Wheeler River Joint IR Technical Meetings – FIRT and Denison
June 2024 (Round 3 Submission)

Objective of Meetings:

The meeting aimed to provide an opportunity for Denison to pose questions and for the Federal Independent Review Team (FIRT) to provide clarifications. Emphasis was placed on addressing the information requirements (IR) subject to discussion, focusing on information gaps, requirements/regulations essential for determining significant adverse effects.

Meeting #1: Wheeler River IR Meetings (IR-100, IR-190 and IR-198-R1)

Presentation: edoc: 7299864
Date: June 5, 2024 2-3:15PM
Attendees:

- In-person: CNSC: Jes Way, Wish Yen; Denison and consultants: Janna Switzer, Carolanne Inglis-McQuay, Brian Fraser
- Virtual: CNSC: Said Hamlat, Samantha Longo; HC: Paul Partridge, Cassidy Dutchak, Ninon Lyrette, Luc Pelletier, Rosalie Awad and Guillaume Colas; ECCC: Marcus Edino, Heather Konopski, Ian Parsons, Robert Nissen; Denison and consultants: Sarah Benson, Pamela Bennett, Jason Dietrich, Rina Parker, Brianne England

IR-100

- Wheeler would not be contributing mercury to the environment, but concern is with existing mercury in the environment.
- Denison's intent is not to use SK guidelines for fish consumption, will be using HC guidance
- HC's best practice is to consider mercury for Indigenous foods, as they are worried that there may be risks in consumption for Nations and communities. It would be to Denison's benefit to have baseline conditions that can be compared to if there are elevated levels identified during monitoring.
    - HC understands Denison's commitment to monitor mercury in country foods, and that no anticipated mercury increases for the project. But there is a more elaborate relationship with nutrient loading and methylmercury
    - Mercury not being carried forward is the basis of the comment – reviewer has no understanding of the basis of this information. HC is trying to better understand potential risk and asking to model baseline conditions – understanding baseline conditions needed to be able to assess, and have this clearly documented to substantiate conclusions.
    - Usual practice to include mercury, since there are fish and fish consumers, precautionary approach, in case there is a potential disturbance of sediment.
    - Denison noted that this has not come up from Nations as a concern.
        - Validating will be done through ERFN monitoring program.
- IR Response needs more details around the potential risks, monitoring results and how assessments could be used to ensure risks are mitigated.
- HC would want to see commitments from Denison to meet CSA standards if appropriate in the ERA under adaptive management.

- Country foods monitoring program needs to have a mechanism for triggers which will use a back-calculated value instead of the Province of Saskatchewan's values.
- If confirm baseline conditions, there is commitment that going forward with project, no matter what data says, will need to run through ERA in the future.
- Have a baseline and should be no increase, if don't see changes, no need to undertake further assessment.

IR-190

- Denison did not identify NO2 as a COPC, and thus did not carry it through for quantitative assessment
    - 2a. HC appreciates that Denison will remove references to the outdated 1970 guidelines.
    - 2b. editorial changes, needed, these will be made.
    - 2c. Industry best practice for non-threshold air pollutants is to carry it forward to risk assessment.
        - HC asked what criteria is being using to exclude NO2 as a COPC – studies point to higher levels of concentrations. HC would typically expect use of the most conservative guideline – because it's short term exceedance, no annual effects, lots of conservative assumptions.
        - HC currently finds the rationale for excluding NO_2 as a COPC is not strong enough and the risk assessment isn't detailed enough. HC is looking for information and best practices from Denison to describe the risks around NO_2 as a COPC. Describe the risk, provide discussions around the uncertainty, proposed policies around activities that would generate NO_2 and how Denison plans to mitigate risks. Include potential risks for workers who are off-duty and characterize the risk with a storyline.
        - Response should describe all conservatism used to come to the conclusions. HC is looking for Denison to "show their work"
        - Proposal by Denison to include qualitative discussion to better justify reasoning for excluding, acknowledge short term exceedance and exposures.
        - HC looking for Denison to better show their work – beef up discussions on risk characterizations, calculations and results are essential.
    - HC advocates for mitigations such as Tier 4 engines or monitoring.
    - Sam advises Denison review the CSA 288.6:22 standard and to ensure the "Shall" statements are considered. Any exceedances in CAAQS might require a quantitative assessment and this compliance could be moved to the ERA review at the licensing phase.
    - HC would like to review the quantitative assessment for NO_2 at the EA phase, not the licensing phase.
- Edits following SME review of minutes:
    - HC would add that it emphasized that the CAAQS should not be used as pollute up to levels and that health effects can occur at all levels of exposure.
    - The discussion on proactive measures to reduce NO_2 emissions appears to be missing from these notes (e.g., use of Tier 4 engines, regular maintenance and repair of engines, anti-idling policies, monitoring, etc.). HC would request inclusion of a bullet to document this discussion point.

- HC is unclear about use of the term "secondary" in the Action Items for IR-190: "*Final EIS will be edited text to remove reference to 1970s criteria and clarify the discussion of "secondary" screening of NO_2 and rationale to not carry NO_2 forward in the risk assessment."* HC would suggest that CNSC provide further clarification or remove the word "secondary".

IR #	Summary of Discussion	Action / Next Steps
IR-100	Denison clarified to HC that in the Round 2 response to IR-190-R1, Denison did not propose to use Government of Saskatchewan fish consumption guidelines. In response to this IR, Denison will clarify the information/commitments/plan already provided on IR-212 (country food monitoring framework) and edit commitment 8-44 to reflect adaptive management on how country food monitoring data influences ERA updates (which are regularly done through the licence requirements per CNSC oversight and N288.6).	Denison's response will outline the commitment in the EIS to the overall development of trigger levels through the country food monitoring program. They do not plan to calculate the trigger levels for the purpose of the IR but would describe how it would be calculated and used. Same generic adaptive management cycle for all aspects of monitoring and follow up cycle. **Denison to provide clarification through an interim IR response for SME Review. For review by HC and CNSC.**
IR-190	There was agreement to some aspect of the discussion (remove 1970s reference) but lack of agreement on approach to exceedance of NO2 criteria. Denison OK to provide further detail but would continue to screen out, as opposed to screening in and carrying forward in risk assessment as "best practice", as suggested by HC. Denison does not agree with HC's suggested approach as there is no requirement or criteria for a 1 hour NO2, HQ exceedance and it is a less preferred way to communicate the actual risk to public, Indigenous communities, and workers. CNSC's ERA representative (Said) agreed that Denison's proposed approach sounded reasonable.	Final EIS will be edited text to remove reference to 1970s criteria and clarify the discussion of "secondary" screening of NO2 and rationale to not carry NO2 forward in the risk assessment. The discussion could include HQ values to satisfy HC info needs within the IR but not within the final EIS. Denison plans to provide a response using the approach outlined in the meeting in place of the SME (HC) ask to determine the Hazard Quotient (HQ). **Action – Jes to validate with Said (complete)** – Said and Jeffrey Indicated that they were comfortable with the path forward and to review the clarification through IR response. **Denison to provide clarification through an interim IR response for SME Review. For review by HC and CNSC.**
IR-190 R1	Not directly discussed, but closely associated with parent IR (IR-190 above)	**This IR was conditionally accepted. To be carried over to licensing.** As part of licensing, Denison will clarify the conditions under which a switch from passive to continuous monitoring would be warranted (e.g., if the 30-d measured NO2 concentration, after conversion to a 1-h concentration, approaches or exceeds the 1-h CAAQS value.
IR 198-R1	Not discussed directly, but this IR is closely related to IR-100	**This IR was conditionally accepted, pending commitment.**

Meeting #2: Wheeler River IR Meetings (IR-107, IR-110 and IR-113)

Presentation: e-doc: 7299865
Date: June 5, 2024 3:15-4:15PM
Attendees:

- In-person: CNSC: Nana Kwamena, Jes Way, Wish Yen, Jeffrey Lam; Denison and consultants: Janna Switzer, Carolanne Inglis-McQuay, Brian Fraser
- Virtual: Said Hamlat, Samantha Longo, Daniel Sauvé, ECCC: Marcus Edino, Heather Konopski, Trish Auser, Ian Parsons; Denison and consultants: Sarah Benson, Pamela Bennett, Jason Dietrich, Rina Parker, Brianne England

IR-107

- Denison offered to share the analysis conducted by comparing all lakes in the LSA with Whitefish Lake. The analysis compares percentage changes between the geometric mean of all lakes and Whitefish Lake.
    - It was noted that all raw baseline data is provided in A-1 of Appendix 8-D, so instead of re-sharing, CNSC would re-share information in EIS documentation
    - **Action**: CNSC to share out the links for the draft EIS submissions which will include supplemental technical documents for this IR (Draft EIS - Appendix 8-D - Appendix A-1). **(Completed).** Should anyone else need it:
        - File Link: https://denisonmines.egnyte.com/fl/27VG5YKWPY/TRANSFER
        - Password: be2AvBVRjAMa
- To resolve the IR, CNSC requested that Denison provide the conservatism perspective that was shared during the technical meeting as part of the submission for review. Denison's current approach of data pooling has resulted in a loss of resolution. Denison has indicated that the inputs used in models are in the draft EIS.
- Low sample size:
    - Looking at table 1, to characterize seasonal conditions would require enough data to develop baseline statistics to allow for comparison of seasonal conditions. Not seeing how data supports being able to characterize at this point.
    - Not a lot of samples per season for that particular site, hard to access in the middle of winter due to weather conditions and safety (samples have been taken in early and late parts of the year and not directly in winter – pooling data over this time)
    - One of CNSC's regulatory requirements to show baseline demonstrates seasonal characterization. No winter sample is a gap.
    - Denison are committed to do more as have more people at the site, where possible. Won't be able to get all locations over winter, but by pooling data and having good reasonable availability, confidence that representative enough.
- Pooled data:
    - Denison pooled the data for the different lakes - because it's consistent with locality and parameters, were able to use this and actually use geometric mean of information as a water quality for COPCs of interest.
    - ECCC: concerns with pooled data and geometric mean, less conservative approaches. By pooling, it eliminates differences between lakes (understand similar, but will need to be

making comparisons against baseline quality conditions, so will need to have baseline characterization for each of the lakes).
    - Pooling of data = losing more resolution than if using water body by water body basis
        - statistical analysis shows water bodies more or less the same and have adequate conservatism in the assessment
- Denison noted that used a conservative approach in terms of inputs to the model, acknowledge that modeling will need to be re-done in the licensing phase, as will have to meet regulations in order to discharge, and options within mitigation realm to mitigate and minimize impacts; these will be levels that have to be pulled and will be worked through in the permitting process.
- Denison proposes a commitment to resolve this through the permitting process as a commitment to provide additional information as 1-2 years of water quality data can't be shared in the next 3 months. Denison commits to provide the requested baseline information which will be collected as part of the pre-construction monitoring to bolster the data. Should there be differences to the current conclusions of the draft EIS, Denison will work with regulators to remodel and reassess.
- Action: SMEs to review shared data, and CNSC-ECCC can take this discussion offline.

IR-110

- Denison will revise the language of the commitment to ensure that the diffuser will be designed to meet the predictions in the draft EIS. (Denison feels this is redundant as the EIS is meant to bound the Project).

IR-113

- Denison hopes that the commitment to update analysis and predictions incorporating new data collected during the licensing for operation period would be acceptable.
- Not discussed - for discussion on June 14.

IR #	Summary of Discussion	Action / Next Steps
IR-107	Denison's understanding is that this IR is resolved. Denison will provide the action / next steps information. New information (WQ data) will be incorporated into the application for the licence to operate application, along with new effluent quality predictions.	The IR considers 4 actions: 1. Provide raw baseline data (perhaps in an appendix). *Data is already on record in the EIS - CNSC to share links with ECCC.* 2. Provide summary statistics for baseline datasets, which at a minimum should include: mean, standard deviation, 95th percentiles, minimum, maximum, and number of samples. Present summary statistics by season (i.e., freshet, summer, fall and under-ice), and include comparisons to relevant water quality guidelines. *Data is already on record in the EIS - CNSC to share links with ECCC.* 3. Identify potential gaps in baseline datasets, and indicate how data gaps will be addressed. Describe the planned baseline monitoring to be conducted including, but not limited to, addressing any data gaps. *Denison can provide as narrative in response to IR. No changes to the final EIS.* 4. Demonstrate that the combined existing baseline data and planned baseline monitoring will yield dataset(s) that provide robust water quality baseline characterization of seasonal conditions (i.e., freshet, summer, fall, under-ice during winter), including a range of flow conditions. *Denison can*

		provide analysis that supports this in an IR response. No changes to the final EIS. **Denison to provide clarification through an interim IR response for SME Review. For review by ECCC and CNSC.**
IR-110	Denison to clarify/reword existing commitment on diffuser design.	Denison to clarify/reword existing commitment on diffuser design in Version 2 of the Commitments Register. **Denison to provide clarification through an interim IR response for SME Review. For review by ECCC and CNSC.**

Meeting #3: Wheeler River IR Meetings (IR-115, IR-115-R1, IR-124, IR-126, IR-194, IR-197)

Presentations: e-doc: 7299866 and 7299867
Date: June 6, 2024 11AM-12PM EST
Attendees:

- In-person: CNSC: Nana Kwamena, Jes Way, Konrad Gorzkowski; Denison and consultants: Janna Switzer, Brian Fraser
- Virtual: CNSC: Melissa Fabian Mendoza, Said Hamlat, Samantha Longo, Daniel Sauvé; ECCC: Marcus Edino, Heather Konopski, Duck Kim, Trish Auser, Ian Parsons, Elizabeth Ashby, Robert Nissen; Denison and consultants: Sarah Benson, Pamela Bennett, Jason Dietrich, Rina Parker, Carolanne Inglis-McQuay, Brianne England

IR-115 and IR-115-R1

- Denison requests CNSC as the regulating authority confirm the guidelines for the effluent discharge. Criteria should be narrowed down and defined based on federal/provincial licensing/permitting requirements. Denison will reassess if there are new CCME guidelines in the future.
- In providing conservative criteria for parameters – some examples that would be higher than provincial criteria, and some lower – justification for criteria should be provided:
    - Table outlines criteria, short term and long term – provide clarification on how criteria will be used.
    - Details will be determined and provided at point of licensing. If it does change when look at available guidelines and make choice, any changes to the conclusions should be shared.
    - Regardless of which are used, Denison have completed assessment based on selected criteria which is extremely conservative - when go to licensing and permitting, criteria will be based on licensing requirements.
- The response presents four screening criteria (two short-term and two long-term) for each parameter. ECCC requests clarification on which particular criteria will be used for screening each parameter, how these criteria will be applied, and the guidelines used for development of these criteria
    - When would they be used and why chosen?

IR-124 and IR-124-R1

- Are there specific areas within watersheds or lakes where sediments might accumulate more than other areas? Main intent of IR is to identify if this sort of scenario has been evaluated.
    - Has not been evaluated, can be confirmed over time through monitoring data, for purposes of representing the regional study area
- ECCC requests the details shared during the technical meeting and additional context be provided in writing for ECCC to review and assess. ECCC notes that the main intent of the IR is to identify whether deposition would accumulate in a specific area of the lake which could impact the environment or habitat more than others.
    - Action: Presentations to be provided (complete)
- Should the response for IR-124 be satisfactory, it should also resolve IR-124-R1

IR-126

- CNSC requests that Denison provide the methodology for BAFs and other published studies used to support this IR. Please consider the Mining Association of Canada's published guidance for selenium.
- SMEs want to understand potentially significant adverse effects:
    - What are the concentrations of selenium in benthic invertebrates?
    - Bioaccumulation factor is based on studies all over norther SK, developed using measured data at various other uranium mine sites. Looking at uptake over time.
    - Basing approach on monitoring data from years of accumulated data in norther SK water bodies. In response, can point out where in the appendix that has this information. It's in the impact value which has all information used. Appendix A to the ERA in Section 3.6.1.?
- Please share the uranium mine studies for SMEs to review – different methodology and would be good to review references and have background on it.
    - ECCC does not think the studies are required to help close off the IR, but will be required for the ERA review in terms of licensing and any information to substantiate Denison's methodology should be provided for the EA process.
    - Action: CNSC would expect that any references used to underpin the responses be included and provided as part of the responses to IR package. Denison to provide any references required to support response or assessment.
- Concerned about effluent discharge amount – volume of flow that that will discharge is significantly lower
- The BAFs, methodologies and monitoring information may be enough to close the IR.
- Action: Denison will discuss offline whether methodologies and monitoring data can be provided.

IR-197

- What additional information is ECCC is asking for? SME understanding that IR had specific CSA standard N288.6
- Atmospheric deposition is the standard used (see clause from N288.1), so Denison feels it is appropriate to use N288.1 here as opposed to N288.6
    - Action: Trish will talk to Duck.

- With regards to atmospheric deposition of mercury, there is none and Denison has no additional information to provide.
- Not expecting mercury deposition from mine, but request this be something included in follow up, to confirm that none.

