Information Requirement (IR) Response Table – Denison's Response to December 2023 FIRT Comments, February 2024

Original IR#	Follow-Up IR #	SME	Project Effects Link	Reference to EIS, appendices, or supporting documentation	Context and Rationale	Information Requirement (IR)	Rationale for Status	Denison's Response	EIS Updates (Yes/No; if Yes, provide EIS Section number)
IR-06	-	CNSC	Geology and groundwater	Section 2.2.1.4, Wellfield for In Situ Recovery Mining	**Context:** This Section of the EIS indicates that a tracer test was completed in 2021 and a feasibility field test was initiated in 2022. No information from these tests is included in the EIS and no reporting timelines are provided. **Rationale:** Guidance from the IAEA (2001) and best practices highlighted by regulatory regimes in other countries such as the United States (IAEA, 2016) and Australia (Geoscience Australia, 2010) indicates that single and multi-well trial (feasibility) testing for mining and remediation techniques should be carried out before a licence for full-scale operations can be granted. This is part of the requirement for Proponents to demonstrate to government authorities that all potential risks have been considered during the life of operation and post-remediation of the mine. Additionally, Section 8.5.2 of the Generic EIS Guidelines states: "Units may be characterized as aquifers or aquitards, and unit descriptions should include their geochemical characteristics, vertical and lateral permeabilities, transport mechanism (diffusion versus advection) and the directions of groundwater flow", And that "The applicant or licensee should present a conceptual and numerical hydrogeological model that discusses the hydrostratigraphy and groundwater flow systems". Outcomes from the tracer test inform model parameters such as effective porosity (see IR-78), dispersion, and dispersivity (see IR-96). The wellfield leach tests and remediation trails ultimately inform environmental monitoring during site activities, and the source term for the groundwater model. This source term represents the contaminants which flow through the desilicified zone into Whitefish Lake, which represents a source of contamination considered in the ERA. **References**: [1] International Atomic Energy Agency (IAEA). 2001. Manual of Acid in Site Leach Uranium Mining Technology. IAEA-TECDOC-1239. Vienna. 283 p. [2] International Atomic Energy Agency (IAEA). 2016. In Situ Leach Uranium Mining: An Overview of Operations. IAEA Nuclear Energy Series No. NF-T-1.4. Vienna. 76 p. [3] Commonwealth of Australia (Geoscience Australia). 2010.	1. Please provide a summary of the results of field tests (i.e., tracer tests, wellfield leach tests, and remediation trials) in the EIS, or provide a technical supporting document with this information, and ensure the documentation is appropriately referenced in the EIS. 2. Please indicate how outcomes from these field tests inform the design of In Situ Recovery. This information should include: • feasibility of meeting remediation targets. • groundwater flow conditions and validation of flow models. • mobilization of contaminants (e.g., Al, Se or V). • potential for free gas evolution/two-phase flow. • identifying composition of lixiviant and production solutions. • success despite presence of >2% carbonate minerals (siderite, FeCO3) in the ore zone (see Table 4-3 of Appendix 7-A). • site-specific data to parameterize, validate, and refine solute transport models (hydraulic conductivity, effective porosity, dispersivity, diffusion, etc.). 3. Please provide further information of proposed operations including % recovery, uranium concentrations, optimal	This response has not been accepted. The mining area decommissioning objectives shown in Table 2.3-3 of the original EIS (Section 2.3.3.1.1) show different numerical values when compared to those shown in Table IR-06-1 of Denison's response to IR-06. Notably, allowable proportions of Al, As, Cd, Cr, Cu, Fe, Mo, SO4, Se, U, V, and Zn are increased over the IR-159 nitial decommissioning objectives. Denison's Final Proposed EIS update for IR-06 does not include any text regarding alteration of decommissioning objectives for the mining area. Please also see follow-up IR-06-R1.	Denison acknowledges that the presentation of information in Table IR-06-1 of Attachment IR-06 has created some confusion; for clarity, Table IR-06-1 of Attachment IR-06 was never meant to replace Table 2.3-3 of the draft EIS. The information provided in Table IR-06-1 of Attachment IR-06 (Annex 1, Attachment IR-06 on page 90/419) was from Denison's Feasibility Field Test (FFT). The FFT was an ISR pilot program permitted by SK ENV and completed under a CNSC nuclear substances license. The purpose of the FFT was to validate previous field and laboratory testing and determine the feasibility of the ISR mining methodology. The leaching and neutralization phases of the FFT were completed in 2022. The leaching phase was designed to assess the effectiveness of the ISR mining method. This phase included controlled injection of an acidic solution into the mineralized zone with recovery of the solution through existing test wells. The neutralization phase involved the injection of a mild alkaline (basic) solution into the leaching zone to neutralize the area and verify the groundwater in the area is returned to acceptable, permitted conditions. Table IR-06-1 was included at the request of the CNSC during the 1st round of IRs and provides context to the reviewer on restoration of the leaching zone to permitted pH conditions. Based on the above, there are no proposed changes to the mining area decommissioning objectives shown in Table 2.3-3 of the draft EIS.	No

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<tr><td></td><td></td><td></td><td></td><td></td><td>Australia's in situ recovery uranium mining best practice guide. ISBN 978-1-921672-95-8. Canberra. 33 p.</td><td>liquid/solid ratios, anticipated reagent consumption, etc.</td><td></td><td></td><td></td></tr>
<tr><td>IR-06</td><td>IR-06-R1</td><td>CNSC</td><td>Geology and groundwater</td><td>Section 2.2.1.4, Wellfield for In Situ Recovery Mining</td><td>Context: This Section of the EIS indicates that a tracer test was completed in 2021 and a feasibility field test was initiated in 2022. No information from these tests is included in the EIS and no reporting timelines are provided.

Rationale: Guidance from the IAEA (2001) and best practices highlighted by regulatory regimes in other countries such as the United States (IAEA, 2016) and Australia (Geoscience Australia, 2010) indicates that single and multi-well trial (feasibility) testing for mining and remediation techniques should be carried out before a licence for full-scale operations can be granted. This is part of the requirement for Proponents to demonstrate to government authorities that all potential risks have been considered during the life of operation and post-remediation of the mine.

Additionally, Section 8.5.2 of the Generic EIS Guidelines states: "Units may be characterized as aquifers or aquitards, and unit descriptions should include their geochemical characteristics, vertical and lateral permeabilities, transport mechanism (diffusion versus advection) and the directions of groundwater flow",

And that "The applicant or licensee should present a conceptual and numerical hydrogeological model that discusses the hydrostratigraphy and groundwater flow systems".

Outcomes from the tracer test inform model parameters such as effective porosity (see IR-78), dispersion, and dispersivity (see IR-96). The wellfield leach tests and remediation trails ultimately inform environmental monitoring during site activities, and the source term for the groundwater model. This source term represents the contaminants which flow through the desilicified zone into Whitefish Lake, which represents a source of contamination considered in the ERA.

References:
[1] International Atomic Energy Agency (IAEA). 2001. Manual of Acid in Site Leach Uranium Mining Technology. IAEA-TECDOC-1239. Vienna. 283 p.
[2] International Atomic Energy Agency (IAEA). 2016. In Situ Leach Uranium Mining: An Overview of Operations. IAEA Nuclear Energy Series No. NF-T-1.4. Vienna. 76 p.
[3] Commonwealth of Australia (Geoscience Australia). 2010.</td><td>1. Please provide a summary of the results of field tests (i.e., tracer tests, wellfield leach tests, and remediation trials) in the EIS, or provide a technical supporting document with this information, and ensure the documentation is appropriately referenced in the EIS.

2. Please indicate how outcomes from these field tests inform the design of In Situ Recovery. This information should include:
• feasibility of meeting remediation targets.
• groundwater flow conditions and validation of flow models.
• mobilization of contaminants (e.g., Al, Se or V).
• potential for free gas evolution/two-phase flow.
• identifying composition of lixiviant and production solutions.
• success despite presence of >2% carbonate minerals (siderite, FeCO3) in the ore zone (see Table 4-3 of Appendix 7-A).
• site-specific data to parameterize, validate, and refine solute transport models (hydraulic conductivity, effective porosity, dispersivity, diffusion, etc.).

3. Please provide further information of proposed operations including % recovery, uranium concentrations, optimal</td><td>CNSC staff request that Denison provide clarification relating to the alteration of mining area decommissioning objectives. Additionally, Denison is requested to provide a discussion on how alteration of the mining area decommissioning objectives fits within the geochemical reactive transport modelling presented in Appendix 7-C (i.e., effect of increase proportions of allowable COPCs on surface water quality), given that these objectives (as shown by "Restored Solution #1" in Table 3-5 of Appendix 7-C) are used as the bounding scenario for groundwater quality during reactive transport scenarios.

Original EIS – Table 2.3-3:
Table 2.3-3: Mining Area Decommissioning Objectives
<table><tr><th>Parameter</th><th>Units</th><th>Restored Solution</th></tr><tr><td>pH</td><td></td><td>4.3</td></tr><tr><td>Aluminum</td><td>mg/L</td><td>7</td></tr><tr><td>Arsenic</td><td>mg/L</td><td>0.06</td></tr><tr><td>Cadmium</td><td>mg/L</td><td>0.015</td></tr><tr><td>Cobalt</td><td>mg/L</td><td>2</td></tr><tr><td>Chromium</td><td>mg/L</td><td>0.05</td></tr><tr><td>Copper</td><td>mg/L</td><td>0.17</td></tr><tr><td>Iron</td><td>mg/L</td><td>100</td></tr><tr><td>Molybdenum</td><td>mg/L</td><td>0.1</td></tr><tr><td>Nickel</td><td>mg/L</td><td>9.7</td></tr><tr><td>Lead</td><td>mg/L</td><td>3.1</td></tr><tr><td>Sulphate</td><td>mg/L</td><td>703</td></tr><tr><td>Selenium</td><td>mg/L</td><td>0.08</td></tr><tr><td>Zinc</td><td>mg/L</td><td>1.4</td></tr><tr><td>Uranium</td><td>mg/L</td><td>100</td></tr><tr><td>Vanadium</td><td>mg/L</td><td>0.51</td></tr><tr><td>^{226}Radium</td><td>Bq/L</td><td>2.00E+02</td></tr></table>
IR-06 Response – Table IR-06-1:</td><td>As noted in the response to IR-06, Denison is not proposing changes to the mining area decommissioning objectives presented in the draft EIS and therefore discussion of said changes within the context of the review comment is not applicable. The objectives presented in Table 2.3-3 of the revised draft EIS are unchanged relative to the draft EIS.</td><td>No</td></tr>
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					Australia's in situ recovery uranium mining best practice guide. ISBN 978-1-921672-95-8. Canberra. 33 p.	liquid/solid ratios, anticipated reagent consumption, etc.	**Table IR-06-1: Feasibility Field Test Leaching Zone Remediation Targets compared to Interim (December 2022) Groundwater Well Monitoring Results** Parameter | Units | Leaching Zone Remediation Target | Neutralization Phase Results [1] pH | pH units | 3.3 | 6.24 Aluminum (Al) | mg/L | 9.1 | 3.3 Arsenic (As) | mg/L | 0.7 | 0.05 Barium (Ba) | mg/L | 0.2 | 0.07 Calcium (Ca) | mg/L | 535 | 203 Cadmium (Cd) | mg/L | 0.3 | 0.00001 Cobalt (Co) | mg/L | 0.24 | 0.0001 Chromium (Cr) | mg/L | 0.38 | <0.0005 Copper (Cu) | mg/L | 0.19 | 0.001 Iron (Fe) | mg/L | 390 | 144 Potassium (K) | mg/L | 45 | 185 Magnesium (Mg) | mg/L | 8.92 | 22.6 Molybdenum (Mo) | mg/L | 0.16 | 0.04 Sodium (Na) | mg/L | 628 | 193 Nickel (Ni) | mg/L | 1.17 | 0.02 Lead (Pb) | mg/L | 2 | 0.04 Sulfate | mg/L | 4,147 | 1114 Selenium | mg/L | 0.47 | 0.0002 Uranium | mg/L | 501 | 85 E-doc: 6858049 p. 93/419 Annex 1 – FIRT IR Table – Technical Review of the **Wheeler River Project** draft EIS Denison Response - August 18, 2023 Parameter | Units | Leaching Zone Remediation Target | Neutralization Phase Results [1] Vanadium | mg/L | 19.3 | 0.2 Zinc | mg/L | 17.1 | 0.5 1 Results are the average of three groundwater monitoring wells (GWR-038, -040 -041) sampled in December 2022		
IR-12	-	ECCC	Change to an environmental component due to hazardous contaminants Change to an environmental component due to hazardous contaminants	Section 2.2.3, Project Description	Context: There is not enough information provided within the draft EIS and site water infrastructure designs to determine if the infrastructure will sufficiently contain mine site contact and non-contact water runoff. It is unclear how water management will occur during all proposed Project stages at the Project airstrip, which is located away from the main Project site. No information has been provided regarding water that may come into contact with fuels and oils from machinery on the air strip, how and where that contaminated water will be treated, and how surface runoff around the airstrip will be managed. Additionally, it is unclear if contaminants from heavy machinery on roads have been considered during runoff collection plans throughout the mine Project site. Water management at the airstrip and roads can have impacts on surface water quality and sediment quality and contaminants (e.g., Hydrocarbons) from these sources should be considered in overall site water management plans. In Section 2.2.3.1 a site drainage plan for contact and non-contact water has been provided in Figure 2.2-17, and water balances have been provided for the different Project phases in Figures 2.2-14 to 2.2-16. In Section 2.2.3.4 a volume of 30,000m3 for the process water pond is provided, and it is stated that the process water pond has the capacity to contain Probable Maximum Precipitation (PMP) event estimated to be 483.3mm while allowing for 1.0m of freeboard. However, there are no estimates on the total volume of water that may be drained from the overall site infrastructure (i.e., the well field,	1. Provide information on how contact and non-contact water from the site airstrip will be managed. Include information on potential contaminant characterization and loadings and an assessment of risk to the environment. 2. Provide further information on how potential contaminants in runoff from roads have been considered in the site water management. Include information on potential contaminant characterization and loadings and an assessment of risk to the environment. 3. Provide estimated volumes of water to be drained from overall site infrastructure (such as the mine terrace, airstrip, camp area etc.), during a 24-hr PMP event. 4. Provide additional information on culvert designs and conveyance capacity for PMP events.	This response has not been accepted, for the following reasons (numbers correspond with original IR): 1-2. In Figure 2.2-17 (Site Drainage Plan with Flow Direction and Culvert Locations) of EIS, site drainage or water management layout is not included for the access road to the airport and the airport area although they constitute part of the Project site. Although surface run off from airstrip or site road are mainly expected to be clean or non-contact water, CNSC expects Denison to provide information on water management system to mitigate risk of flooding and erosion at the airport and the access road. In addition, the access road connecting the mining site with airport crosses two streams (Kratchkowsky Creek and Hart Creek) that flow into Whitefish Lake, CNSC staff expects Denison to ascertain that culverts or crossings will be designed in such a manner that the flood hazard does not increase. Therefore, CNSC staff request that Decision provide information on how the surface runoff generated at airstrip and airport access road would be managed. 3. CNSC accepts estimated total volume of runoff from the wellfield area to Wellfield Pond however the PMP value of 489.3mm is obtained from 1999	1-2. The water management design information presented in the draft EIS is considered appropriate at the EA stage and for this stage of the Project and fit-for-purpose to support the assessment of potential effects. The detailed design information on site water management infrastructure and runoff management requested in this IR and related IRs (i.e., IR-12-R1A and IR-12-R1B) will be provided to the CNSC and province as part of licensing and permitting. Nevertheless, and building on information provided previously, additional information and context regarding site water management and design concepts is provided as follows: • Conceptual site drainage maps spanning the full Project Area scale has been provided in Attachment IR-12 to this IR response table as context for the reviewer. • Design for the access roads and airstrip will in general be such that runoff will be encouraged through appropriate grading to drain away and not pond on or near the road or airstrip. • The overall vision for non-contact water along the access roads and airstrip is to use shallow ditching to dissipate the energy of runoff, to promote settling of suspended solids and allow the runoff to report to ground via natural grades that flow away from the infrastructure and into the natural drainage systems. • The condition of the airstrip and roads would be inspected and maintained routinely. For example, should unexpected water pooling be observed at the airstrip or site roads during Operation, temporary water removal means such as vac trucks or sump pumps could be employed, and the areas would be re-graded to minimize water accumulation. • Infrastructure features that are within 50 to 100 m (depending on grade) of waterbodies and that are associated with cleared land where there is no vegetated buffer may require additional erosion management / controls to ensure protection of the waterbodies from unmitigated suspended solids inputs.	No

