASIAK: Yeah, I understand. I apologize for that. Anyway, I would like then to say that those phenols will be solubilized, will turn into phenolates, sodium phenolates, and if you look at information that was provided on request of United States Department of Energy by Oakridge National Laboratory you will find out that essentially the phenols are one hundred percent recovered from the stabilized material during TCLP test.

Subsequently, the same source that I just referred you to states clearly -- and I am now quoting:

> "Supra et al, 1992 showed that the leaching performance of phenol is better when the queue time is increased."

THE CHAIRPERSON: Mr. Ignasiak, I think we've got a problem here. I think that what you're going to need to do is to bring this information to us in your presentation.

MR. IGNASIAK: Madam Chair ---

THE CHAIRPERSON: I know I've been saying this to you a few times.

MR. IGNASIAK: --- I would rather prefer to submit the information on the subject, because there is a number of other issues that were presented today that I do not agree with and I will raise them in my presentation, if it's okay with you.

THE CHAIRPERSON: Absolutely.

MR. IGNASIAK: Thank you very much.

THE CHAIRPERSON: That's quite the right approach. Thank you.

Ms. MacLellan, do you have some questions for our presenters, please?

--- QUESTIONED BY CAPE BRETON SAVE OUR HEALTH CARE COMMITTEE (MS. MARY-RUTH MACLELLAN)

MS. MACLELLAN: I've had questions since the time I was born and could talk. Anyway, I'll try not to be too long and I'll try to ask short questions.

Let's talk about the cement first. Is there sand in your cement?

MR. DICKSON: The solidification and stabilization process that we discussed today is a cement-based process but there isn't a sand in the cement. There'd be sand in concrete, as we presented in earlier slides, and fine and coarse aggregates, the fine being sand, but in the cement itself, no, there is no sand.

MS. MACLELLAN: So, you mix it with sand, though, correct?

MR. DICKSON: No, we, in fact, don't mix it with sand unless that's part of the mix design that's developed. The mix designs would have reagents added of which cement is one of those reagents, but typically sand is not a reagent and therefore it wouldn't be part of the mixing process. It may be in place, there may be sand in the ground where the cement is mixed, but it's not part of the reagent that we've identified.

MS. MACLELLAN: So, are you telling me now that you don't have developed what you're going to mix with the cement?

THE CHAIRPERSON: I think the question as to what's going to be used in the mix is actually one that goes to the Agency but ---

MS. MACLELLAN: Where I'm going with this is ---

THE CHAIRPERSON: Yes, that would help, I think, for us to know where the question should go.

MS. MACLELLAN: --- it's been my experience around the ocean to watch cement very quickly and rapidly deteriorate when it's hit by the high waves in storm surges with the salt.

So, I'm just wondering what kind of effect proportionately if they're going to use sand it's going to have, because a lot of the problem is the sand. It's just like sandstones, they break down very quickly in the salt water. I'll leave that question and I'll go on.

THE CHAIRPERSON: Well, just for a point of clarification, I think it's been clearly stated that there's no intent to add sand.

MS. MACLELLAN: I think what he said was he wasn't sure yet.

THE CHAIRPERSON: No. Well ---

MR. DICKSON: Madam Chair, if I may? Part of the -- and I apologize, it's been many hours ago that the first presentation was presented, but in the earliest of slides we defined the difference between cement and concrete and then concrete and a solidified, stabilized or treated waste.

And between cement and concrete there's certainly sand as a fine aggregate, a stone as a coarse aggregate and water to make it concrete, but we're not making concrete, we're solidifying and stabilizing a hazardous waste. So, there is no sand or rock, for that matter, or coarse aggregate in the mix.

Now, that's not to say it's not in the ground. There are all kinds of different things in the ground. There will be perhaps sand, inorganics and organics, maybe some stone -- who knows what else might be in the ground -- but it's not the mix design to incorporate those things. They're the in-place materials that are being treated.

MS. MACLELLAN: How far down will the auger actually go?

THE CHAIRPERSON: I think these questions which are about the specific way that this project will be -- would be carried out belong with the Agency rather than the presenter.

I think the questions for the presenter should probably focus perhaps on the -- the more general information they provided or the examples they provided would be the most appropriate.

MS. MACLELLAN: Okay. Well, I'll go back to the areas that they referenced in the sites that they cleaned up. Most of them, in fact all of them, were in the US. The US has a drastic different climate than we do.

Having spent -- I've been almost everywhere in the Eastern Seaboard of the United States, so I know a little bit about what I'm talking about, climate-wise that is.

They don't have the frost we do, they have two growing seasons, we don't. Is there anywhere in Canada with a climate similar to ours that you have done a monolith project?

MR. DICKSON: Madam Chair, we entered into the record earlier this evening three Canadian projects, a project in Brandon, Manitoba, one in Vancouver and Burnaby. Burnaby is the third project.

So, we do have three Canadian examples, the recent examples of solidification and stabilization in Canada, and we've provided project sheets to represent the use of the technology in Canada very recently.

MS. MACLELLAN: So, once again, you haven't done anything in a climate similar to ours.

The next question is -- I think it was Medley in Florida that you mentioned. Do you know the name of the mayor that I could contact in that town?

MR. DICKSON: Madam Chair, we do not know the mayor's name.

MS. MACLELLAN: Thank you.

THE CHAIRPERSON: Thank you, Ms. MacLellan. Well, I think that does -- oh, no, I should ask. Is there anybody else who's not a registered presenter who has a question?

In which case I think we can -- we have come to the end of this evening's session. Thank you very much, Mr. Dickson, Mr. Adaska and Mr. Wilk, you've been at the table a long time. Thank you for your presentations and thank you for your answering of the many questions that we've put to you.

And thank you all for sitting here through this marathon session. We really appreciate your patience and your attention.

Tomorrow -- I am madly looking through my papers to find my -- here we are -- my schedule. We will be returning -- you have the day, or the morning and the afternoon free, and we will be returning and starting at 5:45 on Wednesday and we have two presentations tomorrow evening, the Cape Breton University and Dr. Ron MacCormick.

Thank you all very much, and we will see you tomorrow.

(ADJOURNED TO WEDNESDAY, MAY 10, 2006 AT 5:45 P.M.)

CERTIFICATE OF COURT REPORTERS

We, Philomena Drake, Ruth Bigio, Sandy Adam, Gwen Smith-Dockrill and Lorrie Boylen, 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.

____

Philomena Drake, CCR
Sandy Adam, CCR
Ruth Bigio, CCR
Gwen Smith-Dockrill, CCR
Lorrie Boylen, CCR

Tuesday, May 9, 2006 at Halifax, Nova Scotia