IR #	Summary of Discussion	Action / Next Steps
IR-115	The theme of this discussion was to provide further clarity/rationale on the use of WQOs as two short term and two long term WQOs were shown. Denison can follow up with written response explanation of four criteria referenced and how they will be used. ECCC to review the conservatisms that were introduced in the EIS and specifically with respect to the near-field WQ model.	Denison to provide further clarity/rationale on the use of WQOs as well as WQO hierarchy in an IR response. Rational will not affect the outcome of the EIS. Denison will confirm consistency in all the places the WQOs show up and are used in the EIS and TSDs. The response presents four criteria (two short-term and two long-term) for each parameter. Denison to clarify which particular criteria will be used for screening each parameter, how these criteria will be applied, and the guidelines used for development of these criteria. **Denison to provide clarification through an interim IR response for SME Review. For review by ECCC and CNSC.**
IR-115 R1	Discussed in same context as IR-115	**Same as outlined for IR-115**
IR-124	In this IR, ECCC is asking for information on the manner in which the sediment quality predictions were made. Denison clarified where this information is available in the EIS (mainly in Appendix A to Appendix 10-A). The sediment model represents deposition in the whole lake using partition equations. There is not a significant release of particulates; therefore, the dominant process is expected to be partitioning not particle settling – TSS in effluent is low (6 mg/L). Two models were utilized in the EIS for different purposes. The near-field model assessed different flow scenarios including low flow, and the IMPACT Model was used as the regional model for the risk assessment. The risk assessment focuses on the expected case. Conservative assumptions in both the near-field model and in the IMPACT model were outlined (refer to PowerPoint presentation).	As part of an IR response, Denison to provide further clarity on the manner in which the sediment quality predictions were made and discussion about the fact that we have not underpredicted effects. All lakes were considered depositional. The Kd values used describe the relationships between the constituent concentrations in water and sediment and are based on monitoring data collected over years in the Athabasca Basin (including in the Wheeler drainage). Also, the analysis considered both expected and upper bound cases and we think the sediment predictions provide suitable bounds for the analysis. The Wheeler River environmental monitoring program will be used to validate the predictions and if the data indicates that changes to the Kds are needed, it will be made through routine ERA updates. **Denison to provide clarification through an interim IR response for SME Review. For review by ECCC and CNSC.**
IR-124 R1	Discussed in same context as IR-124	

IR-126	Denison and CNSC to discuss offline, Denison may follow up with references to studies that led to development of northern Saskatchewan bioaccumulation factor. Written follow up explanations in responses to points 1 and 3 will be provided.	As part of this IR response, Denison to provide further clarity on the method used, some updated calculations and information on bioaccumulation factors for selenium. This includes text on how the selenium BAFs were derived for the fish species modelled. The BAF was derived using monitoring data (water and fish tissue data) from other uranium mines in northern Saskatchewan. The BAF includes uptake via the food chain (water to algae and algae to invertebrate, and invertebrate to fish), but it is assessed as one number looking at the transfer from water to fish. Using the monitoring fish tissue data to derive the BAF inherently includes the food chain components. This is standard risk assessment practice and is consistent with guidance in CSA N288.6. Denison will calculate both the fish whole body and fish egg ovary concentrations to compare against the ECCC guidelines using the conversion factors in US EPA in an IR response. As indicated by the reviewer – all are below the guideline. **Denison to provide clarification through an interim IR response for SME Review. For review by ECCC and CNSC.** **Denison to provide references to CNSC that underpin the responses to this topic, and what was developed.**
IR-194	Accepted and moved to licensing.	**This IR was conditionally accepted. Pending commitment, and to be carried over to licensing.**
IR-197	CSA N288 guidance documents are used in an integrated manner and there was confusion from ECCC on reference to the relevant CSA guidelines as though there was an error found. Denison is confident the standards have been used appropriately. In Denison's opinion, this IR was beyond the scope of IRs at this stage of the project review. There is no reason why a mercury-to-air-to-water calculation would be needed for ECCC to advise on the EA conclusions.	In Denison's opinion, this IR was beyond the scope of IRs at this stage of the project review. The rationale for why a mercury-to-air-to-water calculation would be needed for ECCC to advise on the EA conclusions is unclear. No change to the final EIS will be made. Denison's position is that this IR should be closed without further back and forth. However, if needed, Denison can provide clarifications (presented in the meeting PowerPoint presentation) as an IR response (CNSC to advise if this is required). **Action: Unresolved. ECCC to consider presentation details and for further offline discussion between ECCC and CNSC.**

Meeting #4: Wheeler River IR Meetings: SARA and Migratory Birds (IR-134-R1, IR142-159-167-R1, IR-149, IR-149-R1A, 149-R1B, IR-157, IR-170 and IR-174)

Presentation: e-doc: 7299862
Date: June 6, 2024 3-3:50PM EST
Attendees:

- In-person: CNSC: Nana Kwamena, Jes Way; Denison and consultants: Janna Switzer, Brian Fraser
- Virtual: Melissa Fabian Mendoza, Said Hamlat, Verena Sesin; CNSC: Marcus Edino, Heather Konopski, Kristin Mozel; Denison and consultants: Sarah Benson, Pamela Bennett, Brianne England, Carolanne Inglis-McQuay

IR-134, IR-142-159-167-R1, IR-149-R1A, IR-170

- Denison shared an example of a table providing information on species specific sweeps; would like to provide concise summaries
- ECCC indicated this is exactly what was being requested. Table entries with what is being considered for each of the different species at risk

IR-149 and 157

- ECCC has been working collaboratively with the province on understanding how the provincial offset requirements for Boreal Caribou meet the objectives of the Federal Recovery Strategy:
    - As part of the SARA s.11 agreement with Saskatchewan, the province has committed to developing an offsetting tool, which will need to be reviewed by ECCC. However, we have not yet completed a formal review.
    - There is nothing in the s.11 agreement to say that ECCC must approve or support the SK calculator.
    - Not as simple as Denison meeting province's offsetting requirements
    - Denison: Offset commitment to meet the range plan of the province, while province needs to meet recovery strategy of ECCC,
    - Province's calculator hasn't been reviewed by ECCC, and ECCC are looking for assurance that offset calculator meeting federal requirements
- ECCC interest and jurisdiction falls under section 79 of the SARA act, also indigenous interest in species, which is subject to CEAA, 2012.
- In general, recovery strategy related to biophysical features. Even if population is stable, if one bad fire year, could be over the disturbance threshold.

IR-149-R1B

- Denison mentioned that minimal air traffic is expected; Denison looking for specific guidance needed to resolve this IR
    - From ECCC's perspective, the main concern is frequency and timing of flights. If it's 1 or 5, this makes a big difference in disruption to caribou.
    - Lots of potential calving habitat that is in proximity to the project. If there are know calving grounds – what are mitigations? If calving is observed in areas previously not known for calving, what actions will be taken?
    - Looking for mitigations during calving – no fly zones/times or re-routing of flight paths during sensitive periods.

- Mitigation measures are of concern from ECCC caribou biologists – Denison notes that there are no known calving zones in the area.
- Denison asserted that they have information from province of Saskatchewan that there are no concerns regarding calving grounds in proximity to the project and mitigations aren't needed. ECCC requests that Denison provide this information.
- Indigenous knowledge from the EIS indicated that caribou calve near the Wheeler River, but there was no locational data presented. ECCC requested that Denison provide greater detail on the Indigenous knowledge of caribou calving, such as proximity to the project (if unable to give specific details due to confidentiality concerns).

IR-174

- Denison walked through responses to the IR points 1 to 5
- 2:
    - From ECCC - map scale is too large. Looking for something that is more focused on project footprint, in order to better demonstrate proximity (a smaller scale map); should demonstrate known habitats and habitat suitability
    - ECCC noted that mapping of suitable habitat will be required for determining pre-construction survey locations, so this mapping can be used for multiple purposes.
    - Denison indicated that they could do this, but the roosting area would be a focus (map would have no new information)
- 3. From ECCC - If map demonstrates known habitats and habitat suitability, can be tied into #2
- 4. From ECCC - As noted in when discussing previous topic, this would suffice
- 5. Denison - EA commitment to collect additional baseline data. ECCC would accept a commitment to collect additional data between now and pre-clearing, as want to ensure have the data for that assessment.

IR #	Summary of Discussion	Action / Next Steps
IR-134-R1	Information requested in these IRs has been provided in various places in the EIS and IR responses; however, Denison can provide more concise summaries to support the resolution of these IRs. An example for bats was reviewed with ECCC during the meeting; the reviewer agreed this summary would close out this IR if it can be provided for all SAR. Denison agreed to prepare similar tables for the remaining SAR and provide them to ECCC.	Denison to provide pre-clearing summary tables for each SAR in the area for ECCC's review, as part of an IR response. **Denison to provide clarification through an interim IR response for SME Review. For review by ECCC and CNSC.**
IR-142-159-167-R1	See notes for IR-134-R1; a number of IRs were discussed together under the theme of pre-clearance sweeps.	
IR-149	Denison's understanding is that by meeting the Provincial offset requirements, the company will be meeting the objectives of the recovery strategy since the Province is responsible for caribou management. Further certainty is needed before the language	Denison's understanding is that by meeting the Provincial offset requirements, as part of the Saskatchewan range planning, the company will be meeting the objectives of the recovery strategy since the Province is responsible for caribou management.

	provided in ECCC's proposed EA commitment can be translated into Denison's commitment register.	**Action: Unresolved. Further discussion is required on this topic by CNSC and ECCC.**
IR-149 R1A	See notes for IR-134-R1; a number of IRs were discussed together under the theme of pre-clearance sweeps.	
IR-149 R1B	Primary CWS concern is for disturbance related to calving. It is Denison's opinion that this comment should not be an IR at this stage of the review; the EIS concluded there were no significant effects to caribou with the application of mitigation measures which were outlined in the EIS. While some additional information can be provided (see action / next step column), Denison reiterates that the EIS was completed with the appropriate level of detail expected at this stage of the Project.	Denison can provide the following in an IR response: • Anticipated aircraft traffic at the Project airstrip is expected to be minimal, at approximately five flights per week during Operation (this was noted in the EIS; opportunities to optimize the flight schedule will be completed by Denison as the Project advances). • Mitigation measures likely to be incorporated into the operation of the airstrip, with respect to air traffic, would include, as safety allows, maintaining as direct approach and departure flight paths as possible, and obtaining appropriate altitudes, and leaving the LSA and RSA, as quickly as is safely reasonable. • Flight paths can be adjusted based on the location of caribou observations, as it safe and practical to do so. **Denison to provide clarification through an interim IR response for SME Review. For review by ECCC and CNSC.** Note from ECCC: ECCC disagrees with the proponent's conclusions. Any impact to critical habitat is considered a significant impact that will require offsetting. The entire project area (including areas that have been previously impacted) contain the biophysical features required for caribou recovery. Even though the project footprint is small, and the caribou population is stable in SK1, the impact is still significant.
IR-157	See notes for IR-149	
IR-170	See notes for IR-134-R1; a number of IRs were discussed together under the theme of pre-clearance sweeps.	
IR-174	Clarification of the legend in Figure 2-9 was provided (refer to PowerPoint slides). No hibernacula (i.e., caves, mines, buildings with stable and specific temperatures per COSEWIC 2013) are expected in the Project Area. Bat maternal roost potential habitat can be provided in a map form, using existing baseline data, existing ecosite data, and literature data.	In an IR response, Denison will provide an updated version of Appendix 9-F Figure 2-9 Bat Species Observed within the Wildlife Study Areas to 1) zoom in on the Project Area, and 2) un-shade the Project Area. Bat pre-clearance sweep details will be provided as part of IR-134-R1. A roost potential map will be developed as part of this IR response, using existing

		baseline data, existing ecosite data, and literature data. **Denison to provide clarification through an interim IR response for SME Review. For review by ECCC and CNSC.**

Meeting #5: Technical IR Discussions on Wheeler River EA Project (IR-89 and IR-89-R1)

Presentation: e-doc: 7299863
Date: June 6, 2024 4-5PM EST
Attendees:

- In-person: CNSC: Nana Kwamena, Jes Way; Denison and consultants: Janna Switzer, Brian Fraser
- Virtual: Melissa Fabian Mendoza, Said Hamlat, , Quinn Zheng, Marcus Edino, Heather Konopski, Duck Kim, Jordan Hollman; Denison and consultants: Sarah Benson, Pamela Bennett, Brianne England

IR-89, IR-89-R1

- The decilified zone is an important pathway between the ore-zone and Whitefish Lake; would expect a conservative value - an order of magnitude higher in a sensitivity analysis
- ECCC is requesting that Denison complete traditional sensitivity analysis by increasing parameters to demonstrate the robustness of the model and provide an understanding of what could occur in an extreme (unrealistic) scenario, whereas Denison has conducted simluations. Differences in professional opinion were shared:
    - ECCC noted that when look at simulations, determining probable cases that would occur. When look at sensitivity analysis, looking for sensitivity - not a calibrated data set. If increase sensitivity, how does model react to an increase in the sensitivity of parameter? It isn't expected that this will match field observed data, and it isn't considered as a probable scenario. View as a sensitivity analysis, not a worst case scenario.
    - Denison noted that they have modeled what they expect to occur at site and have evaluated probable uncertainty, bounded by observational data that have collected - what is potentially probably at the site. Do not want to produce scenarios that could be construed as representative of what might occur in documentation that will be reviewed by the public. Ran scenarios that they considered realistic, and CNSC has mechanisms to refine through the licensing process (at this stage, sensitivity analysis is a nice to have).
- Denison acknowledged that that do not provide a very fulsome rationale for the change in the median K value in the EIS, and that there is information that is erroneously included, as well as inconsistencies in the values, as a range of values were not updated
- Denison has corrected the geomean and ECCC will review to determine if it's acceptable.

IR #	Summary of Discussion	Action / Next Steps
IR-89	Minor updates to the revised draft EIS were presented and will be corrected in the final EIS (refer to PowerPoint slides). A summary of uncertainty	IR response will be developed to address this IR, which outlines minor revisions to information presented in the revised draft EIS (and as described in the PowerPoint presentation). The response will also

	scenarios tested for geomean K value in desilicified zone (DSZ) were presented. ECCC: Desilicified zone is an important feature in the contaminant transport pathway from the mining zone to the receiving surface water body. ECCC expect Denison to do another sensitivity analysis in terms of K for the desilicified zone to understand the "safety margin" in the current modeling results. Denison summarized the sensitivity analysis they have done in terms of K values for the desilicified zone, and argued that further sensitivity analysis might be able to provide benefit (something nice to have but not a must).	include reference to the existing follow-up commitment related to the DSZ (commitment 7-20 in Version 1 of the Commitments Register). **Denison to provide clarification through an interim IR response for SME Review. For review by ECCC and CNSC. Further discussion required between CNSC and ECCC.** **Notes from Quinn:** In the online meeting with Denison, they proposed that they will update the groundwater model before decommissioning when more information would be available about the site geology, particularly the desilicified zone. Considering the sensitivity analysis Denison have conducted so far, this seems an acceptable path forward.
IR-89 R1	See note for IR-89 above	

Meeting #6: Wheeler River IR Meetings PMP and Climate Change (IR-103, IR-113,

Presentation: e-doc: 7306089
Date: June 14, 2024 1:30-2PM EST
Attendees:

- Denison: Brian Fraser, Brianne England, Janna Switzer, Pamela Bennett, Sarah Benson, Jason Dietrick
- CNSC: Jessica Way, Tesfaye Tarekegn, Melissa Fabian Mendoza, Rain Noakes
- ECCC: Marcus Edino, Trish Auser, Catalin Obreja, Emma Watson, Ian Parsons, Paula Siwik

IR-103

- Denison developed Civil Earthworks Criteria and a Stormwater Management Plan (IR-12).
- The need for a sensitivity analysis will affect the determination of significant adverse effects.
- The distinction between contaminated/uncontaminated areas and contact/non-contact water.
- The Intensity-Duration-Frequency (IDF) with climate considerations (89mm) is used to design conveyance infrastructure of non-contact water.
- Adaptive management and continual improvement will occur throughout the life of the Project.
- The Decommissioning Plan will consider future climate scenarios for landform design and cover infiltration rates.

IR-113

- Denison disagrees that a quantitative climate change assessment is required for the EIS, based on the short period (10yrs. Operations + 5yrs. Decommissioning), future precipitation predictions indicate an increase in the potential assimilative capacity within the receiving environment, the design basis Probable Maximum Precipitation (PMP) bounds projected annual precipitation under high carbon scenario, effluent discharge monitored (Metal & Diamond Mining Effluent Regulations Schedule 4 & 5), discharge limited seasonally/periodically under low flow (flow

proportioned of fixed dilution discharge), adaptive management to adjust discharge during climate-induced changes in flow.

- Denison does not yet have information on how the different precipitation scenarios would affect water quality predictions, limits information would have during EA to look at effects. SMEs would see this as something that would be done in the EA, as it informs how water quality model responds to low and high precipitation scenarios, and understanding water quality, important to understand for effects, and feeds into mitigations. If treatment is needed, if management of additional water is needed, there is a benefit to understanding if mitigations are adequate.
- Action: CNSC/ECCC to look back at what was provided in first two rounds of information (Appendix 6-C and 8-C) - have looked at future climate scenario. In response to round one response of IR
- Sensitivity analysis hasn't specifically been provided – ECCC sees utility in work that has been done here, but don't see that meets the same need and understanding range of water quality that could occur under a low and high precipitation scenario. It's quite essential information to understand at the EA stage.
    - Denison feels that that have looked at practical scenarios and have bound significantly
    - SMEs note that sensitivity analysis could be used to reduce uncertainty on how water quality would behave under precipitation extremes. Data already has aspects that make it not as conservative, as were raised in other meetings on water quality, so there is already uncertainty. Important to look at how the model would react to how sensitive it is to precipitation extremes.
    - Denison suggested also see presentation from IR-115-R1 – Denison can put it all together so have full picture – Action: for SMEs to consider this information
- Denison suggests a sensitivity analysis on water quality predictions for low/high precipitation scenarios (including climate change induced) can be completed during operational licensing, as per REGDOC-2.9.2.

IR #	Summary of Discussion	Action / Next Steps
IR-103	This IR is conditionally accepted. ECCC asked per the IR that Denison commit to providing the confidence intervals related to the IDF (1 in 100 year 24-hour rainfall) and demonstrate climate change resilience of the project (conduct climate risk and resilience assessment) during licensing. Denison explained that it has incorporated future climate (2020-2050 period) in the IDF to derive the 1 in 100 year 24 hour storm event for management of non-contact water. This is above the IDF curve based on current climate (79.9 mm). As noted, ECCC would like to see confidence intervals around a 1:100yr 24 hour IDF curve. Overall project climate change resilience was presented in Section 15 of the EIS.	For future IDF that considers climate change, Denison will provide language for the commitment register to evaluate the the uncertainty in projections of IDF derived 1:100 24 hour events as part of the licensing process. **This IR was conditionally accepted. Pending commitment, and to be carried over to licensing.**
IR-113	During the EA, ECCC would like to see a sensitivity analysis on water quality predictions (site and receiving environment) for low and high precipitation scenarios, including the potential influences of climate change. Denison believes it has adequately considered expected changes in conditions that may be associated	If required, Denison can provide a summary of the rationale on this topic provided to date, along with a plan for mitigation measures for effluent release during low flow periods.

	with climate change in a narrative manner and provided rationale as to why quantitative (model) analyses are not necessarily required. Denison suggests that sensitivity analysis on water quality predictions for low and high precipitation scenarios, including the potential influences of climate change could be completed as part of operational licensing and as applicable to REGDOC-2.9.2, and/or alternatively REGDOC 2.9.1. CNSC has indicated that the issue should be taken offline for discussion between CNSC and Denison.	**Action: Unresolved. Further discussion is required on this topic by CNSC and ECCC.**
IR-113 R1	Not discussed directly, but this IR is closely related to IR-113.	**This IR is being carried over to licensing.**

Meeting #7: Wheeler River IR Meetings: Water Quality Topics (IR-18, IR-101, IR-108, IR-108-R1, IR-114, IR-193, IR-195)

Presentations: e-doc: 7306092 and 7306102
Date: June 14, 2024 2-2:45PM EST
Attendees:

- Denison: Brian Fraser, Brianne England, Janna Switzer, Pamela Bennett, Sarah Benson, Rina Parker, Jason Dietrich
- CNSC: Jessica Way, Melissa Fabian Mendoza, Rain Noakes, Jeffrey Lam
- ECCC: Marcus Edino, Sarah Forte, Ian Parsons, Paula Siwik

IR-18

- Item #1
  - The requested parameters (pH, temperature, hardness, alkalinity, conductivity) were added to Table 2.2-1 and Appendix 8-E.
  - Denison expected to correct the proposed effluent conductivity added to Table 2.2-1 and Appendix 8-E.
  - Predicted conductivity is impossible with Total Dissolved Solids (TDS) reported in Table 2.2-1.
  - ECCC: concerns around TDS not because changes impact the outcomes, asking for the changes so that can confirm themselves.
    - Will provide this information to look at prior to conclusion of this EIS technical review.
  - Denison will provide additional information for conductivity and TDS as part of operational licensing.
- Item #3
  - Addressed in IR-108, IR114, and IR-115.
- Item #4
  - Denison is to follow REGDOC-2.9.2 guidance to develop effluent discharge targets. CNSC to engage with ECCC when necessary.

- Denison is committed to periodic pre-construction sampling to strengthen environmental data and will update the analysis and predictions incorporating any new data collected during the operational licensing process; no changes to the EIS are expected.

IR-101

- Item #2: Denison to justify taking wetland measurements upstream and downstream rather than directly in the wetland.
- Item #3: Denison will provide sediment quality impacts for the requested wetland assessment.
- K_d (soil-water partition coefficient) values presented in table 3-6 of the ERA and have been checked against the W_r measurement data (figure 3-2 and 3-3 of the ERA).
  - Commitments on page 8, proposed resolution: K_d values give a good suggestion of what would be reasonable impacts on the receiving environment.
- Denison clarified that the wetlands are not cut off (likely good exchange) from the main basin of the lake and, therefore, assumes that the lake environment is as likely to be depositional as the nearshore wetland habitat.
- Denison committed to collecting additional pre-construction baseline information within wetlands for water and sediment quality.
- Denison proposes that the EEM study (committed to for IR-126) could include an investigation of the difference in water and sediment quality near and offshore.
- Action: ECCC needs to confirm with colleagues to determine if what Denison shared will be adequate.