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					processing areas, etc.) during a 24-hr PMP event. Additionally, in Figure 2.2.17 culvert locations are provided, however there is no further information on culvert designs, flow ratings and capacity for PMP events. Rationale: In order to be able to understand site water management and flood risk potential, more information needs to be provided regarding the site water infrastructure designs and capture volumes during PMP events. This information will aid ECCC in understanding how contact and non-contact water will be conveyed throughout the site. Runoff from roads and the site airstrip will contain contaminants from vehicles, heavy machinery, aircrafts and de-icing practices. Additional information on the runoff collection systems and expected contaminant concentrations for the site airstrip and roads is needed to determine if the receiving environment and aquatic and terrestrial receptors are protected.		study [A.1], based on historical rainfall data pre-1998, which appears to require updated PMP value. CNSC requests that Denison use a PMP value that is estimated using historical rainfall data that includes the most up to date meteorological data or provide justification on the validity of the current PMP. Further, the site infrastructure runoff water has not been considered in the water management infrastructure. Site water management planning should consider the capture of noncontact water to understand the potential effects of contaminants from non-contact water on the surrounding environment. Please also see follow-up IR-12-R1A and IR-12-R1B, related to this IR. Reference: [A.1] Atmospheric & Hydrologic Sciences Division – Atmospheric Environment Branch. 1999. Environment Canada Prairie & Northern Region – Point Probable Maximum Precipitation for the Prairie Provinces. Regina, Saskatchewan. Report No. AHSD – R99 – 01.	A map showing the distance of Project components to waterbodies is available in Attachment IR-12 as context for the reviewer. The map shows for example, that four waterbodies (waterbody numbers 1, 16, 23, and 86) are within 100 m of the Project footprint where potential erosion protection measures may be employed. The details of erosion control measures at these locations will be outlined in the Environmental Management System to support licensing. • Conceptually, minimizing changes in surface drainage patterns and watersheds is an important mitigation measure in the surface water quantity assessment. Collecting and managing non-contact water along roads and at the airstrip would result in a larger potential Project effect on surface water quantity associated with changes in surface drainage patterns and is not preferred. • As described in the draft EIS, the proposed crossings at Kratchkowsky Creek and Hart Creek are not culverts, but clear span bridges. Clear span bridges are designed to completely span a watercourse without interfering with the channel bed and banks. • As a reminder to ECCC that the road to the Project's proposed airstrip follows an existing, decommissioned road, the Fox Lake Road. • The Project is located within the Wheeler Upland Landscape Area of the Athabasca Plain Ecoregion within the Boreal Shield Ecozone of Saskatchewan. The area is characterized by Brunisolic soils which are typically sandy, well-drained soil. Standing water is not a common occurrence and the well-drained characteristics of the region support the plans to divert non-contact water to ground, and as noted made surfaces would be graded to promote drainage and discourage pooling. • Please refer to our initial response to IR-12 (refer to Annex 1, IR-12 on page 6/419) for additional context on best practice and mitigation measures related to water management and also the scoping and evaluation of accident and malfunction scenarios in the draft EIS. • Importantly, the conceptual management scheme outlined above for non-contact water runoff is consistent with other roads and airstrips in the region – that is, runoff is not currently captured from other roads and airstrips in the region as envisioned by the review comment. This includes infrastructure associated with Saskatchewan Ministry of Highways and Infrastructure, existing uranium mines and mills, and communities including First Nation communities. It is not practical to do so and collection of non-contact water is not needed based on risk and moreover as noted above is to be avoided so as not to necessarily affect water quantity in local drainages and sub-drainages. 3. The reviewer is referred to the response to IR-103 for a discussion regarding the PMP and its suitability and relevance given available data and different methods of calculation included that provided by CSA guidance. Notwithstanding the information provided in response to IR-103 Denison is committed to revisiting this issued as per CNSC's recommendations, as applicable, for the licensing phase of the Project. To reiterate, Denison believes it has fulfilled its information requirements for the EIS as outlined in the EA guidance provided by the province and federal government, including CEAA 2012, and that the FIRT has been provided with the appropriate level of detail on the water management topic for drawing conclusions on the EA process. Notwithstanding	

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								that, Denison recognizes that further information will be required as the Project moves past the EA and into the licensing and permitting phases. It is Denison's opinion that this comment is not an IR related to the EIS. A request for clarification or additional information on a detailed design aspect would need to be responded to by the Denison as part of the licensing process; however, this level of detail is not necessary for drawing conclusions on the EA process.	
IR-12	IR-12-R1A	ECCC	Change to an environmental component due to hazardous contaminants	Section 2.2.3, Project Description Proponent response to IR-12	Context: Runoff water from site infrastructure such as the airstrip and roads may be categorized as non-contact water because it does not come into contact with contaminants of potential concern (COPCs) directly from mining operations infrastructure. However, it still has the potential to contain deleterious substances from mine-related activities such as operation of vehicles, including heavy machinery and aircraft, spills, fire management practices, and snow removal practices. The Metal and Diamond Mining Effluent Regulations (MDMER) pursuant to the Fisheries Act requires all mine effluent and seepage from the mine site that contains deleterious substances be discharged through a final discharge point. This includes deleterious substances in non-contact water from all site infrastructure including the airstrip, roads, and camp area. Rationale: All mine effluent and seepage that contains deleterious substances must be discharged through a final discharge point. This includes site non-contact water which has the potential to contain deleterious substances such as those released from vehicles, machinery, aircrafts, spills, and de-icing practices. The Proponent has not included how non-contact water runoff from site infrastructure will be captured within site water management planning. To understand the potential effects of contaminants from non-contact water on the surrounding environment, site water management planning needs to be updated to include the capture of non-contact water.	1.Update site water management plans to include management of potentially deleterious substances contained in non-contact water from all site infrastructure. 2. Provide updated estimates of water volumes to be drained and managed from overall site infrastructure (including runoff from roads, airstrip, camp area, etc.) during the different Project phases. Include updated information on water treatment flows, capacity and effluent discharge during normal operations, and a 24-hr Probable Maximum Precipitation (PMP) Event.		1 and 2. Denison understands the prohibition related to deleterious substances under Section 36 of the Fisheries Act and Denison affirms its commitment to ensuring no such events occur. However, in the context of this IR, we interpret ECCC is connecting the concept of deleterious substances under MDMER (those constituents identified in Part 1(3) i.e., arsenic; copper; cyanide; lead; nickel; zinc; suspended solids; radium 226; and un-ionized ammonia.) with the general concept of deleterious substance per the Fisheries Act. Mine effluent associated with MDMER defined deleterious substances will be discharged through a final discharge point to Whitefish Lake, and this has been reflected in the water management information presented in the draft EIS, including Section 2.2.3. The IR is suggesting Denison collects runoff water from the airstrip and roads with the rationale that this is needed in order to collect potential contact water associated with hydrocarbons spills (the text in rationale notes: *This includes site non-contact water which has the potential to contain deleterious substances such as those released from vehicles, machinery, aircrafts, spills, and de-icing practices*). As indicated in the draft EIS and in our initial response to IR-12 (refer to Annex 1, IR-12 on page 6/419), should a spill occur, the spill response plan will be followed. The details of Denison's response plans will be developed to support licensing as part of the Waste Management and Emergency Management and Fire Protection programs. Importantly, hydrocarbons are not mine waste-related deleterious substances perm MDMER definition. Collecting and treating non-contact runoff throughout the life of the Project would mean Denison collects an extremely large volume of clean water to protect against infrequent hydrocarbon spills which will be cleaned up in the appropriately scaled process (spill response), in terms of cost and risk to the environment. No other roads or airstrips in the region (including those associated with uranium mine and mill operations) requires the collection and treatment of runoff water from infrastructure such as roads and airstrips. It is not practical to do so and based on risk, the collection of non-contact water is not required. The road or trail to the airstrip is currently an unmaintained road: the decommissioned Fox Lake Road. For road upgrades and airstrip construction, Denison will be using material from the borrow area. Borrow pit area selection was based on geotechnical program completed in 2021 which did not identify any potential for ARD/ML. Further works are ongoing part of engineering activities and with confirmation of characterization through assays of representative samples. As such, the material used to upgrade roads and construct the airstrip will not be a source of metals or ARD. Denison will implement erosion control measures at infrastructure locations within 50 to 100 m of a waterbody (refer to response to IR-12 above and to Attachment IR-12, Figure	No

