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FOR THE MARATHON PALLADIUM PROJECT

TRANSCRIPT OF PROCEEDINGS
held virtually at Toronto
on Wednesday, March 30, 2022, at 9:00 a.m.

VOLUME 12

BEFORE: Debra Sikora, Panel Chair
Gay Drescher, Panel Member
Laurie Bruce, Panel Member

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Mayor Rick Dumas Daryl Skworchinski	On behalf of the town of Marathon
Tracy Zanini Jody Duncan	On behalf of Biigtigong Nishnaabeg
Gregory Crooks Frank Babic	On behalf of Stantec
Sean Capstick	On behalf of Golders
Robert Clavering Allison Kroeze Matthew LeBlanc Jennifer Pellerin	On behalf of Environment and Climate Change Canada
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Laura Romeo	On behalf of Ministry of Heritage, Sport, Tourism and Culture industries

Courtney Bice	On behalf of Transport Canada
Laura Darby Raymond McCarthy Andrea Hanson Colin Hovi Tim Cano	On behalf of Ministry of Northern Development, Mines, Natural Resources
Marie Eve Lenghan	On behalf of NRCan
Sheila Daniel	On behalf of Wood
Kevin Morin	On behalf of Citizens for Responsible Industry in Northwestern Ontario and Northwatch
Jacinth Gilliam Price Alisdair Brown	Ministry of the Environment, Conservation and Parks

Also Present:

Chief Duncan Michano	
Gavin Fitch	Legal counsel to the Panel
Jason Patchell	Panel manager
Robert Purdon	Panel secretariat
Youssouf Kalogo	Panel secretariat
Élyse Maisonneuve-Campbell	Panel secretariat
Kierney Leach	Panel secretariat
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Tracy Utting	Panel secretariat
Audrey Rooney	Panel secretariat
Sophie Regimbald	Panel secretariat
Jillian Smith	Panel secretariat
Frank Bohlken Christine Walsh Colin Varley	
Sandra Brereton	Court reporter

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Virtual proceedings

--- Upon resuming on Wednesday, March 30, 2022, at 9:00 a.m.

PANEL CHAIR: Good morning, everyone, and welcome to day 12 of the public hearings for Marathon Palladium Project.

My name is Debra Sikora, and I'm the chair of the joint review panel. My colleagues on the panel are Gay Drescher to my left, Laurie Bruce to my right. Today we plan on completing our topic-specific session on human environment and health with closing remarks from Generation PGM. We'll then begin our presentations and questions related to accidents and malfunctions, climate change and mine closure. My full opening remarks from day 1 of these hearings can be found in the transcripts and on YouTube.

A few housekeeping items. Just a reminder that live audio and video streams and video recordings of this hearing are available to the public through YouTube. Anyone in the virtual hearing room with their camera or microphone turned on will be captured and images and recordings of you and

your surroundings will be broadcast to a publicly available YouTube video.

If you have any concerns about this, please contact the secretariat. We'll do our best to accommodate while considering the need to conduct an open transparent public process.

The secretariat is assisting with logistical and process-related questions. They can be reached by writing to the project e-mail address found on the public registry.

In the event of an emergency where you are please consider your safety first and exit your location if needed. When it's safe to do so, please let us know how we may assist, and we'll find time to reschedule your presentation if needed.

Today we plan to take a 15-minute break mid-morning and afternoon with a one-hour break for lunch.

An updated hearing schedule is available on the registry. I'll just do a quick summary of today's agenda. We will hear first from Generation PGM with their closing remarks related to human health and the

environment. This will be followed by presenters in the order in which they appear on the hearing schedule, and we'll then follow with questions related to the topics of accidents, malfunctions, climate change and mine closure. We'll continue to provide an opportunity for Generation PGM to respond with closing remarks to any of the information presented for each topic session.

So, before we begin with our presenters this morning are there any questions or procedural matters that anyone would like to raise? Mr. Barretto, good morning.

MR. BARRETTO: Good morning, Madam Chair. Jeremy Barretto for the record, and I'm intentionally on video this time. Madam Chair, I just had a procedural question regarding the presentations.

So, Generation has taken the approach of not repeating information in its daily topic-specific presentations that were presented during the opening general session. So, for example, for today much of its first 10 slides are repeats, and Mr. Anwyll usually

goes to the topic-specific session. We note that CRINO's presentation today, which is on the record as CIAR 1099, about half the slides were previously presented at the aquatics session on March 17th.

So, we just wanted feedback from the panel about whether the panel prefers information to be repeated in each topic-specific session or whether the panel prefers just the new information relevant to that specific topic to be presented. It would just help Generation and other participants present the correct information. Thank you.

PANEL CHAIR: Fair enough, can you just give me a couple minutes to caucus.

MR. BARRETTO: Sure.

PANEL CHAIR: Thank you.

---(DISCUSSION OFF THE RECORD)

PANEL CHAIR: Thank you very much, Mr. Barretto. I think what we'll do is we'll leave it up to individual presenters to present to the panel based on each of their presentations. So, if GenPGM wants to approach things differently, or you mention CRINO, the panel is flexible on what is presented each

day.

MR. BARRETTO: Okay. Thank you, Madam Chair.

PANEL CHAIR: Thank you.

Do we have any other questions or procedural matters before we begin? Okay. So, thank you very much. As I mentioned we will begin today with closing REMARKS FROM GENERATION PGM on the topics of the last couple of days, human health and the environment. Thank you again everyone for flexibility with the hearing schedule.

Good morning, Mr. Anwyll. I'll turn it over to you.

CLOSING REMARKS BY GENERATION PGM:

MR. ANWYLL: Good morning, everyone. Thank you, Madam Chair and members of the joint review panel.

At this time, I'm presenting the closing as you discussed for the human environment sessions. I want to start by noting some commentary provided by Mayor Rick Dumas from the town of Marathon who stated:

"The Marathon Palladium Project will help secure the future

socioeconomic sustainability of the Marathon and region."

We agree that the future socioeconomic stability of Marathon and the surrounding region is key to framing the human environment assessment for the project.

I'll start by thanking a few presenters, and then I'll go through the topics of air and noise, greenhouse gas, then socioeconomic, land use, archeology and then finally the human health detail sections.

So again, over the last two days we heard from Health Canada, MECP, ECCC, Ontario Ministry of Heritage, Sport, Tourism and Culture Industries, representatives from the town of Marathon, of course Biigtigong Nishnaabeg First Nation, Transport Canada, and Citizens for Responsible Industries in Northern Ontario or CRINO.

Thank you all very much for your participation in these sessions. I really do value the input and different views and different sources of information. We'll now provide responses to the key topics.

Generation PGM undertook a

robust multidisciplinary assessment for the atmospheric environment with planned mitigations. No significant adverse effects have been identified during the life phases of the mine.

Now, I'll start with the addressing air quality.

Mr. Crooks presented the air quality evidence. He confirmed that the air-related quality exceedances are due to conservative assumptions or can be limited with mitigation measures. GenPGM's experts responded to the panel's air quality questions. We also engaged with MECP regarding its comments on air quality assessment within the EIS.

I'll now move to the greenhouse gas emission, or GHGs.

GenPGM's Mr. Capstick explained the direct scope 1 and scope 2 electricity, greenhouse gas emissions for the project will represent a very small fraction of Canada and Ontario's overall emissions. The project will provide critical minerals that are necessary for the transition to the low

carbon economy. We explained that the low carbon intensity of the project compared to both Canadian and international peers is based on an international benchmarking.

In response to undertaking 24 we filed the SKARN report. This report compares the carbon footprint of the Marathon Palladium Project on a CO2 equivalent per tonne of copper equivalent produced. So really to compare peer operations.

The report shows that Marathon would be ranked the second lowest of the 13 producing copper mines in Canada and in the best 4 percent of the reported mines worldwide included in the SKARN dataset.

From ECCC Mr. Clavering stated that the GenPGM's approach for greenhouse gas assessment was acceptable and reasonable. ECCC defers to GenPGM to identify specific mitigation measures to further reduce greenhouse gases that are technically and economically feasible beyond measures to reduce emissions that are already proposed.

Regarding noise. GenPGM's noise expert, Mr. Babic, explained that during

construction no significant noise impacts to the community annoyance or sleep disturbance are expected. Mr. Babic also confirmed that predictions -- that the predicted operational noise impacts are within the applicable limits both at the mine and the rail loadout facility and traffic routes.

In response to Health Canada Mr. Babic explained that we did not perform a combined noise assessment because the plan operation and -- the planned mining operation and the rail loadout facilities are 5 kilometres apart. However, even if the noise sources were combined as Health Canada suggested, the combined impacts are still expected to be below the applicable thresholds.

Mr. Smith from MECP stated that GenPGM's predicted traffic noise impacts were compliant with the applicable Ministry of Transportation requirements. MECP further stated that it has no concerns with the traffic noise in the context of the project and that GenPGM has gone above and beyond the expectations for traffic noise assessment.

Gen's experts addressed a variety of questions from the panel regarding noise, including blasting, predicted noise level on Pic River and Bamoos Lake and noise mitigation. Gen confirmed that certain additional mitigations, including alternative backup alarms will be considered for operations.

I would like to spend a moment to discuss the differences between the project -- the differences between what the project will include specifically with the number of trucks per day. I think we caused more confusion than clarity on that element versus how it was modelled.

The project proposes 10 concentrate trucks moving from site to the rail loadout facility in a given day. The EIS also included the possibility of up to 30 trucks of a vanadium magnetite concentrate should the future of this concentrate become financially viable for a total of 40 trucks for the project.

The modelling used to predict the potential effects of the trucks specific

to the noise and air quality were conservative and assumed a worst-case scenario.

For the noise assessment the model considered predicted noise levels from the movement of 10 trucks over a one-hour period in the morning and afternoon to the rail loadout facility. The 10 trucks in an hour is modelled to be much higher than what would actually be occurring as the movement of concentrate would be spread out over the daytime operations. And to note, there are no nighttime deliveries or operations at the rail loadout facility proposed. As a result, the project was expected -- the project is expected that the project-related noise effects will be less than what is predicted in the model.

In addition, the noise modelling included impact from rail coupling and not shunting. Shunting is a much more impactful and more -- much louder activity, and the operation does not consider shunting would be a necessary practice.

Follow-up and monitoring programs for air and noise and greenhouse

gases will be included in adaptive management with indicator parameters to alert the changing conditions. They will allow for flexibility to address new circumstances.

I'll now move on to socioeconomic.

As I mentioned at the outset of my comments, the Marathon Mayor Rick Dumas emphasized the importance of the project in securing a sustainable, socioeconomic future for the town of Marathon and the surrounding region. Mayor Dumas also warned of potential negative socioeconomic impacts to the local community if the project does not proceed. He said that without the development of this project small northern Ontario communities will experience population shrinkage.

He went on to say that you don't need to undertake studies to validate this community decline. You only need to look at the real-world examples of communities who lost their primary industry and wealth generators that never rebounded and who are now just a shadow of the communities they were in their former vibrant selves.

GenPGM submits that the socioeconomic benefits and long-term sustainability they will provide to the communities of Marathon and the surrounding areas are critical points for consideration to the panel. To reach this conclusion GenPGM undertook a robust multidisciplinary approach to socioeconomic environment. We specifically focused our analysis on how the project will affect the economy, local infrastructure and services and land and resource uses.

The panel asked Gen and the town of Marathon representatives about economic impacts, monitoring, health infrastructure, accommodation capacity and the impacts of the project on tourism and recreation and the archeological assessments. Gen's experts and the town of Marathon have provided the panel -- the panel's questions provided with details on each of these subjects.

With respect to the economic and overall impacts of the project on socioeconomics, we discussed the vast majority of the feedback that we've received has been

supportive of the project and its benefits to the area. Mr. Bohlken stated that the project will create jobs during construction and operation phases as well as spinoff employments from spending by the project workers.

Specifically, the project labour workforce will be employed an average of 430 to 500 people on average, peaking at about a thousand for construction and over 400 for operations. The majority of the project's operational employees are anticipated to come from the RSA. The project spending will both directly and indirectly have positive economic impacts on Marathon and the surrounding area. Further, the project will result in millions of dollars of government tax revenue and resource royalties.

I'll now speak about the infrastructure and services as was led by Ms. Janes who answered questions about the ability of the infrastructure and services in the RSA to accommodate the project. Infrastructure and services will be supplemented by services provided by Gen at the project site, including

security, first aid, training programs and the provision of an employee assistance program.

With regards to accommodations, which is an area under strain in Marathon and the surrounding regions, Ms. Janes provided additional details about the plan for housing of the project workers. We explained that GenPGM will provide facilities for the construction workforce and the operational workforce that will be accommodated from outside the RSA.

Mayor Dumas also explained the town of Marathon's plans to build more housing in the community.

Regarding land use and resource use. Ms. Christine Walsh responded to the panel's questions particularly regarding the project's impact on tourism and Crown land use permit holders.

Ms. Walsh stated that the recreational activities will be restricted in the SSA. For safety and security reasons access would be provided through the mine site, specifically from the guard house located at the end of the access road.

Indigenous users will be guided through the site to one of the existing trails to the north of the SSA.

Furthermore, we do not expect the continued -- that continued access and use of the LSA will be affected by the project. Tourism and recreational pursuits are expected to continue at or near the current levels elsewhere in the area.

Project activities, locations and timing will continue to be communicated to the affected land users throughout the life of the project.

With regards to archeology. GenPGM's archeological expert Mr. Varley explained how the archeological assessments followed and will continue to follow the Ontario standards. Mr. Mayo (ph) from the Ontario Ministry of Heritage, Sport, Tourism, Culture and Industries confirmed that under the EA process Gen has carried out the appropriate investigations to identify cultural heritage resources and the potential impacts on them.

We accept the Ministry's

recommendation that the stage 1 and 2 archeological assessments be shared with the Indigenous communities. Existing documents have been shared with BN, and GenPGM is prepared to share with other interested communities.

Indigenous communities will be involved -- will be invited to participate in the plan stage 2 archeological assessment, and GenPGM is planning to share the stage 2 assessments when complete.

Now, on to human health. The project is not expected to have any significant adverse effects on human health. The EIS fully considered the project's potential effects on the aspects, including air quality, water quality, country foods. After mitigation all project-related changes are predicted to be less than the benchmarks that protect human health. GenPGM will monitor in consultation with Indigenous communities all these pathways to verify the assessment's conclusions.

I will now speak about Dr. Newbery from CRINO who suggested a process or

an agreement to be developed to communicate and track the benefits to the town of Marathon arising from the project.

Mayor Dumas from the town of Marathon indicated that he was supportive of this initiative. GenPGM will continue to work with the Mayor and the town of Marathon and other stakeholders to better understand what benefits are important to the community. We will continue to work to ensure that Marathon community benefits from the project. To be clear the potential benefits to Marathon community in no way diminish the benefits of the other Indigenous communities in particular BN. So, in concept we're supportive of this initiative as well.

I'll now respond further to Dr. Newbery's comments regarding a separate environmental monitoring body.

For clarity, the town of Marathon and other participants are included in Gen's regional environment committee, and it was established early in 2021. This committee will be active through all phases of the mine life. Gen believes that the project

is subject to robust environment monitoring regime, including participation by the federal and provincial regulators, Biigtigong Nishnaabeg in particular, the other Indigenous communities and the regional environmental communities -- committees. As a result, we believe that the current environmental monitoring plans are sufficient to ensure environmental protection and transparent communication.

In reference to mercury monitoring, I would like to thank BN for raising the important topic. With respect to BN's request for monitoring for mercury and methylmercury, our prediction is that there will not be elevated levels of mercury or methylmercury in the receiving environment as a result of the project.

However, GenPGM respects and acknowledges BN's request for a sound and comprehensive monitoring program for mercury and methylmercury. Discussions regarding the proposed program are ongoing, but there are general agreement with scope, timing and duration of the program.

Regarding navigable waterways as Ms. Bice from Transport Canada presented. On the potential application to the project. Ms. Bice also spoke about Transport Canada's ongoing engagement with GenPGM and the long review of the project.

Mr. Fraser confirmed that GenPGM's dialogue with Transport Canada is ongoing to incorporate input from communities. Their use of waterways within the vicinity of the SSA is ongoing with respect to potential and future use that will determine approval needs, if any. GenPGM will also continue its dialogue with Transport Canada to incorporate input from local communities about future use of the waterways near the SSA.

In respect to BN and the human health risk assessment, I'll now speak about Ms. Zanini's questions on behalf of BN about the collection of traditional information, ecological knowledge and country foods monitoring.

GenPGM confirmed that the human health receptors in the HHRA included locations -- included location considered

representative of BN's members harvesting in these areas. The assessment also included receptors within the BN community as illustrated in figure 1B in response IR 6-3 reference 950.

GenPGM responded with information about the collection of traditional knowledge and information from BN and other Indigenous communities. At community information sessions that were held within BN, GenPGM received input from community members on ecological, social, economic and cultural values to help determine the valued ecosystem components or VECs. Both VECs and traditional knowledge were used to inform the human health risk assessment.

Finally, GenPGM stated that the country food programs, which was initiated in 2021 to gather country foods sells and dietary information in the community, this information will be used to assess results with respect to human health.

In reference to crystalline silica, exceedance in the crystalline silica criterion are experienced in a small area

around the fence line. In the assessment of crystalline silica we discussed the short-term air quality criterion is conservative because it's based on the effects of long-term exposure. GenPGM has committed to monitoring this silica as part of the baseline air quality monitoring program.

Regarding benzene and benzo(a)pyrene, GenPGM responded to the panel's questions about these substances. We also assessed them under the HHRA and specific sessions in the EIS. We also stated that exposure to benzene and benzo(a)pyrene in indoor air is dominated by in-house sources such as cooking, smoking and household products. Since indoor levels generated from typical household sources are higher than outdoor level, indoor air concentrations are not meaningfully impacted by the outdoor air concentrations generated by the project.

We did assess outdoor exposure of benzene and benzo(a)pyrene, including the incremental lifetime cancer risk that is assumed over an 80-year lifetime. This is a conservative assumption as the mine only

lasts for 12.7 years. Any possible higher hours of outdoor exposure can be offset by the conservatism of assuming a lifetime exposure in the HHRA.

In regards to Health Canada's recommendations for further qualitative assessment on the effects of diesel exhaust for the project, GenPGM submits that a qualitative risk assessment approach was followed by looking at the constituents of diesel in our assessment to appropriately assess the risk to human health from this non-threshold constituent.

Regarding monitoring of air emissions, Gen committed to monitoring and to compare to the criteria of NO2, PM2.5 and PM10. Gen will develop a follow-up program and appropriate action levels in consultation with the agencies and Indigenous communities.

In conclusion, the mitigation and management measures, the project is not predicted to result in any significant adverse environmental effects on the human environment. The project is predicted to create significant employment, investment and

tax revenues for the local community.

I hope that the project plays a part in securing the future of the socioeconomic and the vibrancy of the Marathon region.

Thank you to the panel and all participants for the presentations during the human environment sessions. Thank you very much, folks.

PANEL CHAIR: Thank you very much. Appreciate you doing that this morning.

We will then move into our next topic area, and Generation PGM you're up again to begin our presentations on accidents, malfunctions, effects of the environment on the project and mine closure plan. Thank you.

MR. BARRETTO: Thank you, Madam Chair. Jeremy Barretto for the record. If I could just request that Generation's presentation, which is CIAR 1171, be pulled up, and after I confirm it's the correct presentation, I'll turn it back to Mr. Anwyll to continue.

PANEL CHAIR: Thank you very much.

MR. BARRETTO: Thank you. Perfect. This is our presentation, so Mr. Anwyll will start, and then we have a couple of our other experts that will continue from him. Thank you.

PANEL CHAIR: Thank you.

MR. ANWYLL: Thank you everyone. I'll continue.

Next slide, please.

Again, I think we addressed this, accidents and malfunctions, the effect on the environment, on the project, climate change and decommissioning and closure.

Next slide, please. Next slide.

So again, we have the GenPGM witnesses which will help inform some of the presentations and questions that come up and the technical leads in the area. New on the scene would be Craig Hall, Sean Capstick and Sheila Daniel. Craig's from KP, largely doing the water balance, mine rock stockpile and the PSMF design. Mr. Capstick who we saw yesterday or two days ago, excuse me, is the climate lead, and Sheila Daniel is from Wood is

leading the closure planning.

I won't go over the regular slides. If you can move to slide 10. There we go. And there we go. I'll hand over to our first presents, Mr. Craig Hall (sic).

PRESENTATION BY BRIAN FRASER:

MR. FRASER: Good morning, panel members. It's Brian Fraser for the record. I'll be providing the accidents and malfunctions slide today. Mr. Hall will be available subsequently to help out with some of the questions that will be specific to the mine rock storage area and PSMF design.

Next slide, please.

So this slide highlights GenPGM's commitment to safety and safety culture at GenPGM. GenPGM is striving through leadership -- leadership through performance standards and personal accountability.

GenPGM is promoting a culture of health and safety accountability through proactive education, instruction, information and supervision. GenPGM will develop and implement an effective health and safety management system with the objective of

eliminating hazards and exposures. This will be accomplished by identifying and managing potential hazards and conditions, establishing work practices and procedures to reduce risk, investigating serious accidents and near miss incidents and taking proactive action as is needed.

The intent is to comply with any and all *Occupational Health and Safety Act* provisions to protect workers. And despite intrinsic risk in the work that we do, achieving zero accidents in the workplace can be realized by fulfilling this safety culture.

Next slide. Thank you.

Within that context of health and safety, now we'll review the accidents and malfunctions assessment. Just to provide some context from the EIS guidelines, the EIS guidelines did require, and consistent with those guidelines, an evaluation of potential environmental effects that may result from an accident and malfunction scenarios that would be associated with the project has been completed.

For context, an accident or a

malfunction scenario is an event that occurs out of normal operations. So by that very nature they're unlikely to occur. And when we consider accidents and malfunctions, those go beyond -- the scenarios or the evaluation of those scenarios, goes beyond, you know, what we would typically do in terms of sensitivity with normal effects assessments. These are truly events that occur out of normal practice. So I will just read the text at the bottom of the slides to provide context to what these accidents and malfunctions scenarios refer to.