IR-108 & IR-108-R1

- Denison will update Tables 8.2-2 and 8.2-3 to include all Contaminants of Potential Concern (COPC) that require effluent characterization and receiving environment monitoring under the MDMER.
  - The list of parameters in this comment for the round 3 response also included boron, dissolved phosphorous and strontium, which do not require monitoring under the MDMER. These would have to be updated as well.
- Denison will update Tables 8.2-2 and 8.2-3 to include missing/corrected water quality guidance thresholds and information on values used to derive COPC thresholds (dependent on general parameters).

IR-114

- Item #1: Update all tables to include missing data for mercury, aluminum, Total Suspended Solids (TSS), iron, thallium, manganese, nitrate, and phosphorous.
- Item #3: Ensure that all water quality thresholds are derived from baseline receiving environment concentrations and that water quality guidelines protect aquatic biota.
- Denison stated that screening was completed using the most stringent guidelines. The Near-field water quality models were re-run using updated acute and chronic benchmarks; no parameters of concern were identified.

IR-193

- Acute and chronic water quality threshold request – in ERA can acknowledge that won't be able to release above acute guidelines, but intent is not to update ERA with acute guidelines.

- Denison indicated that they will add unionized ammonia, mercury and phosphorous to ERA Table 3-1. They then get screened out so it isn't necessary to look at them further. This corresponds to the last bullet in their slide on the topic.
- Action: ECCC will need to consult on this language.
    - ECCC consulted with colleagues and determined that this proposal is adequate.

IR-195

- Values in updated ERA are the correct values. One small change not reflected in IR, chloride and sulphate concentrations in predicted effluent quality went down. Values in updated EIS are core values.
    - Predicted chloride and sulfate concentrations were reduced due to additional testing by Denison, were identified as being able to be lowered through bench testing process. Chloride originally based on accurate guideline.
    - Denison committed to providing a short written explanation as to why (effluent quality, decreased sulfate, and chloride) the values in Tables IR195-1 and IR195-2 have changed in between the draft EIS and IR response.

IR #	Summary of Discussion	Action / Next Steps
IR-18	As per the discussion on related IRs (IR-107 and IR-115), new information including updated WQ data and effluent quality predictions (which will include TDS and conductivity) will be incorporated into the application for the licence to operate and ERA updates at that time. Updates to Table 2.2-1 and Appendix 8-, can be made in the final EIS and included as an IR response now; however, these changes do not change the conclusions of the EIS.	Denison will provide updated Section 8 tables in an IR response. Additionally, Denison will provide information to support that the clarifications/revisions indicate do not in fact change the conclusions of the EIS. Denison also understands its obligations and reaffirms them as it concerns REGDOC 2.9.2 (discharge criteria) and will follow the process laid out by CNSC. **Denison to provide clarification through an interim IR response for SME Review. For review by ECCC and CNSC.**
IR-101	Denison confirmed ECCC is specifically asking about wetlands downstream of the effluent release point. Denison clarified that these wetlands are more accurately described as littoral areas (i.e., they are not cut-off from the main lake) of the downstream receivers and not independent wetland complexes. Sediment quality predictions in the lakes were made by applying a partition coefficient, Kd, to describe partitioning of constituents between water and sediment. The Kd values were developed from local data from the RSA and apply equally to nearshore (and the wetland/littoral areas) and offshore habitats downstream of effluent release. Additionally, Denison has committed to the collection of additional baseline information within the nearshore (wetlands) for water quality and sediment quality prior to construction as part of operational licensing (commitment 8-46) and to	Action for ECCC to discuss internally and review information already available to them (in revised draft EIS and in IR responses). ECCC reviewer will consider the information presented to date and confirm with colleagues whether the information is adequate. Denison to provide wetland-related commitments for 1) preliminary EEM (provided with responses to IR-111 and IR-126) and 2) pre-operational wetland sampling (existing commitment 8-46) in an IR response. **Action: Unresolved. Further discussion is required on this topic by CNSC and ECCC.**

	complete a pre-construction preliminary EEM for the site.	
IR-108	Discussion is supportive of including MDMER Schedule 4 effluent characterization parameters and correcting WQOs in Tables 8.2-2 and 8.2-3.	EIS Tables 8.2-2 and 8.2-3 will be updated and provided as part of an IR response. **Denison to provide clarification through an interim IR response for SME Review. For review by ECCC and CNSC.**
IR-108 R1	See notes on IR-108	
IR-114	Denison clarified that the screening was based on the most stringent of the four guidelines/criteria. No additional parameters from the revised draft EIS have been identified as being of concern.	Denison will provide additional/corrected information in a revised IR response. **Denison to provide clarification through an interim IR response for SME Review. For review by ECCC and CNSC.**
IR-193	The ERA is focused on chronic effects, consistent with N288.6. Denison can update Appendix 10-A to include unionized ammonia, mercury, and phosphorus in the Table, but note this is not going through the ERA because they are below the screening values. Denison can provide this updated Appendix 10-A table in the IR response.	An updated screening table will be provided which includes the requested COPCs (Table 3-1 in Appendix 10-A). The COPCs will be shown as screened out and not carried forward through the ERA. **Denison to provide clarification through an interim IR response for SME Review. For review by ECCC and CNSC.**
IR-195	Clarification of discrepancies between numbers in IR table compared to what was presented in the revised draft EIS was provided by Denison. In an IR response, Denison can explain why the numbers changed / new information from bench testing related to SO4 and Cl.	Denison will prepare an IR response will include clarifications and minor updates to Table 3-3 of Appendix 10-A, and specially an explanation as to why values for SO4 and Cl had been updated. **Denison to provide clarification through an interim IR response for SME Review. For review by ECCC and CNSC.**

Meeting #8: Wheeler River IR Meetings (IR-12 and IR-12-R1)

Presentation: e-doc: 7306104
Date: June 14, 2024 3 to 3:30PM EST
Attendees:

- Denison: Brian Fraser, Brianne England, Janna Switzer, Pamela Bennett, Sarah Benson, Xavier LuDac, Jason Dietrick, Rina Parker, Zachary Hart
- CNSC: Jessica Way, Konrad Gorzkowski, Jeffrey Lam, Melissa Fabian Mendoza, Rain Noakes
- ECCC: Marcus Edino, Reg Ejeckam, Sarah Forte, Ian Parsons, Paula Siwik, Catalin Obreja

Summary:

IR-12

- Denison believes that the water management design information in the revised draft EIS is appropriate for the EA and this project stage and fit-for-purpose to support the assessment of potential effects.
- Additional details on water management and runoff infrastructure engineering design will be provided as part of licensing and permitting.
- Design strategy concept (site water divided into two streams):
    - "Contact water" – potentially contaminated water to be managed through site water infrastructure and conveyed to the Industrial Wastewater Treatment Plant (IWWTP).
    - "Non-contact" water would not be treated in the IWWTP.
        - The only mitigation proposed would be for sediment control. Any other contaminants would be small spills and would be addressed by the spill plans.
- 493mm PMP used for potentially contaminated areas with contact water.
- 89mm 1:100 for non-contaminated areas with non-contact water.
- ECCC asked about use of glycol at the airstrip. Denison responded that it would be used in a specific area where the runoff would be collected.

IR-12-R1A (Denison Response)

- Water treatment flows and effluent discharge would not vary between normal operations and 24-hour PMP.
- Non-contact water is not routed through the IWTTP.
- The wellfield runoff pond has been designed to accommodate the PMP.

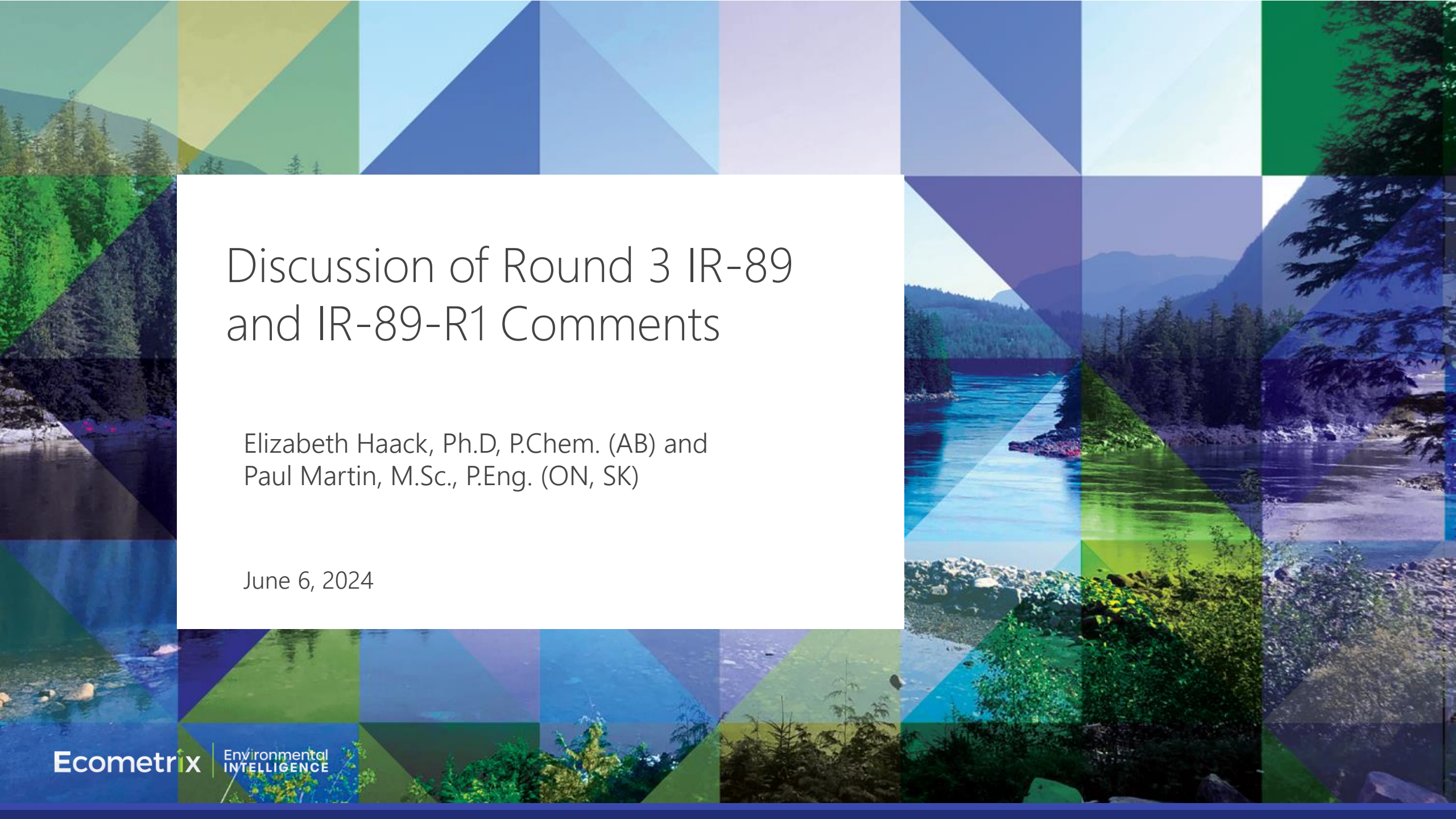
IR #	Summary of Discussion	Action / Next Steps
IR-12	Denison presented the water management design concept and overall design basis. This includes contact and non-contact water, based on the characteristics of the water in relation to mine-related wastes. Recognizing that information on water management is scattered throughout the EIS and in responses to various IRs, Denison offered to provide, as part of an IR response, consolidated information in the form of a site water management plan commensurate with the stage of the Project. The plan will collate information presented to date and provide updated information that has become available since the design has progressed. The plan would consider/discuss/include: • Design strategy and basis (criteria) • An updated site drainage map • Estimates of volumes of water to be managed in the contact and non-contact management areas • Discussion of potential COPCs in the contact and non-contact management areas; • Description of mitigation measures to manage potential COPCs in the contact and non-contact management areas	Denison will provide, as part of an IR response, consolidated information in the form of a site water management plan commensurate with the stage of the Project. **Denison to provide clarification through an interim IR response for SME Review. For review by ECCC and CNSC.**

	• Proposed monitoring	
IR-12 R1A	Denison explained that non-contact water will not be captured and treated; as such, there would be no influence of precipitation (normal v. PMP event) on water treatment and effluent release rates. Water management features in the contact water area (ISR wellfield and processing plant area) are designed to the PMP.	This will be clarified in the IR response and proposed site water management plan. Denison to provide clarification through an interim IR response for SME Review. For review by ECCC and CNSC.

Discussion of Round 3 IR-89 and IR-89-R1 Comments

Elizabeth Haack, Ph.D, P.Chem. (AB) and
Paul Martin, M.Sc., P.Eng. (ON, SK)

June 6, 2024



Ecometrix | Environmental INTELLIGENCE

Synopsis of IR-89 and IR-89-R1 Comments and Responses

- Round 2 – Response (February 2024)
  - Detailed response, including additional scenario with higher K value ($1.4x10^{-4}$ m/s) in the Desilicified zone (DSZ) provided as Attachment
  - Acknowledged: rationale for change in median measured K value for the DSZ not well explained (IR-89 or AD-66)
- Round 3 – Context, Rationale and IR (May 2024)
  - Test a K value in the DSZ with a value at least an order of magnitude higher than the highest field K values
  - Clarify why the geomean K value for the DSZ was modified and provide any supporting evidence.

ATTACHMENT IR-89-R1

Original IR Number	IR-89
Follow Up IR Number	IR-89-R1
Dept.	ECCC
Project effects link	Fish and fish habitat
Reference to EIS, appendices, or supporting documentation	Appendix 7-C, Numerical Modelling: Post- Decommissioning Evaluation, Section 2.3.1.4, Desilicified Zone IR-89 Response from Denison
Context and Rationale (Original IR)	**Context:** The Proponent states that the range of hydraulic conductivities considered in sensitivity analysis was limited to values that fit within a calibration constrained uncertainty analysis of the model. Considering that the Desilicified Zone is of particular interest because it is the main pathway for the COPC to reach Whitefish lake, and that hydraulic conductivities are not entirely understood, ECCC recommends that a larger range of hydraulic conductivities be simulated to understand potential effects on the aquatic environment. The Proponent clarified the details of the calibration-constrained uncertainty analysis that was used for parameter bounding within the model, with hydraulic conductivity sensitivity bounds determined based on model calibration values that were supported by the available physical data. **Rationale:** ECCC agrees that calibration constrained uncertainty analysis using hydraulic head field data is useful to determine probable upper limits of K values. However, there is always some degree of uncertainty in groundwater data and models. Sources of such uncertainty may include errors, lack of complete and representative field data to determine key parameters, or any number of heterogeneities associated with groundwater systems over large scales. Such uncertainties will always exist and can be accounted for by conducting a sensitivity analysis that accounts for the lack of physical data in the Desilicified Zone by running modelling scenarios using parameters that are outside of the calibration constrained values.
Information Requirement (Original IR)	Expand the sensitivity analysis of hydraulic conductivity outside of calibration constrained parameters to account for the lack of physical data in the Desilicified Zone

Calculation of median K value for the Desilicified Zone

Geology and Hydrogeology Baseline Report, Appendix C to Appendix 7-A of the Draft EIS

Table C-1 Summary of Hydraulic Testing Data and Conductivity Values

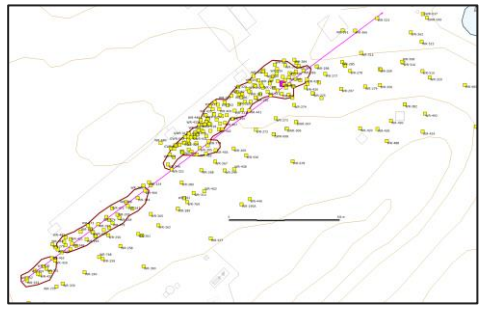
Well Name	Hydrostrat-igraphic Unit	Lithologic Unit	Estimated K (m/s)	Comment	Type of Hydraulic Test	Reference	Direction	Depth to Screen/ Packer (m)	
								Top	Bottom
WR-555	Desilicified Zone	MFb	1.00E-06		Packer test	Golder, 2014	Vertical	213.7	256.5
WR-555		MFb	1.00E-05	Did packer seal?	Packer test	Golder, 2014	Vertical	255.9	298.5
GWR-014		MFc	8.70E-06		Packer test	Scibek, 2019	Vertical	149.0	158.0
WR-555		MFa	2.00E-05		Packer test	Golder, 2014	Vertical	281.7	363.3
GWR-047		MFb	2.70E-06		Pumping test	Petrotek, 2021	Vertical	279.0	282.2
GWR-048		MFa	2.70E-06		Pumping test	Petrotek, 2021	Vertical	379.0	382.0
WR-405	Lower Sandstone Aquifer	MFa	3.00E-05		Packer test	SRK, 2017	Vertical	356.4	379.6
GWR-008		MFa	1.30E-05		Packer test	Scibek, 2019	Oriented	369.0	380.0
GWR-025		MFa	6.60E-06	Packer stayed inflated	Packer test	Scibek, 2019	Vertical	374.0	380.0
GWR-033		MFa	4.00E-06	Pumping well	Pseudo Pump Test	Appendix D	Vertical	345.6	351.6
GWR-048		MFa	2.70E-06		Pumping test	Petrotek, 2021	Vertical	379.0	382.0
WR-555		MFa, Barrier Zones, Ore zone	2.00E-06		Packer test	Golder, 2014	Vertical	365.5	409.5
WR-594		MFa	2.50E-07		Open Hole	SRK, 2015	Oriented	451.2	489.0
WR-601		MFa and Basement	1.30E-06		Packer test	SRK, 2015	Oriented	376.2	822.0

Calculated geomean K value for Desilicified Zone = 4.8 x 10^{-6} m/s

Calculated geomean value for Desilicified Zone erroneously including measured value in the LSA at WR-405

Results from the pumping test are most reliable (0.56 x the calculated geomean value)

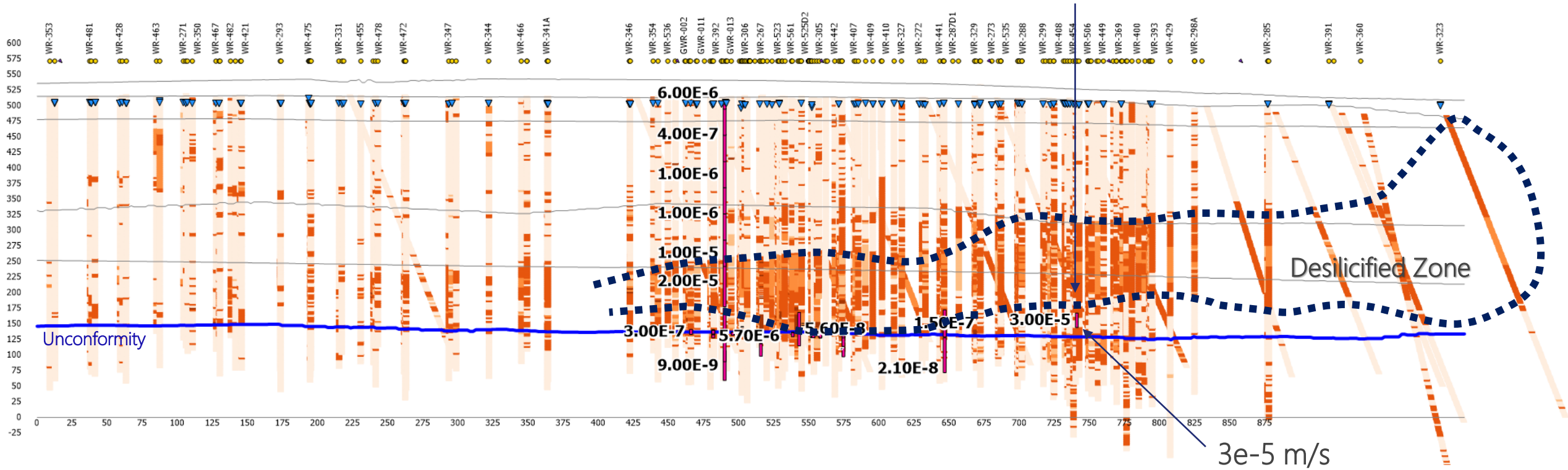
Friability



SW

WR-405

NE



Packer interval at WR-405 was attributed to Lower Sandstone Aquifer as there is lower friability within the packer interval than is present in the DSZ

Acknowledged: (Ecometrix) Updates to Draft EIS inconsistent with respect to geomean value and, specifically, the range of values included in the geomean value calculation

Table 7.3-2: Summary of Hydrostratigraphic Unit Properties

Hydrostratigraphic Units	Field-Based Hydraulic Conductivity (m/s)		Effective Porosity (%)	Storage[2]
	Range	Geomean[1]		
Overburden Aquifer/Aquitard	3×10^{-6} and 2×10^{-4}	-	25% (sand); 18% (till)	20% (Sy)
Upper Sandstone Aquifer	4×10^{-7} to 1×10^{-4}	3.7×10^{-6}	1 to 5%	1x10^{-5} (Ss)
Intermediate Bedrock Aquitard	1×10^{-10} to 3.8×10^{-6}	8.4×10^{-9}	1 to 10%	
Desilicified Zone	1×10^{-6} to 3×10^{-5}	~~6.04~~.8 x 10^{-6}		
Lower Sandstone Aquifer	7.8×10^{-8} to 3×10^{-5}	2.2×10^{-6}		
Upper and Lower Barrier Zone Aquitard (clay cap and sulphide-cemented rock)	Hydraulic tests have not been completed on these units as they are relatively thin in comparison to overlying/underlying units.[3]			1x10^{-6} (Ss)
Ore Zone Aquifer				
Basement Aquitard	1.1×10^{-11} to 1.1×10^{-5}	4.8×10^{-9}		

Notes

1 A geomean value was not calculated for the Overburden Aquifer/Aquitard or the Upper and Lower Barrier zone as only two measurements were available for each unit.