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								IR-12-5: Distance from Project Footprint to Waterbodies) where required (i.e., at locations where there is no vegetated buffer adjacent to the waterbodies). In consideration of the above, Denison maintains that the runoff at the airstrip and roads are non-contact water. The water management mandate for the Wheeler River Project is to keep clean water clean and minimize the total volume of water requiring management, treatment, and discharge. In the draft and revised draft EIS, Denison has evaluated potential Project effects on surface drainage in Section 8.1, as part of the Project-surface water quantity interaction of Project overprinting of drainage areas. As noted in the draft EIS, Section 8.4.1.4.2.1, this assessment was appropriately focused on areas of active water collection. It was noted that the road and airstrip were not considered to affect hydrology materially. Both may potentially redirect some flow and have a small influence on the timing of concentration of runoff and infiltration rates; however, in general, they are anticipated to have a very small influence and are not expected to change runoff volumes at assessment nodes.	
IR-12	IR-12-R1B	ECCC	Water Quality - Change to an environmental component due to hazardous contaminants	Section 2.2.3, Project Description Proponent response to IR-12	Context: The Proponent has clarified that there is no infrastructure in place for management of non-contact water from site infrastructure that may contain COPCs, including but not limited to roads, the airstrip, and the campground. Rationale: To understand the potential effects of contaminants from non-contact water on the surrounding environment, site water management planning needs to be updated to include the type of infrastructure and its location for the capture of non-contact water.	Provide a map marking the locations of proposed surface drainage structures for runoff collection including collection ditches, culverts, diversion ditches, perimeter berms, collection ponds and other similar structures.		It is Denison's opinion that this comment is not an IR related to the EIS. A request for clarification or additional information on a detailed design aspect would need to be responded to by Denison as part of the permitting and licensing process; however, this level of detail is not necessary for drawing conclusions on the EA process. In the draft and revised draft EIS, Denison has evaluated potential Project effects on surface drainage in Section 8.1, as part of the Project-surface water quantity interaction of Project overprinting of drainage areas. As noted in the draft EIS, Section 8.4.1.4.2.1, this assessment was appropriately focused on areas of active water collection. It was noted that the road and airstrip were not considered to affect hydrology materially. Both may potentially redirect some flow and have a small influence on the timing of concentration of runoff and infiltration rates; however, in general, they are anticipated to have a very small influence and are not expected to change runoff volumes at assessment nodes. Notwithstanding the above, Denson has provided the reviewer with additional, conceptual site drainage maps in Attachment IR-12, Figures IR-12-1, IR-12-2, IR-12-3, and IR-12-4; these are supplemental to the site drainage map provided in the draft EIS Figure 2.2-17.	No
IR-13	-	ECCC CNSC	Fish and fish habitat	Section 2.2.4, Waste Management Section 2.2.7.7, Borrow Area Section 2.3.1.3 Site Preparation and Earthworks	Context: The Proponent indicates that a borrow area is planned for an area northeast of the processing plant. The borrow material or overburden will be used during construction for roads, airstrip, pads, and in the batch plant for concrete production needs, during Operation for ongoing maintenance of various Project components and during decommissioning for fill and cover material. Suitable construction fill material will be sourced from the proposed borrow area and any suitable clean sandstone generated during freeze wall and well drilling (Section 2.2.7.7).	Please provide: 1. Information on whether the waste rock from the basement rock is potentially acid generating and metal leaching; a. Confirm that any borrow material to be used for construction will be characterized for potential ARD/ML. b. Confirm that the part of waste rock recovered	This response has not been accepted. In the response, Denison expected that portion of basement rock will be potentially acid generating and stated that all basement rock will be stored on the special waste pad. Waste rock from the sandstone will also be characterized primarily based on geological and geochemical characteristics, and if a portion of the waste rock is potentially acid generating, it will also be stored on the special waste pad. However, criteria for	The commitment for waste rock segregation provided in the draft EIS in combination with Denison's previous response to IR-13 (refer to Annex 1, IR-13 on page 7/419) is considered appropriate for this stage of the Project and fit-for-purpose to support the assessment of potential effects. We remind the reviewer that since (1) there is no release of effluent during construction, and (2) contact water from both the clean and special waste rock pads will be collected and eventually treated in the IWWTP during operation, the details of the waste rock segregation are not required to support the assessment of potential project effects on the environment. It is further noted that Denison has committed to developing a lined storage pad for potentially acid generating (PAG) material that is of sufficient capacity to store all the waste rock that is expected to be removed from the drill holes through life of mine. From an operational risk perspective there is more than ample contingency to manage the risk that may be associated with PAG material. Due to the	No

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					It was also noted in Sections 2.2.1.3 and 2.2.14 that the freeze wall will be established by drilling over 300 vertical holes from surface to the basement rock. The freeze holes will extend 30 m into the basement rock and will produce waste rock from basement rock (Figure 2.2-6). However, there is no information whether the waste rock from basement rock would potentially be acid generating and/or metal leaching. This means that all the extra 30 m of basement rock should also be characterized for potential ARD/ML to determine use or appropriate disposal.
					
					Rationale: ECCC notes that the Proponent did not indicate whether the borrow material and the drill out part of the sandstone layers and basement rock will be tested for Acid rock drainage/metal leaching (ARD/ML) potential before they will be used during construction, operation and decommissioning. ARD/ML is an environmental hazard that will have an adverse effect on waterbodies frequented by fish.
					
					Potential acid generating and metal leaching waste rock could pose negative impacts on the environment if they are not managed adequately.
						from the basement rock, will also be tested for potential ARD/ML.
						
						2. Criteria for segregating the potential acid generating and metal leaching waste rock, if it exists, from clean waste rock; and,
						
						3. A plan to manage the potential acid generating and metal leaching waste rock, if it exists.
							segregating the potential acid generating waste rock from the clean waste rock are not provided.
							
							Denison will examine opportunities to reprocess the mineralized core and cuttings by either recovering uranium or placing the materials underground into the mining area at the end of a well's production. However, it is not clear how the potentially acid generating waste rock will be disposed of in the long term.
								relatively small volume of PAG material that is anticipated to be brought to surface through the ISR method, details for the permanent disposal will be developed as part of decommissioning plan updates. The small PAG volume and short mine life allows a number of decommissioning options; PAG rock could be decommissioned in place, moved to the industrial landfill or IWWTP precipitate pond, and/ or added to grout for well backfilling and closure.
								
								Despite the above, Denison continues to work towards defining waste segregation criteria. In December 2023, Denison completed an Acid Base Accounting (ABA) testing program on 34 composite samples derived from 372 individual pulp samples at the Saskatchewan Research Council (SRC). The testing was done to further the understanding of the geochemical nature of material that would be generated by ISR wellfield drilling, specifically as it concerns expectations with respect to the quantities of PAG and non-PAG material and the derivation of appropriate segregation criteria. Individual pulp samples were selected from representative drill core samples taken throughout the entire length of drillholes throughout the deposit footprint area. Samples were composited along the length of each drill hole to represent the major horizons of the sandstone and the different basement lithologies (refer to Attachment IR-13 for a figure showing the major horizons). The horizons were selected to identify horizon-specific geochemistry, and as such the composites were developed so as to not straddle between different horizons, which could influence the representativeness of the horizon-specific ABA results. The different lithologies sampled represent all of the overlying and underlying horizons at the site, and include the overlying Upper Aquifer, Intermediate Aquitard, and Lower Aquifer. The underlying horizons include the Graphitic Pelite (GFPL), Quartzite (QZIT), and Garnetiferous Pelite (GTPL).
								
								Samples were analyzed for:
								• Paste pH (pH units)
								• Acid Neutralizing (g CaCO3/kg)
								• Acid Producing (g CaCO3/kg)
								• Net Acid Generation (g CaCO3/kg)
								• Sulfate, Acid soluble (%)
								• Sulfide (ug/g)
								• Sulfur (%)
								
								Though definite criteria have not yet been defined, initial consideration of results suggest the following:
								
								• SANDSTONE
								  ○ all upper aquifer and intermediate aquitard samples were not acid generating (non-PAG); and
								  ○ 2 out of 8 lower aquifer samples were acid generating, and the rest were not acid generating (non-PAG).
								
								• BASEMENT
								  ○ Quartzite samples (n=2) are not acid generating (non-PAG); and,
								  ○ Garnetiferous and graphitic pelite samples (n=8) range from being acid consuming to acid generating, but overall are acid generating.	

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								Based on these test results, the lower sandstone aquifer (MFa) and basement would likely be PAG and stored on the special waste pad, but the balance of waste rock is expected to be non-PAG and placed on the clean waste rock pad. Specific waste rock segregation criteria (e.g., for distinction of PAG vs non-PAG material) will be defined using the data referenced above, as well as previous test data, in procedure level documentation that support the Waste Management Program documents that are part of initial licensing with CNSC. The program and plan documents define the overall strategies for minimizing waste generation, improving waste segregation, and implementing sustainable waste management techniques and the means to systematically and effectively manage the generation, handling, storage, disposal, and recycling of waste streams generated during by the Project, respectively, whereas the procedure level documentation is focused on operationalization of high-level strategies. The detailed waste rock segregation criteria will be provided to the CNSC and part of the licensing process and with the province as part of permitting at the appropriate time. While appropriate management of waste rock is important at all mining operations, we note that for context in relation to management and risk to the environment that through the selection of the ISR mining method, the Wheeler River Project is unique in that it is expected to generate a fraction of waste rock (clean, mineralized, and PAG) compared to other mining methods. For the reviewer's context and consideration, refer to Attachment IR-13 for a summary of the Wheeler River Project's expected waste rock volumes compared to a proposed underground uranium mining project in the Athabasca Basin (NexGen's Rook I Project), an underground mining project which recently completed the Saskatchewan EA process (Foran's McIlvenna Bay Project), and an open pit mining project which recently completed the federal EA process (Generation PGM's Marathon Palladium Project); Table IR-13-1, Figure IR-13-2, and Figure IR-13-3 in Attachment IR-13.	
IR-14	-	CNSC	Wastes and Decommissioning	Section 2.3.3.1.3 Decontamination, Demolition, and Disposal (p. 2-82) Table 4.3-2: Key Issues and Concerns from English River First Nation (p. 4-33)	Context: The EIS states "Concrete foundations will be left in place. Any portions of concrete foundations remaining above grade will be levelled and rebar will be cut-off at grade. Large slabs will be perforated on a 2-m grid to permit drainage. Concrete slabs will be covered with 0.5 m of development rock or locally stockpiled till." (p. 2-82) Further, Denison notes that "Concern about responsible authority for restoring the environment, including contaminants when mining concludes. How long will it take to have the environment fully restored and, if Denison is no longer the operator, how will this be completed?" (p. 4-33). This comment status is noted as Complete. Rationale: Permanent structures will remain following decommissioning, according to the excerpt above. It's unclear how engagement activities influenced Denison's planned decommissioning approach, or how the comment above has been addressed or received.	How has the proposal to leave these foundations in place been received by the Indigenous Nations and communities during engagement sessions? Have engagement activities influenced Denison's planned decommissioning approach? Describe in additional detail how the comment from p. 4-33 has been addressed and how this has been received by those who expressed this concern?	This response has not been accepted. The response provided in IR-28 indicates that responses will be updated in the final EIS and future iterations of the IER. Although Denison commits to provide a PDP at a later date, the commitment does not include incorporating or addressing Indigenous concerns. The current response also does not address the concerns raised by Indigenous Nations and communities regarding restoration of the environment or indicate that it was brought to their awareness). Additionally, IR-28 highlights examples of how engagement will be captured in future iterations of the IER and "final EIS". Please provide proposed text for the revised EIS, for subject matter expert (SME) review and acceptance.	Denison will incorporate or address Indigenous concerns into decommissioning plans as the plans are developed. This was noted to in the round 1 response to IR-14; see Annex 1, IR-14 on page 8/419 and excerpt here (emphasis added): "The PDP will be submitted to regulators as part of Project licensing and permitting and will provide additional detailed information with respect to site decommissioning. The PDP would reflect input that will be solicited from Indigenous Nations and communities and others prior to its submission. Prior to executing decommissioning activities, Denison shall prepare and submit a detailed decommissioning plan (DDP) to regulators for acceptance, which builds on the PDP. In this case the DDP would reflect input that will be solicited from Indigenous Nations and communities and others prior to its submission and would also be informed by conditions on the ground at the site at that time, operational experience that has been gained and the regulatory landscape at that time. As is highlighted above, the decommissioning plan will evolve over time and the plan will become more refined as the Project advances. Denison is committed to continue to engage with Indigenous Nations and communities to solicit input." It is consistent with engagement aspects of REGDOC-2.11.2, Decommissioning and also Denison's commitment to conducting meaningful engagement with Indigenous communities and organizations potentially affected by the Project, and to maintain relationships with these communities and organizations throughout all phases of the Project.	No