So despite rigorous planning and the implementation of best practices and preventative measures, the potential exists for accidents and malfunctions to occur during any project phase. If such unplanned events or conditions occur adverse environmental effects could result if not addressed or responded to in an appropriate manner.

Next slide, please.

So just to review the scope of the assessment, we considered accident-malfunction scenarios that had a

potential to adversely affect the environment, again, understanding that such scenarios could occur during any project phase.

The method by which these scenarios were identified was largely based on discussions with the project team and based on professional experience, experience with other projects. Those initial discussions occurred with the Stillwater Canada team back -- as the original EIS was developed, and then subsequently this information was reviewed and updated as appropriate with the GenPGM team.

For the accident-malfunction scenarios identified, the assessment of those considered the nature, mechanism and magnitude of the potential events, so essentially the -- what and how. Its probability from a perspective of the -- from a perspective of the likelihood of those events to occur, they were categorized as being high likelihood so likely to occur, medium likelihood which might occur, low likelihood which is unlikely but the probability cannot be entirely dismissed, and remote events, which we characterize as very unlikely to happen but worthy of

consideration nonetheless.

We then characterized the consequences of these events from an environmental perspective. We consider mitigations that are principally related to design, management, policies, practices, safeguards, capabilities of resources in the area and equipment that are available to safely respond to these scenarios.

And finally, we consider contingency and emergency response procedures as these will form sort of the backbone of response to such events.

Next slide, please.

So this slide highlights the scenarios that were assessed in the accidents and malfunctions assessment. So 20 scenarios in all. So just reading from the slide. Fuel is released during transport to the site. Fuel is released from on-site storage facilities. Fuel is released during on-site dispensing. Propane handling incidents, concentrate hauling incidents, concentrate loadout incidents, chemical incidents during transport to the site, chemical incident with

mine-related -- or within mine-related facilities, rather, controlled release of water to the environment from the PSMF, controlled release of water to the environment from the MRSA, PSMF or reclaim water pipeline failure, water treatment plan incident, unanticipated seepage from the PSMF, unanticipated drainage quality issues from the MRSA, project-related fires, pit slope failure, MRSA slope failure, PSMF slope failure, an explosive accident and premature closure of the mine.

And for reference these are described in CIAR 727, section 6.3 which updates the original EIS submission which is CR 224, also section 6.3.

Next slide, please.

For reference we've looked at or categorized here the probability of each of the scenarios that I've just highlighted.

Three scenarios have been considered high or to have a high likelihood. These are highlighted below, but we have a concentrate handling accident within a building, chemical release within a building

and small project-related fires as likely incidents to happen over the project phases. We've identified two medium likelihood scenarios, both related to fuel releases. Most of the scenarios that we've characterized would be considered to be low probability events. So these events are -- they have been deemed that are likely -- are unlikely to occur, but their occurrence cannot be reasonably disregarded.

And then there's two remote scenarios that have been identified, both related to the PSMF; one in terms of a PSMF slope failure, the other with a controlled release of water from the PSMF.

Next slide, please.

So important within the consideration of accidents and malfunctions are design and considerations to mitigate risk. Now, these design and mitigations for the accident scenarios are provided in table 6.3-2. That's CIAR reference 727 in the EIS addendum volume 2, section 6.3, PDF pages 20 through 26.

So from -- so highlighting

some of the key design and direct mitigations measures that would be common across the scenarios would be application of appropriate design standards and criteria, adherence to industry standards, regulations, guidelines and best practices. Preparation, implementation of operation, maintenance and surveillance manuals. Preparation implementation of the emergency preparedness and response plan, and regular personnel task training and hazard assessments.

Highlighting this last bullet. Staff training, personnel training is a key aspect to being prepared for potential accident-malfunction scenarios, but more so ensuring that we're reducing or mitigating the risk of such scenarios.

Next slide, please.

So just to highlight some of the key conclusions from the assessment. The majority of the scenarios that were identified were considered to have low or remote probability of occurring.

Those that are not or those that are expected to have a higher probability

typically would be expected to have lower environmental consequence. The remote scenarios would have high consequence, but when we consider that the overall risk associated with a scenario is both the function of probability and consequence, we're able to conclude from the assessment that there's low overall risk to the environment based on the analysis as a result of potential project-related accident and malfunction scenarios that would potentially occur over the life of the mine.

Next slide, please.

So not that I suggest that we read through all of these, but these are the tables that I referenced from section 6.3 of the CIAR reference 727, which is the updated EIS addendum.

And perhaps we'll just flip through these next few slides. Great. Thank you. Much appreciated.

So moving on to next portion of the presentation this morning, also as part of the assessment we look at the effects of the environment on the project. Specifically

we're looking at large scale or potentially large scale effects such as fire, seismicity, precipitation and what effects they might have on the project from an environmental point of view. So, you know, typically in the EIS we're looking at the effects of the project the environment. Here we're considering the effects of the environment on the project.

Next slide, please.

So this analysis was completed and is shown in CIAR reference 727 which is the EIS addendum volume 2, specifically section 6.4 starting on page or PDF page 27.

So in the effects of the environment on the project analysis we looked at forest fires, seismic activity, extreme weather events and climate change.

Mr. Capstick will address climate change specifically in the next few slides, but we'll quickly go through forest fires, seismic activity and extreme weather events.

With regards to forest fires. They have the potential to cause damage to

property and infrastructure associated with the project, and those would interrupt operations and potentially cause other or be the initiating event for other events. When we consider fire history in the area, you know, as I think we've discussed through the terrestrial sessions, the boreal forest is a -- common fires or is subject to fires, and that's sort of the nature and disturbance and renewal in the boreal forest.

There have been large scale fires in the region in the past, none specifically associated with the project site. Nevertheless, a major fire could cause damage, property damage, interrupt operations at the mine.

With respect to mitigations, clearing of the project site will ask -- will reduce risk of fire spread and damage. By clearing the project site itself, it becomes a fire break, and that would limit the extent and spread of fire if it was -- if it came through the area.

Response to forest fires would be coordinated through the emergency

preparedness and response plan with local resources. The site is not remote. It is close to the highway, and the provincial forest fire management system is well developed. And as I said coordination of such activities would occur through the emergency preparedness and response plan.

In terms of seismic activity. The area that the project is situated in is an area of low seismic activity. Nevertheless, site infrastructure would be designed in accordance with appropriate factors of safety to account for seismicity in the area.

With regards to extreme weather events here, and specifically we're looking at precipitation and wind. Both are considered through design aspects. So we've identified and understand that there's the potential for future with increased frequency and magnitude of precipitation events.

So site infrastructure has been designed with the capacity to reduce potential effects of these extreme events. For example, the catch basins designed to the one in 100-year event, PSMF -- and Mr. Hall can

speak better to this -- but not only designed to safety factors associated with events but also in flood or inflow design events and ensuring that the PSMF has ample storage capacity to deal with large scale events.

We've already considered wind and design, so there is the potential for high velocity winds to damage buildings or infrastructure.

Specifically with design aspects of the PSMF, the PSMF has been designed to contain wave run up associated with wind from the one in 1,000 year wind event. Also I'll highlight that there would be redundancy into power supply infrastructure as part of design, and that will ensure that the site does not lose power, and there would be a domino effect of loss of control of systems.

As I said, Mr. Capstick is now going to discuss climate change specifically, so I think we can move to the next slide. And I'll introduce Mr. Capstick.

PRESENTATION BY SEAN CAPSTICK:

MR. CAPSTICK: Thank you, Brian. Sean Capstick for the record, Chair

Sikora, panel members.

Today I would like to talk about the impacts of emissions and greenhouse gases not specifically from the project.

As we discussed on Monday, this will have little input into the global radiative forcing. But rather what I would like to talk about is how these projected changes in climate can affect the project, and how Generation PGM has incorporated these changes into the EIS and as part of the adaptive management plan that would be part of the operations and designs.

So I would like to review the approach that GenPGM has developed and then spend some time talking about how this fits into the emerging best practices for incorporating climate change for the mining sector.

So if I can go to the next slide.

First, let me start with the approach. So as Mr. Fraser has talked about, you know, climate change was incorporated as part of the project, and it was looked at how

climate change may change over the life of the project, how these changes may impact the mine operations and designs. And the focus of these impacts primarily was on the water management infrastructure, its ability to manage increased runoff, so these changes to the projected precipitation patterns. So those projections were developed. They looked at changes in what's referred to as return periods or extreme events, and the these are typically referred to as, you know, an intensity, duration or frequency; the amount of rain or precipitation that you would expect in a given time period, you know, measured in millimetres and then, you know, how often that is going to be returned.

So, you know, often referred to as a one in a 100-year event.

So it looked at how that change in precipitation incorporated in that. And the significance was based on the inputs from the various technical disciplines that have presented to the panel or will be presenting today. So they looked at those changes and then included them in their

significance assessments.

But most importantly, you know, the assessments from the EIS document and using the impact assessment as a planning process, it will be used in a final design of these water management structures.

So, you know, how is a change in climate likely to implement -- affect the project, can it be accommodated in the design and then the design will follow to do that.

So that's where the environmental monitoring plans that have been discussed in this part of the panel come into play. So there are monitoring plans for water quality, water quantity, geochemical stability; all issues that climate change could impact. And then the adaptive management plan for the project outlined in section 7 of the (indiscernible) EIS document. That will be the way that these are monitored, changes will be monitored over time, and then the project can adapt to these changes during the operations and closure phase.

So let me now go move on to this in terms of best practices for the sector

and how this is part of the impact assessment process.

So if I can go to the next slide, please.

So the mining association of Canada that develops the -- towards sustainable mining program, it was challenged by its community of interest panel to say you've got a lot of processes that talk about how mines can be managed, but climate change, how the effect of a changing climate affect those projects has not been developed over an overall process.

The mining association said, yes, we agree with that, and Golder and the Mining Association of Canada was successful in developing the funding applications from Natural Resources Canada to develop these guidelines.

As part of this development we consulted with many regulators, including the Impact Assessment Agency, you know, and other provincial regulators, to look at how this can be incorporated as part of regulations. We looked at best practices in

the sector not just in Canada but globally, and the outcome from that, I've got a brief summary for this, it looks at a staged approach throughout the mining lifecycle indicating that that is going to be refined as more information is available for the project and as design progresses.

So the MAC guidance is not exclusively mentioned in the EIS document. You know, the process started before the MAC document. We started the MAC document process in about 2018, 2019. It came out in -- last year, but it is consistent with the approach which is understandable because we built the MAC process based on the practices that were occurring in the mining sector and as part of impact assessments. What I can say now is the -- so let me describe the approach a little bit more detail.

So it's a risk assessment, so that's looking at where projected climate can change the water management structures, the adaption pathways which corresponds to this approach of incorporating climate change in design and then implementing adaptive pathways

which is monitoring and surveillance that Mr. Fraser talked about, and then this adaptive management program that's included in the EIS.

So let me conclude just by saying that, you know, the project life is considered in the near term with regard to climate change. The biggest effects are going to be at the end of the mine operations and into closure, and there is a detailed closure planning process that we'll hear about in a moment where climate change will also be incorporated as part of that closure and the approvals around that closure process.

So in summary, the project has considered the impacts of changing climate, has a plan to consider to refine these considerations as part of the detailed designing stage, will monitor the operations and how climate is affecting the operations through the monitoring program and the adaptive management plan. And this process will be repeated as part of the closure planning and approval.

So I'll turn -- that ends my presentation. I'll turn it over now. Thank

you.

PRESENTATION BY SHEILA DANIEL:

MS. DANIEL: Good morning. Sheila Daniel with Wood for the record.

Could we please go to the next slide.

And I will be speaking on the decommissioning and closure slides. There's a few of them which will end out the presentation for today.

Next slide, please.

The decommission and closure is documented in CIAR 727. So what is decommission and closure. It's the activity designed to reclaim the land within the project footprint to prevent a future use by resident biota as well as traditional and other (indiscernible) activities.

(Reporter clarification)

MS. DANIEL: It's Sheila Daniel for the record. So I will speak to the last part of the presentation regarding decommissioning and closure.

So decommissioning and closure are the activities related to

reclaiming the land for the project footprint to permit the future use of biota and for travel and other land use activities. There's two main types that are at times related to the decommission and closure. There is the first part which is called active closure, approximately five years, Phase IIIA which is decommissioning and closure. It's the period after operations when the most intensive decommissioning activities occur. It includes removal of the site infrastructure as well as regrading and stabilization of the site. It includes placement of the type 2 material or permanent storage, as well as reclamation of the PSMF, the MRSA and the process plant area as well as other site locations.

It will be followed by a post-closure phase called Phase IIIB of 40 years. It follows a substantial active decommissioning activities and will include such items as pit filling until there is a stabilization of the water levels in the pit. It also includes passive regeneration following reclamation and site restoration. Most importantly, for many people it includes

the follow-up and monitoring programs to confirm that the active closure has been -- the results are as expected.

We can go to the next slide, please.

So as is typical there is a conceptual closure plan presented in the original EIS as well as subsequent documentation with the source files noted at the bottom of the slide.

So the conceptual closure plan was provided to enable to find -- provide enough information to be able to accurately assess the potential effects from the decommissioning, closure and abandonment of the mine and related infrastructure.

There was ongoing refinement of the conceptual closure plan and reclamation plan as the project design developed from the original EIS as documented in the three (indiscernible) documents: Conceptual closure plan, supporting information document 18, the updated reclamation plan in additional IR-12, and the updated conceptual closure plan provided most recent in the EIS addendum.

Next slide, please.

So closure and decommissioning will occur on the portions of the site once they reach their maximum extent during operations. That's called progressive reclamation or rehabilitation and is standard in the industry and highly supported by the provincial ministry of Ontario. So progressive reclamation will occur at those site locations once they reach the maximum extent as reasonable as well as for construction-related impacts long before the site closes.

Proactive restoration or progressive reclamation will be completed at the MRSA when the exposed slopes and benches meet their final extent. Other progressive reclamation activities will continue to be explored during detailed design but are expected to include along the toe of the PSMF after development of the ultimate footprint, access corridors and the aggregate pit when no longer in use. The progressive reclamation helps to restore the site during operations, but also provides information for the final decommissioning and closure of the site.

Essentially, it's a test case.

Following decommission and closure of the mine various activities will continue to monitor progress of the site restoration and stabilization as mentioned in the introduction.

The site plan that will result from implementation of the conceptual closure plan is shown on the next slide.

Could we move to the next slide, please.

This figure was provided in CIAR 727 as figure 1.5-3 and shows the -- basically the conceptual closure plan for the reclaimed site.

Go to the next slide, please.

So the conceptual closure plan as mentioned earlier is to inform the effects assessment. However, closure planning does not stop with that aspect. In fact, Ontario has a very robust system.

A regulatory closure plan is required to comply with the requirements of the Ontario *Mining Act*, Reg 240, as well the Provincial Mine Rehabilitation Code. It has

specific requirements required by the provincial ministry which we they will not accept unless it is actually included. The topics include letter of transmittal, certifications of the actual closure plan, including by the company as well as related experts or qualified persons, project information, a summary of the current or the baseline in this case project site conditions, planned progressive rehabilitation, as well as the measures to be taken on closeout, or if the project has to go into a period of temporary suspension or state of inactivity during operations. It includes an environmental monitoring plan which considers physical as well as biological stability in its description of expected site conditions. And to be honest of great importance to the taxpayers of Ontario, determination of the financial costs for closure as well as financial assurance measures.

A key requirement Ontario of the regulatory closure plan is a detailed estimation of the final closure cost as well as the provincial provision of financial

assurance to complete the rehabilitation in advance of the disturbance. So before a shovel hits the ground, money has to be put up front by the mining company to close out whatever the disturbance is required or proposed.

And go to next slide, please.

The objectives the of the regulatory closure plan which is part of the permitting and approvals process for the mine after the EA is signed off is to prevent, reduce or mitigate the adverse environmental effects associated with the construction and operation of the mine during the closure and post-closure phases.

Another objective is to provide for rehabilitation of the affected landscapes to a stable and safe condition and return the affected ecosystems to a self-sustaining and functioning state.

The final objective is to reduce the need for long-term monitoring and maintenance of the site as practical.

So the overall intent of the regulatory closure plan is to achieve project restoration to a functioning ecosystem, to

optimize the potential for its use by traditional land users and to provide other benefits and opportunities for the surrounding communities as practical.

Next slide, please.

As indicated earlier, the rehabilitation and closure of mine and mine sites is regulated by the Ontario *Mining Act* as well as associated Regulation 240. There are specific and detailed requirements with respect to both required closure activities as well as the documentation and regulatory closure plan.

The regulatory closure plan and financial assurance for all stated activities is required to be filed with the Ministry of Northern Development, Mines, Natural Resources and Forestry and has to meet all the mining requirements prior to the start of physical construction.

Consultation and engagement is an important part of the pre-submission process, and the results of consultation-related activities must be approved by the Ministry before a regulatory

closure plan will be reviewed by the Ministry and only then it can be filed if it meets requirements. So there is a staged process to get the closure plan approved in Ontario (skipped audio).

As a result, Generation PGM is currently preparing a draft regulatory closure plan with the format and then content required by the Code in order to support this process. It will be consulted on and refined separate from the federal EA process as is the standard in Ontario.

Generation PGM is committed to ongoing consultation with agencies and Indigenous communities to refine the mine closure concept for implementation. And this is one of the reasons they've reached out early to try and work on the actual regulatory closure plan. Although it's a long way from submission.

Next slide, please.

And pass it back to Drew, please. Or Brian, actually. I think Brian you were going to take this on -- my apologies -- the conclusion.

MR. FRASER: Thank you, Sheila, and thank you, Madam Chair. Brian Fraser, again, for the record. So just to finish off today's presentation with a concluding slide.

So we've talked about potential accident and malfunction scenarios and the effects of the environment on the project, and those have informed GenPGM's design and management plans to reduce likelihood of occurrence and potential adverse effects on the environment.

As Sheila just described Ontario has a robust regulatory process for ensuring that the successful closure, planning and implementation of monitoring of progressive and final rehabilitation measures on mines and that requires engagement with local Indigenous communities and agencies throughout the development of the closure plan, submission of a closure plan to the Ministry prior to construction, certification of the regulatory closure plan along with the required financial assurance for the cost of the rehabilitation and monitoring, again,

prior to construction.

And just to highlight, as Sheila did, that the regulatory closure plan is considered a living document which will be updated periodically over the life of the mine.

And thank you, Madam Chair, that ends our presentation for this morning.

PANEL CHAIR: Thank you very much. Appreciate the presentation. I think we will -- our next presenter is Biigtigong Nishnaabeg First Nation. I wonder if Biigtigong is -- good morning, Ms. Zanini.

MS. ZANINI: Good morning, Chair.

PANEL CHAIR: I'll hand it over to you.

PRESENTATION BY TRACY ZANINI:

MS. ZANINI: Excellent. Thank you, Madam Chair, thank you, panel members. Good morning everyone. For the record my name is Tracy Zanini on behalf of Biigtigong Nishnaabeg.

By way of introduction to Biigtigong, Biigtigong is a progressive and

prosperous nation. Our people have lived, worked and existed on the lands and the shores of Lake Superior and the inlands of the northern Superior region since time and memorial. As we've stated, the proposed mine is located entirely within the unceded, unsurrendered and exclusive Aboriginal title territory of Biigtigong and is nine kilometres away from the community. The project is located adjacent to the Biigtig Zibi or Pic River which is regarded as a sacred river.

Biigtigong are rights holders in this process and stewards of our title area, the lands and resources within it. The proximity of the project to Biigtigong means the project will adversely impact the continued exercise of rights, and we expect there to be a very high impact on rights over the long term.

Yesterday we presented on concerns for the human environment, particularly related to human health and the issue of mercury and methylmercury.

Today we'll present on further issues, concerns and recommended

mitigations concerning accidents and malfunctions, specifically dam breaches and the need for an independent tailings review board. Biigtigong feels these issues must be addressed by the proponent as the actor responsible for the development and the Crown as the actor of authorizing or permitting the project to proceed to ensure that impacts are lessened so that Biigtigong can continue to exercise rights over the long term.

This information has been provided in Biigtigong's written submission to the panel which for the record is registry Document 1093. And now I would like to pass it over to my colleague Jody Duncan to provide details today. Thank you.

PRESENTATION BY JODY DUNCAN:

MR. DUNCAN: Thank you, Tracy, and good morning, Madam Chair and panel members. Jody Duncan on behalf of Biigtigong Nishnaabeg for the record.

And I would like to thank you for this opportunity to present to you our concerns as they relate to accidents and malfunctions.

As my colleague Tracy mentioned, our presentation for today will focus on why we believe there is a need for independent oversight of the design, construction and closure of the process solids management facility, as well as the need for transparent and open communications related to assessments completed on the PSMF.

Throughout this process Biigtigong has provided substantial information to both the proponent and the Crown regarding the exercise of Aboriginal title rights and interests throughout the exclusive Aboriginal title area, including the community's history of trapping and harvesting within the proposed project area.

Members of the Biigtigong have exercised and continue to exercise the community's Aboriginal title rights near the project area through trapping, harvesting, gathering, fishing and ceremony, and to do so they often use historic and family-based travel and access routes as well as family-based hunt camps.

Harvesting that occurs in

this area holds significant value both from a commercial fur-bearer perspective and even more so as it relates to cultural connection, ceremony and social customs. There have been several dozen community harvesters who have documented more than a thousand land use and occupancy features within 5 kilometres of the project site, and within a 10 kilometre radius of the project footprint there are five trap lines that are registered with Biigtigong.

As we have also previously stressed through past presentations, the project is immediately adjacent to the Biigtig Zibi or Pic River, which is a key natural resource for Biigtigong. They rely on this resource for cultural and spiritual connectivity, for the harvesting of fish and as habitat for lake sturgeon, muskie, northern pike and walleye, just to name a few of the culturally significant fish species that inhabit the Biigtig.

And I'll note here that this is by no means an extensive description of Biigtigong's documented and undocumented traditional land use and knowledge in the

areas around the project. We have just provided this to give a -- to assert that it is heavily used area for the exercise of Aboriginal rights and interests, and we must also consider that traditional knowledge and land use is a living body of knowledge that grows and changes over time and that Biigtigong's use of the areas around the project will also grow and change over time. So GenPGM will be constructing the process solids management facility within approximately 5 kilometres of Lake Superior.