2 Sy values expressed as a percent of total volume. Ss values expressed in units of 1/m.

3 Screened intervals of the wells often intercept the ore zone and upper or lower barrier zones. Elevated hydraulic conductivity values were interpreted to reflect the ore zone aquifer and lower values reflect the barrier zone aquitard.

Correction needs to be made to the range reported to specify that the maximum tested hydraulic conductivity value was 2.0 x 10^{-5} (m/s).

Summary of Uncertainty Scenarios Tested for Geomean K value in Desilicified Zone

K Value Measured (m/s)	K Value Assumed in Model (Base Case; m/s)	K Value applied in Sensitivity Analysis (2022 Draft EIS; m/s)	IR (2nd Round; Feb 2024)	Statement
1×10^{-6} to 2×10^{-5} Geomean = 4.8×10^{-6}	5×10^{-6}	Uncertainty Scenario 5: 3.7×10^{-5}		Scenario 5 was selected to represent parameter combinations that resulted in greater groundwater flow to Whitefish Lake (compared to base case). Value used is 2 (1.85) x higher than any measured value, and 7.4 x higher than base case calibration
			IR-55, Alternative Calibration 1.4×10^{-4} m/s	28 x higher than base case 50 x higher than pumping tests (most reliable measure)

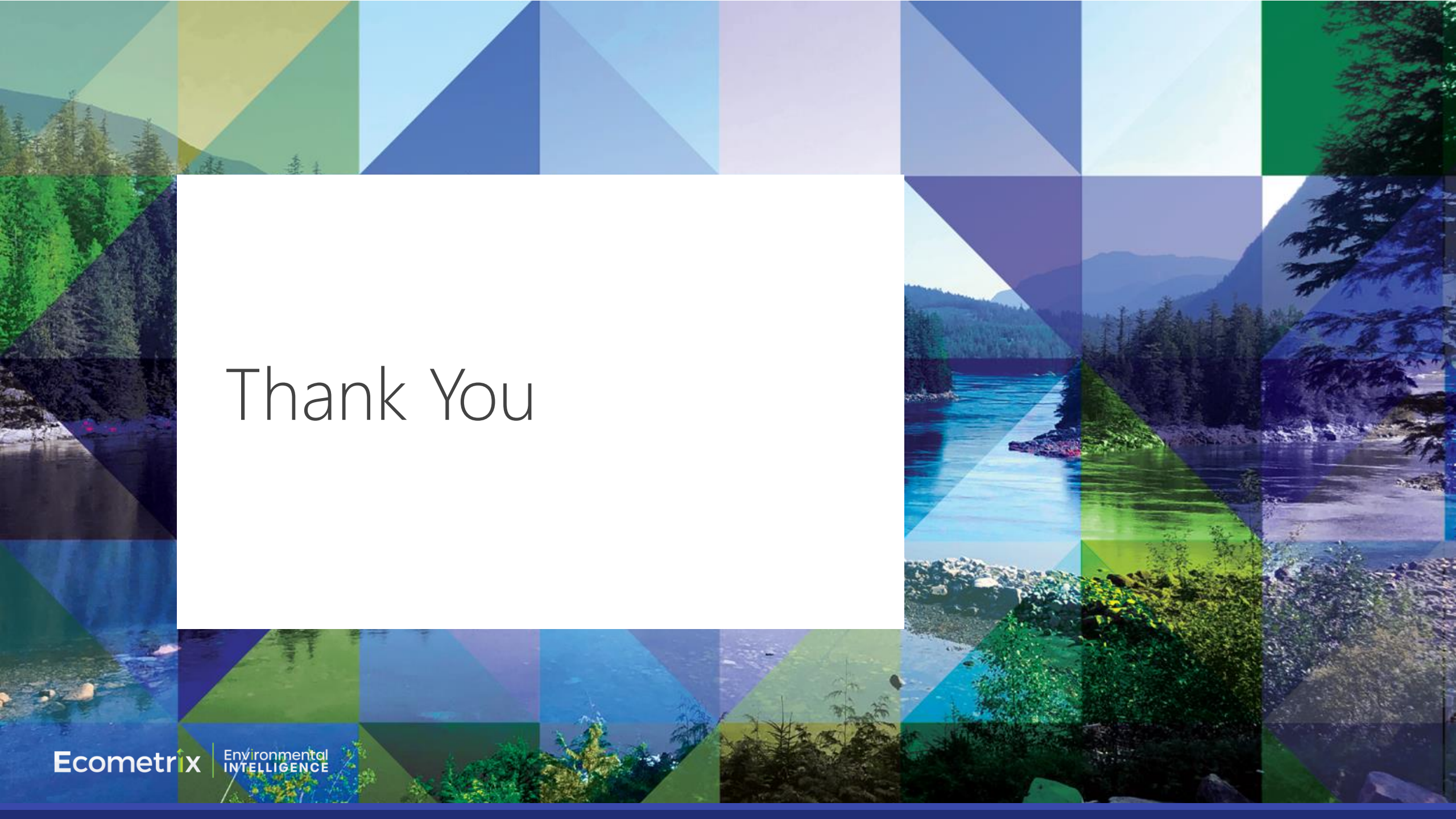
Modelling work is sufficiently bounding for EIS.

Under all uncertainty scenarios tested, EIS conclusions hold

Table IR-89-R1-1: Peak Groundwater Concentrations Reaching Whitefish Lake: Alternative Scenarios Consistent with Observed Conditions (all concentrations in mg/L)

COPC	Groundwater Quality Screening Criteria	EIS Base Case	1. IR-55 Alternative Calibration (K_{ISA}= 1.0E-7 m/s; K_{OSZ} = 1.4E-4 m/s)	2. IR-70 High Ore Zone Hydraulic Conductivity Post Decommissioning (K_{OZ} = 5.0E-5 m/s)	3a. IR-71 20% Lower Groundwater Recharge	3b. IR-71 20% Higher Groundwater Recharge	4. IR 78 & 88 Lower Effective Porosity Paleoweathered Zone (1%)	5. IR-96 Lower Transverse Dispersivity (α_{TV} = α_{TH}= 1.0m)	Comment
Al	0.05	3.0E-02	3.0E-02	3.0E-02	4.1E-02	3.9E-02	3.7E-02	4.3E-02	Naturally near GQSC, Peak @ 750 yrs.
As	0.005	3.2E-04	3.1E-04	3.2E-04	3.2E-04	3.2E-04	3.4E-04	3.3E-04	Naturally near GQSC, Peak @ 2000-3000 yrs.
Ba	--	3.9E-02	3.5E-02	3.9E-02			3.9E-02		Background
Ca	--	7.0	4.5	7.8	7.2	6.9	6.6	12	Peak @ 400 yrs.
Cd	$4.0x10^{-5}$	1.1E-05	1.0E-05	1.1E-05	1.1E-05	1.1E-05	1.2E-05	1.1E-05	Peak @ 500-3000 yrs.
Cl	120	9.9	7.1	10.9	10.1	9.8	9.5	14.6	Peak @ 400 yrs.
Co	$7.8x10^{-4}$	4.2E-04	4.2E-04	4.3E-04	4.2E-04	4.2E-04	4.5E-04	4.5E-04	Late time peak
Cr	$8.9x10^{-3}$	5.3E-04	5.2E-04	5.3E-04			5.3E-04		Peak @ 500 yrs.
Cu	$2.0x10^{-3}$	7.0E-04	7.0E-04	6.9E-04			7.8E-04		Late time peak
F	--	6.1E-02	6.0E-02	6.1E-02			6.2E-02		Late time peak
Fe	0.3	**1.9**	**0.66**	**2.4**	**2.0**	**1.9**	**2.0**	**4.4**	Peak @ 400 yrs.
K	--	3.1	3.2	3.1	3.1	3.0	2.9	3.4	Background
Mg	--	2.8	2.8	2.8	2.8	2.7	2.7	3.9	Background
Mn	0.23	**0.28**	0.22	**0.28**			**0.28**		Peak @ 400 yrs.
Mo	31	3.1E-03	7.3E-04	9.2E-04			8.6E-04		Peak @ 400 yrs.
Na	--	5.1	4.5	5.4	5.2	5.0	6.4	7.6	Peak @ 400 yrs.
Ni	$2.5x10^{-2}$	1.9E-03	1.9E-03	1.9E-03	1.9E-03	1.9E-03	1.9E-03	2.0E-03	Background
P	--	7.4E-02	5.8E-02	7.4E-02	1.2E-04	1.2E-04	9.4E-02	1.3E-04	Peak @ 500 yrs.
Pb	$1.0x10^{-3}$	1.2E-04	1.2E-04	1.2E-04			1.2E-04		Background
Ra	$3.0x10^{-9}$	2.3E-09	1.8E-09	2.1E-09			2.6E-09		Peak @ 400 years and at late time
SO_4	128	13	3.5	16	13	12	13	30	Peak @ 400 yrs.
Se	$2.0x10^{-3}$	8.4E-04	8.2E-04	8.4E-04	8.4E-04	8.3E-04	8.4E-04	8.7E-04	Peak @ 400-800 yrs.
Sr	2.5	1.2E-01	7.7E-02	1.4E-01			1.2E-01		Peak @ 400 yrs.
Th	$1.24x10^{-4}$	3.2E-08	3.0E-08	3.1E-08			3.7E-08		Background
U	0.015	5.4E-04	5.3E-04	5.4E-04	5.5E-04	5.5E-04	1.3E-03	6.0E-04	Late time peak
V	0.12	6.6E-03	1.0E-04	1.3E-04			1.3E-04		Peak @ 400 yrs.
Zn	0.011	4.7E-03	4.6E-03	4.8E-03			5.1E-03		Late time peak
Simulated Time (years)		8720	7600	6400	5600	10000	10000	10000	

Note: two editorial updates to Scenario 1 were made on June 6, 2024 to facilitate round 3 IR discussions: 1) K value was corrected (from 4.0x10-5 m/s to 1.4x10-4 m/s) and 2) Mn was unbolded because it does not exceed the screening criteria


Thank You
Ecometrix
Environmental
INTELLIGENCE

Discussion of Round 3 IR-100, IR-190, IR-198-R1 Comments

Rina Parker, M.A.Sc., P.Eng.

June 5, 2024

Ecometrix | Environmental INTELLIGENCE

IR-100 Mercury in Fish

IR-100 (ROUND 3, May 31, 2024)	Discussion
This IR remains not accepted. It is unclear what threshold concentration(s) of mercury in fish would trigger further assessment of potential health risks. The response to IR-100 includes a commitment to monitor mercury concentrations in fish, and to assess potential health risks if concentrations are greater than that used to derive the Government of Saskatchewan (GoS) guidelines for fish consumption (last updated in 2015). However, using this concentration as a threshold would not be protective of human health if the local population consumes greater quantities than the published consumption guideline. Please provide the following information: 1. Discuss how the fish consumption rates from average and high traditional foods consumer groups (Section 10-A, Table 4-4: Annual Food Intakes for Components of the Human Receptor's Diet) relate to the GoS fish consumption limits for general and sensitive populations. 2. Justify the use of GoS guidelines for fish consumption for mercury monitoring in fish and as a trigger for possible management actions.	To clarify, Denison has not committed to using the Government of Saskatchewan guidelines for fish consumption and identified in the Round 2 IR response "Denison agrees to use Health Canada's 2007 provisional tolerable daily intake (pTDI) values of 0.20 µg/kg bw/day for young children and women of childbearing age for future assessments, or the relevant updated value at that time." Denison outlined in the response to IR-212 a conceptual trigger-response mechanism related to interpreting results from country foods sampled, which would also apply to mercury. - Compare fish tissue concentrations for mercury against measured fish tissue concentrations from the Wheeler River baseline program. - If an increasing trend relative to baseline is observed, verify result, investigate potential cause of increasing trend - Determine if change from baseline is significant and greater than trigger value

Mercury

- The results of the Wheeler River baseline fish tissue sampling program showed measured fish tissue concentrations near the Project in the range of 0.01 to 0.48 mg/kg
- From ERA (Appendix 10-A, Table 4-4)
  - Fish consumption (average consumer): 26.65 kg/yr (0.07 kg/d)
  - Fish consumption (high consumer): 183.44 kg/yr (0.5 kg/d)
- Will develop trigger value as part of country foods monitoring program development.

IR-190 CAAQS for NO_2

IR-190 (ROUND 3, May 31, 2024)	Discussion
The response to IR-190 acknowledges the predicted exceedances of the CAAQS for NO_2. However, the revised information does not appear to have been carried through to all the health risk assessment documents. HC notes that the new CAAQS for NO_2 also recognizes that there is no population health threshold for human health effects; therefore, any increase in exposure will result in an incremental population risk (Environment Canada and Health Canada, 2012; CCME, 2000). In other words, NO_2 is considered a non-threshold substance, meaning that health effects may occur at any level of exposure. Therefore, guideline values should not be construed as limits to which polluting up to is allowed. Please provide the following information: 1. Present modelled concentrations at the nearest human receptor site (i.e., Risk 2 - seasonal resident at McGowan Lake) in Tables 3-9, 3-10 and 3-11). 2. Correct/update Section 3.2.1.3.1: *Nitrogen Dioxide*, of Revised DRAFT EIS Appendix 10-A (February 2024), as follows: a. Remove references to the 1970's National Ambient Air Quality Objectives (NAAQOs) for NO_2. These objectives are no longer relevant and do not support the exclusion of NO_2 from further consideration as a COPC (Ref. AD-67); b. Acknowledge that modelled results exceed the 1-h NO_2 CAAQSs at the *camp workers location* and *fence line* during all project phases; and, c. Consider NO_2 a COPC for further quantitative assessment and characterize the potential health risk related to 1-h exposure to NO_2. 3. Characterize potential health risks from 1-h exposure to NO_2 using HC's guidance. Alternatively, use the updated **2021 WHO Global Air Quality Guidelines** for annual and 24-h NO_2 exposures when calculating hazard quotients. 4. Discuss how the proposed mitigation measures to minimize residual effects of the Project on air quality, as identified in Section 16.1.1 of the Revised DRAFT EIS (January 2024), address the health risks identified in Chapter 10. Also specify whether any additional air quality monitoring and/or mitigation measures are proposed specifically to address human health risks.	1. See tables on next slide – this can be added to the ERA tables 2. The following updates will be made as requested. a) References to the 1970's National Ambient Air Quality Objectives (NAAQOs) for NO_2 will be removed. b) ERA acknowledges exceedances of 1-h NO_2 CAAQSs at the *camp workers location* and *fence line* during all project phases (editorial edits will be made as suggested in the IR response) c) It is not planned to add NO2 as a COPC for further quantitative assessment. There are no exceedances of long-term CAAQS. The model has a number of conservative assumptions associated with it a) Assumption that diesel generators will be used; however, it is anticipated that power will be obtained from the provincial grid. b) Assumption that emission sources operate concurrently at their individual maximum rates of production to estimate the worst-case emission rates 3. Since NO_2 is not identified as a COPC hazard quotients are not calculated. Note that there are no 24 hour or annual exceedances of NO_2 guidelines. 4. As identified in IR-190-R1 NO_2 monitoring is planned during all Phases of the Project. Monitoring will include passive sampling and will follow an adaptive management process to identify if more frequent monitoring is needed.