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								Denison's is of the opinion that 'input' can refer to a wide range of comments, issues, concerns, advice, observations, etc. We believe the information provided in the EIS is sufficient for this stage of the Project and the conceptual decommissioning plan. Future decommissioning plan updates will be overseen by both the province and the CNSC and provide ample opportunity for the review of how Indigenous input has been incorporated into decommissioning plans. While the CDP outlined plans to keep small area of concrete foundations in place the specifics of the decommissioning plan may change. From the revised draft EIS Section 2.3.3.1.3 "Concrete foundations will be left in place. Any portions of concrete foundations remaining above grade will be levelled and rebar will be cut-off at grade. Large slabs will be perforated on a 2-m grid to permit drainage. Concrete slabs will be covered with 0.5 m of development rock or locally stockpiled till." This detail will in no way influence Denison's decommissioning commitment to return the land back to the Province of Saskatchewan for unrestricted surface land use post-closure. Denison has not asked for specific feedback by Indigenous groups on concrete foundations remaining in place as outlined in CDP. The draft EIS was reviewed by several Indigenous groups through the public review process and by ERFN in advance of submission to the CNSC. To date, no concerns have been raised regarding concrete foundations. Despite the above context for the reviewer on when Project decommissioning details will be available and when the related engagement on these details would be conducted, Denison commits to specifically engaging with ERFN and KML on details of the decommissioning plans related to concrete foundations. Denison will incorporate and address engagement related to decommissioning, including plans for structures to be left in place such as concrete foundations, into the appropriate version of the decommissioning plan updates. Please refer to Appendix 4B - Key Issue and Concern No 18 outlining the resolution of ERFN concern noted by the reviewer in IR-14.	
IR-18	-	ECCC	Change to an environmental component due to hazardous contaminants	Section 2.2.3.9, Project Description Appendix 8-E	Context: In Table 2.2-1 the upper bound Industrial Wastewater Treatment Plant (IWWTP) effluent quality final discharge targets for Constituents of Potential Concern (COPCs) are provided. General parameters (e.g., temperature, pH, etc.), and several Schedule 4 Substances with maximum authorized concentrations (lead, nickel, suspended solids, and un-ionized ammonia) under the Metal and Diamond Mining Effluent Regulations (MDMER) have not been provided in this table. There are several COPCs (aluminum, mercury, iron, nitrate, thallium, phosphorus and manganese) for effluent characterization under Schedule 5 Section 4 of the MDMER that have not been provided in this table. Additionally, no information on water quality guidelines has been provided in this table.	1. Update Table 2.2-1 and Appendix 8-E to include all general parameters required for environmental effects monitoring: pH, temperature, hardness, alkalinity, and conductivity. 2. Update Table 2.2-1 and Appendix 8-E to include missing Schedule 4 Substances under the MDMER with maximum authorized concentrations: lead, nickel, suspended solids, and un-ionized ammonia. 3. Update Table 2.2-1 and	This response has not been accepted. ECCC requested that the Proponent update Table 2.2-1 and Appendix 8-E to include all general water quality parameters required for environmental effects monitoring, including pH, temperature, hardness, alkalinity and conductivity. This information was not provided in the updated table in the Proponent's response. ECCC also requested that the Proponent Update Table 2.2-1 and Appendix 8-E to include missing Schedule 5 Section 4 parameters required for effluent characterization under the Metal and Diamond Mining Effluent Regulations (MDMER) including aluminum, iron, nitrate, thallium and manganese. The Proponent has not provided the requested information for	The effluent modelling work presented in the draft EIS focused on COPCs which were predicted based on expected Project activities and water treatment processes and selected following CSA N288.6 Environmental Risk Assessments At Class I Nuclear Facilities And Uranium Mines And Mills. The CNSC participates in CSA documents and endorses use of this document. Schedule 5 of the MDMER outlines the various requirements of Environmental Effects Monitoring (EEM) Studies once a mine is subject to the regulation. The MDMER requires EEM as a condition for the authorization to deposit effluent into waters frequented by fish. Environmental effects monitoring involves assessing whether effluents are having an effect on receiver water quality, fish, fish habitat, and use of fish by humans. Schedule 5 of the MDMER is not a predictive section of the regulation to be used to direct EA scope. It is applicable to operational metal mines. Many MDMER parameters including those in Schedule 5, Section 4 identified by ECCC were not selected for analysis during lab studies completed by Denison to support the EIS,	Yes Revised Draft EIS, Table 2.2-1 in Section 2 Appendix 8-E, Table 15.

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					Furthermore, it is stated that the final effluent quality discharge target for uranium is 0.057 mg/L. However, the Canadian Council of Ministers of the Environment (CCME) water short term (acute) water quality guidelines for the protection of aquatic life is 0.033 mg/L. The proposed effluent discharge target for uranium exceeds the acute water quality guidelines, indicating effluent may pose the risk of being acutely lethal to aquatic biota at end-of-pipe. Rationale: ECCC requests the Proponent include the general water quality parameters that influence water quality thresholds, parameters in Schedule 4 and Schedule 5 Section 4 of the MDMER, and their respective water quality guidelines for consideration and transparency. Discharges from the proposed Project will alter water quality in the immediate receiving area, and this may include some sublethal effects on aquatic biota, which must be minimized. It remains the Proponent's responsibility to adhere to the MDMER to ensure that effluent at the end-of-pipe from all final discharge points be non- acutely lethal and meet requirements for prescribed deleterious substances under Schedule 4 of the regulations.	Appendix 8-E to include missing Schedule 5 Section 4 parameters required for effluent characterization under the MDMER: aluminum, mercury, iron, nitrate, thallium, phosphorus and manganese. 4. Include all acute and chronic water quality thresholds for each parameter in Table 2.2-1 and Appendix 8-E. 5. Describe additional mitigation measures that can be considered to minimize impacts to aquatic biota from uranium concentrations in effluent.	aluminum, iron, nitrate, thallium and manganese. In the Proponent's response it is stated that, "Schedule 5 parameters are included where available." However, it is unclear if this means that the requested effluent characterization concentrations for these parameters is currently unknown, or if these parameters are expected to have negligible concentrations in the effluent. Furthermore, ECCC requested that the Proponent include all acute and chronic water quality thresholds under the most stringent of the MDMER, CCME, and/or Provincial Guidelines for each parameter in Table 2.2-1 and Appendix 8-E. This information has not been provided as only chronic toxicity guidelines have been provided. The Proponent is legally required to meet MDMER release targets and intends to continue to refine effluent quality predictions as part of the BATEA assessment and licensing phase of the Project. ECCC must advise the CNSC of predicted effects of COPCs to surface water quality and recognize the Proponent's legal requirement to comply with the MDMER. Therefore, proposed and draft effluent targets must be reviewed against the requirements of the regulations and with an eye to any potential effects to the receiving environment for both regulated and other effluent parameters. It is necessary for ECCC to review effluent targets for general water quality parameters and MDMER Schedule 5 Section 4 parameters required for effluent characterization and environmental effects monitoring to determine if effluent at the end-of-pipe from all final discharge points is not predicted to be acutely lethal. Additionally, the predicted uranium effluent concentration currently exceeds the acute water quality guidelines for the protection of aquatic life. Table 2.2-1 does not currently provide the information necessary to verify acute and chronic thresholds. Therefore, please see the following reiterated requests: 1. Update Table 2.2-1 and Appendix 8-E to include all general parameters required for environmental	since they were not COPCs associated with IWWTP design. Information from laboratory tests is not available at this stage for all of the MDMER parameters. Further, MDMER Schedule 5 Section 4 include a list of parameters to be monitored (not modelled) and many of the 'missing' parameters have no associated limits under MDMER. Denison is committed to meet all requirements of MDMER, which includes future EEM programs. With respect to the bullet items in the IR the following is noted. 1) Table 2.2-1 and Appendix 8-E have been updated to include all general water quality parameters required for environmental effects monitoring, including pH, temperature, hardness, alkalinity and conductivity. 2) Table 2.2-1 and Appendix 8-E have been updated to include the following missing Schedule 5 Section 4 parameters required for effluent characterization: aluminum, iron, nitrate, thallium, and manganese. 1) Updates to Table 2.2-1 and Appendix 8-E Include all acute and chronic water quality thresholds for each parameter as well as information on the concentrations of modifying environmental factors (i.e. pH, hardness, etc.) used to calculate these guidelines as footnotes. Denison is committed to meet the requirements of the MDMER as previously stated. Denison is also committed to working through the process of identifying discharge criteria as stipulated under Provincial legislation for mine effluent discharge as part of the application for an approval to operate a pollutant control facility as well as per the requirements and conditions of the CNSC, the licensing body for the Project. Denison will follow the advice of the CNSC with regard to requirements for further consultation with ECCC.	

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							effects monitoring: pH, temperature, hardness, alkalinity, and conductivity. 2. Update Table 2.2-1 and Appendix 8-E to include the following missing Schedule 5 Section 4 parameters required for effluent characterization: aluminum, iron, nitrate, thallium, and manganese. Provide further explanation if this information is not available. 3. Include all acute and chronic water quality thresholds for each parameter in Table 2.2-1 and Appendix 8-E. Include information on the concentrations of modifying environmental factors (i.e. pH, hardness, etc.) used to calculate these guidelines as footnotes. 4. Provide a clear commitment to ECCC for continued consultation on developing effluent discharge targets including a review of final predicted effluent discharge targets once available.		
IR-23	-	CNSC	Alternative Means	Section 2.10.2 Alternative Means Appendix 2-A PD Engagement Tables Appendix 2-C Alternative Means Assessment (p. 3)	Context: There are multiple rows in the Indigenous Tables for Appendix 2-A where comments and concerns raised by Indigenous Nations and communities and other members of the public were taken into consideration in the Alternative Means Assessment. However, it is unclear how these were considered. A few examples: • 16-EN-DesNd-101.1: Interested in any future business opportunities that may be available as Denison advances their Wheeler River Project. • 16-EN-ERFN-100.15: In that territory near the Wheeler River there are a lot of spawning and calving areas for moose, caribou; those creeks are for whitefish spawning. There's lots of heavy muskeg there. A lot of us have been there, and we'd like to know there'll still be access to the area. • 6-EN-ERFN-100.17: Today because of climate change, things are starting to happen that normally didn't happen. Even the permafrost is now further down. In the Wheeler River area, where there's some permafrost, have your environment guys seen a change? Will there be a change? These are some of the questions that need to be answered in order to come out with a positive spin. Rationale: Appendix 2-C, Alternative Means assessment, states (p.3): "Engagement with Interested Parties naturally included	Please explain how comments and concerns collected during Denison's engagement sessions were considered or influenced the alternative means assessment. Please include this information in the EIS and/or it's appendices.	This response has not been accepted. The response and additional Annex (Table 2.10-1) provided in the draft EIS submission do not address concerns listed in the examples requested by CNSC staff. The additional row in Table 2.10-3 meant to address input received from interested parties does not clearly demonstrate how comments received regarding alternative means were incorporated into the evaluation factor. Additionally, references provided in this row are not in the submission package or the original EIS.	The reviewer is referred to the revised Draft EIS, Appendix 2-A. The column titled "Denison's Response to Question/Concern (where applicable)" outlines additional context on how the comment was considered in the EIS. This includes the specific comments listed by the reviewer, i.e., 16-EN-DesNd-101.1, 16-EN-ERFN-100.15 and 16-EN-ERFN-100.17. For additional context, the previous IR response (Annex 1, IR-23 on page 13/419) provided a narrative on how the comments included in Appendix 2-C were part of the fulsome consideration of alternative means. The alternative means assessment is largely a screening level exercise to identify more versus less preferred options. The fact that it is carried out at the screening level is appropriate for this stage of the Project, given the level of design that was available at the time many of the engagement discussion occurred and that is typical for such resource development projects. The alternative means assessment is conducted across a range of criteria including biophysical environment, human environment, technical factors, cost factors, and any engagement comments specific to the options or more generally on importance of environmental protection, economic/business opportunities or concern about climate change. The alternative means assessment process is outlined in Appendix 2-C and summarized in Section 2.10 of the Project Description. In response to the second part of this comment, we would like to clarify that the tables presented in Attachment IR-24 (Annex 1, IR-24 on page 13/419; and a reminder that Attachment IR-24 is now included in the revised draft EIS as part of updates to Section 2.10 Project Alternatives) were directly from the draft EIS Appendix 2-C. Specifically, Table 2.10-3 in Attachment IR-24 is a direct copy of Table 6 from Appendix 2-C and this is stated directly in the table title. There was no new information contained in the Attachment IR-	Yes Appendix 2-A (Updated includes a column titled "Denison's Response to Question/Concern (where applicable)")