With regard to accidents and malfunction were any sort of catastrophic dam failure to occur on the western and the southern sides of the PSMF, this could result in a process solids release into Angler Creek and potentially Lake Superior. This could devastate salmonic populations in Angler Creek which are historically and contemporarily harvested by Biigtigong, in addition to having significant impacts on Sturdy Cove which is also used extensively by Biigtigong for a variety of purposes.

If a dam breach were to occur

on the southeast side of the process solids management facility, the resulting release of process solids could overwhelm the water management and storm water management ponds resulting in a release of process solids into the Biigtig Zibi.

Any sort of dam failure during construction, operations, closure or post-closure resulting in process solids released to the environment, including can go Lake Superior and the Biigtig, would be a severe and profound tragedy that Biigtigong insists GenPGM make all efforts possible to prevent.

We cannot stress enough the immense impacts that a catastrophic failure of the PSMF dams would have on the health and well being of Biigtigong, and while we do understand it can be difficult to contemplate what these impacts may look like given these scenarios are rather hypothetical, we do, however, and rather unfortunately, have a similar event that occurred in Canada that we can look to in order to help us understand what these impacts may be.

In 2016 the First Nations health authority published a report that examined the health impacts on Indigenous communities resulting from the Mount Polley mine tailings breach in British Columbia.

And for those unfamiliar with the Mount Polley event, in August 2014 the Mount Polley copper and gold mine tailings dam breached, and over a period of three days the 4-square kilometre pond drained releasing approximately 17 million cubic metres of tailings water and 8 million cubic metres of tailings into Polley Lake, Quesnel Lake and Hazeltine Creek.

In this particular case it was determined that the main cause of the breach was a design oversight wherein the complexities of the geological environment made the dam susceptible to foundation failure, and these were not adequately addressed in the design of the tailings dams.

The First Nations health authority report found that the majority of impacted Indigenous communities reported impacts to their personal fishing practices,

increases in emotional stress and inter-community tension. Traditional fishing areas were avoided by some communities due to their connection to the impacted river system, which in this case was the Fraser River system, and as a result members of these communities reportedly travelled further distances to catch fish through the season.

Results of the study also highlighted the extent of the post-breach emotional stress at the community level. For instance, some communities described an intense emotional response associated to the tailings dam failure and health services -- health service providers noticed increases in anger, sadness, fear and confusion among community members.

The uncertainty surrounding the event and the potential irreversible impacts to the environment were described as deeply concerning by many of the impacted communities.

So we can see that this event had very deep and profound impacts on the affected Indigenous communities and no doubt

were a similar event to occur with the process solids management facility, the impacts to Biigtigong would be just as severe if not more so. And while we do recognize that the dam breach scenarios that we described earlier are, first, hypothetical, and second, likely to be considered low probability, the impacts of such an event would be extremely severe and long lasting. In consideration of the severity and duration of this impact. We must seriously consider how a dam failure can be prevented.

Biigtigong maintains that the design, construction and closure of the PSMF must be done with oversight from an observational body consisting of independent, third party experts with knowledge of the challenges and risk faced by the Marathon Palladium Project.

In other words, we believe the PSMF design construction and closure should be overseen by what are typically called an independent tailings review board, which I'll refer to as an ITRB hereafter. We believe the ITRB should consist of individuals that are recognized senior experts in the

areas of geotechnical engineering, hydrogeology and geochemistry, and that the ITRB should be responsible for reviewing the dam construction, reviewing site investigations, design, maintenance, water management and long-term closure planning.

As well, we believe the ITRB should be responsible for making recommendations to GenPGM on areas that it feels warrant further investigation or attention as it relates to the construction, design and closure of the PSMF.

The ITRB must also be equipped with the mechanisms to ensure proper implementation and follow-up is completed on the recommendations they provide to GenPGM. This may be done through the use of an action log maintained by GenPGM that ensures responsibility is assigned and that demonstrates proper implementation and follow-up on recommendations made by the ITRB.

Having an ITRB oversee the design, construction and closure of the PSMF would provide Biigtigong with substantial reassurance that a catastrophic failure of the

PSMF dams will not occur.

In summary of this particular issue, Biigtigong requires that an independent tailings review board be established to oversee the design, construction and closure of the process solids management facility and that Biigtigong be engaged in this process either through existing mechanisms such as environmental monitoring committees or through other mechanisms that we're open to discussing with GenPGM.

So related to this, we also wanted to discuss the need for open and transparent communications related to any assessments completed on the PSMF.

So the *Lakes and Rivers Improvement Act* governs the design construction, operation, maintenance and safety of dams in Ontario. In order to construct the PSMF GenPGM will be required to obtain permits under the *Lakes and Rivers Improvement Act* or LRIA. As part of this permitting progress GenPGM may be required to complete a dam safety review, which is a series of inspections, detailed background

reviews and technical assessments completed at a regular frequency by a third party engineering firm to determine the status of the containment structures, including their present performance, their past and current conditions, their use, stability, maintenance and other -- any other safety implications.

An essential part of the dam safety review is the dam breach assessment, which has the purpose of determining and evaluating a hypothetical dam breach or process solids release under a series of particular scenarios and site conditions. And the purpose of this dam breach assessment is to present the physical, environmental and socio-cultural heritage impacts of a hypothetical dam breach.

We require that GenPGM commit to conducting and sharing the results of their third party dam breach assessment with Biigtigong.

While we do understand this information can be difficult to digest, we believe it absolutely necessary that it be shared with Biigtigong. This will ensure that

we are fully informed on the potential impacts of the project, even those that may be considered low probability such as a dam breach, and allow us to provide GenPGM with recommendations on how to protect important traditional resources were such an event to ever occur.

And with that, that concludes our presentation for today. I would like to thank you, Madam Chair and panel members, for your time and look forward to our questioning later today. Thank you.

PANEL CHAIR: Thank you very much, Mr. Duncan and Ms. Zanini, for the presentation. Much appreciated.

I think we'll take our morning break. Let's return here at 10:45, slightly longer break this morning. Thank you very much. See you back here at 10:45.

--- Recess taken at 10:25 a.m.

--- Upon resuming at 10:46 a.m.

PANEL CHAIR: Welcome back, everyone. We will now turn to Citizens for Responsible Industry in Northwestern Ontario for your presentation. Do we have CRINO ready

to go?

DR. MORIN: Sorry. Yes, Madam Chair. It's Kevin Morin. I'm ready to present.

PANEL CHAIR: Good morning Mr. Morin. Would you be able to turn your video on, please. Perfect.

PRESENTATION BY KEVIN MORIN:

DR. MORIN: So my presentation today is on behalf of Citizens for Responsible Industry in Northwestern Ontario, CRINO, and Northwatch.

I presented on day 4 of this hearing on issues of -- related to water quality as they pertain to construction phase and operation phase, and I'm back to talk about some additional issues as well as review some of the ones I mentioned as they pertain to the closure.

I explained on day 4 of this hearing that MLARD stands for metal leaching and acid rock drainage. MLARD is a catchall acronym for such issues as water contamination by high leached concentrations of natural elements in NAPH, solid contamination by elevated solid phase concentrations as can be

found in some blowing mine dust and geochemical source terms.

This information is also typically used to predict environmental impacts to the environment, air, aquatic life and terrestrial life.

MLARD information forms a daisy chain where the underestimation of MLARD can lead to serious and risky underestimations of contamination to water, land, soil, terrestrial life and aquatic life. This includes mercury, arsenic, cadmium, lead, uranium and dozens of other elements. MLARD can continue for thousands of years, and as we know at ancient Roman mines they show that it goes on for that long at least. So it's relevant for closure.

As Generation PGM said this morning, the closure phases would consist of two parts. One would be a more active phase for five years, and then a more passive phase of closure for 40 years.

No, that's wrong. Actually closure goes on for millennia, if not millions of years. The mine doesn't go away when it

closes. The closure phase is more than 99 percent of a mine's existence, so it's critical. Mostly we know water contamination can worsen decades after closure. The latest example I've seen of that is on the CBC news website last week about the mine in Yukon called Faro, F-A-R-O, and about 20 years after it closed its water contamination is getting worse.

PANEL CHAIR: Mr. Morin, sorry, did you want us to advance any of your slides?

DR. MORIN: No, Madam Chair, I'm just about to come to that. I was just going over some of the things I wanted to make a point on before I continued on.

PANEL CHAIR: I see, thank you.

DR. MORIN: So, again, please think of closure not as -- in terms on an economic life of a company which might be 40 years after the mine closes. Think of it in terms of millennia or even millions of years. That's the interest that First Nations would have and local communities. Will the dam still

be standing in a thousand years. Or 10,000 years. If nobody is taking care of them, they will eventually fail. That's a hundred percent guarantee. So the tailings would spread out over the environment such as into Hare Lake.

Over on the other side of the mine the waste rock pile will eventually collapse, and it may run down the land scope into the Pic River, so mine waste would end up in the Pic River. That's what can happen over thousands of years. These issues would be of concern to First Nation and local communities.

Next slide, please.

So this presentation is not a standalone document, and I've been reviewing the Marathon Palladium Project for 10 years now, so presentation time is relatively short, and so I can't go into all the details in these documents. Please note there are written documents that talk about these issues I'm about to summarize. And other ones.

Next slide, please.

On day 4 of the hearing I mentioned there were three primary messages that I had time to discuss, and one was

predictions of dissolved water contamination are grossly underestimated during construction, operation and closure.

On the afternoon of day 4 Dr. Nicholson on behalf of Generation PGM took exception to my discussion of contamination and contaminants. He said:

"A second point of clarification is with regard to the measurement of chemical constituents. And these are natural chemical constituents not contaminants."

When natural chemical constituents from mining activity reach high levels that can damage DNA, prevent reproduction orb even acutely kill aquatic and terrestrial life, then I consider them contamination. I will continue to refer to any elevated levels of natural chemical constituents as contaminants, and this includes mercury, arsenic, cadmium, lead and dozens of other elements.

So one of the things I pointed out on day 4 was the company used small 1-kilogram samples inside a laboratory

where the conditions are very quiet and stable. And they put these in these 1-kilogram cells that hold them, and they waited until they slowed down, and they can slow down a factor of 10 or a hundred. Basically they start napping; they don't stop reacting completely, but they slow down.

They then took these napping samples, the rates, and unreliably applied it to a scale 100 billion times larger than what they were testing in order to predict full scale mine waste. And these mine wastes will be outside. They will be under uncontrolled, variable weather and climate conditions, so they don't get the naps. They are going to be more reactive.

However, before this the results of small 1-kilogram tests were reduced about a hundred times further by incorrectly using a few scaling factors.

In my work scaling factors are not the appropriate way of adjusting slow, stable napping rates from quiet, stable laboratory cells up 100 billion times to natural variable conditions. Nevertheless, the

company has chosen to follow this route, so it's important to look a little closer at this.

There are many scaling factors related to each physical, chemical and biological mechanism operating in a mine site. Some are less than one; some are greater than one. All these have to be multiplied together which results in a single cumulative scaling factor.

Published case studies of cumulative scaling factors show that the results from these 1-kilogram cells under stable laboratory conditions should not be divided by anything at all, just left as is. Other ones show that they can be divided by up to 10 to 20 maximum. For the Marathon Palladium Project the 1-kilogram results were divided by 300 times, as we were told by the company on day 4 of this hearing. Is it any surprise that no significant off-site contamination is predicted anywhere, anytime.

There are no published case studies showing the reduction from these 1-kilogram cells is anywhere close to 300, but

only a maximum of 10 to 20 or no reduction at all. This is not speculation or opinion, but fact based on published information from mine sites.

Thus, we know from published information that the MLARD and water contamination at the Marathon Palladium Project has very likely been grossly underestimated. Why would Generation PGM divide their 1-kilogram cells by a total of 300 when such a value has not been documented in published literature? During the day -- in the afternoon of day 4 we were told by the company they used only two scaling factors which happened to be both less than one, particle size and temperature.

For particle size the company explained that only fine particles react and release MLARD. Actually that's wrong. You will see this if you go and look at any boulder and look for cracks, edges and points sticking out showing that these areas of the boulders are in fact reacting.

In any case, the company explained on day 4 that the waste rock at the

Marathon Palladium Project would contain less than 1 percent fine reactive particles. Here's what Dr. Nicholson said on behalf of Generation PGM:

"And we estimate to the best of our knowledge that only 1 percent or less of the material will actually be represented by what is tested in the lab at the very at least."

And:

"But we have very, very little of that fine material that will end up in our pile, and that's the justification for using those to get a reasonable estimate of rates for those systems."

No evidence or published information was provided for this. I've heard such speculation and opinions and "best of our knowledge" that there is less than 1 percent fine particles in waste rock, but I know there has been no measurements, no published measurements to support this. I know this because I was a senior author on the federal MIN (ph) program's critical literature review on waste rock, and I have published papers on

mine waste rock, including one last year.

On the other hand, there is published information from large scale field investigations on the percentages of fine reactive particles. This includes many dozens from Europe based on many types of rock and its handling. Based on this published information rather than opinion and speculation, I know that blasted crushed and piled rock typically contains at least 5 to 20 percent fine particles, meaning the Marathon Palladium Project has underestimated its MLARD by at least 5 to 20 times just based on this one scaling factor.

I know this because I base my values on published information when site-specific information is not available. If the Marathon Palladium Project wishes to use an undocumented overly low value, then the onus is on the company to prove that such an undocumented low percentage applies. The company offers no proof for this. The field investigations elsewhere say there are best of knowledge not based on any measured information is wrong, and a seriously

underestimated water contamination at the Marathon Palladium Project.

I do not ask you to automatically believe me, and I ask you not to automatically believe Generation PGM either. Please search the internet yourself. You will find no published studies with actual measurements supporting the 1 percent or less fine reactive particles, but you will find many case studies saying it's not that low. And you will find no field scale investigations at the Marathon Palladium Project supporting such an abnormally low percentage of reactive fine particles. If you find this to be the case, you will know the Marathon Palladium Project has underestimated water contamination.

Also please check videos on YouTube using these search terms, blasted rock. When you watch those videos, if you see a lot of dust, which are the fine particles we're talking about, you will know the Marathon Palladium Project has underestimated water contamination.

The other scaling factor used

for the Marathon Palladium Project was temperature as we heard on day 4 of this hearing. Please notice that the company does not explain what temperature were used, the temperature of what. Imagine north of Lake Superior on a cold winter day when the air temperature is minus 15 degrees Celsius; water would be frozen. Thus leaching and MLARD would come to a virtual standstill likely for many months. Minerals just don't react much at minus 15.

What does happen is these minerals freeze and later thaw as they crack and break into finer reactive particles through time, making more fine reactive particles each year. That is another issue ignored by the Marathon Palladium Project; they assume the percentage of fine particles never change which violates common knowledge of rocks breaking down to soil.

The main problem with this temperature scaling factor used by Generation PGM is that most Canadians know that when the air is minus 15 degrees outside, then beneath the snow cover the ground temperature is

higher than the air temperature. Thus it is not minus 15 at depths of metres to tens of metres down into the ground beneath the snow.

Do you want to guess what temperature mentioned by the company on day 4 was used to predict mineral reactivity 10s of metres into the ground beneath the snow cover? You were not told it was the air temperature.

Please don't automatically believe me, and I ask you not to automatically believe Generation PGM. Please check this for yourself. If you find the temperature many metres down in the ground beneath the snow cover to be warmer than the winter air temperature, then you will know the Marathon Palladium Project has underestimated water contamination.

Now, my final point here is I want to get to an error. I suspect every expert on MLARD knows that sulfide minerals like those found in Marathon type 1 rock, type 2 rock and tailings will give off heat when they're exposed to air. And in the most extreme cases probably not at the Marathon Palladium Project they glow red.

In typical cases they give off enough heat to keep themselves above freezing during winter months, and thus they are more reactive down in the ground than indicated by the air temperature. Even at the Ekati diamond mine approximately 200 kilometres north of Yellowknife they find temperatures of plus 10 to plus 20 in some of their waste rock during the depths of their winter. Its waste rock was initially predicted to freeze solid, but like the Marathon Palladium Project the predictions forgot to include the heat generated by the oxidation of sulfide minerals.

And the MLARD studies for the Marathon Palladium Project have confirmed these sulfide minerals in type 1 rock, type 2 rock and tailings do in fact oxidize and generate heat when exposed to air. Even the 1-kilogram cells show this. However, the heat that is also generated during this oxidation was completely ignored for the Marathon Palladium Project; instead air temperature was used to incorrectly slow down the predictive rates and severity of MLARD.

I ask that you do not automatically believe me, and I ask you do not automatically believe Generation PGM. Please use your favourite internet search engine to type something like sulfide mineral oxidation and heat. You'll even find Canadian guides with the titles like "the Basics of Self-Heating of Sulfide Mineral Mixtures."

If you find sulfide minerals general a lot of heat when they're mined in exposed to air, you will know that the Marathon Palladium Project has underestimated the reactivity of its minerals their capacity to contaminate water. This is in addition to using air temperature as ground temperature metres to -- 10s of metres in the ground.

If you reach this conclusion, then the leaching of elements of mercury, arsenic, cadmium, lead and dozens of other elements have been grossly underestimated at Marathon Palladium Project. If you are interested in proof that waste rock at the Ekati diamond mine near the Arctic Circle is much warmer than the near arctic air, please check the online document registry of its

regulatory agency, that is the McKenzie Valley Land and Water Board. Their registry contains all the documents for that site.

So I'm puzzled on why you were not clearly told that that scaling factor of temperature for all rock and all tailings at the Marathon Palladium Project was based on air temperature.

Next slide, please.

Other mining companies conduct on-site testing using hundreds to thousands of kilograms of mine waste such as from readily available drill core, and these are the photos you see in the centre part. These form a bridge between the laboratory humidity cells under stable, quiet napping conditions. It's the first step up to say here is what is going to happen under on-site conditions which are variable and reactive, it keeps the particles awake, and to scale up then to the full site, mine site components.

Next slide, please.

This on-site testing using at least hundreds of kilograms of drill core is critical because, first of all, it provides an

on-site outside data. Not inside the laboratory but unstable data outside to show whether the lab-controlled inside samples can even be scaled up 100 to 1,000 times as a predictive target.

And they also show how mine waste would react and would contaminate water outside of these quiet lab-controlled conditions. After 10 years of requests this all important on-site work has not been done. Generation PGM has agreed to do it after the mine starts when it is too late.

About 12 years ago I received an unsolicited e-mail from a federally funded research organization in Chile. They explained that Chile had recognized how important these on-site kinetic tests are for proper upscaling and predictions of full scale MLARD. The Chilean researchers explained they had searched the internet to find people who are knowledgeable and experienced in the design, construction and interpretation of these on-site kinetic tests. They found the work I had published to be the most detailed in part because the Canadian mining industry had

already embraced these on-site tests for decades. They asked me to fly to Chile to give a presentation on these on-site tests as well as other related aspects of MLARD. I did, and hundreds of people attended the presentations.

That was the level of interest in Chile 12 years ago on these on-site kinetic tests.

I've pointed out to the Marathon Palladium Project for 10 years how important it is to run the these on-site tests like most other Canadian mining projects do and other countries do, so that full scale MLARD is not underestimated. Generation PGM still refuses, but has recently agreed to run them after the mine starts. This makes no sense to me for MLARD predictions because the full scale mine waste facilities will already be receiving large amounts of mine waste. It will be too late.

Next slide, please.

Therefore, for the Marathon Palladium Project what happens inside under the quiet, napping laboratory-controlled conditions with the 1-kilogram samples further

reduced, I thought it was about a hundred times, the company clarified on day 4 of this hearing it was 300 times, reduced 300 times mathematically is considered identical to what will happen outside under natural, variable uncontrolled conditions. Mathematically adjusted 100 billion times more.

This is unreliable and directed towards grossly underestimating full scale water contamination at the Marathon Palladium Project.

Next slide, please.

A second point I'm going summarize, and this came from day 4 of the hearing, is that Generation PGM claims no unacceptable off-site water contamination ever.

Next slide, please.

Why would Generation PGM and it's consultants predict there will never ever be any unacceptable degradation to surrounding water quality. I've provided many reasons in my written comments, and just presented one about how 1-kilogram lab-controlled samples were used to grossly underestimate full scale

water contamination. Obviously if the off-site contamination -- if the on-site contamination is grossly underestimated, then the contamination of surrounding natural waters is also -- is underpredicted.

Nevertheless, some on-site water is still predicted to exceed water quality guidelines like those for arsenic, chromium, copper and selenium. If these are underestimated on-site -- if these underestimated on-site levels are still high, then why are no significant off-site water impacts predicted. There are several reasons.

Next slide, please.

For example, the predicted lack of off-site water quality degradation depends on dilution in the Pic River, Hare Lake and creeks. All off-site predictions for the Marathon Palladium Project are after dilution is factored in. Dilution does not happen instantaneously in rivers and lakes. There is some type of mixing zone, contaminant mixing zone that exists and could be any size.

Next slide, please.

Information on these mixing

zone go into regulatory permits stating the portion of the lake or river that cannot be used for certain purposes like drinking or fishing. The permit also specifies distances from the diffusers that release the contaminated water where water quality levels must be met.

Next slide, please.

I have searched through the documents and the IRs on the Marathon Palladium Project to find this information on contaminated mixing zones before dilution is complete in the Pic River and Hare Lake -- and in Hare Lake. I cannot find any details on the designs of outfalls and diffusers or any of these details. However, during day 4 of this hearing, I heard a presentation by Generation PGM that modelling of the grossly underestimated contaminations from the Wong (ph) treatment system for only suspended solids into Hare Lake had in fact been modelled as a plume and to assess meromixis.

And this is where when dense water comes out of a treatment plant, it's dense, and it sinks to the bottom. That's what

meromixises are getting at. It doesn't mix with the water sinks and sits there.

So I have again checked the EA addendum which is the latest formal design of the Marathon Palladium Project for this hearing and could not find this plume modelling. Nevertheless, I definitely believe the modelling exists.

On day 4 of this hearing and today I pointed out that dissolved concentrations could be 100 times higher than currently predicted perhaps even 300 times higher. I explained that this has serious implications for the mixing zone and meromixis in Hare Lake.