NO_2 Concentrations and Exceedances

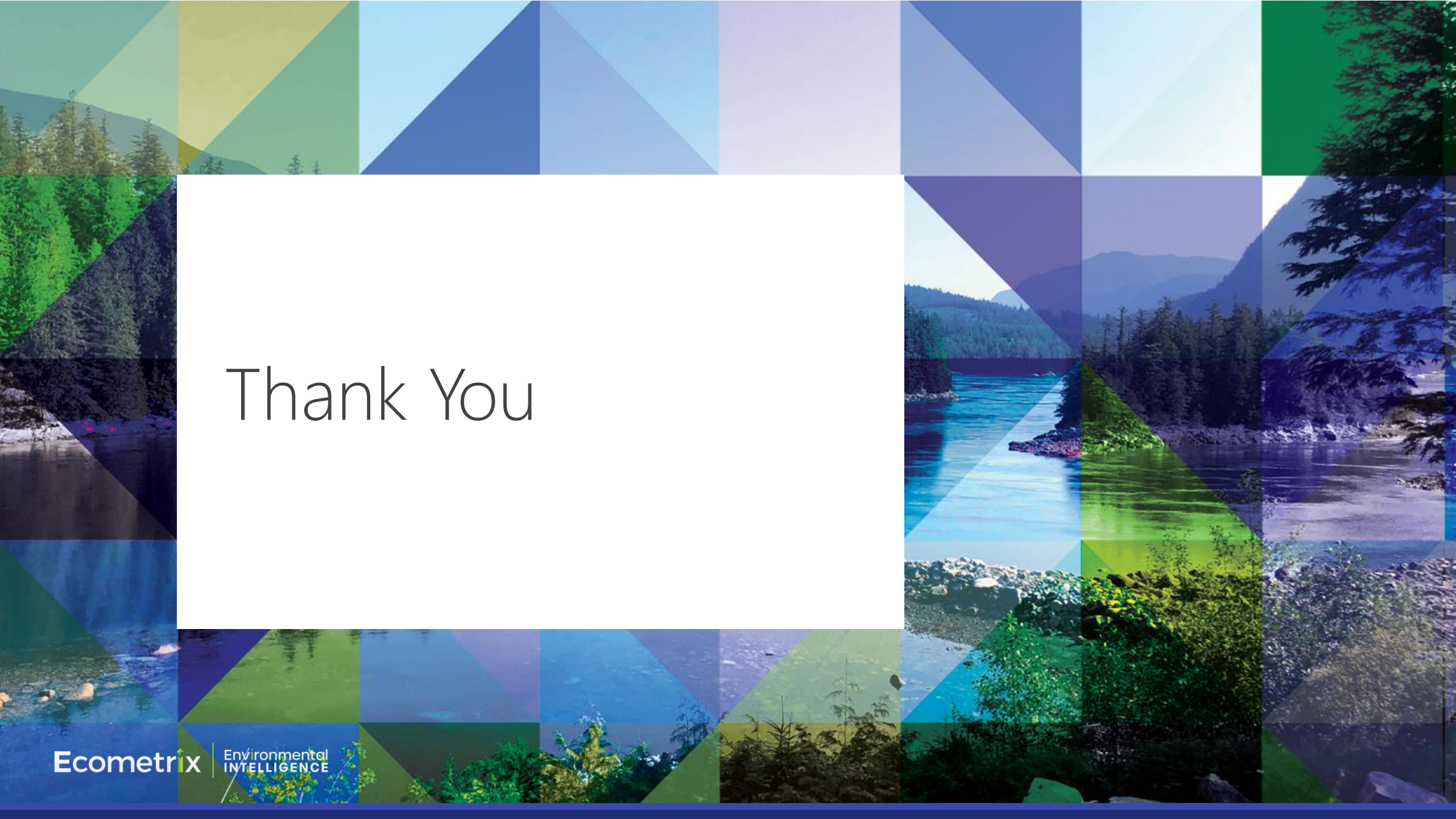
		NO_2 1 hr ug/m³			NO_2 annual ug/m³		
Location	Name	Construction	Operation	Decommissioning	Construction	Operation	Decommissioning
On-Site Ecological Location	Risk1	124.32	116.30	120.86	8.34	4.41	7.08
Trapper (LA1) - McGowan Lake	Risk2	42.97	40.18	41.64	4.65	3.97	4.60
Camp Worker	Risk3	180.95	274.83	355.07	17.1	11.3	16.4
Seasonal Resident (Russell Lake)	Risk4	22.9	24.0	22.7	4.0	3.8	4.0
Reference Receptor (LA-7)	Risk5	40.2	43.2	39.0	4.2	3.9	4.2
	CAAQS	79.0	79.0	79.0	23.0	23.0	23.0

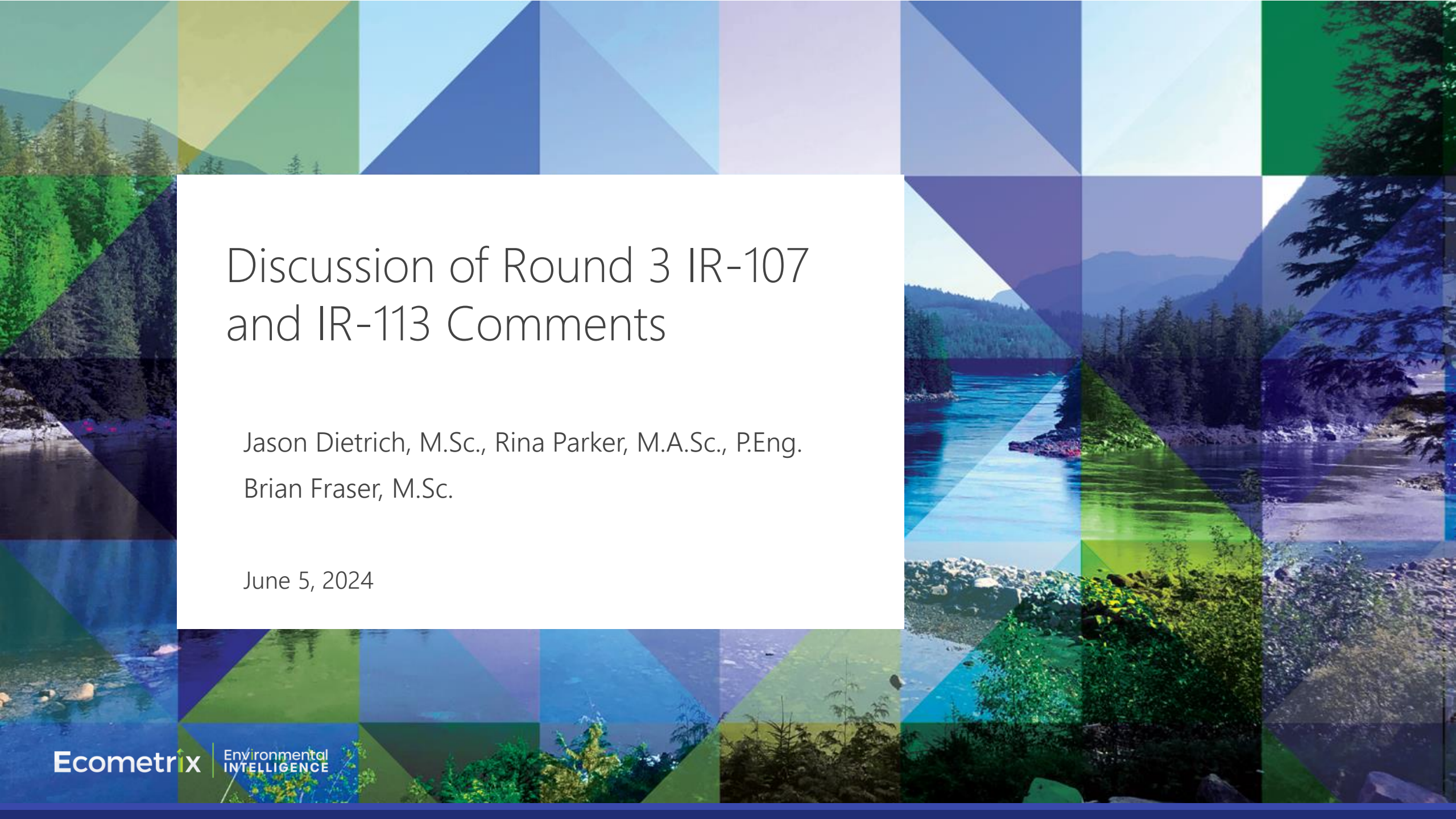
Note: Blue shading indicates exceedance of CAAQS

		NO_2 1 hr Frequency of Exceedance		
Location	Name	Construction	Operation	Decommissioning
On-Site Ecological Location	Risk1	0.5%	0.4%	0.4%
Trapper (LA1) - McGowan Lake	Risk2	-	-	-
Camp Worker	Risk3	3.4%	4.6%	5.6%
Seasonal Resident (Russell Lake)	Risk4	-	-	-
Reference Receptor (LA-7)	Risk5	-	-	-

IR-198-R1 Monitoring Lead and Mercury

IR-198-R1 (ROUND 3, May 31, 2024)	Discussion
Note To Denison: This IR is being conditionally accepted. If Denison commits to monitoring lead and mercury in country foods, as well as including these in any further assessment conducted to determine their potential risk to human health from consumption of country foods, this IR can be resolved. This commitment would include: 1. Establishing/confirming baseline concentrations of Hg in water, sediment, and fish tissues before construction; 2. Regular monitoring during construction, operation and post-closure; and, 3. Undertaking an HHRA should monitoring results exceed established/confirmed baseline levels, to inform decisions on adaptive management and mitigation measures. The Proposed rationale text for posting: Denison has captured their commitment related to monitoring lead and mercury in country foods, as well as including arsenic, cadmium, lead, and mercury in any further assessment conducted to determine their potential risk to human health from consumption of country foods. This commitment includes (would include): 1. Establishing/confirming baseline concentrations of Hg in water, sediment, and fish tissues before construction; 3[sic]. 2. Regular monitoring during construction, operation and post-closure; and, 3. Undertaking an HHRA should monitoring results exceed established/confirmed baseline levels, to inform decisions on adaptive management and mitigation measures This IR has been accepted for the purposes of the current EA process, and the aforementioned issues will be further assessed as part of licensing technical reviews, prior to the granting of a license.	This IR has been accepted.


Thank You
Ecometrix
Environmental
INTELLIGENCE



Discussion of Round 3 IR-107 and IR-113 Comments

Jason Dietrich, M.Sc., Rina Parker, M.A.Sc., P.Eng.

Brian Fraser, M.Sc.

June 5, 2024

Ecometrix | Environmental INTELLIGENCE

IR-107 Round Three Comments

IR (ROUND 3, May 31, 2024)	Status -May 31, 2024
Before this IR is accepted, the Proponent is requested to provide the statistical correlation analysis to confirm that data is correlated. Additionally, the four expectations set out in the rationale for status have not been adequately responded to. The Proponent should incorporate the following information into the EIS and ERA: 1) Provide raw baseline data (perhaps in an appendix). 2) Provide summary statistics for baseline datasets, which at a minimum should include: mean, standard deviation, 95th percentiles, minimum, maximum, and number of samples. Present summary statistics by season (i.e., freshet, summer, fall and under-ice), and include comparisons to relevant water quality guidelines. 3) Identify potential gaps in baseline datasets, and indicate how data gaps will be addressed. Describe the planned baseline monitoring to be conducted including, but not limited to, addressing any data gaps. 4) Demonstrate that the combined existing baseline data and planned baseline monitoring will yield dataset(s) that provide robust water quality baseline characterization of seasonal conditions (i.e., freshet, summer, fall, under-ice during winter), including a range of flow conditions. The Proponent should also incorporate the additional baseline data collected into the analysis and conclusions of the finalized EIS and ERA. Concerning the other aspects of the IR, these responses are accepted based on Denison's commitment to conduct periodic sampling prior to construction to strengthen existing environmental data. CNSC staff will review this information to ensure EA predictions remain valid and recommend collecting samples in the fall to spring timeframe, as samples from these seasons is sparse in the current dataset.	Not Accepted

IR-107 Statistical analysis to confirm data is correlated or similar

1. Analysis was conducted by comparing all Lakes in LSA vs. LA-5 and compared the percent (%) change between the geometric mean of all lakes and LA-5.
2. The results of this analysis indicated consistency between lakes with the percent difference less than 10% for the majority of COPCs and less than 12% for all COPCs.
3. Additional information will be provided as part of this IR for review

IR-107 additional expectations

1. Provide raw baseline data (perhaps in an appendix).

2. Provide summary statistics for baseline datasets, which at a minimum should include: mean, standard deviation, 95th percentiles, minimum, maximum, and number of samples. Present summary statistics by season (i.e., freshet, summer, fall and under-ice), and include comparisons to relevant water quality guidelines.

- All raw baseline data was provided in Appendix A-1 of Appendix 8-D of the EIS.

- Appendix A-1 of Appendix 8-D included the following: mean, SD, 75th percentile, 95th percentile, minimum, maximum, sample size (n) and screening against criteria by date.

IR-107 additional expectations

3. Identify potential gaps in baseline datasets, and indicate how data gaps will be addressed. Describe the planned baseline monitoring to be conducted including, but not limited to, addressing any data gaps.
4. Demonstrate that the combined existing baseline data and planned baseline monitoring will yield dataset(s) that provide robust water quality baseline characterization of seasonal conditions (i.e., freshet, summer, fall, under-ice during winter), including a range of flow conditions.

Denison feels strongly that the baseline water quality data collected are suitable for the purposes of the EIS and the application of additional conservatisms in the use of the data provide a conservative (i.e., protective) framework for evaluating potential effects.

Denison has committed to periodic sampling prior to construction to strengthen existing environmental data.

Denison will commit to update the analysis and predictions incorporating any new data collected during the licencing process, but there is not expectation that here would be any change to the EIS conclusions.

IR-107 additional expectations

Wheeler River Project
Baseline Aquatic Environment Study

Table A-1
Baseline Water Quality Data

Appendix A

Parameter		Bicarbonate	Carbonate	Chloride	Hydroxide	P. Alkalinity	pH	Specific Conductivity	Sum of Ions	Total Alkalinity	Hardness	Ammonia as N	Nitrate	Total Kjeldahl Nitrogen	Mercury	Total Organic Carbon
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	units	µS/cm		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Water Quality Benchmarks	SEQG/SSWQO											0.103	13.29			
	CCME CWQG			120			6.5 - 9								0.000026	
	Reference			CWQG			CWQG					SEQG	SEQG		CWQG	
Baseline Water Quality Characteristics	Count	142	142	142	142	142	142	142	142	142	142	142	103	142	142	142
	#DL	0	142	7	142	142	0	0	0	0	0	95	68	1	138	0
	Min	1	<1	<0.1	<1	<1	5.7	8	5	1.0	3	<0.01	<0.04	<0.05	<0.0000001	1.4
	Mean	8.5	1	0.37	1.014084507	1.084507042	6.8	18	14	7.1	5.3	0.033	0.11	0.27	8.4E-06	2.8
	75th	10	1	0.50	1	1	7.0	20	16	8.3	6.0	0.013	0.09	0.3	0.00001	3.1
	95th	20	1	0.70	1	1	7.1	26	28	16	7.0	0.068	0.44	0.44	0.00001	5.255
	Max	46	1	0.90	2	7	7.2	47	51	38	13	1.2	0.66	1.6	0.000068	8.4
	Geomean	6.7	1	0.32	1.009810446	1.027786217	6.7	17	12	5.8	5.2	0.015	0.067	0.25	5.9E-06	2.7
	SD	6.3	0	0.18	0.118256572	0.709539435	0.26	5.5	7.0	5.1	1.4	0.13	0.15	0.16	6.2E-06	1.1
Location	Sample Date															
LA-1	08-Jun-2011	2	<1	0.4	<1	<1	6.94	17	6.0	2.0	5.0	<0.01	<0.04	0.25	<0.00001	2.5
LA-1	12-Aug-2012	5	<1	0.4	<1	<1	6.52	17	10	4.0	6.0	<0.01		0.31	<0.00001	2.6
LA-1	29-Mar-2014	12	<1	0.5	<1	<1	6.83	24	18	10	6.0	0.09	0.49	0.17	<0.00001	2.3
LA-1	14-Sep-2016	10	<1	0.4	<1	<1	6.79	19	14	8.0	5.0	<0.01	<0.04	0.38	<0.000001	2.3
LA-1	02-Jul-2018	8	<1	0.4	<1	<1	6.71	9	12	7	4	<0.01	<0.04	0.33	<0.0000001	2.2
LA-1	16-Mar-2018	10	<1	0.5	<1	<1	6.82	15	15	8	5	0.03	0.29	0.2	0.000004	2.3
LA-1-Bottom	02-Jul-2018	5	<1	0.4	<1	<1	6.62	10	9	4	4	<0.01	<0.04	0.23	0.0000009	2
LA-1-Bottom	16-Mar-2018	6	<1	0.5	<1	<1	6.8	14	12	5	5	0.02	0.6	0.14	0.000007	2.2
LA-2	06-Jun-2011	5	<1	0.5	<1	<1	7.00	18	10	4.0	5.0	<0.01	<0.04	0.22	<0.00001	2.5
LA-2	28-Mar-2014	15	<1	0.7	<1	<1	6.9	25	22	12	7.0	0.04	0.53	0.15	<0.00001	2.2
LA-2	21-Sep-2016	11	<1	0.7	<1	<1	7.19	22	16	9.0	5.0	<0.01	0.05	0.22	<0.000001	2.2
LA-3	07-Jun-2011	4	<1	0.7	<1	<1	6.95	20	9.0	3.0	5.0	<0.01	<0.04	0.27	<0.00001	2.8
LA-3	28-Mar-2014	12	<1	0.9	<1	<1	6.92	24	19	10	6.0	0.04	0.4	0.16	<0.00001	2.3
LA-3	21-Sep-2016	8	<1	0.8	<1	<1	7.15	22	14	7.0	5.0	<0.01	0.05	0.25	<0.000001	2.3
LA-4	29-Mar-2014	20	<1	0.6	<1	<1	6.98	26	27	16	7.0	0.07	0.18	0.08	<0.00001	1.5
LA-4	21-Sep-2016	15	<1	0.6	<1	<1	7.19	24	21	12	5.0	<0.01	0.05	0.24	<0.000001	1.4
LA-5	08-Aug-2012	4	<1	0.3	<1	<1	6.57	16	8.0	3.0	5.0	<0.01		0.34	<0.00001	4.3
LA-5	01-Apr-2014	16	<1	0.4	<1	<1	7.01	22	22	13	6.0	0.05	0.26	0.14	<0.00001	1.9
LA-5	10-Sep-2016	8	<1	0.3	<1	<1	6.95	19	12	7.0	5.0	0.07	<0.04	0.19	<0.000001	2.2
LA-6	13-Aug-2012	5	<1	0.3	<1	<1	6.55	16	10	4.0	5.0	<0.01		0.29	<0.00001	2.9
LA-6	30-Mar-2014	46	<1	0.3	<1	<1	5.71	21	51	38	5.0	0.05	0.31	0.24	<0.00001	2.2
LA-6	12-Sep-2016	4	<1	0.4	<1	<1	6.71	18	8.0	3.0	5.0	0.04	<0.04	0.43	<0.000001	2.3
LA-6	02-Jul-2018	8	<1	0.3	<1	<1	6.75	9	12	7	4	<0.01	<0.04	0.28	<0.0000001	2.2
LA-6	17-Mar-2018	4	<1	0.3	<1	<1	6.79	12	9	3	4	0.02	0.3	0.29	0.000007	2.2
LA-7	09-Aug-2012	26	<1	0.4	<1	<1	6.73	18	32	21	6.0	<0.01		0.34	<0.00001	3.2
LA-7	29-Mar-2014	23	<1	0.7	<1	<1	6.82	26	30	19	7.0	0.12	0.26	0.44	<0.00001	2.0
LA-7	10-Sep-2016	10	<1	0.5	<1	<1	7.14	21	14	8.0	5.0	0.01	<0.04	0.32	<0.000001	2.4

Ecometrix | Environmental INTELLIGENCE

IR-113 Round Three Comments

IR (ROUND 3, May 31, 2024)	Status -May 31, 2024
The Proponent should conduct a sensitivity analysis on water quality predictions for low and high precipitation scenarios, including the potential influences of climate change to assist in fulfilling the IR from the previous round. This information is required to assess the potential for significant adverse effects to the environment. If additional baseline information is required, it should be sourced or otherwise collected.	Not Accepted