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					alternatives means and the engagement input was included in the evaluation of alternative means. Refer to the references list below and Appendix 2-A Engagement Database Summary – Project Description for details of engagement information referenced in this alternative means assessment." It is unclear in section 2.10.2 of the EIS, Appendix 2-A or Appendix 2C how the comments documented by Denison have been considered or influenced the alternative means assessment.			24 (Annex 1, IR-24 on page 13/419) tables compared to what was provided in the draft EIS, specifically Appendix 2-C. Denison has committed to undertaking engagement with Indigenous Communities of Interest and Communities of Interest, which if they desire it, may include discussion of project alternatives in the context of licensing, as may be appropriate.	
IR-25	-	CNSC	Current use of lands and resources for traditional purposes Current use of lands and resources for traditional purposes	Section 3, Sections 4, Section 5, Section 11 (and all other applicable once Métis Knowledge Use Study is completed)	Context: The EIS states that Denison is currently negotiating an agreement with MN-S and no traditional land use information is included throughout the EIS given no agreement was signed or Traditional land use information was shared at the time the EIS was being drafted. As noted in the EIS Denison has committed that: "As information becomes available from the agreed-upon process between the Métis Nation – Saskatchewan and Denison, it will be incorporated into the final EIS." (p. 11-36) Rationale: More information is required to better understand the issues and concerns, valued components, and current use of lands and resources for traditional purposes by MN-S near the Project area. Requirements are detailed in CNSC's Generic EIS Guidelines, section 8.9: Indigenous land and resource use.	Please update the revised Draft EIS to reflect the integration of the Métis Use and Knowledge Study in the Draft EIS where applicable, when this study is completed and provided to Denison. In addition, please include an updated Issues and Concerns table that includes relevant information from the MN-S as a result of engagement activities and relevant MN-S studies in the next version of the EIS, as appropriate. Should this information not be made available to Denison at the time of revising the draft EIS, the next version of the EIS and the response to this IR should provide a status update on discussions and engagement with MN-S and next steps.	This response has not been accepted. As the information from MN-S has not yet been incorporated into a version of the EIS for review, CNSC cannot accept this response as complete. MN-S has provided new information to Denison and this should be reflected in Denison's assessment. CNSC requires that Denison provide additional information within the revised version of the EIS. The response should include the newly revised text within the EIS and the page numbers of where staff can find the information.	The information from the MN-S has been updated in the revised draft EIS in track changes form, for ease of review. The following sections have updates: • 3.3.2 • 3.4.2.3 • 3.4.4 • 3.4.8 • 11.1.1.1 • 11.1.1.2 • 11.1.2.3 • 11.1.3.1.2 • 11.1.3.2.2 • 11.1.4.3.1 • 11.1.4.5.1 • 11.2.1.1 • 11.2.2 • 11.2.3.2 • 11.2.3.3.1 • 11.2.3.9 • 11.2.4.4.1 • 12.1.1.1 • 12.1.1.3.1 • 12.1.2.4 • 12.1.3.2.3 • 12.1.4.2.1 • 12.2.1.1 • 12.2.1.3.1 • 12.2.2 • 12.2.3.2 • 12.2.3.3 • 12.2.4.2.2 • 12.2.4.2.3 • 12.3.1.1 • 12.3.2 • 13.1.1 • 13.1.2	Yes Revised Draft EIS sections: • 3.3.2 • 3.4.2.3 • 3.4.4 • 3.4.8 • 11.1.1.1 • 11.1.1.2 • 11.1.2.3 • 11.1.3.1.2 • 11.1.3.2.2 • 11.1.4.3.1 • 11.1.4.5.1 • 11.2.1.1 • 11.2.2 • 11.2.3.2 • 11.2.3.3.1 • 11.2.3.9 • 11.2.4.4.1 • 12.1.1.1 • 12.1.1.3.1 • 12.1.2.4 • 12.1.3.2.3 • 12.1.4.2.1 • 12.2.1.1 • 12.2.1.3.1 • 12.2.2 • 12.2.3.2 • 12.2.3.3 • 12.2.4.2.2 • 12.2.4.2.3 • 12.3.1.1 • 12.3.2 • 13.1.1

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								• 13.1.3.1 • 13.1.4 • 13.2 • 13.2.1.3 • 13.2.1.6 • 13.2.3 • 13.3.2.1 • 13.3.2.1	• 13.1.2 • 13.1.3.1 • 13.1.4 • 13.2 • 13.2.1.3 • 13.2.1.6 • 13.2.3 • 13.3.2.1 • 13.3.2.1
IR-28	-	CNSC	Current use of lands and resources for traditional purposes Current use of lands and resources for traditional purposes	Section 4, IER and engagement appendices, including: Appendix 2-A Appendix 6-B Appendix 7-B Appendix 8-A Appendix 9-A Appendix 10-B Appendix 11-A Appendix 12-A Appendix 13-A Appendix 14-B	Context: The summary of issues tables do not appear to include all of the key issues identified by the Indigenous Nations and communities. For example, some Indigenous Nations and communities have shared concerns with respect to accident prevention and overall safety on the Key Lake road (Highway 914) due to increased traffic, impacts on treaty rights and section 35 rights due to cumulative impacts, and decommissioning, that were not captured in the issues and concerns and summary tables in Section 4.3.2 and in the IER. The tables in the engagement appendices include a column titled "Response (From Denison)". The "Response" column does not include responses, but instead points the reader to where this comment or concern was considered. When navigating to the sections referenced, it is often unclear how this information was considered or influenced the assessment. Rationale: Additional detail is required in order to ensure the key issues are all identified and to understand the status of validation for each issue raised and the response provided.	1. Update the summary of issues and concerns tables to include all relevant issues and concerns raised by each of the Indigenous Nations and communities to date, including concerns raised in the Indigenous Knowledge studies provided, additional engagement, and Draft EIS comments. 2. Please include a column in the issues and concerns tables to clearly articulate the specific mitigation/monitoring measures that Denison have committed to, or any other measures, in order to address the concerns raised by each Indigenous Nation and community during the engagement process to date. 3. Denison must demonstrate that each Indigenous Nation and community has validated that the summary of issues and concerns table reflects their understanding or agreement, and/or a path forward to complete the validation throughout the EIS and the updated IER. Validation must be complete by the time the technical review is complete, prior to submission of a final EIS. Should Denison not be able to fully address issues, concerns or feedback raised by any Indigenous Nation or community,	This response has not been accepted. Denison provided information about the verification process for KML with an example chart that CNSC staff deem acceptable. CNSC requires that Denison complete this process with all identified Indigenous Nations and communities. It will be expected that a fully updated IER and issues and concerns tables for each Nation as per the original IR, in a future version of the revised EIS for SME review and acceptance. For part 3 of the IR, Denison must have validation from all Nations and Communities. Validation from ERFN, YNLRO and other Nations with interest in the Project should also be obtained. Alternatively, a path forward to complete the validation can also be provided.	Section 4 of the EIS and the IER have been fully updated with engagement information as recent as January 2024. The Interests, Issues and Concerns tables have been fully updated with responses from Denison to the items identified, including whether or not the Denison responses have been deemed acceptable and validated, or whether or not the engagement efforts in this regard are ongoing. Where engagement efforts are ongoing, if possible, a definitive indication of next steps is provided in respect of the resolution process. Denison notes that it is not always possible to specifically outline next steps with respect to validation, but the commitment to working toward a resolution should also be acceptable, as Denison alone cannot determine an engagement process for Indigenous nations; the Indigenous nations and communities may wish an alternative course of action. It is also important to note that Denison's engagement efforts may not yield positive validation on all Interests, Issues and Concerns raised by all Indigenous Nations and Communities (i.e., consensus on every topic may not be achieved), but wherever possible, Denison's efforts to be transparent about what those issues are, and the process associated with the attempts to find positive resolution will be identified.	Yes Revised Draft EIS, Section 4

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						through mitigation and monitoring measures, this should be documented, and a rationale provided. 4. Update the response column of the Engagement tables to describe how these were considered in the sections referenced. Consider renaming this column to reflect the nature of the content (i.e., how the information was considered).			
IR-35	-	CNSC	Change to an environmental component due to hazardous contaminants	Section 6, Chemicals of Potential Concern	Context: The use of petroleum products (e.g., propane, gasoline, and diesel) at the Denison Mines Wheeler River site is associated with vehicles and periodic operational testing of emergency generators as well as stationary pumps for emergency power or fire water systems. Thus, the air emissions will contain acrolein. Rationale: This chemical of potential concern (COPC) poses potential risks to human health via inhalation, but acrolein appears to have been missed or deemed insignificant. However, its consideration in the assessment will provide information on the significance of the associated risk.	Please consider acrolein in the assessment or provide a rationale for its exclusion.	This response has not been accepted. Although the requested assessment is provided in response to IR-35, this information also needs to be reflected in a revised version of the EIS. Please provide proposed text for the revised EIS, for SME review and acceptance. Please also see follow-up IR-35-R1.	The quantitative screening analysis of acrolein has been included in the revised Draft EIS as a new appendix, Appendix, D to Appendix 6-A to support the conclusion that acrolein is not a COPC. The information provided in this new appendix is too extensive to include in this IR response table and the additional text and supporting analyses can be referenced in the updated version of Appendix 6-A that was included as part of the overall response package to the second round of FIRT IRs. A summary of this analysis is also provided in Section 6.1.1.2 in the revised Draft EIS ("Acrolein emissions from diesel combustion were also evaluated using a quantitative screening analysis (detailed in Appendix 6-A) but were determined to be negligible and not considered a COPC."). Tables 3-10 and 3-11 in Appendix 10-A were also updated to be consistent with the changes made in Section 6 of the revised Draft EIS and these changes can be referenced in that former document (Appendix 10-A) an updated version of which was included as part of the overall response package to the second round of FIRT IRs. For reference, the assessment includes estimated concentrations of 1-hour and 24-hour acrolein compared to Ontario Ambient Air Quality Criteria. It has also been updated to include estimated annual acrolein concentrations. The annual concentrations are predicted to be below the Tolerable Concentration (0.4 µg/m3) from Environment and Climate Change Canada and Health Canada's Priority Substances List Assessment Report as well as the chronic reference concentration (0.02 µg/m3) from the US EPA. As such, acrolein can be screened out as a COPC from further assessment.	Yes Revised Draft EIS Section 6.1.1.2 Revised Draft EIS Appendix 6-A, Appendix D (new) Revised Draft EIS Appendix 10-A, Table 3-10 and Table 3-11
IR-35	IR-35-R1	Health Canada (HC)	Change to an environmental component due to hazardous contaminants IR-35 Response from Denison	Section 6, Chemicals of Potential Concern	Context: Potential health risks from long-term exposure to acrolein were not considered in the Proponent's response to IR-35. Rationale: No annual predicted concentrations for acrolein were provided in the draft EIS or in the response to IR-35. Concentrations were modelled for short-term exposure (1h and 24h) only in the draft EIS and compared to the 1-hour and 24-hour Ontario Ambient Air Quality Criteria for acrolein. It is Health Canada (HC) guidance to assess both potential short and	Use predicted annual concentrations and available chronic reference concentrations to account for potential health risks from long-term exposure to acrolein to support the decision to screen out acrolein as a COPC from further assessment.		See response to IR-35.	See response to IR-35

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					long-term health effects. The predicted annual concentrations for acrolein should be compared against chronic reference concentrations (e.g., the USEPA Reference Concentration (RfC)1 (0.02 µg/m3) and the Tolerable Concentration (TC) from Environment and Climate Change Canada and Health Canada's Priority Substances List Assessment Report2 (0.4 µg/m3)).				
IR-37	-	CNSC	Air Quality	Section 6.1.1.1, CALPUFF model	Context: "The Saskatchewan Ministry of Environment (SK MOE) has developed the Saskatchewan Air Quality Modelling Guideline (SK MOE 2012a) to assist Proponents in conducting air dispersion modelling assessments in a consistent manner. The guideline defines the recommended approach for dispersion modelling assessments in Saskatchewan, including model selection, emission source characterization, and the determination of compliance criteria to apply." Rationale: Saskatchewan air quality guideline requires consultation on use of CALPUFF model, where it states" The ministry acknowledges that there will be situations where specialized air dispersion models such as CALPUFF, CALQ3HCR and others may be applicable. The use of specialized models requires consultation with the ministry" OR "Pre-consultation with the ministry must be undertaken prior to the facility conducting specialized modelling (p. 3)." It is not clear if Denison Mines consulted with Saskatchewan MOE on use of CALPUFF model. Noted that Section 6.1.4.2 is again referring to Saskatchewan MOE guidance for justification, but no indication that they consulted with them (a requirement).	Please confirm and provide a summary of the consultation with the Saskatchewan MOE on the use of CALPUFF model for the Wheeler River EIS as per provincial air quality guidelines.	This response has not been accepted. Although a summary is provided in response to IR-37, this also needs to be reflected in revised version of EIS. Please provide proposed text for the revised EIS, for SME review and acceptance.	A summary of consultation described in the previous IR response (Annex 1, IR-37 on page 17/419) has been added to the revised Draft EIS in Section 6.1.4.2. ("In consultation with the SK MOE, CALPUFF was selected for the Air Quality assessment primarily for its ability to model long range transport in the large RSA, along with its wet and dry removal processes and chemical transformation algorithms that are needed to generate inputs for the human health assessment. Consultations with the SK MOE regarding the use and setup of CALMET/CALPUFF began in December 2019 (Fudge 2019), with follow-up correspondences regarding CALMET in March 2020 (IEC 2020) and April/May 2021 (Fudge 2021a, b, IEC 2021). In August 2021, SK MOE staff also completed a review of the CALPUFF model input files (Fudge 2021c). To overcome the limited meteorological record in the Project study areas, a prognostic meteorological data set was developed." The References section in Appendix 6-A has also been revised (updated) for consistency with the revised Draft EIS.	Yes Revised Draft EIS Section 6.1.4.2 and Appendix 6-A
IR-41	-	CNSC	Air Quality	Section 6.1.6.2.2, Background concentrations	Context: The EIS states that "Conservative regional background concentrations from the Saskatchewan Air Quality Modelling Guideline (SK MOE 2012a) and based on the La Loche monitoring station were used for particulate matter, NO2, SO2, and CO. The La Loche monitoring station is located near anthropogenic sources, while the Project is in a remote area removed from anthropogenic sources." Rationale: If La Loche monitoring station is located near anthropogenic sources and the Project is not, use of this data is not a conservative or realistic representation of background.	Please provide additional rationale to justify the appropriateness of La Loche monitoring station concentrations as background for project location.	This response has not been accepted. Please propose a more suitable background site to use as background subtraction. La Loche is not a suitable background site as it is potentially impacted from other industrial sources; it is expected that another background site removed from other industrial sources be identified and used.	Denison and its SME restate its assertion that the La Loche station provides data that suit the intended purpose of the EIS. For context, the rationale for using the Saskatchewan Ministry of Environment regional air quality data set (which is derived from the La Loche station data) has been included in the revised draft EIS. La Loche is a small village and Clearwater River Dene Nation community in northwest Saskatchewan with a population of around 3,600 people. While the regional air quality data set was described as being 'near anthropogenic sources' we would like to clarify that there are no major industries with emissions in the community. The anthropogenic sources would be expected to be associated with vehicles and dust from gravel roads. The regional air quality data set was applied in the air quality modelling assessment to meet the requirements of the Saskatchewan Air Quality Modelling Guideline. This	Yes Revised Draft EIS 6.1.3.2.7