On day 4 the company provided a rebuttal to my concern that dissolved concentrations in the treated effluent would be 100 times higher than modelled for Hare Lake. Here's what Generation PGM said about this:

"Thank you. If we could backtrack a bit or provide some response to the line of questioning with this, one that would be consideration of his discussion of

the mixing zone. So I just wanted to clarify Dr. Morin hadn't seen the detailed modelling that had been done -- presented in the IRB reference. So we have within that analysis considered an upper bound effluent density. So we've looked at what five times the expected effluent density within that analysis to provide some comfort because various government agencies have raised the issue of potential for meromixis just to develop in Hare Lake.

"So the modelling included sensitivity analysis at everyone's different densities. So I think we've addressed the idea that the effluent could be more dense sensitivity analysis, five times better than expected, and we still see no issues with the development of meromixis."

Again, meromixis is the settling of dense water to the bottom of a lake so it doesn't mix and get diluted. I do not ask the panel and people listening to me today to automatically believe me, and I also ask you not to automatically believe the company either. Please check this for

yourself.

If you find 100 times higher concentrations to be much greater than five times higher used by the company, then you will know for with yourself the company certainly has not, quote, addressed the idea that the effluent could be more dense at everyone's different densities.

The --

PANEL CHAIR: Mr. Morin, I'm sorry to interrupt you. I just wanted to do a time check. I think we're coming up to about 25, 30 minutes, and I think you have more than 10 slides left. So just want to ensure that, you know, we're sticking with time allotments for presenters. Thank you.

DR. MORIN: Okay. Thank you, Madam Chair.

Next slide, please.

And one of the messages I gave on day 4 was that the wrong type of water treatment is proposed for water contamination at the Marathon Palladium Project. And they have addressed dissolved that is floating contaminants -- sorry, they addressed

suspended, that is floating particles, and not the dissolved issues which I'm explaining could be a hundred times higher.

Next slide, please.

Where they do give details they mention flocculation.

Next slide, please.

And for the Marathon Palladium Project suspended contaminants like the four right-side beakers in that photo below have not been predicted as part of MLARD and surrounding contaminations. They should have been predicted, the suspended particles, because that's part of total concentrations, but they weren't.

On the other hand the dissolved contaminants, the left-side beaker below, which will require water treatment was not predicted.

Next slide, please.

So water treatment plants for dissolved contaminants must be custom designed for the site and are not off the shelf from a supplier. To get some idea how complex and expensive these custom-designed dissolve

contaminant treatment plants can be, please use your favourite internet search engine, type in these terms mine, water, treatment plant and then click on images or photos. You will see how each is unique reflecting the on-site specific flow rates, the number of contaminants and the concentrations of the contaminants.

It will also be apparent from the photos why they typically cost tens of millions of dollars. They typically a few million dollars each in every year to operate. They are not built to operate only for a few years and cannot be within a few months or even one year design costed, funded, ordered, delivered, built and optimized. Realistically this could take several years, and until such a plant is built and operating at the Marathon Palladium Project billions of litres of contaminated water would have to be stored in impermeable ponds and pits with billions more accumulating every year while waiting for the dissolved many contaminant treatment plant to be built and functioning.

If Generation PGM cannot

afford this, especially during construction and soon after operation starts, then the government and people of Ontario will have to pay to build and operate it.

Next slide, please.

And again, I said I have written comments, so there are more, and I just don't have time to go through with all of these comments. They are all written down, and you can check the written documentation.

So next slide, please.

Now, one issue that briefly came up on day 4 of the hearing, and I'll just go through it quickly, is how much contamination, how much of each natural element is in the mine -- the Marathon mine waste and how has it been measured. For health risks certain amounts of those solid contaminants in the mine dust particles are critical to assess danger to pathways such as inhalation. If it passes through your digestive system, not much of it dissolves. But if it goes into your lungs, your lungs will attack those particles and start breaking them down, so that becomes different.

Next slide, please.

So the Marathon Palladium Project defined a degree of solid contamination in their mine waste and dust by comparing their contaminant levels to the average values in the earth's crust. Here's the problem. Contaminant levels in the earth's crust are measured by completely dissolving the samples of it all the way and measuring it. However, the Marathon Palladium Project dissolved only part of the contamination in their mine waste using a procedure called aqua regia instead of a more thorough approach used for crustal samples.

Next slide, please.

Therefore, is it at all surprising the Marathon Palladium Project would tell us their partial levels of contamination are not typically high when compared to the full levels in the earth's crust.

Next slide, please.

However, we cannot tell how much worse Marathon Palladium Project contamination is. It could than 10 times or

more worse. Only some unknown portion of the contamination has been measured and reported to us, and the rest is hidden from us because Generation PGM ignored the rest.

This also means the health risk due to inhalation of mine dust by animals and humans has been underestimated. This also means the contamination added to surrounding natural soils by wind blown mine dust has been underestimated. Do you think a mining project that has underestimated contamination should be approved?

Now, I just want the read a few quotes and then finish with my last point.

What do others say about this aqua regia digestion. Here's some quotations. SGS Labs Canada, a big laboratory and consulting company in Canada says "Two acid digests --"

And that's this aqua regia and it consists of two acids:

"Two acid digests are the weakest of the digestions and will not attack silicate minerals. As such the two-acid leach can only be expected to provide partial

results for most elements."

ALS which a huge international lab company, including throughout Canada says:

"Aqua regia is a partial digestion using nitric and hydrochloric acid at one to three ratio."

Act Labs, a Canadian lab company, describes its aqua regia as "aqua regia partial digestion."

Dr. Nicholson on behalf of Generation PGM said the following on the day 4 of this hearing, and I'm going to read this exactly word-for-word as he said it so you will know I'm not misquoting him. Quote:

"In my materials, and there are several ways of measuring these chemical constituents in (indiscernible), and the (indiscernible) regia digestion method that was used in this project is very common. It is a combination of hydrochloric and nitric acid, a very strong mixture that dissolves almost everything."

Please don't automatically believe me, and I ask that you don't

automatically believe Generation PGM. I ask a favour that you spend a few minutes on your favourite internet search engine and type in a question like, what is aqua regia digestion. If you find the consensus is that it partially dissolves at least some elements, then you will know that MLARD in water contamination at Marathon Palladium Project has been underestimated.

And this carries over to air and water contamination and soil contamination, and impacts on vegetation and animals related to mine dust. This includes underestimations of mercury, arsenic, cadmium, lead, uranium and dozens of other elements.

PANEL CHAIR: Mr. Morin, I see you're just about to wrap up. We do need to wrap the presentation. Thank you.

DR. MORIN: Yes, I'm sorry, Madam Chair. I'm just about to finish. So if I can go next slide, please.

PANEL CHAIR: Thank you.

DR. MORIN: So therefore I conclude under Ontario Regulation 240 part 7 for MLARD, the Marathon Palladium Project has

failed to determine the potential for significant metal leaching or acid rock drainage, and if necessary to ensure the development and implementation of effective prevention, mitigation and monitoring strategies.

And just to finish off I want to explain that at the beginning day 4 of this hearing hydrogeologists for Generation PGM presented the results of their groundwater modelling that show little groundwater would move beneath and far from the site, and that "particle tracking" showed the groundwater under the mine site would move very little over 100 years.

I found this shocking because most hydrogeologists would know this is wrong, and the company's data even showed this was wrong. Shallow groundwater will be contaminated much worse than currently predicted as I've explained, and it would move up to 1,000 times faster and in greater volumes. Some shallow groundwater would move so fast, within a year it could discharge into the Pic River or Hare Lake and even reach Lake

Superior within a year.

Thus, all predicted environmental impacts from water at the Marathon Palladium Project have been underestimated. There will be contaminated groundwater moving very quickly around the site within a few months according to the company's own data, some springing to the surface and running off into the surrounding environment.

Now, please don't automatically believe me and please don't automatically believe Generation PGM. Please go outside and look at the rock at the surface and see if it's broken up near the surface or look for photos on the internet, then look for information or just think about it. Will the rock 70 metres down in the ground be less broken because the company has modelled that whole interval from the surface all the way to 70 metres as one unit and gave it the lowest measured (indiscernible) conductivity.

Now, to further support this point -- and I'm just about done -- to further support this point in the afternoon of day 4

of this hearing I asked the Ph.D. hydrogeologist with Natural Resources Canada about this issue. She said that she would expect the layer of the earth's surface from the earth's surface down to about 10 metres at the Marathon site to be more broken and permeable than the deeper rock. Thus the shallow groundwater would move up to 1,000 times faster than currently predicted based on values (indiscernible) draw conductivity measured by Generation PGM.

So to close, therefore, not only has the degree and severity of water contamination such as by mercury, arsenic, lead and cadmium been grossly underestimated so has the speed and volume that this contaminated water will flow beneath the site and into the surrounding environment, Pic River, Hare Lake and other water courses.

And last slide, please. So this presentation over the concerns was sponsored by Citizens for Responsible Industry in Northwestern Ontario and Northwatch. Thank you.

PANEL CHAIR: Thank you, Mr.

Morin. We'll move now to the Ministry of Northern Development Mines, Natural Resources and Forestry, the mineral development branch. I wonder if we could have presenters from the Ministry. Good morning.

PRESENTATION BY RAYMOND MCCARTHY:

MR. MCCARTHY: Good morning, Madam Chair.

For the record my name is Raymond McCarthy from the Ministry of Northern Development, Mines, Natural Resources and Forestry.

Just for the record, we're a ministry that's amalgamated recently, so if I call ourselves ENDM, which was our former name or just briefly summarize that as NDM, Northern Development and Mines, I'm referring to the whole. Okay. I just don't want anyone to feel like I'm talking about straight entities. We're still getting used to the very long acronym.

If I could have the next slide, please.

Our participants today, our reviewers, are myself Raymond McCarthy; I'm

the surface water rehabilitation specialist for NDM. We're also joined today by Andrea Hanson who is our groundwater rehabilitation specialist, and Colin Hovi who is our mineral exploration development consultant who is expert in permitting.

Before I continue I would like to acknowledge where I am right now in Sudbury. Where I am is the traditional lands of Atikameksheng Anishnawbek, which is to my southwest here, used since time and memorial. We also have a neighbouring community of Wahnapitae First Nation to our east. We're also on a traditional trading and voyage route for the Métis people of Ontario.

So just putting that out there because it's very important for us to understand and recognize the land that we're on because we enjoy its natural beauty and its resources.

Next slide, please.

So just an overview of the things we're going to talk about. Much like every other ministry from Ontario, you're going to hear about our mandate which is

provided by the Ontario *Mining Act*. We'll talk to you a bit about closure planning. Ontario regulation 240 which contains the Mine Rehabilitation Code is what we use to assess closure planning. We're going to address the specific questions posed by the joint review panel to our ministry, give you a very brief review of the surface and groundwater studies that we've reviewed and then provide a summary of our recommendations.

Next slide, please.

So the *Mining Act* is the only Act that our ministry uses as a whole. Lots of other ministries have several acts they have to work under. So we've heard about the *Rivers and Lakes Improvement Act*, *Navigable Waters Act*.

Our primary foundation is the *Mining Act,* and that provides us with our purpose when we are working under the Regulations and the Act itself, and that is to encourage prospecting and the registration of mining claims and exploration and development resources in a manner that is consistent with the recognition and affirmation of existing

Aboriginal and treaty rights in section 35 of the *Constitution Act of 1982*, including the duty to consult and minimize the impact of these activities an public health safety of the environment.

So this is what we have to turn to. Every time we're looking to make discretionary decision under the Act, this is what guides us.

Next slide, please.

So I bring up the mining sequence because it's important for us to recognize where we are in this process. Mining has been taking place in Ontario since there -- before there was an Ontario; before it was -- received its name as is now. And mining doesn't always just follow the same sequence. It can go back and forth. It can be cyclical. But where we are in this specific project is in the space between advanced exploration and development.

So for our purposes we are looking at things before a shovel has really gone in the ground, before we've developed this mine, before things like closure had been

thought about, before we have any infrastructure to really evaluate. So I want us to really firmly understand that we're in the space that is very early in the process especially for our ministry which we'll explain.

Next slide, please.

Excellent. So closure planning. Before mineral exploration can begin, for the purposes of revenue Generation the closure plan has to be approved by Northern Development and Mines branch. Closure plans are very detailed, and they layout how a proponent intends on return the environment to a state that is as close to pre-impact as possible. Closure plans are regularly updated. We have heard them called living documents, and that's very true. Any time there's a material change in that site, that operation, which includes things like new infrastructure. Maybe you put up a new building; maybe you have a new -- a more efficient process. Anything that materially changes how that site works, we have to get an updated risk assessment or closure plan. That will identify

what the change is and how that plan changes to accommodate that.

I would like to make everyone understand that operational environmental standards are for effluent, air, noise pollution and all these additional factors are the purview, they're set by other provincial and federal regulators.

Next slide, please.

Closure planning is a separate process from environmental assessment, EAs, EIS baseline studies. So it is a separate process than what we are engaged in now. We're actually in the process before closure planning.

One of the great things about being in our job is that we get the benefit of the wealth of knowledge generated by a processes such as this, so EA processes, baseline studies, community consultation. We get that wealth of information delivered to us when we start reviewing a closure plan. Like I said, it takes place over the life of the mine, and every few years whenever there's a major change, we update it, so it stays

current. It also stays current to the regulation at the time that we review an amendment, and it stays current to the science.

A mine is considered closed once it meets the rehabilitation code. So that's when we're, like, it's closed, and we can stop worrying about it. I'll explain rehab code in just a moment.

Next slide, please.

So Ontario regulation 240/00, it's a lengthy regulation, and it has two major components that are schedule 1 and schedule 2. I'm talking about schedule 2 here first because we're talking about closure plans. So you can see the 12 sections that are mandated to be contained within every closure plan that we receive. So if your closure plan doesn't have sections of this completed, we will refuse to register that plan, and we'll send it back for correction.

You can see it's standardized, so we get the same types of information, or we request the same types of information from all of our clients so that we

have a standardized approach, and we know what we're getting and that it's the information we need.

A closure plan is really an owner's manual to the site so that if, for whatever reason, that company is unable to continue operations, perhaps they go insolvent or there's some sort of -- it could be -- if the company is not able to continue working, we're able to go to this plan, open it up and see what they were doing in terms of treatment and to continue or contract somebody to continue that work. So it's very comprehensive.

And it is certified by professionals.

Number 2 there is certification, so each of the monitoring plans, studies, things like that have to be certified by professionals.

Next slide, please.

So the Mine Rehabilitation Code which is schedule 1 of OReg 240 covers these nine sections that you see. So each of these headings has specific instructions on

how that mine hazard is to be reclaimed or stabilized so that the land can be returned to a more natural state, a stable state.

So we've got nine different headings. I'm a specialist on number 5; that's the surface water. But you can see we take a holistic approach, everything from mine openings to the stability of the mine itself, all the way back to what the re-vegetation of the site is going to like post-closure.

Next slide, please.

So the specific questions that we were asked by the joint review panel are displayed on the screen here. The first two questions what is the likelihood that the project would cause significant adverse environmental effects, and the second question provide comment on dam safety and seismicity.

Could I have next slide, please.

So environmental effects prediction is the job and the mandate of other resource ministries such as the Ministry of the Environment and Climate Change and Parks and Natural Resources and Forestry section of

NDMNRF, so that is out of scope for us. It is not part of our mandate to project significant adverse environmental effects. That's not what our mandate is.

Same thing with providing comment on dam safety and seismicity. We won't provide a comment on that. It is out of scope at this time until we receive a closure plan. Dams are handled differently depending on whether they are on-line or off-line which is an entirely different discussion.

So that's worked out between the NDM section and the NRF section as we get more information on the site. So like I said, until we have a closure plan that part of the site will not be assessed.

The next question we were asked is what the predicted effectiveness of proposed mitigation measures would be.

If I could have the next slide, please.

From of the information that we've received and like I've mentioned we are not in possession of a closure plan, so for us to be able to make comment on the

appropriateness of closure and mitigation activities and monitoring, we have very limited information. What we can tell you is the techniques and processes that we've seen in the scenarios that Generation PGM presented are industry standard. We haven't seen any wild, wonderful, strange mitigation techniques that we haven't seen any other place.

Next slide, please.

So like I said, because we're not in possession of a closure plan and that this process is not a parallel or equivalent process to closure plan, we cannot discuss if there are any additional mitigation measures necessary at this moment. So it's out of scope at this time. When we receive a full closure plan, that's when we can start making that assessment.

Same with the proposed monitoring and follow-up programs, they are out of scope at this time just because the level of detail isn't there, but that's again because that is a separate process. We will -- we insist that that information is included. As you can see it was part of the closure plan

outline from schedule 2.

Next slide, please.

So from the surface and groundwater aspect from the materials that we reviewed, we see that the proponent has a good understanding of baseline conditions. That will be very helpful in their closure plan submitted in the future. We review lots of plans, and sometimes being able to get baseline data, very good baseline data is difficult.

In this case we have much more information than we would normally get, so this is why we were brought in. Normally NDM or the mining part of MNDRF are brought into these processes because we are pleasure planners. It's been really helpful for us to able to look at what the proponent is planning and studying because we've been able to interject a few things, such as we require for you to monitor for these chemicals at closure. So you should start monitoring for these chemicals right now.

But like I said, we don't have any legislative authority over this

process. When we look at the actual data that was presented, the groundwater data appears to be a good chemical characterization. They have projected some impacts. They characterized the materials and proposed an MLARD management plan.

And they are going to continue to study material on-site for further appropriate management strategies, which is something that proponents do. Like I said, closure planning is an iterative process, so as the proponent better understands the geochemistry of their site, they are able to tune their treatment plans and their overall reclamation activities.

In the surface water arena it's the same sort of thing where the proponent has done a good job at characterizing surface water within the area and the surrounding area. So we've got a really good idea of what lakes and rivers in the area, what the local water chemistry is like, and that the components within the study, what are being proposed to be used for mitigating surface water is still industry

standard and is a well understand process. We don't have a lot of questions about what's been proposed at this point in time.

Next slide, please.

So our summary recommendation, I'd just again like to point out that the NDM portion of NDMNRF has no legislative authority over the project at this juncture when it comes to environmental issues. We acknowledge that there has comprehensive baseline studies. That's all we can do right now. Until we have a closure plan, we will not be commenting on closure. We can confirm that there's nothing unique or unusual that we've seen. It all seems to be industry practice. And that when we're receipt of a closure plan, we will be comparing it against the Mine Rehabilitation Code and Ontario Regulation 240/00 in order to make sure that it conforms to that, and that it is an appropriate closure plan.

Next slide, please.

Actually, I think that's it. We're available for any questions from the panel. Thank you very much.

PANEL CHAIR: Thank you very much, Mr. McCarthy. Sorry, I just want to make sure I have your name right. Appreciate your presentation.

I think what we'll do now is move to the question phase for this set of presenters, and I will start with Biigtigong Nishnaabeg First Nations. I wonder if you have any questions you would like to pose to presenters on the topics you've heard this morning.

MS. ZANINI: Thank you, Madam Chair. If we could just have one moment to caucus internally.

PANEL CHAIR: Certainly. Thank you.

MS. ZANINI: Thank you. Thank you, Madam Chair. Tracy Zanini for the record. At this time we don't have any questions for any of the presenters this morning. Thank you.

PANEL CHAIR: Thank you, Ms. Zanini.

Citizens for Responsible Industry in Northwestern Ontario, Dr. Morin, do you have any questions for presenters

today?

DR. MORIN: No, Madam Chair, I have no questions. Thank you.

PANEL CHAIR: Thank you. Sorry, Ministry of Northern Development, Mines, Natural Resources and Forestry, I wondered if you had any questions of presenters this morning.

MR. CANO: We have no questions at this time. Thank you.

PANEL CHAIR: Are there other participants on the line who have questions for presenters this morning? Generation PGM, I wonder if you had questions for presenters this morning?

MR. BARRETTO: Thank you, Madam Chair, and thanks to the presenters. Generation PGM has no questions.

QUESTIONS SESSION:

PANEL CHAIR: Maybe what I'll do is I will start.

The panel does have a number of questions related to the various topics this morning, so I think what I'll do is I'll get started on the first one as a start, and

then perhaps before we break for lunch there's just possibly a couple of updates I may ask for.

Okay. So this will be -- this series of questions will be related to accidents and malfunctions. And one of the first series of questions is related to the process solids management facility and slope failure. We have heard information about that from presenters this morning.

So just from an overall context perspective, Generation PGM provided information both in their presentation and their EIS addendum, a number documents, on potential accidents and malfunctions in CIAR 727, chapter 6.3. And participants including Biigtigong Nishnaabeg, Pays Plat First Nations and Citizens for Responsible Industry in Northwestern Ontario have expressed concerns regarding the risk of a dam breach or failure at the process solids management facilities and the impacts it would have, potentially have on many of the valued ecosystem components.

We heard again this morning,

Biigtigong Nishnaabeg stated that any dam failure during construction, operations, closure or post-closure resulting in process solids being released to Lake Superior or the Biigtig Zibi, the Pic River, would be an immense and profound tragedy that Biigtigong Nishnaabeg insists the proponent cut no corners to present, partial quote. Pays Plat First Nation has also stated that such an accident would mean irreversible damage to Pays Plat First Nation traditional territory, noting that Lake Superior is a sacred living entity, and Pays Plat First Nation has protected her since time and memorial.

So in that regard the panel does have a series of questions to pose related to dam breaches or failures to better understand the risks and proposed mitigation.

So my first series of questions are to Generation PGM.

So first one. Generation PGM states that based on the design and configuration of the PSMF a worst-case scenario has been characterized as a slope failure resulting in a partial breach of the

PSMF embankment.

So a partial slope failure could lead to this release of solids from cells under various scenarios, and for each potential scenario the release due to a slope failure is assumed to include process water and the upper process solid surface, and that is contained in CIAR 727, section 6.3, PDF 25 for reference.

So would GenPGM be able to explain why a partial slope failure resulting in a partial breach of the PSMF embankment was determined to be the worst-case scenario as opposed to a total failure or full breach? Could GenPGM in its view describe what makes a full slope failure in breach of multiple slopes an inapplicable worst-case scenario?