IR-113

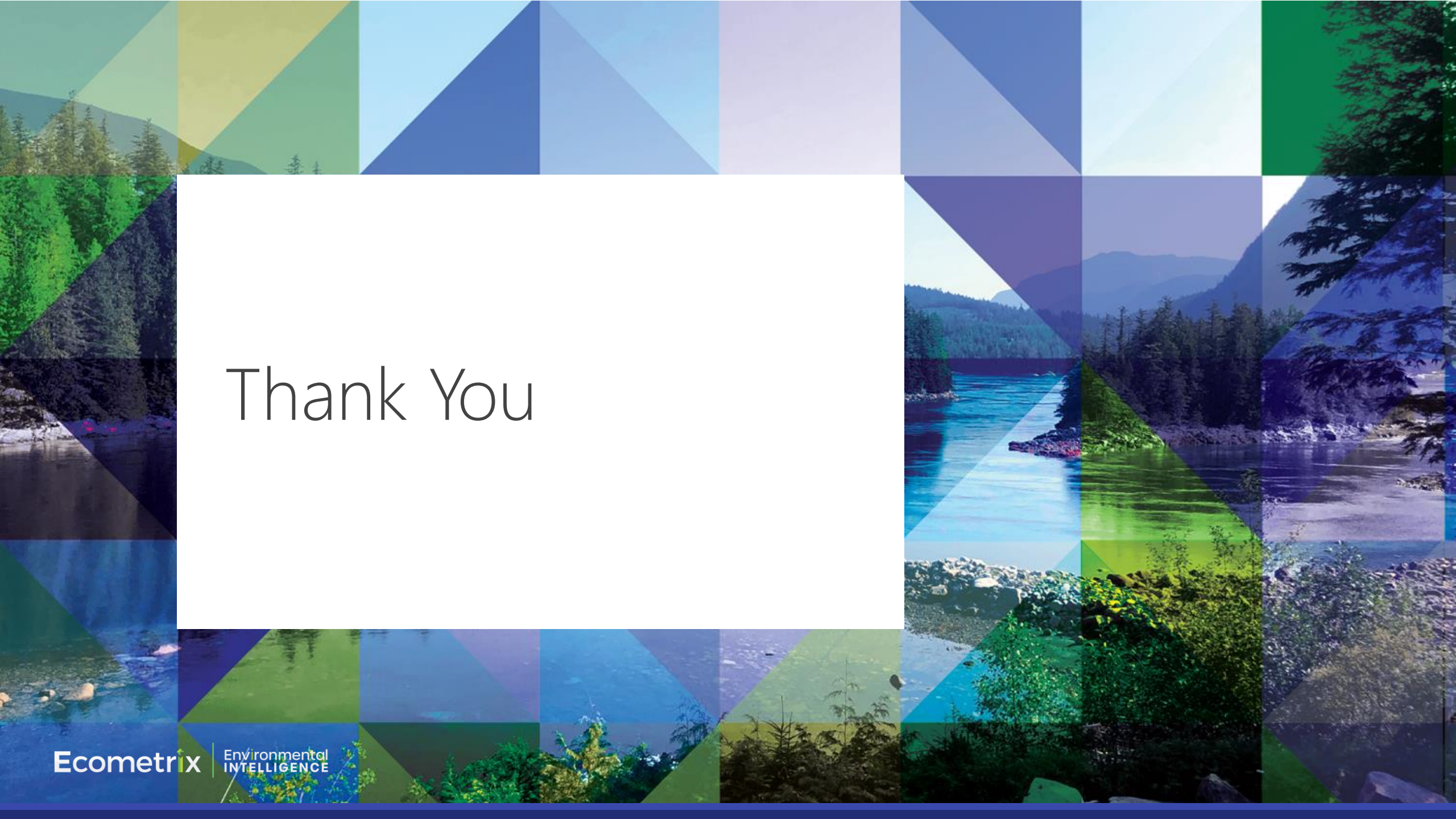
Denison disagrees that a qualitative climate change assessment is required at this time for the purposes of the EIS because:

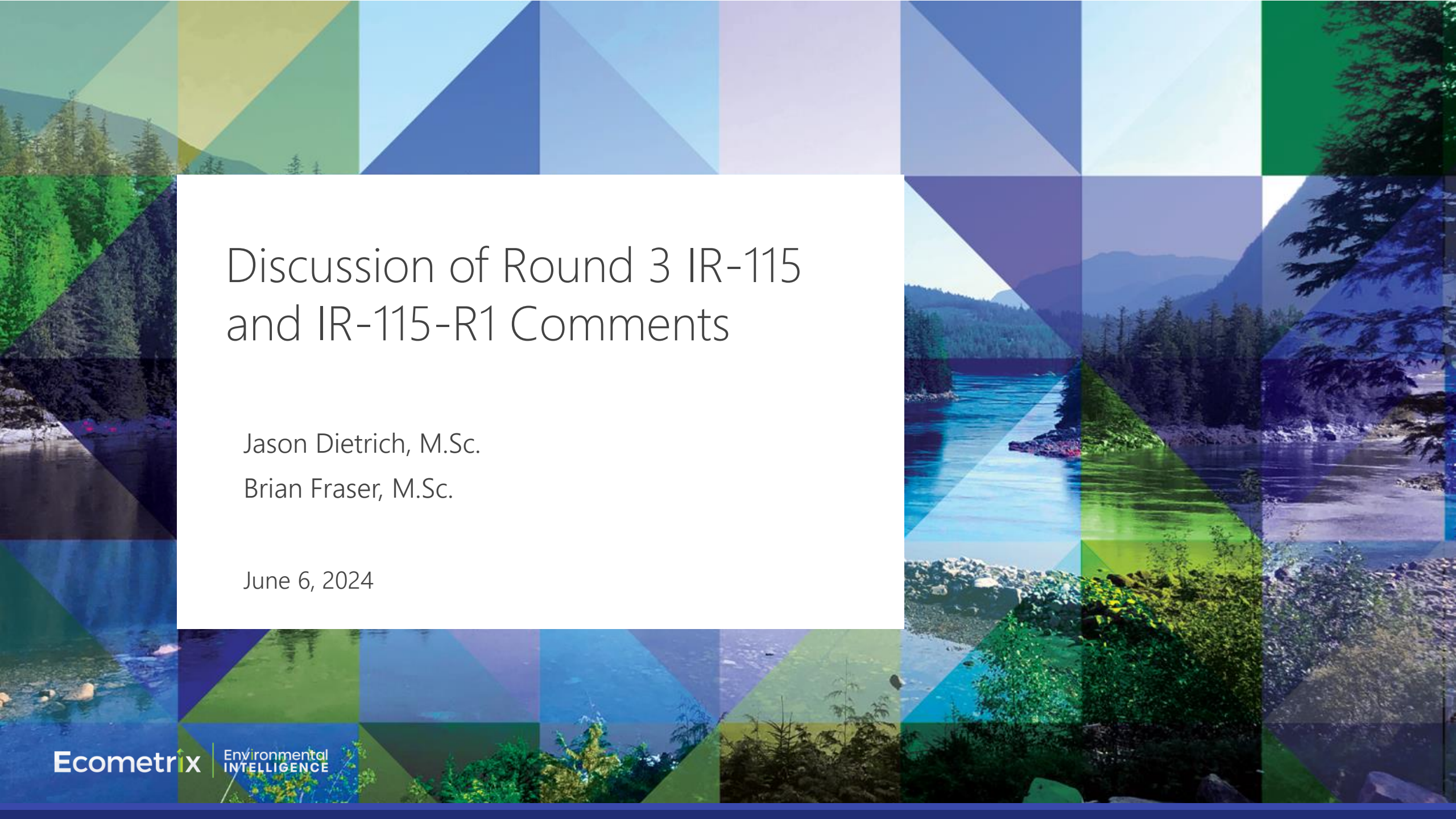
1) The duration of the project (15 years) is of short duration within the context of climate change thereby making it unlikely that large scale changes in precipitation and temperature will occur.
2) The design basis PMP is robust and inclusive of projected total annual precipitation under a high carbon scenario.
3) Effluent discharge will be monitored as per the MDMER Schedules 4 and 5;
4) Under scenarios of low flow condition, discharge can be limited seasonally or periodically and specific to the assimilative capacity of the receiver (flow proportioned of fixed dilution discharge);
5) Adaptive management and adjustment to discharge timing and volume as needed over time to meet criteria based on climate induced changes in flow.

IR-113

Denison suggests that a sensitivity analysis on water quality predictions for low and high precipitation scenarios, including the potential influences of climate change can be completed as part of licensing and as applicable to REGDOC-2.9.2.

This would be consistent with the approach of further analysis conducted as part of licensing and following collection of additional water quality data to support such modelling.


Thank You
Ecometrix
Environmental
INTELLIGENCE



Discussion of Round 3 IR-115 and IR-115-R1 Comments

Jason Dietrich, M.Sc.

Brian Fraser, M.Sc.

June 6, 2024

Ecometrix | Environmental INTELLIGENCE

IR-115 / 115-R1 Round Three Comments

IR (ROUND 3, May 31, 2024)	Status -May 31, 2024
The Proponent has not fully responded to the previous round's IR. For items one and two, some of the information provided on contaminants of potential concern (COPCs) and the background concentrations of hardness in the receiving environment is not sufficiently conservative. Item three requested rationale that all selected water quality thresholds (i.e., screening criteria) are at levels protective of aquatic life, which was not provided. The updated Table 8.2-8 provides two short-term and two long-term screening criteria for each parameter. The screening criteria reflect calculated screening criteria for both background hardness and project-induced hardness, however, it is unclear which criteria the Proponent intends to apply in their assessment since four separate criteria are provided (see IR-114). The information presented in Table 8.2-8 indicates there are no background water quality exceedances of guidelines. However, it is noted that several screening criteria do not reflect the most conservative guidelines, which is not consistent with the approach described in Appendix 10-A (Environmental Risk Assessment). For some examples, the short-term screening criteria value of 500 mg/L for nitrate is much higher than the BC MOE nitrate guideline of 32.8 mg/L., the long-term criteria for un-ionized ammonia of 6.87 mg/L is much higher than the CCME guideline of 0.019 mg/L and the MDMER limit, and the long-term phosphorus screening criteria represent a trigger range that is two to three trophic levels above background, which is much higher than the CCME guidance framework recommends. The Proponent should review and update Table 8.2-8 to provide conservative screening criteria for all parameters, and include a consideration of the CCME, FEQG, SEQG, and BC MOE when selecting the screening criteria. Screening criteria selection should be informed by the most conservative guidelines. Cases where the Proponent does not propose to apply the most conservative screening criteria should be accompanied with a discussion and rationale for the selection. The Proponent should also specifically state which criteria will be used in screening, how these criteria will be or are applied, how the EA conclusions are informed by the criteria, and whether any EA conclusions are altered by changes to screening criteria.	Not Accepted

IR-115-R1 - However, it is noted that several screening criteria do not reflect the most conservative guidelines, which is not consistent with the approach described in Appendix 10-A (Environmental Risk Assessment).

The approach taken in the ERA and EIS was as follows:

1. Is there a Saskatchewan provincial screening criteria available?
2. Is there a federal screening criteria available?
3. Us the most stringent of either of these two for the assessment
4. Where there is not screening criteria either federally or provincially, use an available criteria from another jurisdiction.

The most stringent criteria in any jurisdiction was not deemed reasonable for the purposes of the EIS nor was this the intention of the methods described in Appendix 10-A or the ERA. This can be corrected to reflect the hierarchy above.

IR-115-R1 - Item three requested rationale that all selected water quality thresholds (i.e., screening criteria) are at levels protective of aquatic life, which was not provided

1. We used the criteria protective of aquatic life. These criteria are typically derived to be protective of the all life stages of all species.
2. The nearfield analysis was conducted with high conservatism
   - Average effluent rate of 36.5 m^3/hr and continuous flow – this is an unlikely scenario
   - The water quality analysis was conducted for each of the low flow scenarios (i.e., 7Q10 low flow, monthly low flow, and monthly average flow) for the receiving water environment
   - Ninety-fifth percentile (95%) concentrations of constituents at baseline condition were used in modelling potential effects.
   - Based on pilot tests completed for the IWWTP to date, sulphate, chromium, molybdenum, TSS, and selenium have been identified as having potential management needs. However, for each of these parameters, the estimated discharge concentrations provided were conservative in nature with a contingency factor of 2 to 3 times.

IR-115-R1 - four separate criteria are provided (see IR-114).

The updated Table 8.2-8 provides two short-term and two long-term screening criteria for each parameter. The screening criteria reflect calculated screening criteria for both background hardness and project-induced hardness.

For the majority of parameters, the prediction is that effluent will be below long-term criteria at the background screening criteria except for sulphate, chromium and molybdenum (Nearfield model)

Parameters whose available assimilative capacity exceed short term criteria listed in Table 8.2-10 for both sets of screening criteria (background and induced) include chloride, TSS, arsenic, cadmium, copper, manganese, uranium, and zinc. (Nearfield model)

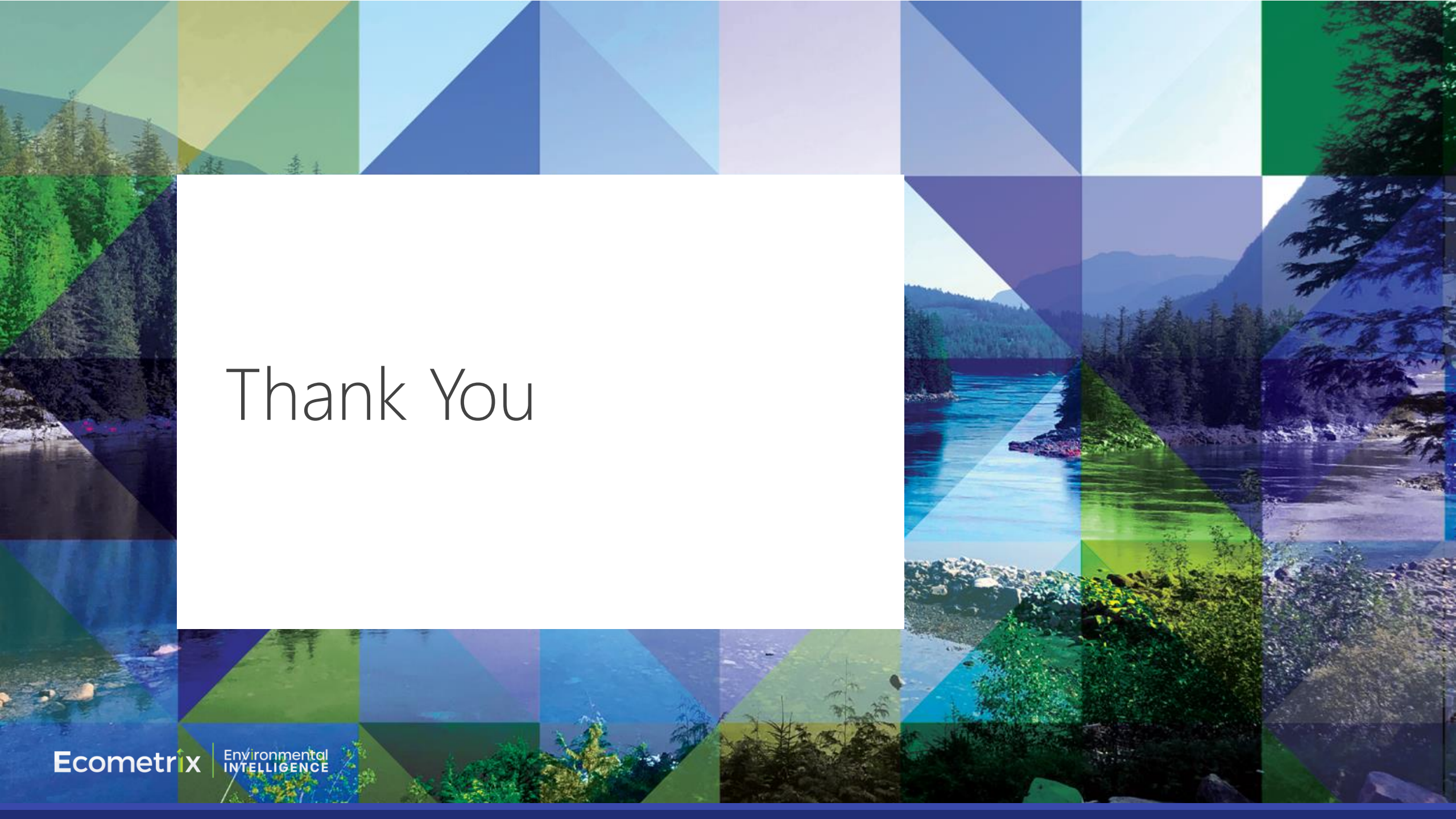
IR-115-R1 - four separate criteria are provided (see IR-114).

But Denison has committed to the following mitigation and must meet REGDOC 2.9.2

- Develop site-specific effluent treatment to treat COPCs to appropriate release limits in accordance with provincial standards and licence/permit conditions.
- Discharge effluent under a scenario that will meet provincial and federal discharge criteria as identified through permitting. Scenarios may include:
  - – discharging at a fixed rate while maintaining an appropriate minimum dilution ratio (i.e., discharge when able to meet the required dilution ratio and cease discharge during periods when unable to meet the necessary dilution ratio);
  - – discharging under a variable waste load allocation (i.e., discharge an appropriate effluent volume based on flow in the receiver to maintain minimum dilution ratio); and
  - – managing discharge via a hybrid of these (i.e., discharge effluent at a fixed rate to maintain the required dilution ratio, but the fixed rate can be varied on a seasonal basis based on flow).

We feel strongly that analysis and screening is adequate for the purposes of the EIS and the application of additional conservatisms in the use of the data provide a conservative (i.e., protective) framework for evaluating potential effects.

Denison has committed to periodic sampling prior to construction to strengthen existing environmental data and will commit to update the analysis and predictions incorporating any new data collected during the licencing process, but there is no expectation that there would be any change to the EIS conclusions.


Thank You
Ecometrix
Environmental
INTELLIGENCE

Discussion of Round 3 IR-124, IR-124-R1, IR-126, IR-197 Comments

Rina Parker, M.A.Sc., P.Eng.