[1] https://iris.epa.gov/static/pdfs/0364_summary.pdf
[2] https://www.canada.ca/content/dam/hc-sc/migration/hc-sc/ewh-semt/alt_formats/hecs-sesc/pdf/pubs/contaminants/psl2-lsp2/acrolein/acrolein-eng.pdf

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					For a realistic approach, background data considered should be upper 95th percentile (or max if n<10) from an area representative of project location For a conservative approach, background data from an area located even further from anthropogenic sources (if this exists) should be used, or an upper limit of background less than upper 95th should be applied as the background. Upper limit of background is used to screen out COPCs or often subtracted from total to ascertain relative contribution / impact from source, so using a higher upper limit may result in COPCs screening out or appear to have a lower relative contribution. If background was added to source, then approach used would be conservative. If this is the case, confirmation and reference to where this is discussed in methodology should be provided.			approach is used so that worst-case concentrations in air are predicted and evaluated against applicable air quality standards. We also note that northern Saskatchewan does not have an abundance of stations where parameters relevant to this assessment are measured and no stations are in truly remote areas (e.g., located away from small communities). For instance, the next closest station after La Loche is at Buffalo Narrows. which is about 200km away from the Project and would be expected to have similar air quality to La Loche as the communities are somewhat comparable in terms of size and industries, or lack thereof. Denison commits that it will consider and evaluate the potential use of alternative data sets that may be representative of baseline conditions in northern Saskatchewan, should such be available, for future measurement programs and air quality modelling. Denison notes again, however, that use of the La Loche station data was appropriate and fit for purpose. The text of Section 6.3.2.1.7 of the revised Draft EIS has been modified as follows for clarity (added text in bold, deleted text with strike through): "T**he Saskatchewan Air Quality Modelling Guideline (SK MOE 2012a) requires that background concentration data be added to air model predictions using an accepted set of data. Following the SK MOE requirements,** the regional SK MOE data presented in Table 6.1 12 were conservatively used to represent background concentrations of TSP, PM10, PM2.5, CO, SO2, and NO2. **In the absence of SK MOE data,** ~~while the~~ Key Lake data were selected to represent background concentrations of uranium, arsenic, and nickel. For copper, lead, selenium, and zinc, the Cigar Lake data in Table 6.1 14 were used. For the remaining metals (i.e., cadmium, cobalt, chromium, molybdenum, and vanadium), the average compositions from recent dustfall data (Table 6.1 7) were conservatively applied to the background concentrations of TSP. For example, the 24-hour background concentration of cadmium is 0.0006% x 46.2 µg/m^3, or 0.00028 µg/m^3. Since the data set for dustfall was limited to two samples, Key Lake and Cigar Lake data were favoured over dustfall data. For dustfall, the lowest arithmetic average of measured concentrations across all monitoring stations was used to represent background levels; therefore, the adopted background dustfall level is 0.06 mg/cm^2/30-day. **As described in Section 6.1.3.2.5, the SK MOE regional data is considered conservative. While this data set has been adopted for the purposes of modelling and evaluating worst-case COPC concentrations in air, future measurement programs and air quality modelling for the Project will be evaluated using alternative data sets that are more recent and representative of baseline conditions in northern Saskatchewan (i.e., Buffalo Narrows monitoring station).**"	
IR-44	-	HC	Physical stressors (noise and vibration)	Section 6.2.8, (p. 6-71)	The noise complaints resolution and response procedure is not sufficiently described in the EIS. Context: Section 6.2.8 discusses Monitoring and Follow- up. The	1. Provide the details of the noise complaints resolution and response procedure as per Health Canada (2017).	This response has not been accepted as preliminary details for mitigation and monitoring plans for noise impacts and complaints resolution process were not provided.	Denison notes that it believes the specific the request for the Noise Complaint Resolution and Response Procedure is beyond the scope of the requirements of an EA of a designated project under the Canadian Environmental Assessment Act, 2012. This request is also outside the scope of the Project Terms of Reference (Draft EIS, Appendix 1-A).	Yes Revised Draft EIS, 6.2.8

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					Proponent indicates: "The EMS will also include a community complaints and response procedure" (p. 6-71). Rationale: Details have not been provided regarding how the complaints would be received, addressed or what the timelines will be for providing a response or resolution. It is important to provide information to potentially affected communities in advance of particularly noisy activities. Community consultation and advanced notification of noisy activities has been shown to reduce complaints (see Health Canada, 2017).	2. Consider conducting community consultations and/or implementing an advanced community notification system to pro-actively reduce the probability noise-related impacts and complaints.	The response partially addresses IR-44 through the commitment to developing the complaints resolution process. However, CNSC expects that the noise complaint resolution and response procedure will be included for review in the EIS. Section 9 (p. 44) of the EIS Guidelines state that the EIS "Shall present an outline of the preliminary environmental monitoring program, including: • the description of the characteristics of the monitoring program where foreseeable (e.g., location of interventions, planned protocols, list of measured parameters, analytical methods employed, schedule, human and financial resources required), • plans to engage Indigenous groups in monitoring, where appropriate." Please provide proposed text for the revised EIS, for SME review and CNSC acceptance.	Denison will submit management system documentation (procedures, plans) as part of the future licensing process; however, this level of detail is not necessary for drawing conclusions on the EA process. As noted previously, Denison has committed to developing a community complaints and response procedure and the response procedure will be consistent with the appropriate Health Canada guidance. It would be premature to define the details of such a procedure without having engaged with the Indigenous Communities of Interest first. To this, it is also relevant to provide some spatial context that will inform engagement and the nature of the procedure. The Project is located on crown land in a remote area of Saskatchewan's boreal forest. No communities are located within the immediate proximity of the Wheeler River property. Travelling by existing roads, the closest community to the Project is approximately 260 km away. Calculated using a straight line, the closest communities are approximately 150 km from the site and Saskatoon is 600 km south. The majority of crown land leases in the LSA are assumed to contain rustic, remote cabins which are typically used seasonally. Notwithstanding the above, we have provided additional details for Health Canada's consideration and the details, along with Denison's commitment to developing a community complaints and response procedure consistent with the appropriate Health Canada guidance, will be added to Section 6.2.8 of the revised Draft EIS and Appendix 6-E. Prior to the commencement of the first routine noise monitoring campaign during Construction, Indigenous Groups and other Interested Parties will be notified of the monitoring schedule and planned locations. Initially, the proposed locations will be the same locations as were used in the baseline program for direct comparison of the data to the baseline conditions. These locations may be revised or expanded upon to include other locations based on feedback received. At the same time, Indigenous Groups and other Interested Parties will also be notified of how noise complaints may be registered. If a noise complaint is received, the associated monitoring would then take place at the location of the complainant. Upon receiving a noise complaint, the responsible Denison environmental staff will implement a complaints response and resolution process, documented using a complaints management form. The information to be recorded during the registration of the complaint will include the name and contact details of the complainant, the nature of the complaint, a description of the possible source(s) at the site associated with the complaint. Sound levels will then be monitored at the location of the complainant according to the description below, and a recommended action will be identified within two days with a timeline for implementation. Follow-up with the complainant will then take place to ensure that the issue has been resolved and follow-up monitoring will be completed where appropriate. Once the complainant is satisfied that that the issue has been resolved, the complaint will be formally closed out and a summary report will be completed by Denison and kept on file.	Appendix 6-E
IR-48	-	HC	Physical stressors (noise and vibration)	Appendix 6-E, Figure 6.2.3, p. 6-57	Noise-sensitive receptors are not included on noise contour maps. Context: Noise-sensitive receptors are identified in the acoustic model report in Section 6 Appendix 6-E but not presented on any maps in the atmospheric and acoustic sections of the main report (Figure 6.2-3).	1. For more clarity, identify noise-sensitive receptors on Figure 6.2-3: Noise Assessment Study Area as well as on contour maps showing the baseline and predicted noise levels.	This response has not been accepted. The map provided in the response did not include the contour lines requested in IR-48 to illustrate the maximum baseline and predicted noise levels. Furthermore, the map does not provide labels for receptor locations that appropriately describe the type of noise-sensitive receptor.	We remind the reviewer that the Project is located on crown land in a remote area of Saskatchewan's boreal forest. No communities are located within the immediate proximity of the Wheeler River property. Travelling by existing roads, the closest community to the Project is approximately 260 km away. Calculated using a straight line, the closest communities are approximately 150 km from the site and Saskatoon is 600 km south. The majority of crown land leases in the LSA are assumed to contain rustic, remote cabins which are typically used seasonally in the summer.	Yes Revised Draft EIS, 6.2.4.2.1, Appendix 6-E Revised Draft EIS, Section 10, Figure

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					Rationale: The noise assessment typically includes a map illustrating modelled noise levels from the Project at receptor locations in the study area.
					
					Certainty regarding the presence of human receptors in the regional study area is also recommended in order to assess cumulative impacts.
							HC requests that a map showing the following be provided:
							1. Contour lines representing the maximum baselines and predicted noise levels at the location of the receptors;
							2. Labels for receptor locations that are more descriptive of receptor type (e.g., hunting camp, ceremonial area).
							
							It was also noted that the receptor location of Risk 2 (i.e., Trapper/Intensive Land User) in the provided map was not consistent with other receptor location maps in the Draft EIS (e.g. Section 10, Figure 10.1-7 Human Receptor Locations for the Project Human Health Risk Assessment). These differences included both the receptor location (i.e., opposite sides of McGowen Lake) and type (i.e. Trapper/Intensive Land User vs. Seasonal Resident). The receptor locations and types should be confirmed and consistently used throughout the EIS, and any discrepancies should be explained.
							
							Finally, a portion of Figure 8 – Adjusted Ldn (p.19 – appendix 6-E) is cut off from the page, preventing proper review. HC requests that the full/complete version adjusted to fit the page be provided.
								The figure provided with the previous IR response (Annex 1, IR-48 on page 21/419) is included in the revised draft EIS as Figure 6.2-4. The purpose of this figure was to introduce the study areas and receptors. This figure is not meant to present results of the noise assessment and as such, the request to include contour lines representing the maximum baselines and predicted noise levels at the location of the receptors is not appropriate. Denison has included the receptor locations on the contour maps with the predicted noise levels (Appendix 6-E, Figures 8 to 15). Denison and its SME believe it is appropriate to have the detailed figures contained in Appendix 6-E, and there is no need to repeat them within Section 6.
								
								In response to this IR, we have completed the following revisions in Section 6 of the revised draft EIS:
								
								• Updated Section 6.2.4.2 to include reference to specific Appendix 6-E figures for cross-referencing ease.
								• Added a summary table that describes the sensitive noise receptors (Table 6.2-3) which may provide additional context to Figure 6.2-4.
								• Updated the human risk receptor names for Risk 2 and Risk 4 as we recognize the earlier version of the names may have caused some confusion when compared to the HHRA receptors in Section 10.
								  ○ "Risk 2 - trapper" is now "Risk 2 - seasonal resident at McGowan Lake."
								  ○ "Risk 4 - seasonal resident" is now "Risk 2 - seasonal resident at Russell Lake."
								• Adjusted Figure 8 in Appendix 6-E to fit the page.
								