MR. ANWYLL: Thank you for that important question, Panel Chair. I'll caucus quickly and organize an answer.

PANEL CHAIR: Thank you.

MR. ANWYLL: I'll hand over to Mr. Craig Hall, that is -- that will be the engineer of record should the project go ahead.

PANEL CHAIR: Thank you.

MR. HALL: Good morning, Madam Chair and panel members. Thank you for the question. Could I request that CIAR reference 741, PDF page 449 be brought up, please.

PANEL CHAIR: Thank you. It will just take us a moment.

MR. HALL: Thank you for that. Could I just have you scroll down a little bit. Very good. Or perhaps maybe zoom out a little bit so we can see the whole image, please. Okay. Very good. Thank you.

So this image here shows the process solids management facility arrangement in its final configuration when the embankment has been fully constructed and basically it's at its design capacity. So the perimeter embankments are shown in the pale orange/tan brown hatching. And these embankments we constructed using runamine (ph) rock fill using the downstream construction method and would be founded directly on bedrock.

If we can now scroll down to the next PDF page, please.

In figure 18.26 we show a

typical cross section of the embankment, and this illustrates the downstream construction method for the perimeter embankments.

If we start on the left side of this figure and work to the right, you'll see there's an initial embankment shown for year 1 at elevation 353, and then there's several stages shown for year 4, year 6 and year 10 as we advance to the right and the embankment elevation increases from elevation 353 to elevation 380.

So with each of these embankment raises, the embankment's expanded to the downstream or away from the basins or where the tailings are contained -- process solids are contained. And this is the -- basically illustrates the downstream construction method.

So with this construction method the rock fill is going to be placed directly over the bedrock foundation, and so it founded on very competent foundation and fully supported by the durable rock fill.

On the upstream portion of the embankment you can see that there's two

transition zones, and then there's a dashed line that represents the geomembrane liner. With this construction method we end up with a very wide and robust embankment. When we look at hypothetical failure or a dam breach for the PSMF and what can lead to these conditions, we need to look at the -- what can lead to basically erosion and removal of this embankment configuration.

Maybe just scroll down back up to the PDF 449, please.

So when we look at the arrangement that is shown here, the majority of the water from the process will be managed back to the process plant or transferred to the water management pond. So there will be very little water managed within the PSMF. So if there were as a condition that led to an overtopping of the embankment during a sunny day type failure, when we don't have an IDF event, there's very little water to basically lead to the erosion of that rock fill. And when we talk about dam breach assessments, we look at sunny day as well as rainy-day-type event. So a rainy day event is when we've

subsequently had an inflow design flood and the facility is potentially at the maximum operating level, and then there's more water or energy stored within the facility.

Under the scenario there would then be the potential for a greater amount of erosion of the embankment should an overtopping event occur and lead to water flowing over the embankment.

It's very unlikely that we would come to this condition because we have an emergency spillway which is shown at -- in the blue arrows to manage that event so that we wouldn't have overtopping of the embankment. It would be conveyed via controlled spillway so that we don't have a catastrophic event from occurring.

In addition to that, above the allowance for that inflow design flood, there's also a dry freeboard allowance. So we have, you know, just over a metre of additional freeboard so that you really have the -- it's very unlikely you would have overtopping of the embankment.

That being said, you know, if

something happened that could lead to that hypothetical event and you had the overtopping occur, due to the width and the nature of that rock fill that constructs the embankment, we feel that it's very unlikely to erode the entire embankment, and that's why we've included for only a partial release of the tailings. We acknowledge that there would be a full release of the pond and then a release of the upper tailings.

I would note that a dam bridge assessment is currently in process to support permitting should the project go ahead, but this is going to take a number of months to complete and that will fully assess the potential dimensions of a breach and the volume of release associated with that hypothetical breach event.

PANEL CHAIR: Thank you for that explanation.

I'm going to read out my next question -- just you have a referenced that in your explanation here and along with the images. I'll ask my question and -- so Pays Plat First Nation has stated that an in quote:

"We have been assured that the dam constructed will be a downstream dam which has mitigated a number much other concerns."

And that's CIAR 1081, PDF 35. Your explanation of the conceptual tailings dam design and in particular the downstream construction which you just described, are there other types of construction that create similar stable structures? Is this one that was unique to this project? Just want to ensure we have a good understanding that this design, perhaps one of the mitigating features you've just talked about to prevent such an event.

MR. HALL: Okay. Thank you for the question, Madam Chair. I just request a moment to caucus, please.

PANEL CHAIR: Yeah.

MR. HALL: Thank you for that moment to caucus, Madam Chair.

So there are other embankment construction techniques, these include both centre line, modified centre line and upstream construction methodologies. These embankment

construction methodologies basically -- rather than the centre line of the embankment shifting downstream, the centre line either stays over the original centre line and just advances upwards or can advance upstream.

When we look at, say, upstream the embankment construction methodology potentially uses a portion of the tailings from the embankment construction. So when we talk about these methods, they are less robust because they don't rely on the rock fill as the full foundation and structural component of the embankment. They start to rely on a portion of the tailings to support the upstream portion of the embankment.

So in this particular case we chose to use a more robust design methodology, and due to the available mine rock that will be available through the mine life, it allowed us to support the downstream methodology because we have construction materials available to support the downstream construction methodology.

PANEL CHAIR: Thank you. Thank

you.

Generation -- just keeping on this topic. Generation PGM states that the environmental effects of a partial breach event would include loss of containment of solid fraction resulting in swamping of previously undisturbed terrestrial habit. As such, liquid fraction could drain to natural surface water features, including Hare Lake tributary, stream 6, Shack Lake tributary, negatively affecting water quality, and this is referenced in CIAR 727, 6.3, PDF 25.

Could GenPGM describe in some further detail the potential negative effects to the affected surface water features in the event of a failure?

MR. HALL: Thank you for the question, Madam Chair. Just request a moment to caucus, please.

PANEL CHAIR: Yeah.

MR. HALL: Thank you.

Thank you for the time caucus, Madam Chair. Brian Fraser will answer this question.

PANEL CHAIR: Thank you.

MR. FRASER: Good morning, Madam Chair. Brian Fraser for the record.

With respect to potential water quality effects associated with the partial breach, if that was to occur, it would be expected that the supernatant or liquid portion of the process solids could report into a natural surface feature as we've indicated and you've indicated in your question.

The concentrations of constituents in the PSMF would be below relevant thresholds, and given that this is a short-term event, we would look to acute thresholds as those benchmarks since the exposures would be short term in the order of hours. So we wouldn't expect any significant effects directly associated with the release, and those would be -- or the release would end up in short-term exposures.

And I would also note that if that event was to occur, it would be associated with a significant precipitation event or snow melt or something of that nature.

So the process solids supernate nor the water in the process solids facility would likely be significantly diluted by that precipitation or runoff or snow melt event. So as said it's a short-term event that we don't foresee significant issues with.

PANEL CHAIR: Thank you. I just wonder if you could -- I believe you spoke to the issue of the liquid portion of an event like that. Is there any possibility of that solid portion accumulating in the event of a breach, and could you talk a little bit about potential impacts to that entering local water courses, if that's, you know, traveling distances during a potential breach.

MR. FRASER: Sure. Brian Fraser again, for the record.

Yes, it's quite possible that during the event the water that's coming into local receivers could have relatively high TSS levels. It's likely that those would settle in the near term, or the near field area largely would swamp benthic habitats, but also consider that the -- this event would likely be associated with relatively high flows, so

settling might not be such a big issue. TSS would be carried downstream; finer particles would be carried downstream. Again, noting that this is likely to be associated with an event that would be common into the local study area itself. So it's likely that local receivers would be running high, with relatively high TSS levels to begin with.

PANEL CHAIR: Okay. I'm just going to take my moments here for a moment.

So in the event of a situation that you've described along with a potential weather event or a potential breach, could you talk a little bit about proposed mitigation for any impacted, say, terrestrial habitat, wildlife or bird habitat or potential mortality in the event of such an accident or malfunction.

MR. FRASER: Thank you, Madam Chair. Brian Fraser again for the record.

In terms of impact, mitigation -- sorry, assuming that the event happens, so we're now kind of beyond mitigating the event, so now we're talking about clean up. So once it was safe to do so,

the area that would be affected could be surveyed to understand the extent of the solids and the spreading of the solids on terrestrial habitat, let's say, and a plan to clean up and restore that area would be initiated and then executed.

In terms of acute mortality, it's hard to say. It's possible if birds were nesting in the area of the breach and where the solid spread that could potentially lead to mortality of those birds nesting. Small animals could get caught. But the event is likely occurring not in an instant. It's likely developing over time. So not to say that there wouldn't be mortality of local wildlife that was in the -- as a I said nesting, but it's not something that's going to happen kind of in an instant.

PANEL CHAIR: Okay. I realize we are talking about the potential for an accident scenario, but if this were to happen, can you explain a little bit about the direct or indirect effect to Indigenous peoples from a human health perspective, including the safety of country foods and how that might be

addressed by Generation PGM.

MR. FRASER: Thank you, Madam Chair. I'm just going to caucus for one minute.

Thank you. I guess to begin with, you know, we certainly acknowledge the significance of this event with respect to local Indigenous communities and their use of the land for harvesting. It would be a very unfortunate event that the company would certainly take exceedingly seriously. And in part, you know, explains the significant construction or the downstream construction and the design mitigation so that this event doesn't happen.

But, you know, assuming that an event has happened, as I said, any materials that would be deposited into the environment within the zone of influence, there would be a plan to reclaim that area. So pick up the solids, you know, bring them back into the facility. That in and of itself, that reclamation process would affect the local environment to the extent that you would have to be picking up terrestrial vegetation soils

along with the solids from the process solids facility.

So in addition to that cleanup, there would be reclamation planning that would involve our local Indigenous partners so that over the long term these areas could be restored to a natural setting that could be used in the future for traditional harvesting and that kind of thing.

PANEL CHAIR: Thank you. I'm curious, you've referenced the actions taken in terms of cleanup. Does GenPGM have specific resources, equipment, tools that they will engage for these types of cleanup activities, and where might those be referenced for sort of ongoing operations or in light of potential accidents and malfunctions?

MR. FRASER: Yes, so I can speak to the specifics -- I can't speak to the specifics of a plan at this point, but this would definitely be something that would be incorporated within the emergency preparedness and response plan. So this would be a specific topic addressed within that plan.

Typically the equipment that

you would need to do excavation would be available on-site because it would be being used for other purposes and could be mobilized for the purpose of cleaning up the solids and reclaiming the area, but as I said, this would definitely be something that would be specified in detail within the emergency response plan.

PANEL CHAIR: Thank you.

Just maybe a question more generally. From your perspective could this accident-malfunction scenario result in a significant adverse effects to any other of the VECs?

MR. FRASER: Well, certainly within the zone of impact associated with the event to the extent that VECs are in the area, that would be -- they would be affected, but we would largely be talking about terrestrial vegetation potentially some wildlife.

As I said, the consequences of the release of the water into local streams beyond TSS which would impact at least in the short term, you know, swamping of benthic habitats. The concentrations of constituents

are not likely to be high enough to cause a significant impact as those exposures would be short term.

PANEL CHAIR: Thank you very much.

I have a couple of questions for ECCC and MECP just to close off this particular topic of questioning, so I wonder -- good morning, Mr. Clavering. And I don't know who we've got from MECP, Ms. Gilliam-Price. Welcome. Thank you.

So what I would like to ask both of you, what are your views on the potential effects of a worst-case scenario as described with the PSMF slope failure event, the identification of the partial slope versus partial breach versus full breach?

And I'll ask you the next question; do you agree with Generation PGM's proposed response measures and that they could mitigate any significant adverse effects and whether you had any additional measures to recommend.

MR. CLAVERING: Rob Clavering, Environment and Climate Change Canada for the

record. If I could just have a moment to caucus with my team, please.

PANEL CHAIR: Yes, and Ms. Gilliam-Price, the same?

MS. GILLIAM-PRICE: Yes.

MR. CLAVERING: Thank you for the time to caucus. I'll start my response when MECP is ready as well.

PANEL CHAIR: Thank you.

MS. GILLIAM-PRICE: We're ready as well.

MR. CLAVERING: Oh, okay. Great.

So Robert Clavering, Environment and Climate Change Canada for the record. ECCC -- I'm going to be answering both questions as one overall statement.

So ECCC recommends that GenPGM prepare an emergency -- prepare their emergency response plan prior to construction, and that it reflects all plausible types of accidents and malfunctions and takes into account site-specific conditions and sensitivities associated with the project. The emergency response plan should demonstrate the

proponent's ability to prevent, prepare for, respond to and recover from an accident -- from accidents and malfunctions.

And ECCC also recommends that GenPGM commit to mitigation strategies, contingency plans and response capabilities that are commensurate with the environmental risks that this project may pose, including but not limited to these worst-case scenarios such as the dam failure scenario as described.

PANEL CHAIR: Thank you. And MECP, go ahead.

MS. GILLIAM-PRICE: Okay. Jacinth Gilliam-Price for the record.

So I just want to start off by saying that I don't quite believe that we're in the position to answer this question directly, but we'll provide some opinion there. MECP doesn't normally deal with dam stability. But with respect to dam stability MECP would support a review by an independent tailings review board of the proposed dams.

So our mandate, MECP's mandate does not cover dam stability or hazards. So we would suggest that the panel

may want to redirect that question to Northern Development and Mines as they are the Ontario ministry that deals with dam stability.

However, to respond to the second part of the question, we would agree with the estimates that were provided with respect to effects and what has been proposed for mitigation -- mitigating spill is what we would typically -- is typical of what we would expect to see for planning for such a scenario.

PANEL CHAIR: Okay. Thank you. Thank you, really appreciate that.

I think given the hour, it's just almost at 12:30. I think we will take a break for lunch and continue our questions this afternoon.

I wonder, I did want to ask some questions around dams, dam classification ratings, and I'm just mindful of our presenter from MND, MNRF. I want to make sure that we do have someone on-line that would be able to address some of those questions once we return from lunch. I see we've got a number of....

Hello, Mr. Cano.

MR. CANO: We don't actually have an engineer available today, but we could certainly write the question down and do an undertaking to take care of that for you.

PANEL CHAIR: Okay. So we'll come back. I'll ask my questions, and then we can determine if we need undertaking from there. Thank you.

MR. CANO: Thank you very much.

PANEL CHAIR: Thanks, everyone. We'll be back at 1:30.

--- Recess taken at 12:27 p.m.

--- Upon resuming at 1:30 p.m.

PANEL CHAIR: Welcome back, everyone. I think we're right at 1:30. And I'm going to continue our questioning on accidents and malfunctions.

My next few questions are actually to Ministry of Northern Development, Natural Resources and Forestry, but again, not sure which section. They are related to dam classification and hazard -- dam hazard classification. So why don't I ask the first question, and then we'll see who is on-line to

maybe be able to respond.

So Ministry of Northern Development, Natural Resources and Forestry noted in their sufficiency submission, and this is CIAR number 886, comment 28, that during the *Lakes and Rivers Improvement Act* approval process the inflow design flood or IDF is based on the dam hazard classification which deals with the importance associated with the dam and the level of risk associated with the failure of the dam.

So in other words, the idea from the dam design will depend upon that hazard classification.

So we were wondering if one of the representatives from the Ministry could outline the general regulatory landscape for tailings dams, including kind of what's the applicable legislation and how when that legislation is applied to the design, construction, operation and closure of mine tailings dams. That's sort of the broader question.

And then I did have a couple more questions related to the actual

classification or risk assessment. Perhaps I'm not using the right words, but I think there's a formal classification assessment that one goes through as part of that. So I wonder if the representatives could let me know if there's someone that could respond.

MR. CANO: I can probably respond, but we'll need to caucus first.

PANEL CHAIR: Okay. Thank you, Mr. Cano.

MR. CANO: Thank you. Thank you for the time. Tim Cano for the record. Just because of the breadth of the question, we feel we'll need an undertaking to do it justice.

PANEL CHAIR: Okay. I wonder if I should read the next couple of questions, because they do pertain to the same topic.

What we're looking for -- so we talked about outlining that regulatory landscape, and in that context we're interested in understanding, you know, who that regulatory authority is with respect to any kind of compliance follow-up, and what are those tools that are brought to bear in the

event that there are found to be deficiencies or events that take place as they pertain to dam structures.

And then more specifically, the third question was, again, related to the sufficiency review submission where the Ministry indicated that the environmental impact statement should address the IDF in the context of dam hazard classification, and that they need to confirm Generation PGM's dam hazard classifications for dams on-site, and the reference there is CIAR number, again, 886, the PDF is page 30. Our question was going to be can the Ministry explain what would be required of GenPGM in order to undertake this request for dam hazard classification.

So just trying to get a sense of -- a little more detail with respect to the ministry's request of Generation PGM. What would be required, and, you know, what's that regulatory framework that is connected to dam structures, potential failures that kind of thing?

MR. CANO: If we could have a

moment to caucus again, I can get you an answer to that, please.

PANEL CHAIR: Okay. Thanks.

MR. CANO: Thank you. Panel, I'm back. Tim Cano for the record.

Just based on the complexity of the question, I'm afraid we're going to have to ask for an undertaking for that as well. You're not on sound.

UNDERTAKING 29:

PANEL CHAIR: Sorry, thank you. It will be undertaking number 29 for the record. Thank you.

MR. CANO: Thank you.

PANEL CHAIR: So just staying on this same topic, I had a question for Generation PGM. And while we don't have the benefit of response to the questions I just asked, I wondered -- had a couple of questions with respect to this same dam hazard classifications.

And would GenPGM be able to identify that classification for each of the dams that will be constructed on-site to help the panel get a level of understanding of the

level of risk associated with the dam breach or failure?

And the clarification question I have -- I think it was Mr. Hall this morning talked about a dam breach assessment being underway, and it would be a number of months before it's completed. I wondered if I could get some clarification. The actual hazard classification is this something that precedes the formal assessment or feeds into that assessment? So just get a sense of what that looks like.

MR. ANWYLL: Yeah, gotcha. I understand your question. I'll jump into caucus quickly and pull the appropriate folks around.

PANEL CHAIR: Thank you.

MR. ANWYLL: Give me a second. Thank you.

MR. HALL: Hello, Madam Chair. Craig Hall for the record. I would like to respond to the question, please.

PANEL CHAIR: Great, thank you.

MR. HALL: So with the process

solids management facility design and the level of work that was advanced to support the feasibility study for the project, a preliminary hazard potential classification was developed to inform the selection of the design parameters. That will be more fully developed as part of detailed design to support permitting, and that's when we'll bring in the dam breach assessment to confirm the initial estimates that we made for the preliminary hazard potential classification.

So when we look at the process solids management facility, when we did our initial estimate, we came up with a high hazard potential classification. And recognizing that it was preliminary, we actually used a larger inflow design flood such that if the hazard potential classification increased through the permitting to very high under the *Lakes and Rivers Improvement Act*, we knew that we had sufficient freeboard included to manager the IDF as well as the emergency spillways were adequately sized. So that's the approach that we've used through the feasibility level work.

When we go over to the catch basins embankments along the east side of the mine rock storage area, there we came up with a low hazard potential classification because of the relative size and, you know, short distance between the Pic River fully understanding that, you know, a breach to the Pic River has very negative aspects with respect to BN, but from the physical attributes we came up with a low hazard potential classification through the feasibility level work. Again, that will be, you know, reviewed through the permitting process and ongoing consultations with BN.

As we develop the dam breach assessment and have those results available, it's my understanding from Generation Mining that that will be shared with BN as part of the process.

PANEL CHAIR: Thank you, that's very helpful. I wonder -- so you mentioned the PSMF; you mention the cells. Are there other dams that you had to conduct the -- even the preliminary hazard classification? And I guess I would ask would it be possible

to have that submitted as an undertaking? Has that been done even at the preliminary stage that that could help inform the question?

MR. HALL: I will just caucus for one moment on that, please.

PANEL CHAIR: Thank you.

MR. HALL: Okay. Thank you for the time to caucus, Madam Chair. Craig Hall for the record again.

So we are able to provide that preliminary hazard potential classification for the process solids management facility.

UNDERTAKING 30:

PANEL CHAIR: That's great, thank you very much. That would be undertaking number 30.

MR. HALL: Okay.

PANEL CHAIR: Thank you.

Okay. My next question relates to information we've heard today around an independent tailings review board. So I have questions both for Ministry of Northern Development, Natural Resources and Forestry and also to Generation PGM.

So just as a bit of context, Biigtigong Nishnaabeg this morning and in their submissions has requested that the design, construction, closure of the PSMF be done with oversight from a body consisting of third party experts and noted independent tailings review board.

For reference CIAR number 1080, PDF 17, and then we did hear some feedback from Ministry of Environment, Conservation and Parks this morning as well.

So my first question to Northern Development, Natural Resources and Forestry is is the Ministry aware of any existing or similar type entities either in Ontario or elsewhere, and do you have any views on how effective this would be or any concerns with the establishment of such a review board? And I would ask Generation PGM the same question.

Mr. McCarthy?

MR. MCCARTHY: Yes. Hi there, Madam Chair. We would like a moment to caucus, and we'll get back to you.

PANEL CHAIR: Thank you.

MR. HALL: I would also like a moment to caucus as well, Madam Chair.

PANEL CHAIR: Thank you, Mr. Hall.

MR. ANWYLL: Madam Chair?

PANEL CHAIR: Yes, Mr. Anwyll, go ahead.

MR. ANWYLL: We can present now, or we can certainly wait until Mr. McCarthy is ready as well. Whatever is easiest.

PANEL CHAIR: Sure go ahead. Oh, Mr. McCarthy, you were just about to --

MR. MCCARTHY: Could we get a restatement of the question just so that we can get the proper answer for you.

PANEL CHAIR: Certainly. Yes. My question was, are you aware of any existing similar type entities that's been noted in submissions called an independent tailings review board? So just interested if you're aware of any similar type entities either in Ontario or elsewhere?

Do you have views on how effective this would be with respect to the

mandate that was set out in the submission or the proposed mandate of such a board, and any concerns with the establishment of same.

MR. MCCARTHY: Thank you, Madam Chair. We'll caucus further.