June 6, 2024

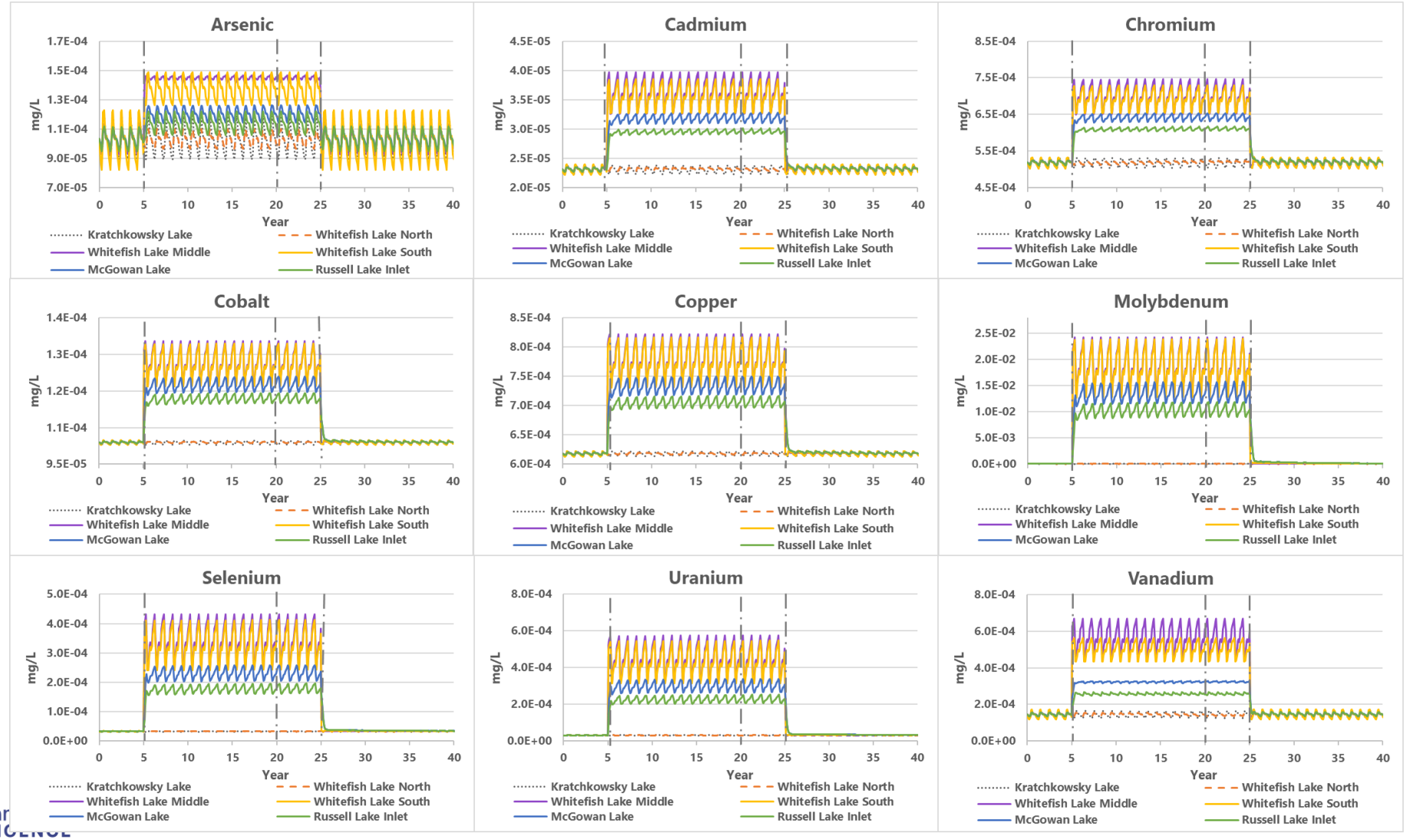
Ecometrix | Environmental INTELLIGENCE

IR-124 Surface Water and Sediment Modelling

IR-124 (ROUND 3, May 31, 2024)	Discussion
The Proponent has not fully responded to the previous round's IR. The modeling of surface water and sediment COPC's described in Appendix 10-A show results for the receiving waterbodies, but it is not clear how the results for the COPC concentrations for water quality and sediment quality calculated for each of the water bodies, shown in Figure 6-1 and 6-2 respectively, are being interpreted. The Proponent has not explained if these modeled values are based on the worst-case scenarios that account for environmental variables such as seasonal changes in hydrology and chemistry or if they have only accounted for changes in operational effluent discharge scenarios to consider the upper bound discharge rates. Additionally, it is unclear whether depositional areas for sediment were identified based on hydrological data. Additional information is also needed regarding baseline exceedances of sediment COPC thresholds and the associated risk assessment of mine operations on the receiving water body. The Proponent should consider maximum COPC scenarios for the receiving water bodies in baseline assessments and the risk assessment, including seasonal variability and sediment depositional areas to determine whether the baseline assessment and risk assessment fully considered the effects of the operations of the proposed mine. The Proponent should provide supplemental information to aid in determining if the environmental model has considered environmental variability such as seasonal changes in water levels, flows and sedimentation. The Proponent should also demonstrate that the model has considered a reasonable expected worst case scenario, such as a 100 year return. This IR is addressing quality of inputs (ex. baseline data, conservatism of scenarios modelled, environmental variability, etc.) in to modelling. This information is required to assess the conservatism of modelling the bounding conditions and potential for significant adverse effects to the environment.	• Figure 6-1 and Figure 6-2 in Appendix 10-A are referring to the sensitivity analysis which specifically looks at the difference between expected and upper bound effluent discharge rates. All other parameters are unchanged from the expected case. • Appendix A to the ERA is called " Wheeler River Project IMPACT Model" provides detailed information on the equations used, assumptions made and inputs used in the IMPACT model • The IMPACT Model considers monthly fluctuations in flows in all waterbodies. This is described in Section 3.1 of Appendix A.

Modelled Water Concentrations during Project Phases

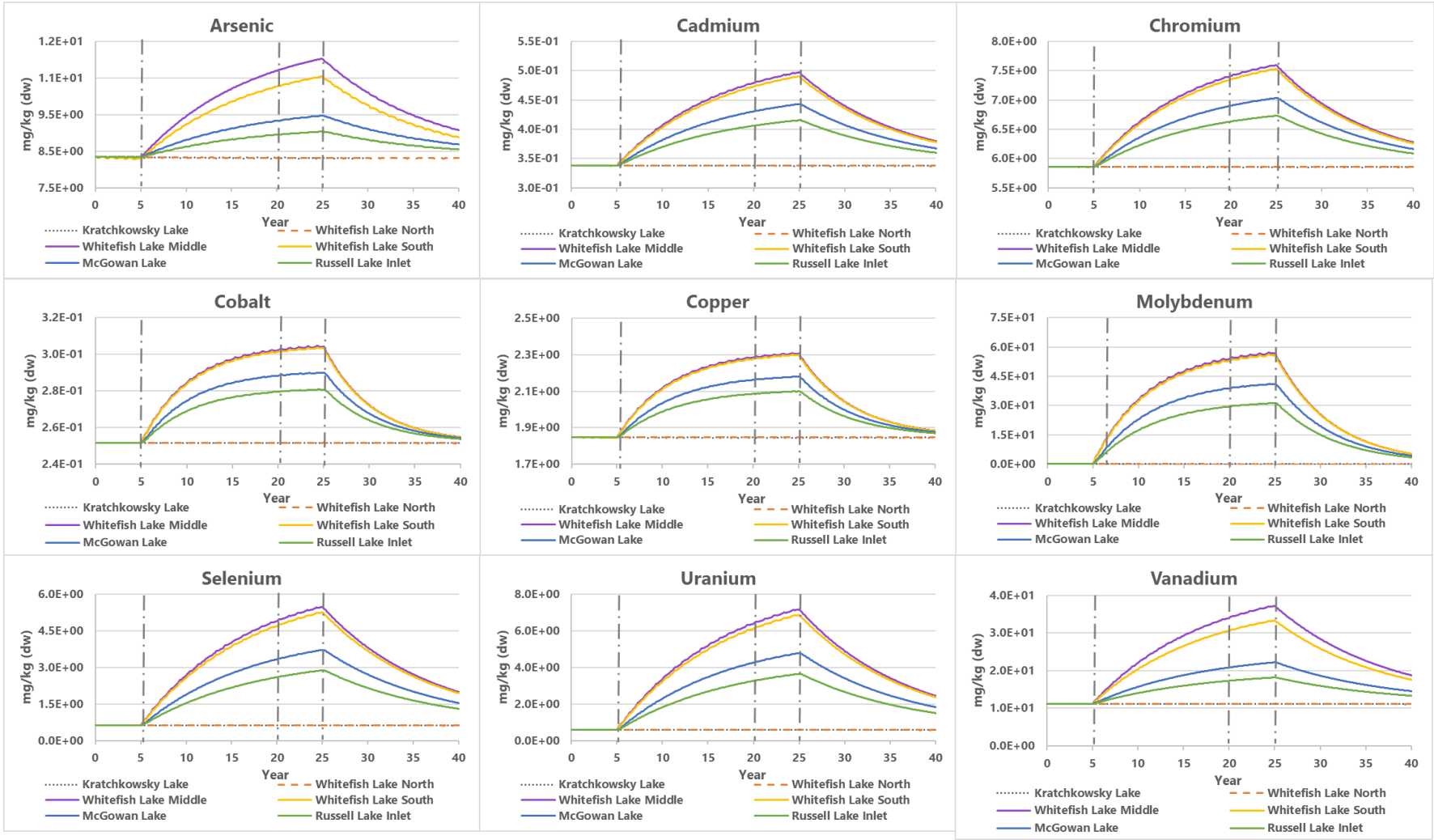
Figure 3-2 in Appendix 10-A



Modelled Sediment Concentrations during Project Phases

Figure 3-3 in Appendix 10-A

The sediment model represents deposition in the whole lake using partition equations. There is not a significant release of particulates; therefore, the dominant process is expected to be partitioning not particle settling – TSS in effluent is low (6 mg/L).



Near-field Model and IMPACT Model

- Two models were utilized for different purposes. The near-field model assessed different flow scenarios including low flow, and the IMPACT Model was used as the regional model for the risk assessment. The risk assessment focuses on the expected case.
- There are numerous conservative assumptions in the near-field model
  - The water quality analysis was conducted for each of the low flow scenarios (i.e., 7Q10 low flow, monthly low flow, and monthly average flow) for the receiving water environment
  - Ninety-fifth percentile (95^{th} %) concentrations of constituents at baseline condition were used in modelling potential effects.
  - Average effluent rate of 36.5 m^3/hr and continuous flow – this is an unlikely scenario
  - Effluent quality is conservative, as many based on pilot tests completed for the IWWTP to date with a contingency factor of 1 to 3 times incorporated for conservatism.

Near-field Model and IMPACT Model

- There are numerous conservative assumptions in the IMPACT model
  - Ecological receptor assumptions: home ranges are selected based on expected home range during sensitive life stages, 100% residency assumptions for wildlife to capture risk from exposure from life stage of interest.
  - Human receptor assumptions: traditional foods diet is conservative and reflects both average and high consumers. The amount of traditional food obtained from the Project area is conservative based on current understanding of land use.
  - The results shown in the ERA represents the maximum dose/risk receptors would receive over the Project phases
  - Toxicity reference values uses incorporate safety and uncertainty factors

IR-124-R1 Surface Water and Sediment Modelling

IR-124-R1 (ROUND 3, May 31, 2024)	Discussion
The Proponent has not fully responded to the previous round's IR. The modeling of surface water and sediment COPC's described in Appendix 10-A, Figure 6-1 and 6-2 respectively shows results for the receiving waterbodies. However, it is unclear if these modeled values are based on the worst-case scenarios that account for environmental variables such as seasonal changes in hydrology and chemistry, or if they have only accounted for changes in operational effluent discharge scenarios to consider the upper bound discharge rates. The Proponent's responses regarding baseline exceedances of COPC thresholds in the receiving waterbodies require additional information regarding environmental variability, including but not limited to seasonal changes in water levels, flows and sedimentation, in order to determine whether the model has considered environmental variability. The Proponent should also demonstrate that the model has fully considered a reasonably expected worst case scenario, such as a 100-year return period for the above variables. The Proponent should include a consideration of the maximum COPC scenario for the receiving water bodies in baseline assessments and the risk assessment, including seasonal variability and sediment depositional areas, to consider the effects of the operations of the proposed mine.	To clarify, the environmental risk assessment considers both seasonal variability including changes in monthly flows as well as consideration of sediment deposition in the whole lake.

IR-126 Selenium

IR-126 (ROUND 3, May 31, 2024)	Discussion
The Proponent did not compare their predictions for fish tissue selenium to the FEQGs in the ERA as requested. Furthermore, in their response the Proponent does not use available species-specific moisture content and conversion factors available for northern pike and lake whitefish when converting muscle selenium concentrations to whole-body selenium concentrations. This means that the Proponent's prediction likely underestimates the selenium tissue concentrations in the fish. Consequently, the hazard quotients reported are lower than expected. Additionally, the method used by the Proponent to predict selenium concentrations in northern pike and lake whitefish does not appear to include dietary uptake and bioaccumulation of selenium, only direct contact with pore water and overlying water is considered (Table 5-5 in Appendix 10A; Section 2.2.2 of Appendix A to Appendix 10-A). Selenium uptake through the aquatic food web has been shown to result in bioaccumulation of selenium in aquatic-dependent wildlife and resulting in reproductive impairments and malformations (ECCC 2022). Dietary sources of selenium would typically be expected to be the main contribution to tissue concentrations of selenium compared to selenium uptake from water. In most situations, the conversion of inorganic selenium to organic selenium through uptake from water into periphyton/algae is the rate limiting step of selenium bioaccumulation into higher level organisms including benthic invertebrates and fish. This step is affected by many environmental parameters (e.g. temperature, substrate, lentic/lotic environment). Considering that the effluent discharge contains 42 ug/L selenium, consideration of dietary selenium is warranted. The Proponent should update the final EIS with the following information: 1. Update the ERA with the assessment of selenium concentrations in fish tissue to include a comparison of selenium fish tissue concentrations to ECCC FEQG guidelines for either fish whole body tissue (6.7 ug/g dry weight) or fish egg/ovary tissue (14.7 ug/g dry weight) using species-specific moisture content and muscle : whole body and/or egg-ovary : muscle conversion factors (see Tables B-1b, Table B-3, Table B-4, and Table B-5 in US EPA (2021)). 2. Update the ERA for the assessment of selenium concentrations in fish tissue using a method that considers dietary uptake and bioaccumulation in order to determine predicted fish tissue concentrations of selenium in northern pike and lake whitefish. This is recommended to be done over all Project phases for both the Expected Case and sensitivity scenarios. 3. Provide predicted fish tissue selenium concentrations that include the range of variability of data used to develop the tissue selenium predictions. Only one output value without a confidence interval is provided for each location and species (see Table B.5 in Appendix B of Appendix 10-A).	1. Round 2 IR response provided a comparison against the ECCC FEQG by converting the muscle tissue concentrations to whole-body tissue concentrations using generic conversion values. The dry weight to fresh weight conversion factor used was 0.25. Based on measured dry weight content in fish (northern pike and white sucker the dry weight content ranged from 0.24 to 0.26 which is consistent with literature values; therefore, there is no need to change. (see next slide for additional results). 2. The ERA has done what the reviewer is requesting. The ERA utilizes a bioaccumulation factor (BAF) model from water to tissue to conservatively reflect all the multi-media contributions to update. The BAFs are provided in Appendix A to the ERA in Section 3.6.1. 3. The fish tissue selenium concentrations represent the maximum concentration over the Project phases. This is the most conservative result.

IR-126 Selenium

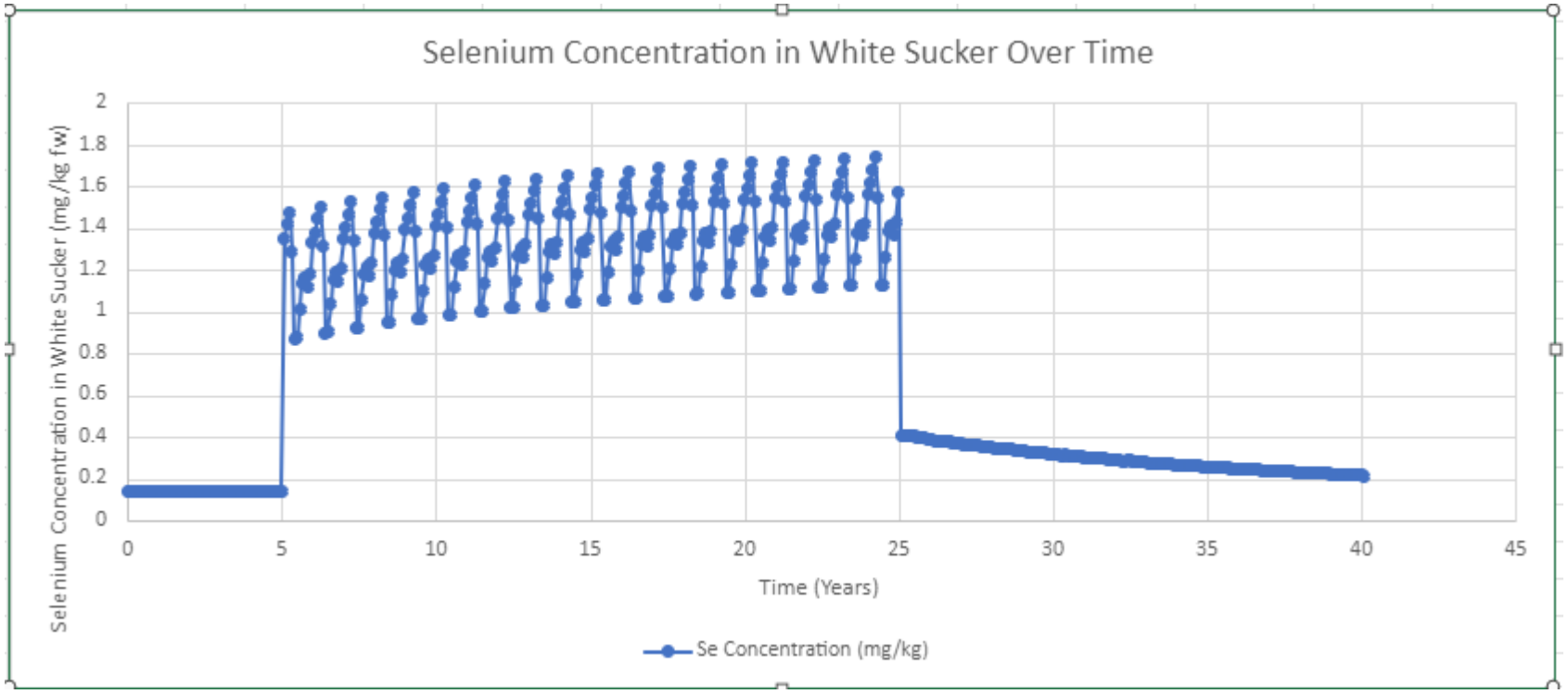
- White Sucker - Good agreement between literature and measured
  - Moisture Content (Table B-1b): 77.37
  - Moisture Content Baseline Data: 76.55%
  - Moisture Content CSA N288.1: 75%
- Table B-4 of US EPA (2021) provides muscle to whole-body correction factor for white sucker (1.34)

Fish Species	Lake	Muscle ug/g fw	Muscle ug/g dw	IR-Response Whole Body ug/g dw	Updated Whole Body ug/g dw
W. Sucker	Ref	1.46E-01	5.84E-01	4.60E-01	4.65E-01
	WL North	1.43E-01	5.72E-01	4.50E-01	4.55E-01
	WL Mid	1.74E+00	6.96E+00	5.48E+00	5.54E+00
	WL South	1.66E+00	6.64E+00	5.23E+00	5.28E+00
	McGowan	1.06E+00	4.24E+00	3.34E+00	3.37E+00
	Russell	8.06E-01	3.22E+00	2.54E+00	2.57E+00

Conclusion: There is minimal difference between previous assumptions and updated assumptions.
All results still below the ECCC FEQG of 6.7 µg/g dry weight

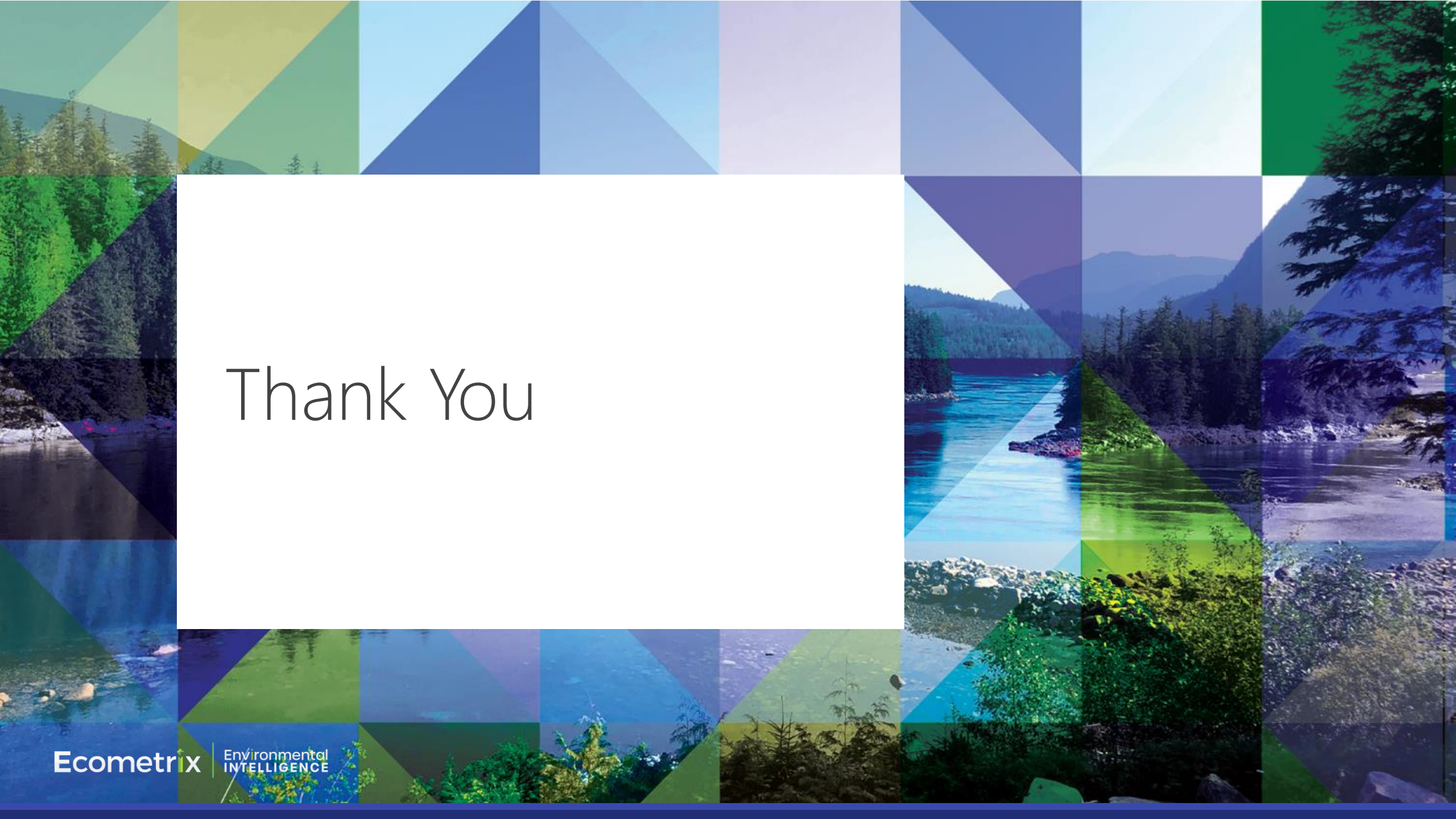
Updates include: Baseline data moisture content, US EPA correction factor from Table B-4.