								We thank the reviewer for highlighting a mapping error in the Section 10 receptor locations. In the revised draft EIS Section 10, Figure 10.1-7 has been updated to correct the location of the McGowan recreational fisher/hunter. The location was incorrectly shown on the east side of the lake in the draft EIS when it should have been placed on the west side of the lake. Please note this was a mapping error only and the location and assessment of the receptor within the HHRA was correct and matches the updated figure in the revised draft EIS.
								
								It is noted that this IR response does not change the outcome of the noise assessment. Information added to the EIS documentation as noted above is for editorial purposes.
									10.1-7 was updated and the corresponding Appendix 10-A figure (Figure 4-2)

IR-52	-	ECCC	Fish and fish habitat	Section 7, Geology and Groundwater Appendix 7	Context: According to the Proponent, "an acidic or low pH mining solution will be used to leach uranium ores from the ground. Mining solution may be a mixture of sulphuric acid, hydrogen peroxide, ferric sulphate, and freshwater (from shallow groundwater well or surface waterbody) or recycled water. Wellfield will consist of a combination of injection and recovery wells, in the general the arrangement of one recovery well in the center surrounded by four injection wells (5-spot pattern) with about 5 to 10 m between wells. The final wellfield is expected to	1. Explain why 3D hydrogeology and contaminant transport numerical modelling of the injection and extraction wells was not presented. 2. Alternatively, provide simulation results and a sensitivity analysis for the injection and extraction of the acidic solution in the mining area.	This response has not been accepted as the Proponent did not provide the information that would allow validation of the conclusion that hydraulic containment was successful. Hydraulic containment is to be utilized as a process to prevent the migration of contaminants away from injection well locations by groundwater. The Proponent indicated that tracer testing demonstrated hydraulic containment of the injected solution (as per the response to IR-6).	Containment of mining solution during operation will be confirmed by a robust groundwater monitoring network comprised of numerous wells located at various vertical depth horizons above the mineralized zone. Data generated from the groundwater monitoring plan would serve various purposes, such as to assess performance and the controls associated with the ISR process. Denison provided the CNSC with the results of the tracer test ("Hydrologic Report, Summary of Findings, 2019 to 2021" prepared by Petrotek) as part of the response to the first round of IRs. The first-round response to IR-06 (Annex 1, IR-06, starting at page 90/419) summarized the results of the tracer test pertaining to hydraulic control of the injected solutions. Hydraulic control of the injected solution was demonstrated through analysis of groundwater samples from monitoring wells surrounding the test well pattern. No elevated values of the tracer were observed in the monitoring wells.	No

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					include approximately 300 wells over an area measuring 90 m wide x 750 m long''. As the components/contaminants mentioned in the description of the hydrogeologic contaminant transport processes above may be transported to Whitesfish Lake through groundwater, the injection and recovery wells should be included in the model. Rationale: The hydrogeologic contaminant transport processes described above are an important part of the proposed Project and it is not clear why numerical modelling results and a sensitivity analysis for the above processes was not presented.		Hydraulic containment is an important process as part of a multi-pronged approach to preventing the migration of contaminants to Whitefish Lake by groundwater migration. Consideration of all field test data will allow ECCC to review the Proponent's conclusions about hydraulic containment. Provide all field test data to allow ECCC to review the conclusion that hydraulic containment was successful.	To eliminate potential excursion of mining solutions to the regional groundwater Denison will engineer and create an artificial freeze wall to encompass the uranium deposit and isolate the mining area; the freeze wall will extend vertically approximately 400 m from the basement rock up to surface (details in EIS Section 2.2.1.3, 2.2.1.4.2.3, and 2.3.2). The freeze wall is a no flow boundary and will prevent the mining solutions from travelling out of the mining area and into the regional groundwater system. Denison reiterates that contaminants will not be able to migrate to Whitefish Lake during Operations and into the Decommissioning period until mining area remediation objectives are met and the freeze wall is allowed to thaw. The inclusion of a freeze wall isolates the mining area from the regional groundwater system and this design feature provides a high level of protection to groundwater resources. Denison believes it has fulfilled its requirements for the EIS as outlined in the EA guidance provided by the province and federal government, including CEAA 2012, and that the FIRT has been provided with the appropriate level of detail on this topic for concluding the EA process. Notwithstanding that, Denison recognizes that further information may be required as the Project moves past the EA and into the licensing and permitting phases. The ISR mining model for the Wheeler River Phoenix deposit and the hydraulic containment on the mining solutions within the assessed area has been validated and signed off by a Qualified Professional, a legal requirement of a 43-101 Feasibility Study. The detailed data is not available publicly however, should the CSNC wish to further discuss the details with the Qualified Professional to support licensing requirements, Denison will arrange such a meeting.	
IR-53	-	CNSC	Geology and Groundwater	Section 7.3, Table 7.3.-2 Appendix 7-C	Context: The field-based hydraulic conductivity values (referred to as K values hereafter) in Table 7.3-2 (p. 7-32, main EIS report) indicate that the K value ranges of upper and lower sandstone aquifers have a significant overlap with those of the intermediate sandstone aquitard. However, the calibrated K value in Table 2-2 (p. 2.7, Appendix 7-C)) for the intermediate sandstone aquitard is close to the lower end of the field-based K value range, while the calibrated K values for the upper and lower sandstone aquifers are close to the upper end of the field-based K value range. Rationale: It is not clear how representative the calibrated K values are of the field-based K values for each hydro-stratigraphic unit, and if the significant difference between the K values for the upper and lower sandstone aquifers and those for the intermediate sandstone aquitard is supported by the geological properties of the corresponding stratigraphy units. It is stated in the report (p. 7-36, main EIS report) that "Vertical fracture or fault zones that hydraulically connect the Local (upper) and Semi-Regional (lower) groundwater flow regimes	Please provide additional information to support the representativeness of the calibrated K values (for example, use graph to present the measured K values and the calibrated K values).	This response has not been accepted. Please include figure(s) (y axis representing depth below ground, x axis representing K, different length of vertical line segment representing different packer testing intervals, etc.) showing the field measured K values, as well as the calibrated K value for the upper sandstone aquifer, intermediate aquitard, and lower sandstone aquifer. This would help demonstrate the distribution of field measured K values and representativeness of calibrated K values.	All hydraulic conductivity (K) values for the intermediate sandstone aquitard considered in developing the regional model are presented in Appendix C of Appendix 7-A of the draft EIS. This Appendix includes the depth range for all packer intervals. Note that when reviewing these data, any K values that are prefixed with "<" (e.g., < 1.0e-7), indicate that the fractured rock has very low hydraulic conductivity. Denison does not feel a figure illustrating the data included in the table would add additional value to the information presented (as it would be redundant to the information provided) and the K values selected for the used in the model in Appendix 7-C of the Draft EIS. Note that hydraulic conductivity values applied in the numerical modelling reflect not only the packer tests, but also our conceptual model, which is based on core logging, lithology and mineral contents, and geochemistry sampling. Further the interpretation of the lower hydraulic conductivity for the Intermediate Sandstone is consistent with the AECL published interpretation at Cigar Lake (i.e., a very similar setting).	No

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					are present throughout the Athabasca Basin". But fractures and fault zones are not explicitly considered in the model. There is possibility that these features could increase the hydraulic connection between the upper and lower sandstone aquifer.				
IR-55	-	NRCan	Fish and fish habitat	Section 7.3.3.1; Appendix 7-A, sections 3.4, 3.5, 3.8, 4.2; Appendix 7-C, section 2.8	Context: According to the Proponent's conceptual hydrogeological model (EIS, sec 7.3.3, Figure 7.3-7, Table 7.3-2; Appendix 7-A, sec. 3.4, Table 3-4), the horizontal hydraulic conductivity of the Intermediate Sandstone (Iss) aquitard is 8.4 E-09 m/s based on field measurements. The Proponent further assumes a 10:1 anisotropy ratio for the unit (Appendix 7-A, sec. 3.5.1) such that its estimated vertical conductivity is 8.4 E- 10 m/s. Based on this information, structural geology and groundwater quality data, the Proponent concludes that the connectivity between the Upper sandstone aquifer and the Intermediate Sandstone aquifer (sic) is limited (EIS sec. 7.3.3.3; Appendix 7-A, sec. 4.4). While acknowledging the paucity of conductivity data and the Proponent's attempt to mitigate this by leveraging collateral information on fracture frequency and clay content (Appendix 7-A, sec. 3.3.1), NRCan considers that the hydraulic conductivity assigned to the Iss aquitard is unrealistically low and inconsistent with the following lines of evidence: a) The conductivity value for the Iss is based on the geometric mean of 18 field measurements, 12 of which are from the same borehole (WR-695) located in the Gryphon zone, beyond the domain of the numerical model (Appendix 7-A, Appendix C, Table C-1). If the conductivity data were weighted equally, with one value per borehole, the geometric mean would be approximately 1.5 E-07 m/s, or two orders of magnitude higher; b) The Proponent notes that vertical fracture or fault zones that hydraulically connect Upper and Lower aquifer systems are present throughout the Athabasca Basin including in the Phoenix area (EIS, sec. 7.3.3.2.2; Appendix 7-A, sec.3.8.1); c) The Proponent notes that groundwater chemistry data (major ions) corroborate the presence of structurally controlled vertical hydraulic connections between the Upper and Lower aquifer systems (EIS, sec. 7.3.3.2.2, sec. 7.3.3.3; Appendix 7-A, 4.3.3); d) Groundwater chemistry data (Appendix 7-A, sec. 4.2, Table 4-1) also indicate the presence of detectable levels of "bomb" tritium (indicating recharge waters < 50 years old) in the Lower Sandstone Aquifer (GWR-025, GWR-008, GWR-033) and in the Iss (GWR-009, GWR-034), outside the area of U mineralization. This is also evidence of vertical hydraulic connection through the Iss. In summary, whereas the Proponent conceptualizes the Iss as a very low-permeability unit with localized vertical hydraulic connection (WS Shear), NRCan interprets the Iss as a "leaky" aquitard with pervasive fracture-controlled and much higher vertical hydraulic conductivity.	In the "Parameter Uncertainty Assessment" for the numerical groundwater flow model (Appendix 7-C, sec. 2.8), NRCan requests that the Proponent develop a calibrated numerical model with an alternate conceptualization of the Intermediate sandstone as a "leaky" aquitard with a horizontal hydraulic conductivity on the order of 1 E-07 m/s and a much lower anisotropy ratio. This should involve modifying the model lateral boundary conditions to allow for groundwater inflow/outflow across the entire thickness of the Athabasca Sandstone Group rather than just the Lower Sandstone aquifer.	This response has not been accepted. In response to IR-55, the Proponent states "The viewpoint from the third party assessment team does not align with the conceptual model proposed by the reviewer; however, an alternative calibrated groundwater flow model with a hydraulic conductivity of 1.0E-7 for the Intermediate Sandstone unit has been developed." If the alternative model requested in IR-55 has been developed by the Proponent, NRCan requests that full details of this model be provided in an attachment.	Additional documentation has been provided in Attachment IR-55 for the groundwater flow system that results from a calibrated condition where the Intermediate Sandstone Aquitard has a hydraulic conductivity of 1.0E-7. An acceptable calibration was able to be achieved with the higher hydraulic conductivity in the Intermediate Sandstone Aquitard. As is appropriate to maintain a calibrated condition, the hydraulic conductivity within other hydrogeologic units were also varied. The match to the observation data is not as good as the base case calibrated model, but it is within acceptable limits. The alternative calibrated groundwater flow model, with a higher hydraulic conductivity in the Intermediate Sandstone Aquitard, results in higher volumes of groundwater flow converging upon Whitefish Lake, resulting in a decreased contribution of flow from the deep aquifers to the total volumetric groundwater flow to the lake. Geochemical reactive transport of COPCs is further discussed as part of IR-89-R1, including for the groundwater flow conditions described in IR-55. Reflecting the smaller relative contribution of deep groundwater to flow to Whitefish Lake, there is an overall reduction in peak COPC concentrations in groundwater beneath the lake.	No