PANEL CHAIR: Thank you. And Generation PGM, certainly go ahead. Any concerns with the creation of such an independent board?

MR. ANWYLL: Yeah, Drew Anwyll for the record, Madam Chair.

So the total contrary. We have absolutely no concern. In fact at numerous operations we've seen the third set of eyes, the independent tailing reviews to be effective and extremely useful. In fact, we've already started with an independent tailings review through the feasibility study, and we're continuing in the detail design.

So at this point it's been analysis largely on the stability, the construction methodology, the operations, operating procedures, water management that are associated with the PSMF, and I'll hand over to Mr. Hall to clarify, again, some of

the circumstances and incidents where he's seen it useful at other operations.

PANEL CHAIR: Thank you.

MR. HALL: Thanks, Drew. Craig Hall for the record, Madam Chair.

So the inclusion of an independent tailings review board, it's outlined in the Mining Association Canada's guidelines for the management of tailings storage facilities, and it's also included in the global industry standard on tailings management that was recently developed by the International Council on Mining and Metal -- Mining and Metals.

So ITRBs are becoming fairly common, certainly on new facilities, and, you know, companies that have existing facilities are going through the process of onboarding independent tailings review boards. So it's certainly, you know, becoming the state of practice if not already the state of practice. So, you know, as being a practitioner in the industry, we're definitely supportive of it.

PANEL CHAIR: All right. Thank you very much. Mr. McCarthy.

MR. MCCARTHY: Thank you, Madam Chair. So this is a question that would require a specialist who hasn't been invited to participate in the proceedings thus far. If you are okay with us providing him with a Zoom link, we could get them on to present. Otherwise we would request an undertaking to respond to this more fully in the preceding day or two.

PANEL CHAIR: Okay. Let me -- I'll get back to you on which is the best approach. Really appreciate you letting me know. Thank you.

MR. MCCARTHY: Not a problem. Thank you.

PANEL CHAIR: Just one moment, please.

Okay. Okay. My next set of questions, we're still on accidents and malfunctions, so I'm kind of going through some of the items that were highlighted, Generation PGM, in your presentation this morning just to get a little more clarity.

So for context I'm looking at the topic area of unanticipated seepage from

the process solids management facility. Generation PGM states that:

"Unanticipated seepage from the PSMF could occur in the event that seepage rates have been underestimated."

And this is noted in CIAR number 727, 6.3, PDF 16. Water quality effects would likely be associated with subwatersheds 105 and 106 which includes Angler Creek and would occur relatively quickly. That's sort of noted on PDF page 23.

GenPGM also states that:

"It is assumed that the unanticipated seepage would require some form of management. However, we're not aware that any management plan has been provided."

So my series of questions. The panel has heard from Indigenous groups that Angler Creek is of importance for both cultural activities as well as harvesting. Can Generation PGM describe the worst-case scenario for this type of incident? For example, what would be the maximum volumes, the time of year, season, weather conditions, you know, duration of the accident, the

geographic extent and toxicity levels, just to name a few in terms of assessing the probability of this event?

MR. HALL: Thank you for the question, Madam Chair. Could I request a moment to caucus, please.

PANEL CHAIR: Yes.

MR. HALL: Thank you. Okay. Thank you for the time to caucus, Madam Chair. Craig Hall for the record.

I would like to ask CIAR reference 627, appendix D5 to be brought up, please.

PANEL CHAIR: Okay. It will take just a minute.

MR. HALL: Thank you.

PANEL CHAIR: Do you happen to have a page number Mr. Hall?

MR. HALL: PDF page 30.

PANEL CHAIR: 30.

MR. HALL: Okay. Thank you very much. So I just wanted to speak to the PSMF arrangement, the seepage collection measures, and then I'll pass it off to my colleagues to discuss the seepage estimates.

So if we look at the left-hand side of this figure, we could see the process solids management facility. The polygons in green and blue and red basically identify the extents of the PSMF. The blue polygons around the perimeter of the PSMF identify the locations of the seepage collection basins, so those are located along the downstream toe of the perimeter embankments.

So if we look at the PSMF embankments themselves, they include a geomembrane liner on the upstream face of the embankments to minimize seepage through the embankment. That geomembrane liner is tied into the bedrock foundation with a concrete plinth so that we can minimize seepage through that interface.

Potential seepage that may flow through that near surface bedrock would report to the seepage collection basins, and the locations of the seepage collection basins provide for tough topographic control so that that, you know, near surface seepage that may be migrating through the bedrock would end up

in these collection locations.

So when we talk about unintended seepage from the facility, it's, you know, seepage that's going around these measures that have been included to, you know, collect the seepage as much as possible. And it's fully recognized that seepage from the facilities to the downstream environment needs to be avoided as much as possible.

So we'll ask my Michelle Fraser to speak to groundwater seepage estimates now.

PANEL CHAIR: Thank you.

MS. FRASER: Good afternoon, Madam Chair. Michelle Fraser for the record.

PANEL CHAIR: Good afternoon.

MS. FRASER: The seepage estimates from the PSMF were conservatively estimated as the groundwater flow modelling did not account for consolidation of the tailings, routing of the bedrock or the seepage collection ditches, and each of these would reduce the seepage from the PSMF. This was done conservatively in the effects assessment not accounting for those.

In addition, the assessment or effects of the seepage from the PSMF was also completed with the conservative assumption of no attenuation along the groundwater flow path. The groundwater flow model was also used to understand the travel times of seepage from the PSMF in which the seepage is not predicted to migrate beyond the footprint of the PSMF within a hundred years.

So having said that there were a number sensitivity analysis done using the groundwater flow model to understand the sensitivity of our predictions to the seepage rate up from the PSMF to the hydraulic properties that were in the model and how it was all modelled. So in CIAR number 227, CID (ph) number 15, that's the impact assessment for hydrogeology from the original EIS.

And in the assessment we did do sensitivity analysis around the hydraulic conductivity of the bedrock, so if the hydraulic conductivity was higher or lower, how would that affect the seepage estimates from the PSMF. We also looked at the sensitivity of the predictions of seepage with

respect to bedrock routing. So there were some analysis done around that to understand a range of what those seepage estimates would be.

In addition, there's also going to be a groundwater monitoring program that will be implemented as the mine development proceeds into permitting. That program as we've mentioned before, it's going to include both quantity and quality, and we're accounting for our predicted effects of seepage in this monitoring program by accounting for the flow paths and the travel times.

So there will be monitoring wells placed immediately adjacent to the PSMF nested in the overburden and the shallow bedrock which is the predicted flow paths of seepage, and the wells will also be placed immediately adjacent to the PSMF because of the predicted long travel times. We want to install the wells as close to the facility, and then another second set of wells a little bit further down gradient of those but to allow the validation of the predictions of

seepage within a reasonable timeframe.

So that monitoring program will include an adaptive management component. That component will through triggers thresholds for groundwater quantity and quality that alert to changing conditions which will allow this flexibility to address and accommodate new circumstances. For example, if we're seeing seepage quality that is beyond that that was predicted in the EA, it will give us the time to implement new mitigation measures if needed.

So there will be an associated response plan with those triggers, and it will include contingency options for the management seepage that may be implemented if necessary.

I'll pass you off to Mr. Brian Fraser now just finish up the response.

PANEL CHAIR: Thank you.

MR. FRASER: Thank you, Michelle. Madam Chair, it's Brian Fraser for the record.

So what I can offer and I think might be helpful to the discussion is

sort of the down gradient effects as you mentioned in your question.

So we think we can use or we think we can use appropriately, to provide some perspective on that, the water quality model scenarios for closure during the closure phase.

So given the conservative nature of the model predictions both as Craig and Michelle have indicated, the closure predictions for subwatersheds 105 and 106 might provide a quite useful surrogate in this situation. Those predictions have assumed no attenuation with relatively high seepage rates as Michelle explained. And as we see in those model scenarios without attenuation, and we assume that the process water that's entrained in the PSMF essentially reports directly into those watersheds, water quality in subwatersheds 105 and 106 remains below appropriate water quality objectives for the protection of aquatic life.

So I think overall in this scenario as explained by Craig in terms of PSMF construction, Michelle in terms of how

the hydrogeology environment works and then with respect to how the closure phase for water quality was modelled, I think we can be relatively assured water quality in the subwatersheds will be protected.

PANEL CHAIR: Thank you.

I had a question related to the rating that you applied in your accidents and malfunctions with respect to unanticipated seepage being low. I think you may have answered that in the questions you've just responded, but anything else you would like to add with respect to -- given potential impacts if this were to happen, the probability and likelihood of the low rating for the seepage, accident or malfunction?

MR. FRASER: Thank you, Madam Chair. Just give me one sec to caucus.

PANEL CHAIR: Okay.

MR. FRASER: Thank you.

MR. HALL: Thank you, Madam Chair, for the question. Craig Hall for the record.

Our assessment does remain low. The only other comment that we would add

for the record is that if we did see increased seepage for some reason that wasn't as expected, it would be a addressed as part of the adaptive management plan for the facility. And when we speak specifically to the PSMF, there will be an operation maintenance and surveillance manual developed for the facility, and this will identify a trigger action response plan.

So, you know, an example of one of the items in that trigger action response plan would be seepage rates from the PSMF, and if we saw increased rates that were not compliant with the design, then such things as a pump back program from downstream monitoring wells could be incorporated as part of the adaptive management plan.

So that's kind of a general idea of the approach that would be taken if such an occurrence was observed.

PANEL CHAIR: Actually I did want to ask -- probe a little bit on that response.

In the event as you say if this did occur, Generation PGM has described

potential degradation of water quality in stream 6 downstream of the PSMF such that aquatic biota may be negatively impacted and a potential for increased base flow in the stream 6 subwatershed. So just trying to get a sense of if this event were to occur what would those effects to fish or fish habitat, species at risk, wildlife be expected, and what are some of those response scenarios to mitigate any of those effects?

MR. HALL: Thank you for the question, Madam Chair. Just request some time to caucus, please. Thank you for the time to caucus Madam Chair. Michelle Fraser will respond to the question.

PANEL CHAIR: Thank you.

MS. FRASER: Madam Chair, Michelle Fraser for the record.

So actually if you don't mind just repeating the question just so that --

PANEL CHAIR: Yes. So Generation PGM described the potential environmental effects for this accident scenario as degradation of water quality in stream 6, downstream of the PSMF such that

aquatic biota would -- could be negatively affected and increased base flows in the stream 6 subwatershed.

And given the description of at least these two potential effects, I wanted to understand more clearly, you know, how that would impact fish, fish habitat, species at risk, wildlife, other receiving sort of areas of this potential impact, and what opportunities to mitigate this, or as we've heard in other accidents and malfunctions cleanup efforts would be available to be brought to such an event?

MS. FRASER: Okay. So the mitigation measures, that doesn't change. So the seepage from the PSMF through the ground is generally relatively speaking long travel times when you're thinking of the ability to implement mitigation measures and such compared to when you're thinking of like a surface runoff into the stream. And so the mitigation measure wouldn't change. It would still be to monitor any foreseen increased effects of seepage from the PSMF. Then it would be to implement the mitigation measure

at the source, as Mr. Hall indicated maybe by way of pump back well to contain the seepage.

So the mitigation measure would remain the same, is to address the seepage at the source.

PANEL CHAIR: Okay. That's helpful clarification.

I wonder is there -- with this type of potential event, the timeframe within which that response can happen. You talked about monitoring trigger events. Being able -- trigger values being put into place for that monitoring. Just trying to think about what kind of residual effects may persist as the response is happening. Do you have a sense of -- you know, what's that timeline within which there is a potential for effects to persist in those vulnerable areas that I described or that you've actually described in the submission related to response times for addressing the issue of seepage?

MS. FRASER: Yes, so I would just like a moment to caucus.

PANEL CHAIR: Okay.

MS. FRASER: Thank you for the moment.

The adaptive management plan, like you mentioned, is going to include triggers and thresholds. The intent of those thresholds is to be -- to alert to changing conditions prior to observing a significant effect. So if we predict seepage from the PSMF is of a certain quality, the threshold for an investigation would not be that predicted quality. It would be some proportion, lower percentage of that quality so that we can investigate, determine if there is a project-related effect that is or may potentially occur and implement mitigation measures prior to that happening. So I just wanted to explain that part of the adaptive management plan.

And then in terms of the mitigation and the timelines and such, the mitigation measures for excess seepage from -- the potential excess seepage from the PSMF are all located up gradient of the surface water receivers.

So the objective is to

identify the change in potential seepage prior to it reaching the creek, and if that does occur, then mitigation measures would be implemented. And when we're talking about groundwater flow, again, the predicted travel times are very long. Even if we did a sensitivity analysis on those travel times, we're still looking at years to decades of flow, travel to the creek. And the time it would take to implement a mitigation measure such as a pump back system would be on the order of months.

PANEL CHAIR: Okay. Thank you.

Just on the topic of alerts pertaining to what you would put in place or Generation PGM would put in place. Would there be a point in time where there would be alerts to the community or Indigenous groups? Would they be notified if there were any sort of water quality issues? Perhaps not just related to seepage PSMF but slope failure, that kind of potential accident malfunction. Curious to know whether that's part of the management plan going forward.

MS. FRASER: The management

plans will be submitted to support permitting, and in the permitting process the management plans should have a notification process, and there is -- at which point -- at which threshold is crossed is at that point of notification such as the MECP. So that is usually a standard component of the management plans.

PANEL CHAIR: Thank you.

MS. FRASER: So Generation PGM did also commit earlier, I believe it was yesterday, to a communication plan as part of that as well.

PANEL CHAIR: Perfect. Thank you.

And then just does Generation PGM from their perspective could this worst-case scenario accident and malfunction result in any significant adverse effects to any of the VECs?

MS. FRASER: Just to caucus for a moment so that we have the right person for that response.

PANEL CHAIR: Okay. Thank you.

MS. FRASER: I'm going to pass

you off to Mr. Fraser.

PANEL CHAIR: Thank you.

MR. FRASER: Thank you, Michelle. Madam Chair, it's Brian Fraser for the record.

Yes, we can confirm in consideration of the mitigations that would be provided that we do not anticipate significant adverse effects to those VECs you mentioned.

PANEL CHAIR: Thank you very much. Thank you.

So just as I close out this particular topic, I wonder if we could have Environment and Climate Change Canada and MECP on the line.

So similar question. Looking for your views on the potential effects of worst-case scenario event relating to unanticipated seepage of the PSMF. And are you in agreement with GenPGM's proposed response measures, and that they can mitigate any significant adverse effects?

MR. CLAVERING: Rob Clavering from Environment Climate Change Canada for the record. If you can just give me a moment to

caucus.

PANEL CHAIR: Yes, and MECP as well?

MS. GILLIAM-PRICE: Yes, please.

MR. CLAVERING: So Rob Clavering, Environment Climate Change Canada for the record.

PANEL CHAIR: Thank you. Go ahead.

MR. CLAVERING: Yeah. I'm just going to reiterate some of what has been said before and during the aquatic session, and we'll answer both questions as part of one overall statement.

Accounting for (skipped audio) has ECCC indicated before, accounting for seepage in effects predictions is important to the understanding of potential impacts to the Pic River as well as other waterbodies within the watershed. This is why ECCC is recommending a wastewater management plan and follow-up monitoring program, including groundwater monitoring network to be developed and implemented in order to verify

predictions and identify the need for additional mitigation and monitoring measures to protect aquatic life if required.

We also want to emphasize that subsection 36(3) of the *Fishery Act* does provide that general prohibition that unless authorized by federal regulation, that no person shall deposit or permit deposit of deleterious substances of any type to waters frequented by fish or any other place where these substances may enter such waters.

And also like to add and point out that in the event of seepage entering the environment that there is the requirement for notification to the Ontario spill action centre, which is a one-window approach, and this reporting would inform both the Ministry, province as well as ECCC.

PANEL CHAIR: Thank you.

MS. GILLIAM-PRICE: Jacinth Gilliam-Price here. I'm going to pass our response off to Alisdair Brown who is covering hydrogeology for the project.

PANEL CHAIR: Thank you.

MR. BROWN: This is Alisdair

Brown for the record. We generally agree with what is being proposed by Generation. Generally when we're dealing with seepage and looking for unknown seepage we would be asking at permitting that they prepare a detailed monitoring program for the purpose of trying to detect seepage that was beyond what was predicted, and we would also tie that in with a contingency plan that would have measures that could be taken to address if there was any seepage of that type so that it could be mitigated.

PANEL CHAIR: Thank you very much.

My next set of questions are related to the controlled release of water to the environment from the PSMF and the MRSA. So I have a number of questions for Generation PGM with respect to this.

So Generation PGM describes the controlled release of untreated process water and runoff water from the PSMF over a spillway to Hare Lake for the inflow design flood condition 1 in 10,000 year, 24-hour event. Can Generation PGM confirm that 1

million cubic metres of water discharged over one to two days is a worst-case scenario for a controlled PSMF release.

MR. ANWYLL: Thanks for the question. I'll certainly caucus quickly. Thank you.

MR. HALL: Thank you for the question, Madam Chair. I can confirm that that estimated volume of approximately 1 million cubic metres is correct. That estimate is based on approximately 14,000 cubic metres per hour over three days.

One clarification that I would like to put on the record is that that spillway discharge is to stream 6 and not Hare Lake. That is an error on the table. Where it is correctly indicated is CIAR reference 727, section 6.3.2.9, and that's PDF page 11.

PANEL CHAIR: So just so I understand correctly, I know what I read out was over spillway to Hare Lake. That should be spillway to stream 6?

MR. HALL: That's correct.

PANEL CHAIR: Okay. So thank you for that.

I have another similar question related to the MRSA. So Generation PGM has also described the controlled release of untreated runoff water from the MRSA to the Pic River in the event that the MRSA environmental design storm occurred during the height of the spring runoff.

So could Generation PGM confirm that peak discharge of approximately 540 and 350 metres cubed per hour from catch basins 2 and 3 respectively would be an absolute worst-case scenario taking into account time of year and climate change predictions?

MR. HALL: Thank you for the question, Madam Chair. Just take a moment to caucus, please. Thank you nor the time to caucus, Madam Chair.

The values that are included in the table there that you referenced, those are very conservative estimates. Those estimates were developed when the catch basins were originally sized for a 1 in 25-year event. Subsequent to that work there's been a commitment to size the MRSA catch basins for

the 1 in a 100-year 24-hour event including for climate change, so an increase in that event over time.

So we would actually contain the full 100-year event and the release would be less than what is estimated.

PANEL CHAIR: So less than the 540 and the 350?

MR. HALL: Correct.

PANEL CHAIR: Do you have any numbers or just a percentage less? Is it --

MR. HALL: I don't have specific numbers, no.

PANEL CHAIR: Fair enough. I did want to just go back really quickly to your response in the first one.

You did confirm that the 1 million cubic metres discharged over one to two days was worst-case scenario, but then I think you added 14,000 cubic metres per hour over three days. So I just wondered the difference in the one and two day reference and then the three day reference. Could you help clarify?

MR. HALL: I'll just take a

minute to double check that and caucus, please.

PANEL CHAIR: Okay, thanks.

MR. HALL: Thank you for the time to caucus. The million cubic metres over the one to two days was to indicate there would be a significant amount over a short time period. When we actually look at the math it's approximately 14,000 cubic metres per day over a 14 -- sorry, 14 thousand cubic metres per day over a three-day period, but in the table it was rounded to a million over to one to two days just to indicate that it would be a significant event over a short period of time.

PANEL CHAIR: Okay. Thank you.

Just in this same topic area, can Generation PGM please explain its considerations and approach in determining the probability and likelihood rating for this particular probability as remote for the PSMF release and low for the MRSA release.

MR. HALL: Thank you for the question, Madam Chair. I'll just take one moment to caucus, please. Thank you for the

time to caucus Madam Chair.

When we look at the process solids management facility, you know, it's been sized to contain the environmental design storm and then a portion of the inflow design flood over and above that.

So to have the event where we would see discharge from the spillway we basically need the 1 in 10,000-year event to occur over the approximately 13, 14-year mine life. So give the likelihood of that it's classified as remote.

And then if we look at the MRSA catch basins, we would need a 1 in 100-year event to occur over again a 13, 14-year mine life and that was classified as low.

PANEL CHAIR: Thank you. Just a question on chronic threshold levels for certain metals. So the EIS addendum states that certain metals may be above chronic threshold effect levels but only for a relatively short period of time, therefore no chronic effects anticipated.

Can Generation PGM explain

your assumption that certain metals may be above the chronic threshold effects for only a relatively short period of time, and is there a time threshold where those affects may occur? Have you anticipated or can you tell us about any scenarios where chronic effects or toxicity may happen.

MR. HALL: Thanks for the question. Request some time to caucus, please.

PANEL CHAIR: Yes.

MR. FRASER: Thank you, Madam Chair. It's Brian Fraser for the record. And just by way of clarification, I assume this is with reference to either the PSMF overflow event or the MRSA overflow event.

PANEL CHAIR: Yes, please.

MR. FRASER: Yes. So we've acknowledged the possibility that chronic effects levels could be exceeded, although our quantitative predictions on the MRSA event in particular don't demonstrate that. We looked specifically at the rate of release from the storm event into mean annual flows in the Pic River, which we believe is very conservative given that the event would happen during a

significant rain event or precipitation event. But we've assumed an average flow in the river.

But as you would expect, flows in the river in that kind of event would be exceedingly high as well and our predictive effects assessment essentially does not provide for -- or provides for small incremental changes. But as I said, we have acknowledged the possibility of water quality constituents exceeding a chronic benchmark.

Chronic benchmarks are long-term exposure benchmarks, weeks to months of exposure leading to changes or chronic effects that might be effects on growth or reproduction, those types of effects.

The scale of the overflow event in the river would be in the order of hours and days. So given that, we're quite comfortable in the conclusion that while it's possible that we could exceed some chronic thresholds, that there would be no significant adverse effects based on duration of exposure.

PANEL CHAIR: Thank you. One last question just on this particular topic.

Based on the anticipated size fraction of the tailings, are there risks of dispersion of any suspended solids beyond the area close or proximal to the spillway in the event of a controlled release of water from the PSMF, and is there a risk of those suspended solids remaining in suspension for any extended periods sort of adding or increasing the possibility of dispersion of those suspended solids?