Selenium in White Sucker over Time (LA-5)



IR-197 Atmospheric Deposition

IR-197 (ROUND 3, May 31, 2024)	Discussion
The Proponent is not using the correct CSA standard to address this information requirement. The response refers to guidance from CSA N288.1 (i.e., *Guidelines for modelling radionuclide environmental transport, fate and exposure associated with the normal operation of nuclear facilities)*, however, the information requirement specifies CSA N288.6, which is a different standard. In lieu of requesting information on atmospheric deposition of all contaminants of potential concern (COPC) to surface water and associated effects, the Proponent should: 1. Provide an estimate of atmospheric deposition of mercury (all species) from Project-related emissions. Include a sensitivity analysis as well as expected seasonal variations in the deposition rate with an emphasis on accumulated deposition for the lake ice breakup period. 2. Update water quality mercury predictions (all species) for Whitefish Lake using scenario(s) that incorporate atmospheric deposition from Project-related emissions. Based on the findings, assess any Project-related effects to aquatic receptors from mercury (all species). Discuss potential effects on sediment quality. 3. Discuss how the response was informed by the CSA N288.6 standard (i.e., Environmental risk assessments at class I nuclear facilities and uranium mines and mills. CSA Group; February 2022).	1. There are no Project-related emissions of mercury to air therefore the request to estimate atmospheric deposition of mercury from Project-related emissions is not applicable. The Round 2 IR response provided an example for uranium to show how atmospheric deposition to lakes is considered minor. 2. There are no Project-related emissions of mercury to air therefore the request to estimate atmospheric deposition of mercury from Project-related emissions is not applicable. 3. The CSA N288.6 standard provides guidance on conducting environmental risk assessment, but does not provide detailed guidance on fate and transport models. The CSA N288.6 standard refers to other documents for the details. This includes CSA N288.1. For example, Clause 1.4 of N288.6 states "An understanding of the fate and transport of contaminants in the environment is necessary for performing an ERA; however, a detailed discussion of fate and transport models is outside the scope of this Standard. The risk assessor should consult CSA N288.1 for information on these concepts. Examples of additional models are provided in Clause 6.3.7." The examples of models provided include N288.1 as well as the IMPACT model which implements the equations in N288.1.


Thank You
Ecometrix
Environmental
INTELLIGENCE

Denison Mines

Denison Mines Corp.
Wheeler River Project

June 6, 2024

Terrestrial Environment

Round 3 Information Requirements (IRs)

Agenda

- Terrestrial Environment
- Remaining IRs
  - Species-specific information for pre-clearance sweeps
    - IR-134-R1: Bats
    - IR-149-R1A: caribou
    - IR-142, IR-159, IR-167-R1: SAR in general
    - IR-170: SAR, including nighthawk
  - Bats
    - IR-174
  - Caribou
    - Caribou offset commitment
      - IR-149, IR-157
    - Caribou mitigations related to Project flights
      - IR-149-R1B

Terrestrial Environment

Draft EIS Section 9.3 Ungulates, Furbearers, and Woodland Caribou and 9.4 Raptors, Migratory Breeding Birds, and Bird Species at Risk – *Habitat-based assessments*

- **Ungulates, Furbearers, and Woodland Caribou**

Key Indicators:

Moose
Wolverine, Pine Marten, Mink, Muskrat
Woodland Caribou

Direct habitat loss
Sensory disturbance
Collisions with project vehicles & equipment
Harvest and/or predation

Potential Effects Considered:

Amount of habitat that may be altered or lost relative to its availability in the Terrestrial RSA
Mortalities directly or indirectly attributable to the Project

- **Raptors, Migratory Breeding Birds, & Bird Species at Risk**

Key Indicators:

Bald Eagle, Osprey
Waterbirds and Waterfowl
Upland Game Birds
Migratory Songbirds
Common Nighthawk
Short-eared Owl
Yellow Rail
Rusty Blackbird
Olive-sided Flycatcher

Direct habitat loss
Sensory disturbance
Collisions with project vehicles & equipment
Incidental take of birds, nests, eggs

Potential Effects Considered:

Amount of habitat that may be altered or lost relative to its availability in the Terrestrial RSA
Mortalities directly or indirectly attributable to the Project

Terrestrial Environment Valued Components

- Terrain
- Soil
- Organic Matter/Peat
- Vegetation and Ecosystems
- Listed Plant Species
- Wetlands
- Ungulates
- Furbearers
- Woodland Caribou
- Raptors
- Migratory Breeding Birds
- Bird Species at Risk

Terrestrial Environment – Species at Risk (SAR)

Wildlife Valued Components, Key Indicators, and Measurable Parameters included in the Habitat-based Assessment

Valued Component	Key Indicator	Measurable Parameter
Furbearers	Wolverine	Amount of habitat (km^2) (not necessarily occupied) that may be altered or lost relative to its availability in the Regional Study Area (RSA). The number of wolverine mortalities directly or indirectly attributable to the Project.
Woodland Caribou	Woodland caribou	Amount of habitat (km^2) (not necessarily occupied) that may be altered or lost relative to its availability in the RSA. The number of woodland caribou mortalities directly or indirectly attributable to the Project.
Bird Species at Risk	Common Nighthawk	Percentage of habitat for Common Nighthawk altered/lost directly or indirectly as a result of Project activities. The number of Common Nighthawk mortalities directly or indirectly attributable to the Project.
	Rusty Blackbird	Percentage of habitat for Rusty Blackbird altered/lost directly or indirectly as a result of Project activities. The number of rusty blackbird mortalities directly or indirectly attributable to the Project
	Olive-sided Flycatcher	Percentage of habitat for Olive-sided Flycatcher altered/lost directly or indirectly as a result of Project activities. The number of Olive-sided Flycatcher mortalities directly or indirectly attributable to the Project
	Short-eared Owl	Percentage of habitat for Short-eared Owl altered/lost directly or indirectly as a result of Project activities. The number of Short-eared Owl mortalities directly or indirectly attributable to the Project.
	Yellow Rail	Percentage of habitat for Yellow Rail altered/lost directly or indirectly as a result of Project activities. The number of Yellow Rail mortalities directly or indirectly attributable to the Project.

Terrestrial Environment – Species at Risk (SAR)

- Supplemental information generated during EIS review:
  - IR responses
    - Round 1 – submitted August 2023
    - Round 2 – submitted February 2024
  - Revised draft EIS new appendices:
    - Appendix 9-D Wildlife Species At Risk
      - Additional information for 9 SAR which were not included in the draft EIS as KIs.
        - The information provided in the SAR appendix includes a summary of the life history requirements, the expected Project effects, proposed mitigation measures, and anticipated residual effects on these listed species.
    - Appendix 9-E Caribou Management Framework
    - Appendix 9-F Supplemental Information Generated During the Draft EIS Review

Terrestrial Environment – Remaining IRs

Species-specific information for pre-clearance sweeps

IR-134-R1: Bats
IR-149-R1A: caribou
IR-142, IR-159, IR-167-R1: SAR in general
IR-170: SAR, including nighthawk

- Various IRs requesting details on how pre-clearance sweeps will be tailored to SAR
  - Denison's EIS has concluded there are no significant effects on wildlife and bird SAR.
  - Denison believes we have provided sufficient information in the EIS and IR responses for the federal government to make a determination as to the effect of the Project on SAR, within the approved scope of the Project and *CEAA 2012*.
    - Details related to management plans are under development to support CNSC licensing and provincial permitting.
    - We also note that ongoing SAR management is under Provincial jurisdiction.
  - Information requested in these IRs has been provided in various places in the EIS and IR responses; however, Denison can provide more concise summaries to support the resolution of these IRs (example on next slide)
    - We request the opportunity to meet and discuss draft details with ECCC directly in the next 1-2 weeks, prior to submitting a formal IR response

Terrestrial Environment – Remaining IRs

Species-specific information for pre-clearance sweeps

IR-134-R1: Bats
IR-149-R1A: caribou
IR-142, IR-159, IR-167-R1: SAR in general
IR-170: SAR, including nighthawk

Species of Concern	Important Habitat and Needs	Survey Target Areas	Survey Technique	Timing	Information Source
Little Brown Myotis and Northern Bat	The presence of large snags, tree cavities, is an important attribute in old growth forest stands that provides maternity roosts and day roosts for northern myotis and little brown bats. Building are also used.	Treed areas with the largest diameter and/or older trees. Focus on older forest, or areas with large snags in younger forest within the project footprint (majority is regenerating forest 1-5m).	Daytime visual search of trees and potential roost sites. Systematic meandering search of areas to be cleared during active bat season. Focus on searching for roost features (snags, cracks, stumps, cavities, bark peeling) and bat sign (e.g., guano).	May to Sept	Broders et al. 2005; Garroway and Broders 2008; Park and Broders 2012; Ford et al. 2016; Randall et al. 2014; Resources Information Standards Committee (RISC). 2022.
	Foraging habitat in proximity to roosting sites is also an important factor in roost selection.	Treed areas in proximity to clearings, wetlands and open water.			

Terrestrial Environment – Remaining IRs

Bats: IR-174

To close this IR, Denison must:

1. Clarify the legend of Figure 2-9 with respect to frequency of detection
   - Total number of passes and/or buzzes detected (Appendix 9-B Terrestrial Baseline).
2. Provide suitable bat SAR habitat information in the form of a map
   - Literature data, existing ecosite data, and existing bat survey data can be used to develop habitat maps, as part of the response to this IR.
   - We expect no hibernacula in the Project Area (i.e., caves, mines, buildings with stable and specific temperatures per COSEWIC 2013). Terrain is low relief due to flat-lying sandstone and almost continuous cover of sandy glacial deposits (i.e., surface is predominately sand textured); there are no mines or building in the Project Area.
3. Provide additional baseline data for bat SAR based on literature sources and justify applicability to the project
   - See point 2.
4. Provide a description of proposed methods for bat SAR field monitoring for review
   - Denison can summarize the proposed methods for discussion with ECCC in the next 1-2 weeks (see previous 2 slides).
5. Commit to an EA commitment to collect additional bat SAR field baseline data prior to disturbance
   - We believe the habitat-based information in Appendix 9-D (*see summary on next slide*), plus additional mapping as part of Point 2 above, is sufficient for the EA stage. If any EA commitments are being considered, they would be follow-up only and not be used for significance determination.

Appendix 9-D Table 4.1 (excerpt)

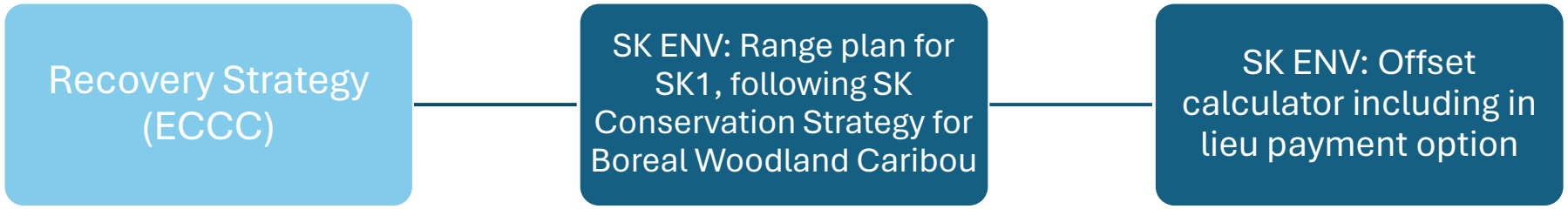
Component	Wildlife SAR	Measurable Parameters	Project Activities Resulting in Primary Interactions	Project Phase	Species-Specific Mitigation Measures[1]	Predicted Residual Effect	Significance
Terrestrial Environment	Little brown myotis Northern myotis	Amount of habitat that is altered or lost relative to its availability in the Terrestrial RSA.	• Development of access roads and air strip. • Site preparation and earthworks; clearing, leveling and grading of the Project Area. • On-site and off-site operation of vehicles and transport of materials. • Air transportation for workers.	Construction	• **Vegetation clearing activities will occur outside of roosting periods, when practical.** • **Pre- disturbance wildlife clearance surveys will be completed to identify site-specific habitat features such as maternal rooting sites and hibernacula used by bat species. If features are identified in the Project Footprint, appropriate setbacks and/or timing windows will be implemented in accordance with the SARGSS (SK MOE 2017 (that will also be defined in the Wildlife Management Plan).** • **In the event a maternal roosting site is identified on the Project Footprint, exclusionary methods (e.g., installing a one-way bat exit) will be implemented following the summer maternity roost season. This installation would allow for bats to leave but not the ability to re-enter the roosting site.** • **Locations of these site-specific habitat features used by bats will be communicated to appropriate Project personnel and the requirement to limit disturbance in these areas will be implemented.** • **Specific exclusion methods will be added as mitigation measures (Section 9.4.5 of the final EIS) to prevent access to buildings and other infrastructure.**	Alteration and/or loss of habitat: predicted to be low magnitude, local geographical extent, long-term duration, frequent, fully reversible.	Not Significant: the predicted residual effect of alteration and/or loss of habitat is not expected to alter the integrity of the habitat for bat species within the Terrestrial RSA to the point where it is not sustainable or available to contribute to ecological functions.
			• On-site and off-site operation of vehicles and transport of materials. • Air transportation for workers.	Operation			
			• Demolition and disposal of non-salvageable surface infrastructure and materials. • On-site and off-site operation of vehicles and transport of materials. • Reclamation of disturbed areas.	Decommissioning			
		Mortalities directly or indirectly attributable to the Project.	• Development of access roads and air strip. • Site preparation and earthworks; clearing, leveling and grading of the Project Area. • On-site and off-site operation of vehicles and transport of materials. • Air transportation for workers.	Construction		Change in mortality: predicted to be low magnitude, local in geographical extent, long-term duration, infrequent, and fully reversible.	The predicted residual effect of change in mortality is not expected to alter the integrity of the regional populations of the bat species to the point where they are not sustainable or available to contribute to ecological functions
			• On-site and off-site operation of vehicles and transport of materials. • Air transportation for workers.	Operation			
			• Demolition and disposal of non-salvageable surface infrastructure and materials. • On-site and off-site operation of vehicles and transport of materials. • Reclamation of disturbed areas.	Decommissioning			

Terrestrial Environment – Remaining IRs

Caribou offset commitment: IR-149 and IR-157

- ECCC notes IRs are accepted if Denison commits to the following:
  - *Denison's offsetting plan will meet the objectives of the Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal population, in Canada*

Our understanding is that by meeting the Provincial offset requirements, we are meeting the objectives of the recovery strategy since the Province is responsible for caribou management.



Denison Mines

Terrestrial Environment – Remaining IRs

Caribou offset commitment: IR-149 and IR-157

- Denison's EIS has concluded there are no significant effects on caribou.
- The caribou population in SK1 is stable and SK1 is not at the disturbance threshold, based on recent update from Saskatchewan Ministry of Environment (SK ENV 2023):
  - 53% disturbed, 47% undisturbed – i.e., SK1 conservation unit is currently below the disturbance threshold of 40% undisturbed habitat.
- Denison has committed to offsetting with SK ENV.
  - Denison will need approval through the province for offsetting and this must be accomplished through the provincial offsetting framework.
  - Our understanding is that if ECCC does not agree with ENV's offsetting plans, this is a federal-provincial government issue, not a proponent issue related to an EA under *CEAA 2012*.

Terrestrial Environment – Remaining IRs

Caribou mitigation: IR-149-R1B

Round 2 IR	Denison's response	Round 3 IR
1. Provide additional information on the timing and frequency of air traffic using the Project air strip. 2. Provide specific mitigations related to impacts from air traffic, including mitigations related to frequency and timing of flights.	Please see response to IR-149. In addition, in direct response to IR-149-R1B the following is noted. The flight schedules have not yet been determined at this relatively early stage of planning for the Project. Mitigation measures likely to be incorporated into the operation of the airstrip, with respect to air traffic, would include, as safety allows, maintaining as direct approach and departure flight paths as possible, and obtaining appropriate altitudes, and leaving the LSA and RSA, as quickly as is safely reasonable.	Item two has been accepted as the Proponent has provided potential measures likely to be incorporated into operations of the airstrip, but item one remains outstanding. The information requested was not provided as the Proponent notes it is too early in the planning phase to provide this information. Once flight schedules have been determined, the Proponent should share them for review. If this cannot be provided at this time, the Proponent should provide information on the frequency and approximate timing of flights, as well as any periods of restricted activity planned for mitigation purposes. In addition, Denison is expected to provide details on specific mitigation measures to address sensory impacts to caribou, such as restricted activity periods to accommodate for the caribou calving season, or different flight paths. Please see the related follow up advice for IR-149-R1B in the Advice to the Proponent document.

Denison Mines

Terrestrial Environment – Remaining IRs

Caribou mitigation: IR-149-R1B

- This comment should not be an IR at this stage of the review.
  - The EIS concluded there are no significant effects on caribou, which included the assessment of habitat alteration due to sensory disturbances, including the operation of an airstrip.
  - It is not reasonable, in Denison's view, that flight schedules have to be defined at this early stage of the Project.
- While some additional information can be provided (*see bullets below*), we reiterate that the EIS was completed with the appropriate level of detail expected at this stage of the Project.
  - Anticipated aircraft traffic at the Project airstrip is expected to be minimal, at approximately five flights per week during Operation.
  - Mitigation measures likely to be incorporated into the operation of the airstrip, with respect to air traffic, would include, as safety allows, maintaining as direct approach and departure flight paths as possible, and obtaining appropriate altitudes, and leaving the LSA and RSA, as quickly as is safely reasonable.
  - If ECCC has specific additional recommendations for mitigation measures, we would ask that they provide them for our consideration.