MR. FRASER: Thank you, Madam Chair. Just take one second to caucus. Thank you, Madam Chair. Brian Fraser for the record.

So as we've discussed, we've characterized this event at remote in terms of probability, but it is conceivable that smaller particle size clay fraction sized suspended sediment would be mobilized during the event, and those particles don't settle readily and would travel some distance.

Having said that, there would be -- I said it's a relatively short event. The amount of water generated in this event would be -- that it would be relatively dilute and the likely effect would be -- or the

effect would likely be masked by the natural erosion processes happening within the watershed.

As you can imagine, these types of events aren't specific to the facility; they would be happening on the local basis so there would be quite a lot of suspended solids being mobilized into streams as is always the case during storm events.

PANEL CHAIR: Thank you. I've got three or four questions for Generation PGM related to PSMF or a reclaim water pipeline failure. And then just following that we'll take a break. Let me give you a bit of context here.

So for the PSMF or a reclaim water pipe failure accident and malfunction scenario, Generation PGM described the potential environmental concerns in relation to type 1 solids, type 2 solids, liquid phases of process solids, and reclaim water, and the reference is CIAR number 727, section 6.3, PDF 23.

And just quickly, you've described a solid fraction would swamp the

area in the vicinity of the pipeline failure, affecting terrestrial habitat, but no toxicological related concerns due to solids chemistries for type 1 and metals not in bioavailable form for type 2.

You describe liquid fraction may drain into existing surface water features, but metals below acute thresholds but above chronic thresholds, given short duration of exposure, no negative effects predicted. And finally, reclaim water may drain into the existing surface water feature; metal levels below acute thresholds but above chronic thresholds, and given short duration of exposure, no negative effects predicted.

So question 1. You describe a pipeline failure as an event that could occur as the result of a mechanical failure or a rupture due to a severe impact. Can Generation PGM confirm that the release of about 1,050 tonnes of process solids and about 1,300 cubic metres of reclaim water would be an absolute worst-case scenario taking into consideration the year of mine life, time of year, season, extreme weather, climate change. There is a

reference I can provide: PDF 14 of chapter 6.3, CIAR 727.

MR. FRASER: Thank you for the question, Madam Chair. We'll just caucus for a moment.

MR. HALL: Thank you for the question, Madam Chair. Craig Hall for the record.

I can confirm that those values listed on conservative estimates. There will be a real-time monitoring of both those pipeline systems such that if there is a change in flow or pressure they will be shut down. So that estimate basically provides for some time for that occur which would be over a few minutes, but obviously there's a volume in the pipeline that could drain to wherever the rupture location is.

PANEL CHAIR: Thank you.

MR. HALL: Just to note that the pipe work is contained within the footprint of the PSMF and the plant site so there would not be an off-site release during the event.

PANEL CHAIR: And maybe just a

follow-on question, although you may have answered some of this just now, but looking for the considerations and approach you took in determining the probability and likelihood rating of this as low for PSMF or reclaim water pipeline failure event.

MR. HALL: With that low characterization, I mentioned earlier the OMS manual, or operating maintenance and surveillance manual, part of the regular operation of the facility on each shift there would be someone responsible for inspecting these pipelines. So they are going to drive along the road alignments, have a look, make sure there's no visible leaks, this type of thing. Because that level of monitoring occurs on a regular basis we felt that low is an appropriate rating.

PANEL CHAIR: It's 10 after 3:00. I think we're going to take a break till -- just a 15-minute break till 25 after. Thank you for your information thus far and we'll return here at 3:25. Thank you.

--- Recess taken at 3:10 p.m.

--- Upon resuming at 3:25 p.m.

PANEL CHAIR: Welcome back, everyone. I'm going to continue the line of questioning for accidents and malfunctions, and this topic is related to water treatment plant failure. Again my questions are to Generation PGM.

So for the water treatment plant accident and malfunction scenario the potential and environmental issues identified by Generation PGM are no acute toxicity to aquatic biota expected based on predicted water quality. Certain metals may be above chronic threshold effect levels but only for a relatively short period of time, therefore no chronic effects anticipated.

I wanted to confirm that this description does imply that untreated water may be released to Hare Lake in the instance where there is a water treatment plant failure, however the response procedures provide for this scenario state "the procedure will focus on halting the flow of water from the plant to the environment, identifying the issues associated with the failure, and subsequently rectifying the issue so the plant

can be brought back on-line."

So that sort of sets up a little bit of the context and our first question is does Generation PGM anticipate that mine effluent will continue to be discharged into Hare Lake should the water treatment system in place fail.

MR. ANWYLL: I'll caucus quickly if I could, Madam Chair.

PANEL CHAIR: Thank you.

MR. HALL: Thank you for the question, Madam Chair. Craig Hall for the record.

So there's no intent to discharge untreated water to Hare Lake through the water treatment plant. In the event that the water treatment system wasn't operating correctly and there was a lag time in detecting this -- I mean, there will be real-time monitoring in the water treatment plant, but in the event that it's not treating as per the requirements and obviously there's water going through the system and there's a detection time, so there is potential for water that's not being treated in the system

to get discharged to Hare Lake are for very short period of time while that is being detected.

Once that's detected, water discharge to Hare Lake through the water treatment facility would stop and we would temporarily store that water within the PSMF and the available freeboard and contingency storage capacity until the water treatment plant could be brought back on-line.

PANEL CHAIR: Okay, thank you. Actually it was a second question I had in terms of predicting sort of a worst-case scenario response time to repair the treatment system and have it back on-line and where would that -- would you have adequate water storage available at all times to accommodate any kind of delay in treatment or restoration of the plant.

MR. HALL: There is significant contingency storage within the PSMF. Obviously if there's a significant delay and we were approaching the designed filling levels, under a worst-case scenario the operations may need to be suspended for a

period of time under a worst-case scenario.

PANEL CHAIR: Thank you. Just one second.

Generation has indicated that there will be no acute toxicity to aquatic biota as a result of a water treatment plant failure. However, the panel notes that quantitative predictions of mill reagents were not developed as part of the water quality model, and as such, we have heard GenPGM's commitment to monitor effluent toxicity, and that's reference CIAR 950, IR 5-3, PDF 9.

So could Generation PGM explain its level of confidence that there would no acute toxicity given that the mill reagents weren't developed as water quality modelling?

MR. HALL: Thank you for the question, Madam Chair. I'll just take a moment to caucus and get the right person to answer the question.

MR. FRASER: Madam Chair, Brian Fraser for the record. We have a high degree of confidence that we would not be seeing acute toxicity. As was discussed in

previous sessions, these are normal over the counter reagents that are used in mills as sort of run of the course, run of operations.

Those mines and mills do routine toxicity testing. There's no indication from any other sources that we found that would attribute acute toxicity to those chemicals. But as you did say, we've committed to measuring the levels of those chemicals in effluent to understand that better and there will be routine acute toxicity testing as well as sublethal toxicity testing done per requirements that would be part of the provincial operating permits, the ECA, as well as to satisfy conditions for the mining and MDMER.

PANEL CHAIR: Thank you.

Another series of questions related to spills, the first one being a potential for fuel release during transport.

So during this accident malfunction scenario the potential environmental issues identified by Generation PGM are contamination of terrestrial habitat in the immediate area of release with toxicity

to soil-dwelling invertebrates and local vegetation, and contamination of aquatic habitat, water sediments with toxicity to aquatic biota, fish, benthic and invertebrates.

So could Generation describe the worst-case scenario of an incident related to a fuel release during transport? For instance, I would like to get an idea, has Generation PGM considered potential maximum volumes in conjunction with sort of a worst case time of year or season, weather conditions, geographic extent, and toxicity levels.

So I just want to get an idea if there were fuel spilled during transport along that part of the road close to the Pic River, what kind of scenarios have been assessed with respect to worst-case scenario of a potential fuel spill.

MR. FRASER: Thank you for the question, Madam Chair. We'll just take a moment to caucus.

Brian Fraser again for the record, Madam Chair. So let's address

terrestrial release first, if that's okay.

PANEL CHAIR: Yes.

MR. FRASER: Tanker truck sizes might vary, but it could be anywhere from approximately 34,000 litres to 60,000 litres. So we have characterized such an event on the low probability scale. So I think it's always important to consider overall risk both within probability and consequence, not to diminish the level of consequence but just to put the overall risk in perspective.

Deliveries would be made by licensed providers with train drivers. There would be transportation and community or communication plans around those, sort of typical mitigations that would be associated with large-scale deliveries to lessen probability.

Also I'll note that the -- part of the rationale to move the access road away from the Pic River once construction starts is purposely to ensure or lessen the likelihood that such an event might occur. But let's consider the hypothetical where an event does occur. I think that's fair.

If that volume was to go to ground, if it occurred when the ground wasn't frozen I think you rightly assumed that it would seep into the ground and would impact that local area around the spill. Given that the site is not remote and there would be emergency response procedures in place both in terms of the contracting company or the supplier being primary response and GenPGM coordinating through secondary response with local resources, it's unlikely that that event or that spill would be in place very long.

So assuming the entire contents was to spill, then emergency response would be activated, resources would be mobilized to the area once it was determined that it was safe to move forward. Any free product would be vacuumed up. Any contaminated soils, vegetation, would be excavated and then the area tested and reclamation -- once it was determined that it was appropriate to reclamate, that reclamation would occur.

PANEL CHAIR: Thank you. I just want a little follow-on to that.

So the timeline of the

potential event, you've got that immediate timeline where there is the potential, you've talked about terrestrial. And then you've got the clean-up and potential kind of residual effects.

Just wonder if you could talk a little bit about how those have been assessed kind of immediately following the incident and any residual effects after the incident and how those have been sort of characterized in terms of effects to various VECs.

MR. FRASER: On the terrestrial release, it's unlikely that there would be long-term effects. I said the spill would be contained to a local area and based on clean-up would not persist. So I think we can reasonably say with some comfort that on the terrestrial side there would be no long-term effects, minus of course the area that's been cleaned up and reclamated.

PANEL CHAIR: And potential for other aquatic fish.

MR. FRASER: So if again, and I would qualify as being a very unlikely

scenario where the truck went into a water course, it's -- obviously it's a different type response. There's still opportunity for clean up. It's a more extensive and slightly more invasive process obviously. When the fuel would be released some of it would volatilize. Diesel in particular is heavy and would likely bind with sediment particles.

But there would be -- and would be relatively -- depending on where it spilled. If it was in a creek that had a low velocity area and relatively shallow it would likely -- a significant portion of it if it was diesel would likely settle out, attaching to sediment particles, but some would remain in the liquid phase.

I think you would expect that you would see, much like you sometimes do, that sheen on water, and that material would travel downstream. There would likely be acute effects in the immediate area of the spill, but as it moved downstream it would be diluted. Typically it would be isolated to the very surface of the area where you see that sheen.

And then as I said, it's not an isolated area so there would be spill response implemented in a relatively short timeframe, conditions assessed, and then the spill contained and clean-up procedures would start.

PANEL CHAIR: Thank you. Just to close off that, could this worst-case accident malfunction scenario result in a significant adverse effect to any of the VECs?

MR. FRASER: Within the context of significant adverse effects, if we're -- we've defined the levels of significance around viabilities of populations. Certainly it effect individuals but it would be highly unlikely to affect populations at that level.

PANEL CHAIR: Thank you. Just one minute. I just wanted to follow-up again still on the spill scenario. And this would be related to a chemical release during transport.

So with respect to a potential release of chemicals during transport, Generation PGM indicates in the EIS

addendum that the severity of a release of any chemicals being transported to the mine site would depend on several factors, including the nature of the material, the location, the time of year and the volume. No specific additional information had been provided on a particular scenario. And I would reference CIAR 727 6.3 PDF 10.

In their hearing submission, Environment and Climate Change Canada indicates that it disagrees with Generation PGM's conclusion regarding the inability to define a particular event as, in their view, a single event can be identified given the nature of the products that will be stored at the project site will be known to the proponent. And I would reference there CIAR number 1086, PDF page 119.

So my question, Generation PGM indicates in the EIS addendum that the largest volume event would be related to the transport of mill process chemicals, and could you describe the plausible worst-case scenario chemical release during transport that could occur related to any mine-related process,

potable or mine water treatment or blasting chemicals; for instance, again sort of thinking about maximum volumes, time of year, duration of the accident, geographic extent.

I am looking to get similar details on how you described a fuel scenario but related to the types of chemicals you, Generation PGM, would have at the mine site or being transported to the mine site.

MR. FRASER: Thank you for the question, Madam Chair. Just give us a few minutes to put that information together for you. Thank you, Madam Chair.

Why don't we take a view of one of the flotation chemicals. They will come to the site in powder form in essentially 1,000 kilogram or 1 tonne totes. So we can walk through again a scenario whereby there's a release to ground and then subsequently released to water.

So we'll assume for the scenario that this does not occur in the winter. If there's a release to ground in the winter obviously the ground is frozen and then it becomes quite simple to clean up. But let's

assume we're sometime in the summer and the contents of one tote are released to ground. As I said, it's a powder and therefore it would remain within the immediate vicinity of the release.

Per the emergency response plan, as soon as that occurred or within a reasonable timeframe subsequent to that occur, again because the mine site is not remote, resources could be deployed to the site and then that material excavated.

And not only that material, if there was -- presumably it would be mixed in with soil and plant material in the area where the release could occur, and that material would be cleaned up, it would be disposed of in an appropriate manner, and then the area reclaimed.

If it was released to water, these are water soluble chemicals, so likely the powder would begin to dissolve. Concentrations of those chemicals in that immediate vicinity could be quite high. As they are dissolving there could be some acute toxicity associated with that in the immediate

vicinity, and then in more far afield areas where dilution was provided those concentrations would dissipate.

So again if we go back to the previous example, and just for reference I would say that generally speaking we would think that the loss of diesel fuel is kind of a bounding scenario to any kind of chemical release we would see associated with the mine, but I appreciate the desire to get a handle on or a description of a chemical release. But within the context of the release itself, I think with some comfort we can says there certainly could be some acute toxicity associated at the individual level, but our significance determination or our significance threshold being effects at this population level, those would not occur.

PANEL CHAIR: So with respect to that, in its hearing submission Environment and Climate Change Canada recommends that Generation PGM be required to conduct a quantitative risk assessment associated with a chemical release during transport and identify any potential environmental issues.

As part of this risk assessment Generation PGM should commit to mitigation strategies, contingency plans and response capabilities that are commensurate with the environmental risks that this project may pose including, but not limited to, contingency plans based on worst case and alternative accident scenarios. And I know that we have heard from ECCC today on a couple of occasions with respect to that.

So just wanted to ask generally, does Generation PGM have any concerns with following this recommendation from ECCC.

MR. FRASER: Thank you, Madam Chair. Just give me one second to caucus.

Madam Chair, Brian Fraser for the record.

We have no concerns with the comments provide by ECCC earlier. This is a hundred percent consistent with best practice, and I think, as we've stated in the EIS documentation, the emergency response and preparedness plan would be completed consistent with CSA guidance and would

necessarily include specifics around spill response and risk associated with that.

PANEL CHAIR: Thank you. So that concludes the panel questions on accidents and malfunctions.

We're just going to take five minutes to caucus and get questions prepared for potential effects to the environment. So how about just 4:05-ish we'll be right back. Thank you.

--- Recess taken at 3:59 p.m.

--- Upon resuming at 4:04 p.m.

PANEL CHAIR: Thank you. Just a couple of things. The panel does have a number questions on -- and I might have said this backwards before the five minutes -- it's the effects of the environment on the project. So those are the -- that's the context of the questions we have.

I'm going to suggest that we do go to 6 o'clock this evening. I'll get through as many of these questions as we can, but that does mean that our closure questions will move into tomorrow. So I just want to let participants know that that is what things are

looking like right now.

And with that -- and just before we close today I'll also do a quick summary on the undertakings and the status of those.

So right now I do have a number of questions related to the effects of the environment on the project, with the first topic being forest fires and a few questions for Generation PGM.

So Generation PGM states that a major fire at the site could cause property damage and the interruption of operations. The data from the Canadian Wildlife fire information system indicates some frequency of fires regionally in the area of interest from about 1980 to 2019, though forest fire activity in the immediate vicinity of the project site appears limited. And I do have some references of that if necessary but I'll start with my few questions.

Does Generation PGM have any concerns on how a forest fire event could disrupt the integrity of water or any kind of fluid retaining structures or fuel storage?

MR. ANWYLL: I'll kindly caucus quickly if I could.

MR. DART: Thank you for the question, Madam Chair. Jeremy Dart for the record.

One of the processes that Generation PGM is going to undertake is clearing the entire site study area. That will help de-risk the infrastructure that is located within the site study area.

So from a fire perspective there would be a very low probability that water management structures or fuel facilities on site would be compromised. The only exception would be possibly the transmission line that runs off site to tie into the Terrace Bay (indiscernible), and that could be compromised by fire, as well as the water line that leaves the site to Hare Lake.

We would also undertake appropriate brush clearing to maintain those right-of-ways, but yeah, there would be a low potential for those two pieces of infrastructure to be damaged from a fire.

I believe you are on mute,

Madam Chair.

PANEL CHAIR: I am, thank you.

Are there additional mitigation measures that Generation PGM could put in place to reduce the potential for any kind of mercury mobilization into local surface waters following a forest fire event?

MR. DART: Thank you for the question. If you can just give us a moment to caucus. Thank you for the question, Madam Chair. Jeremy Dart for the record.

So with respect to mercury mobilization, the company will have cleared the site study area of overburden materials. That would not allow any mobilization of mercury to occur in the event of a fire, and then we don't expect to have a fire within the site study area due to the clearing so no further mitigation would be required.

We have collection and erosion control designs within the site study area.

PANEL CHAIR: Thank you. Has Generation PGM considered the potential for a major forest fire? In its closure

re-vegetation plan, for example, are there particular plant species that may or may not be more resilient in terms of effects from a fire?

MR. ANWYLL: Sorry, Madam Chair, can you repeat the question for me again.

PANEL CHAIR: Has Generation PGM considered the potential for a major forest fire in its closure re-vegetation plan, just thinking along the lines of selecting particular plant species that may or may not be more resilient for planting --

MR. ANWYLL: Fair enough, I understand your question. I can't answer it but I'll caucus quickly to get somebody who can.

PANEL CHAIR: Thank you.

MR. ANWYLL: Thank you for the question. We did manage to track down somebody who can provide an informed answer. So Dr. Foster will come back and clarify.

PANEL CHAIR: Thank you.

DR. FOSTER: Rob Foster for the record. The predominant species that we're

going to be using for re-vegetation of the forested portion of the site study area post-closure will be combination of jack pine and black spruce. Both are fire adaptive species and are widespread across the boreal forest. Jack pine in particular has serotinous cones, so the cones that are sort of welded shut by sap and that they only open in the presence of fire or extremely hot ground conditions on (indiscernible) bedrock so it's very suitable for planting in dry soil conditions where fire is a risk and it thrives after fire. I mean, it's really driven by fire.

Black spruce as semi-serotinous cones. They have a broader ecological range in wet and dry areas so they are pretty adaptable, but these cones will also open up post-fire and then seed onto the exposed soil.

We also plan on including native species where available in some of the herbaceous and forward (ph) mixes, including fireweed, which is an early successional species that's fire adaptive as well. Thank

you.

PANEL CHAIR: Thank you very much.

For my next question, it's a common question to three government organizations. So I wonder if we could have NRCAN, Ministry of Natural Resources and Forestry, and Environment and Climate Change Canada on the line. Thank you. Very quick.

So I have a common question for all three and then a couple of additional questions for each organization.

So the one common question is do you have any concerns with the potential for forest forests in the project area and its effects on the project. And I think in my previous context GenPGM had noted that Canadian Wildlife fire information system data does indicate some frequency of fire regionally in the area of interest, though fire activity in the immediate vicinity of the project appears limited. So just with that context.

To MNRF specifically, would you have anything to add to that context with

respect to likelihood of forest fires in the project area. And then just to ECCC, in addition to the concern for any potential for forest fires in the project area as it pertains to climate change during operations, closure, or post-closure.

MS. DARBY: Madam Chair, if we could just take a moment to caucus that would be appreciated.

PANEL CHAIR: Certainly, for all of you.

NRCan, go ahead.

MS. LENGHAN: Thank you, Madam Chair. Maybe I can go first.

The Canadian Forest Service of NRCAN did not provide this expertise for the review of this project. We focused more on the caribou habitat suitability and functional landscape connectivity for the project. However, I can seek for the question internally to see if SN (ph) and maybe get back to you so take this as an undertaking.

PANEL CHAIR: I can let you know if we need to do an undertaking. I appreciate your response. Thank you.

MS. LENGHAN: Thank you.

PANEL CHAIR: Environment and Climate Change Canada, are you ready?

MR. CLAVERING: Robert Clavering from Climate Change Canada for the record.

I wanted to confirm that with respect to forest fires, that forest fires are not within the mandate of ECCC, and our expectation of GenPGM would be that they follow their emergency response plan in the event there were to be a forest fire that affected the project.

PANEL CHAIR: Thanks very much, appreciate that.

MS. DARBY: Thanks for the time to caucus.

Unfortunately, we don't have one of our fire -- wildland fire specialists with us, but from what we do have chatting within our group of experts we have -- the DIS, we did make a comment in regards to the EIS having insufficient information in relation to wildland fire, and that came from (indiscernible) fire unit. And this is related

to the wildland fire policy provincial statement of 2020, and then the *Forest Fire Prevention Act.*

Part of the legislative requirement in regards to forest fires is that any mine located within 300 metres of a forested area is required -- requires that the surrounding area to be cleared of flammable debris for a distance of at least 30 metres.

So definitely there is some requirements on our friend in regards to minimizing that impact. Unfortunately, I can't give your a response in regards to the likelihood of a forest fire in that area without reaching out to our forest fire folks to get more information.

PANEL CHAIR: Okay. Thank you, I appreciate that clarification and I can let you know if we need further follow-up on that.

MS. DARBY: Thanks.

PANEL CHAIR: Thank you very much.

My next few questions are related to extreme weather and climate change. They are to Generation PGM and they relate

specifically to Timmins storm and precipitation amounts for the PSMF design.

So it is the panel's understanding that Generation PGM has proposed to design the PSMF to contain an environmental design storm of 408 millimetres and an inflow design flood capacity of an additional 328 millimetres.

In considering this scenario of a June 2002 Timmins storm event, following a 30-day snow melt event, Generation PGM calculates the rainfall as 193 millimetres, and the panel assumes a 30-day snow melt to be 275 millimetres based on the response to IR 4, question 3. And that is CIAR number is 917, PDF page 4.

So in this scenario the PSMF would need the capacity to contain a total of 468 millimetres, if the math was right, leaving an additional 268 millimetres capacity available before the emergency overflow spillway would be required.

So my first question is, could you confirm this understanding of the precipitation amounts, the 30-day snow melt,

and if the required capacity is correct? And in that context, earlier today we heard I think from Mr. Hall about an additional 1 metre freeboard, and is this in addition to that capacity or the that 1 metre sort of -- does that include the capacity that we've just talked about here?

MR. ANWYLL: We understand your question. I'll caucus quickly to discuss with Mr. Hall.

PANEL CHAIR: Mr. Hall, did you mean to be on mute? I wasn't sure.

MR. HALL: Apologies. Thank you for the question, Madam Chair. Craig Hall.

So for clarification on the environmental design storm. So in the original EIS submission when we had looked at sizing the PSMF we had used a Timmins storm event, which is that 193 millimetre event that was referenced in the subsequent update to the facility arrangement to support the EIS addendum.

We increased the EDS to the 100-year 24-hour precipitation event and 30-day precipitation event to be more in line

with current industry practice.

So back in 2012 we used the regional storm event and then over the proceeding eight, nine years industry practice had evolved some and using the one in 100-year event with a 30-day snow melt is more appropriate with what's generally being used in the industry now.

When we talk about storm water management capacity within the process solids management facility we have an allowance for environmental design storm above the maximum design operating level. Above this there's an allowance for the inflow design flood, which includes for conveyance over the emergency spillway should this occur right at the end of the operations.

During much of the mine life when the embankment is being raised incrementally there will be excess capacity to store that IDF. But there is a potential during certain periods within the mine life that will would be sufficient capacity to only manage it through the spillway and not temporarily store the IDF.

So then over and above these two freeboard allowances, which are often referred to as your wet freeboard, we have a dry freeboard allowance. And this dry freeboard allowance is an allowance for wave setup and runup, so that if you have, you know, winds associated with the design storm event and waves being generated in the facility you don't get wave action leading to overtopping an embankment or splashing and potentially leading to erosion.

So that metre that I referenced is that approximate dry freeboard, and it will confirm would that exact elevation is through the detailed design process.

PANEL CHAIR: Okay. So those are additive, so the EDS, the IDF and this drive freeboard?

MR. HALL: That's correct.

PANEL CHAIR: Thank you. Appreciate that clarification.

So my next question -- bit of a preamble, first of all.

In Generation PGM's hydrology updated baseline report, and this is CIAR 722,

it provided projections of extreme precipitation for the next 20 years over period of 2010 to 2040, was the reference, for a number different precipitation durations and return periods.

ECCC's hearing submission notes that these values were derived for a local station from a single climate model using a statistical tool, and ECCC states that the use of a single model does not account for uncertainty related to a climate model selection and that the modelled simulations described in the EIS addendum are unlikely to be robust because the changes in local observed extreme precipitation are small when compared with the natural variability of extreme precipitation.

So with that, ECCC has recommended that where projected climate changes are relevant to the project design values related to potential changes in short duration precipitation extremes, that Generation PGM should use scientifically appropriate, best available methodology, such as those outlined in the recent CSA guidance,

CSA 2019, to characterize potential future changes.

So with all that said, does Generation PGM have any concerns with this recommendation from ECCC?

MR. HALL: Thank you for the question. I'll ask for a moment to caucus for the correct person to answer the question. Thank you for the time to caucus, Madam Chair. I'll pass this over to Mr. Sheldon Smith.

PANEL CHAIR: Thank you.

MR. SMITH: Good day, Madam Chair. Sheldon Smith for the record. I think I can speak to this, and then I'll pass it over to Mr. Capstick subsequently.

If I understand the question correctly, the comment is really coming from the perspective of use of an ensemble approach for climate change projections.

We use the CanESM2 model, which is recommended by the Ministry of Natural Resources and Forestry, and a 2015 document. That's the basis of the CanESM2 model that we used. However, going to an ensemble approach, which I think is

essentially intent of the comment, we don't anticipate that that would in any way really change the assessment or the results produced.

I'll turn it over to Mr. Capstick now.

MR. CAPSTICK: Thank you, Sheldon. Sean Capstick for the record.

I just want to reinforce the concept that Sheldon described is part of that adaptive management and a continual improvement process. So as the EA is informed by the studies right, and as it goes through into detail design and use of updated models, use of updated approaches, the multi-model ensemble as specified in the recent strategic assessment on climate change document that was released in the last few weeks, those would be part of that continual improvement process. So thank you for letting me make that clarification.

PANEL CHAIR: Thank you. Thanks very much.

Just one minor clarification. Back to the Timmins storm event and 30-day snow melt. We appreciate the clarification on

amounts.

The panel noted that as stated in chapter 6.4 of CIAR number 727, and you have also indicate this, storage capacity has been incorporated in the PSMF design to contain that wave runup associated with the one in 1,000-year wind event. You just referenced that before.

Can you just confirm or clarify for the panel that whether -- if the PSMF design capacity would be sufficient for the one in 1,000-year wind event occurring during or following the Timmins storm event after the 30-day snow melt. So again, is it considered in its totality or was that a separate assessment?

MR. HALL: So in the current freeboard assessment we're no longer including for the Timmins storm because we now using the larger EDS of the one in 100-year 30-day snow melt.

So that total freeboard calculation -- we have the EDS event, plus the IDF, and then based on the water depth resulting in that -- from those two storm

events, the wind speed and the fetch length (ph) over the area of the PSMF, we then calculate the wave setup and runup for that one in a 1,000-year event. So that dry freeboard is over top of the wet freeboard for that one in a 1,000-year wind event inclusive of that IDF volume.

PANEL CHAIR: Thank you.

Now, with respect to the MRSA and open pits, I have a few questions.

On March the 18th during the topic-specific questions related to water, the panel noted that supplemental information request 9, so that's CIAR number 587, states:

"During the initial years of mine development the open pits will have limited storage capacity and runoff resulting from this same Timmins storm event may not be contained within the open pits eventually entering the Pic River. In the same submission the proponent states that runoff from the June 2002 storm event would potentially result in overtopping of the MRSA catch basin and then spillways and runoff to the Pic River."

Generation PGM, as you've

noted, has since changed catch basin capacity to the one in 100-year 24-hour precipitation event, as opposed to the one in 25-year event, which is 133 millimetres with the overflow spillway capacity of the 142 millimetres.

Could Generation PGM just explain how the 142 millimetre overflow spillway capacity was derived?

MR. HALL: Just take a moment to caucus, please.

PANEL CHAIR: Sure.

MR. HALL: Thank you for the question, Madam Chair. Craig Hall.

So that 142 millimetre event, or the one in 200-year return period event, we forecast out based on the return period precipitation events.

PANEL CHAIR: Sorry, forecasted out based on?

MR. HALL: Forecasted out based on the estimated return period precipitation.

PANEL CHAIR: Thank you. So just a bit of a long context and a short question for next.

So again, on March 18th during questioning, and I do have a transcript reference if needed -- actually Mr. Hall, you stated that Generation PGM used the 133 millimetre catch basin design value from table 6.4 of the hydrology baseline report for its one in 100-year 24-hour precipitation. This incorporates intensity, duration, frequency curves for Pukaskwa National Park for a projection from 2010 to 2040.

The panel notes that the values in table 6(4) are for an immediate case climate scenario. The panel understands this to mean a medium stabilization scenario with average means of curbing emissions. The panel notes that the value for a very high emission scenario that assumes a failure to curb global warming is 136.6 millimetres for a one in 100-year 24-hour precipitation.

And so our question is, can Generation PGM explain why they chose the immediate (sic) case climate scenario for its design rather than a more conservative high emission scenario?

MR. HALL: Thank you for the

question, Madam Chair. I'll just take a moment to caucus, please.

PANEL CHAIR: Mr. Hall? I was just reminded that I was saying "immediate." It's intermediate. My apologies.

MR. HALL: Thank you for the clarification. I'll just go back to caucus.

PANEL CHAIR: Okay, thanks.

MR. SMITH: Thank you, Madam Chair. It's Sheldon Smith again.

So just to speak to this. I think what is really quite important to note is that in this -- essentially this near-term, we're talking about a time period from 2010 to 2040. So we're talking about the next 20 years, there aren't a lot of major changes between the different representative concentration pathways that we use, 2.6, 4.5 or 8.5. As you pointed out, the difference between 4.5 and 8.5 is only about 3, 3-and-a-half millimetres' difference between the total volume or the total depth of the 100-year events for those two different concentration scenarios.

I'm just going to turn it

over to Mr. Capstick to speak about what happens once we get out past that 2040 horizon.

PANEL CHAIR: Thank you.

MR. CAPSTICK: Thank you Sheldon.

So the radiative concentration pathways that radiate enforcing (ph) that we've talked about in terms of the effect of the greenhouse gases, under the different representative concentration pathways it's a relatively small difference in terms of that radiative forcing until you get to this 2050.

And then the different radiative forcings diverge. You have the lower emission scenarios, there's a peak in decline, if the world is successful in looking at the Paris Accord greenhouse gas commitments. In the high (garbled audio) scenario there's a continue (garbled audio) increase in that.

So as you move to the end of the century those radiative forcings make a much greater difference in terms of temperature and then precipitation as a

secondary impact. But the changes you noted, Chair Sikora, in terms of those differences are very small, and that's based on those radiative forcings.

PANEL CHAIR: Thank you, that's helpful. Thank you. Just a couple more references.

On March 18th -- actually Mr. Smith had stated during questioning, and part of this is in quotes:

"The Timmins event in my understanding is a multiday event. It has what we call a height of wrath, which is the actual hour to hour amount of precipitation. There is intensity within 12 hours but this occurred over a multiday period. It's difficult to compare one in 100-year 24-hour event with an event like Timmins, for instance, that occurred over more than that time period. It's an actual event whereas the event that we're indicating here is a statistically derived event."

I do have references, if needed. But my question is, can Generation PGM provide further explanation as to its level of

confidence that an MRSA catch basin design of 133 millimetres is a conservative climate change design value given that an extreme rainfall event from 2002 may have had a greater 12-hour precipitation than 133 millimetres?

MR. ANWYLL: Thank you for the question, Madam Chair. I would like to caucus quickly, Chair Sikora, if I could.

PANEL CHAIR: Yes.

MR. HALL: Thank you for the question, Madam Chair. Craig Hall.

So I'm looking at the overall water management strategy for MRSA catch basins. We have to size the basins to store the 100-year 24-hour event as noted. And then there's also the water transfer from the basins to the water management pond, adjacent to the PSMF, and that water transfer rate would be included at rate of 750 cubic metres per hour.

The purpose of that water transfer rate is to keep the ponds, or the basins I should say, drawn down and maintain that surge to surge capacity so we have that

active water management continuously in place. So if we do have a multiday event, although it may be less than intense over a 12- or 24-hour period, there could be overall more rain, or however days it is, we're able to actively transfer that water volume from the basins to the water management pond.

PANEL CHAIR: One moment here. I have a question actually for ECCC.

On March the 18th the panel asked Generation PGM to provide an estimate of the quantity of water that may overflow annually from the MRSA catch basin to the Pic River and the likelihood for an overflow event to occur.

Generation PGM responded that the probability is very unlikely so the amount of discharge during a given year of operations would be zero, and I do have a transcript reference if needed.

But based on what you have heard, does ECCC agree with this conclusion and, if not, what would you assess the likelihood of an overflow of the catch basin, MRSA catch basin, to be during the life of the

project?

MR. CLAVERING: Robert Clavering from Climate Change Canada for the record. If I can just have a moment to caucus, please.

At this point in time I would like to introduce my colleague, Jennifer Pellerin, who will be able to respond to this question.

PANEL CHAIR: Thank you, Ms. Pellerin.

MS. PELLERIN: Jennifer Pellerin for the record, ECCC.

So as far as the probability of discharge from the MRSA catch basins, we would expect it to be less than 1 percent in any given year because of that 100-year design event. And that would be near the end of mine life, so with that climate change incorporated into the design.

PANEL CHAIR: Thank you.

Next question to Generation PGM. On March 19th the panel asked a number of questions related to a water treatment system prior to discharge. In its response Dr.

Nicholson noted that as a contingency if treatment were required with a more rapid response there are vendors with mobile equipment that can be brought onto site more rapidly than designing a more permanent system, which would be the plan in the longer term, if necessary.

Can Generation PGM describe the measures that would be in place to ensure that the storage capacity for all water-retaining structures on-site are not exceeded during extreme precipitation events to allow enough lead time to deploy either a temporary or permanent water treatment system should the effluent not meet discharge criteria?

MR. ANWYLL: I would like to caucus quickly, please.

PANEL CHAIR: Thanks.

MR. HALL: Thank you for the question, Madam Chair. Craig Hall for the record.

For my clarification, could you just restate the question, please.

PANEL CHAIR: Can Generation

PGM describe the measures that would be in place to ensure that the storage capacity for all water-retaining structures on-site are not exceeded during extreme precipitation events to allow enough lead time to deploy either a temporary or permanent water treatment system should effluent not meet discharge criteria?

It was in the context of treatment of water treatment plant.

MR. HALL: Thank you for that, Madam Chair.

So in the context of maintaining freeboard within the water management pond, storm water management pond, MRSA catch basins and the PSMF, each of these facilities will have a defined maximum operating level, and this will be written into the operation maintenance and surveillance manuals.

So in the event that the operating level was approaching the design maximum filling level of the facilities, and we're running up to a point where we cannot provide the specified contingency storage capacity, essentially at that time either you

would have to suspend operations so you are no longer depositing tailings into the -- process solids into the process solids management facility, if you are operating under that scenario and you for some reason got above that operating threshold, there would be contingency measures to say transfer water back to the open pit so that we could maintain the facilities below that design operating level until and which time the water treatment facility, or temporary treatment facility, could be brought to site and used.

So if we get into that worst-case scenario and talk about transfer to the pit there is the potential for suspension of operations depending on when it happens in the mine life. If it's during the period that we have more than one pit active and there is available capacity in the south pit or the central pit to manage water, and allow for mining to occur in the north pit.

PANEL CHAIR: Okay, thank you. Appreciate that. Next question is related to seasonal discharge in Hare Lake.

We have understood throughout

the last few weeks that Generation PGM does intend to discharge into Hare Lake seasonally during the ice-free period. The panel also understands that intermediate case climate precipitation projections to 2040 have been incorporated into the hydrologic modelling. However, we would like to clarify how extreme whether events have been account for in the context of the seasonal discharge to Hare Lake.

So if Generation PGM could describe what measures would be in place to ensure that there is sufficient capacity with the PSMF and water management pond to accommodate tailings production and site water management throughout the winter season without discharging effluent into Hare Lake, and hopefully this would include in the discussion possibility of any extreme whether events that may see unseasonable warm temperatures, snow melt, rain, and even the potential for extended power outages.

MR. HALL: Thank you for the question, Madam Chair. I'll just take a moment to caucus, please.

PANEL CHAIR: Thank you.

MR. HALL: Thank you for the question, Chair Sikora. Craig Hall.

So when we developed the water balance for the process solids management facility and the inclusion of managing water from the site we did evaluate one in 20-year wet and dry conditions to understand what that climatic variation may mean within the overall site water balance, both to confirm that we had sufficient capacity to store and discharge water by the water treatment system but also have sufficient water to maintain operations because the process plant requires a fair amount of water.

When we speak to winter operations and ice within the PSMF, during the winter operating months there is an occlusion for one metre of ice cover within the PSMF. So if we had that environmental design storm occur early in the spring or late winter, so we have the rain on snow melt, we basically include for that inflow happening with the ice cover still within the PSMF, water management

pond.

I believe you are still on mute.

PANEL CHAIR: Thank you. Next question is related to extreme drought, and in particular the PSMF and open pit and the design of long term management of type 2 materials. So again bit of context setting.

The panel notes that Generation PGM has used the coupled global climate model obtained from the Canadian Centre for Climate Modelling and Analysis for its climate change predictions in the project area up to 2070.

We also note as stated in response IR 22-2 and supplemental IR 6, the proponent concludes that there is the potential for drying of the upper type 1 process solids under dry and extreme -- extreme dry precipitation conditions.

So under extreme dry conditions, colonizing vegetation on the PSMF cover could also be stressed, however neither should result in unsaturated storage conditions in the type 2 process solids. It's

also stated in these IR responses that extreme dry conditions were modelled using the fifth percentile precipitation conditions.

So with that context, can Generation PGM confirm if these fifth percentile precipitation conditions were derived using climate change precipitation predictions?

MR. HALL: Thank you for the question, Madam Chair. I'll just take a moment to cause, please. Thank you for the time to caucus.

Could you provide some additional clarification or context for the question for us, please.

PANEL CHAIR: Yes, I've got some context so -- I've got some references as well.

We note that Generation PGM did use the CGCM3, the couple global climate model, for its climate change predictions in the project area to 2070. We also note that you've concluded there is a potential for drying of the upper type 1 process solids under dry and extreme dry precipitation

conditions.

So under extreme dry conditions colonizing vegetation on the PSMF cover could also be stressed, however neither should result in unsaturated storage conditions in the type 2 process solids.

It's also stated that in these IR responses extreme dry conditions were modelled using the fifth percentile precipitation conditions.

So our question was whether you could confirm if the fifth percentile precipitation conditions were derived using climate change precipitation predictions and what -- if yes, what predicted years were used.

I think what we're looking for, if not -- Generation PGM has expressed confidence that under extended extreme dry conditions post-closure that the type 2 process solids would remain saturated beyond a hundred years.

I'm not sure if that's helpful.

MR. HALL: Thank you for that

clarification. I'll take a moment to caucus. Thank you for that time to caucus, Madam Chair.

In speaking of our confidence in maintaining the type 2 process solids within the PSMF in a saturated state over the long term, the deposition plan is to have been developed such that a minimum of 5 metres of type 1 tailings will be deposited over the type 2 tailings within cell 2A and we're confident that depth of cover will maintain the type 2 tailings in a saturated state long term.

PANEL CHAIR: Thank you.

Just come more questions. This one related to water taking in Hare Lake. Generation PGM has stated that the first choice to supply supplemental mine process water is Hare Lake, and if water flow is too low in the Hare Lake system supplemental process water may be obtained from the Pic River.

The panel notes that MECP has raised concerns with regard to Generation PGM's modelling for low flow into Hare Lake. I

think we asked a similar question about Pic River water taking.

Can Generation PGM describe the maximum water takings for Hare Lake during extreme extended dry periods? What are the potential effects that could occur as a result of this water taking during already dry conditions?

MR. HALL: Thank you for the question, Madam Chair. Just ask for a moment to caucus, please. Thank you Madam Chair. Sheldon Smith is going to answer the question.

PANEL CHAIR: Thank you.

MR. SMITH: Good day, Madam Chair. Sheldon Smith, I think that when we discussed this on the aquatics water days of March 18th-19th we talked a bit about the potential water taking from the Pic and we've certainly described this -- the conditions surrounding a taking from the Pic River, being a very important and critical water body.

The same kind of conditions would also have to be developed particularly when it comes to extended dry periods for taking from Hare Lake. This is a permitting

issue, it would be subject to a permit to take water from MECP, and as a result there would be conditions imposed in that permit to ensure that any taking during dry periods didn't negatively impact the ecological system in Hare Lake.

PANEL CHAIR: Thank you very much. That does conclude the panel questions on effects of the environment on the project. I really appreciate the extra time everyone has committed to staying for questioning.

I did mention that we will continue with our mine closure questions as we reconvene in the morning, and we'll have to adjust our schedule, presentation schedule, accordingly so that we can complete those questions.

Before we depart for the day I just wanted to again thank everyone for their submission of the undertakings. The remaining ones without a due date already agreed to, just MECP number 10, 16 and 23, and thank you for committing to provide those in the next day or two.

A couple of things just

before I finalize questions. Earlier one of my first questions -- sorry. Do I see a hand up? Yes, Ms. Darby, I believe.

MS. DARBY: I was going to add before you wrap for the end of the day -- I have a CIAR number reference I can give for forest fires. So I can do that when you're finished. I just wanted to -- before you end, be helpful for your reference.

PANEL CHAIR: Thank you. And I was going to actually loop back to you to say I wouldn't necessarily need an undertaking to the questions I had asked earlier, but thank you for the reference to this CIAR number. I will take that, if you have it now.

MS. DARBY: So it's just CIAR number 886, comments number 11 and 12 are specific. Comments we made on wildland fire.

PANEL CHAIR: Thank you very much. And to NRCAN as well, I know you had a question related to whether or not we need an undertaking and I think we are good not to proceed with an undertaking. Thank you very much for the offer.

I just had one question for

Generation PGM and MECP. I know -- Mr. Barretto, I think you told us yesterday that conversations had begun with MECP regarding the table that was discussed a couple of days ago and just wondered if you could give a quick update or expected timeline for that, if available.

MR. BARRETTO: Yes, Madam Chair, Jeremy Barretto for the record.

There were further discussions with MECP and GenPGM representatives today. Just give me one moment and I'll confirm we don't have the final resolution, but if we don't I expect it within a day or two. If I could just a moment.

PANEL CHAIR: Yes, go ahead, thank you.

MR. BARRETTO: I can report we've provided MECP with further information and we're just waiting for their feedback that it's sufficient and we hope to receive it this week, but we'll report back to the panel in any case.

PANEL CHAIR: Thank you, appreciate that.

Okay with that, we will -- unless there are any more questions we will reconvene 9 a.m. tomorrow. We will complete closure questions at that point in time and move into our next scheduled topic area.

Thank you once again on behalf of the panel for all of the flexibility. We very much appreciate that and we'll see you tomorrow morning.

--- Whereupon at 5:29 p.m. the proceedings were adjourned till Thursday, March 31, 2022, at 9:00 a.m.