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					Rationale: The significance of NRCan's alternative interpretation of the Iss hydrostratigraphic unit is that deep groundwaters, including mining-impacted waters, may represent a greater proportion of baseflow discharge to Whitefish Lake than the 1% currently estimated in the Proponent's groundwater flow model (EIS, sec. 7.4.2.1, p.7-51; Appendix 7-C, sec. 2.6.3).				
IR-56	-	CNSC	Geology and Groundwater	Section 7.3.3.2	Context: It is stated in Section 7.3.3.2 (p. 7-37, main EIS report) that "Exploration boreholes drilled in the Phoenix area, where left unplugged, have the potential to provide preferential flow paths between the Overburden and Upper and Lower Sandstone Aquifers. Exploration holes were reportedly grouted approximately 10 to 20 m above and below the ore zone, resulting in open holes remaining throughout the overlying materials. These portions of the open holes may act as open conduits for groundwater flow through the 400 m of Athabasca Group Sandstone." Rationale: It is not clear why the exploration boreholes have not been decommissioned.	Please clarify why the exploration boreholes have not been decommissioned and the timeline to decommission the boreholes according to appropriate guidelines/procedures. If it is not decommissioned before the ISR operation, what is the potential impact of the unplugged boreholes on the mining solution migration?	This response has not been accepted. Although Denison's response is acceptable, in order for the response to be accepted the following text should be incorporated in the EIS: "During Operation, select exploration boreholes will be re-utilized for narrow diameter injection wells that will be developed with monitoring devices for the determination of excursions and water levels. Exploration boreholes not selected for the use of narrow injection wells will be grouted to surface to seal off any remaining conduit."	The requested text (verbatim per the "Rationale for Status" column) has been added to Section 7.3.3.2 of the revised draft EIS.	Yes Revised Draft EIS, Section 7.3.3.2.
IR-57	-	NRCan	Fish and fish habitat	Section 7.3.3.2 Appendix 7-A, sections 3.1.2 and 3.7 Appendix 7-C, section 2.5.2	Context: The Proponent's conceptual model of groundwater flow in the Local Study Area (EIS, sec 7.3.3, Figure 7.3-7) involves an unconfined Upper system hosted by overburden and the Upper sandstone aquifer, and a Lower confined system hosted by the Lower Sandstone Aquifer. The Intermediate Sandstone aquitard acts as a confining unit. Vertical heads gradients are directed downwards west of the Phoenix deposit and upwards beneath surface water receptors including Whitefish Lake (EIS, sec. 7.3.3.2). Using head data from nested monitoring wells (Appendix 7-A, sec. 3.1.2, Table 3-1) the Proponent calculates upward gradients in cluster WR-607, between the Lower Sandstone aquifer and the Upper Sandstone aquifer. In cluster LA-5, an upward gradient is calculated between the Upper Sandstone and the overburden unit (Appendix 7-A, Table 3-5). In areas west and south-west of the Phoenix deposit, groundwater is estimated to flow downward under a vertical gradient of approximately 0.015 m/m (Appendix 7-A, p.3-15). Rationale: In NRCan's opinion, the Proponent's interpretation of vertical head gradients in the LSA is not fully accurate. For the "Up-Gradient" monitoring well cluster, the tabulated head data (Appendix 7-A, Table 3-1) and data logger hydrographs (Appendix 7-A, Appendix B) indicate a downward gradient (0.014 m/m) from the overburden unit to the Intermediate Sandstone and an upward gradient (0.056 m/m) from the Lower Sandstone	In section 2.5.2 of Appendix 7-C (Calibration Results), the Proponent should demonstrate that the numerical groundwater flow model reproduces quantitatively or at least qualitatively the vertical head gradients calculated from observations in the nested monitoring well clusters (Appendix 7-A, Table 3-1).	This response has not been accepted. Using data provided in Attachment #57 (observed and simulated static water levels, screen mid-point elevations), NRCan was unable to reproduce the head gradient values reported by the Proponent in their table.The Proponent should check the gradient calculations.	Denison thanks NRCan for their careful review of the information provided. Gradient calculations have been checked and corrections made. The calculation error does not affect the discussion however, as the same formula was used for observed and simulated gradient calculations. The technical contents of the original response (Annex 1, IR-57, starting at page 200/419) have been added to Appendix 7-C as Section 2.5.2.4., including a Table (Table 2-7) with the calculated gradients shown, as follows. "Observed and simulated vertical gradients at available the well clusters presented in Appendix 7-A (Table 3-1), are summarized in Table 2-7. Observed static water levels are presented as there were issues with the barometric pressure correction for transient water levels. Vertical gradients are implicitly incorporated into the 3D model calibration as water levels from all observation wells are incorporated as calibration targets using their coordinates in 3D space. As indicated by the results presented in Figure 2-7, the model provides an excellent representation of the observed gradients estimated using these monitoring well clusters. • At the northwest (NW) cluster, the observed and simulated gradients are virtually identical. • At the southeast (SE) cluster, the gradient from the shallow overburden (OVB) to the intermediate sandstone aquitard (ISA) is under-estimated in the model, however the water level at GWR-007 is believed to be perched above the regional water table, and therefore not a good representation of vertical gradients; regardless both the model and observed data indicate a downward vertical gradient. The gradient between the ISA and the lower sandstone aquifer (LSA) is negligible, which is replicated within the model.	Yes, Appendix 7-C, Section 2.5.2.4

<table>
<tr><th>Original IR#</th><th>Follow-Up IR #</th><th>SME</th><th>Project Effects Link</th><th>Reference to EIS, appendices, or supporting documentation</th><th>Context and Rationale</th><th>Information Requirement (IR)</th><th>Rationale for Status</th><th>Denison's Response</th><th>EIS Updates (Yes/No; if Yes, provide EIS Section number)</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>to the Intermediate Sandstone. Head data from the "NW" monitoring well cluster indicate a similar pattern of downward (0.016 m/m) and upward (0.014 m/m) gradients converging in the Intermediate Sandstone. In the "Downgradient" and "SE" monitoring well clusters, head observations and data logger hydrographs indicate downward gradients from the shallow aquifer system but essentially equal heads in the Intermediate and Lower Sandstones. This more complex picture of groundwater flow systems in the LSA does not appear to have been captured in the Proponent's conceptual model. Given the importance of the baseline hydrogeological regime for predicting the transport and fate of COPCs in the post-decommissioning period, the Proponent needs to demonstrate that the numerical groundwater flow model accounts for observed vertical head gradients.</td><td></td><td></td><td>

At the up-gradient cluster, the observed are very well represented by the simulated gradients, including the flow directions.
At the down-gradient cluster, the gradient between the ISA and the LSA is negligible, which is replicated within the model. The gradient between the OVB and ISA is observed to be downward. However, GWR-005 is located near the shore of Whitefish Lake but has an observed water level 2 m higher than the average lake level. Consequently, the simulated upward is considered reasonable.
At the Whitefish Lake Bay, the simulated and observed gradients between the upper sandstone aquifer (USA) and the overburden (OVB) are both upward and of similar magnitude. It is noted that he hydraulic head difference between the two observation wells is rounded to 0.1 m."

Table 2-7: Observed and Simulated Vertical Gradients at Available Well Clusters
<table>
<tr><th>Cluster</th><th>Well</th><th>Hydrostratigraphic Unit</th><th>Observed Water Level (static) (m asl)</th><th>Simulated Water Level (m asl)</th><th>Screen mid-point Elevation (m asl)</th><th>Observed Gradient (m/m)[a]</th><th>Simulated Gradient (m/m)[a]</th><th>Notes</th></tr>
<tr><td rowspan="3">NW</td><td>GWR-003</td><td>Overburden</td><td>503.97</td><td>503.87</td><td>467.8</td><td></td><td></td><td></td></tr>
<tr><td>GWR-027</td><td>ISA</td><td>500.91</td><td>501.00</td><td>246.3</td><td>0.0138</td><td>0.0130</td><td></td></tr>
<tr><td>GWR-025</td><td>LSA</td><td>502.34</td><td>502.40</td><td>146.3</td><td>-0.0143</td><td>-0.0140</td><td></td></tr>
<tr><td rowspan="3">SE</td><td>GWR-007</td><td>Overburden</td><td>514.12</td><td>503.48</td><td>515.2</td><td></td><td></td><td>perched aquifer at GWR-007 impacts gradient calculation</td></tr>
<tr><td>GWR-009</td><td>ISA</td><td>502.20</td><td>502.57</td><td>285.5</td><td>0.0519</td><td>0.0039</td><td></td></tr>
<tr><td>GWR-008</td><td>LSA</td><td>502.40</td><td>502.37</td><td>166.2</td><td>-0.0017</td><td>0.0017</td><td></td></tr>
<tr><td rowspan="3">Up- gradient</td><td>GWR-006</td><td>Overburden</td><td>514.70</td><td>515.81</td><td>504.75</td><td></td><td></td><td></td></tr>
<tr><td>GWR-028</td><td>ISA</td><td>511.00</td><td>510.40</td><td>241</td><td>0.0140</td><td>0.0205</td><td>Wells GWR-028 and GWR-029 are 520 m apart.</td></tr>
<tr><td>GWR-029</td><td>LSA</td><td>514.80</td><td>515.07</td><td>172.25</td><td>-0.0553</td><td>-0.0680</td><td></td></tr>
<tr><td rowspan="3">Down-gradient</td><td>GWR-005</td><td>Overburden</td><td>501.99</td><td>500.94</td><td>382.55</td><td></td><td></td><td></td></tr>
<tr><td>GWR-014</td><td>ISA</td><td>501.60</td><td>501.21</td><td>348.05</td><td>0.0113</td><td>-0.0079</td><td>Wells GWR-014 and GWR-012 are 430 m apart.</td></tr>
<tr><td>GWR-012</td><td>LSA</td><td>501.27</td><td>501.40</td><td>166.5</td><td>0.0018</td><td>-0.0010</td><td></td></tr>
<tr><td rowspan="2">Whitefish Lake Bay</td><td>GWR-036</td><td>Overburden</td><td>502.3</td><td>501.59</td><td>459.9</td><td></td><td></td><td></td></tr>
<tr><td>GWR-037</td><td>USA</td><td>502.4</td><td>501.62</td><td>441.3</td><td>-0.0054</td><td>-0.0017</td><td></td></tr>
</table>
Notes:
[a] – Downward gradients are indicated by positive values and upward gradients by negative values.
</td><td></td></tr>
<tr><td>IR-61</td><td>-</td><td>CNSC</td><td>Geology and Groundwater</td><td>Section 7.4.2</td><td>Context: There is no discussion of potential induced seismicity from mining processes.

Rationale: Induced seismicity may lead to a loss of process as identified for natural seismicity.</td><td>Please provide information on the potential mining-induced seismicity.</td><td>This response has not been accepted.

CNSC staff expect a discussion of the occurrence of mining-induced seismicity in general in Saskatchewan, and the inclusion of a summary of potential sources of induced seismicity related to ISR mining (such as the response that Denison provided for IR-61) and the corresponding mitigation measures in the EIS. The paucity of records of seismicity in northern Saskatchewan (as stated in EIS Section 15.2) does not necessarily indicate a lower potential for future induced seismicity. It should be noted that earthquakes of up to magnitude (ML) 4.4 are spatially correlated</td><td>The following has been added to Section 7.4.2.4 of the revised Draft EIS:

"Within the broader context of terrain stability, it is noted that natural seismic activity in Northern Saskatchewan is quite rare with no significant events in recorded history (refer to Section 15.2 Seismic Events).

Mining induced seismicity has been of interest for some time, with mining-induced seismicity reported in Canadian hard-rock mines since the 1920s (Hudyma et al, 2017) and the first formal Canadian research on the problem starting in the 1930s (Hedley, 1992). Hasegawa et al. (1989) and Ortlepp (1992) describe several mechanisms by which induced seismicity may be capable of occurring in relation to underground (excavation based) mining; though, those mechanisms generally relate to discrete, large-scale rockmass failures whereas more than 90% of seismic events can be categorized as micro seismic events with moment magnitude < 0 (Hudyma, 2008).</td><td>Yes

Revised Draft EIS, Section 7.4.2.4</td></tr>
</table>

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							with locations of extractive industries with ongoing activity. Please provide proposed text for the revised EIS, for SME review and acceptance.	In Saskatchewan, investigations of inducted seismic have been completed in association with potash mining and uranium operations. Sedghizadeh et al. (2023) applied statistical methods to investigate the nature of micro seismicity in a potash mine. Clustering analysis of micro seismicity indicated that the majority of events could be treated as independent background events mostly driven by underground mining operations; however, there is some clustering of seismicity and the formation of limited aftershock sequences of the "burst-type" (i.e., those that have only one parent event and many children). For example, with respect to uranium mining (Barghwal and van der Baan) investigated the source mechanisms and possible causes of micro seismicity recorded in an underground Uranium mine for a period of one month in January 2011. The events occurred near the main working level at 480 m depth and show some temporal correlation with the daily rate of rock removal. The study concluded the observed micro seismicity occurred due to reactivation of pre-existing faults that were favourably oriented in the static stress state created by the extensive horizontal tunnel network and due to dynamic stress due to rock crushing activities. Despite the above noted link between seismicity and conventional hard-rock mining techniques / operations, as well as compared to high pressure liquid injection processes, the potential for mining-induced seismicity from the nature of the ISR mining that is proposed by the Project is interpreted as being quite low, given that the mechanisms that are purported to create or induce seismicity will not occur. Nevertheless, potential for mining-induced events for the Project that could be postulated to occur as the result of a few sources are discussed below for completeness: 1) collapse of cavity voids from leaching, 2) hydraulic fracturing, and 3) use of permeability enhancement techniques. 1. Collapse of cavity voids. To clarify, the portion of the deposit being mined is never truly a void (as in a large empty underground cavern); rather, what remains will be a honeycomb textured environment with water filled interstices. The mined area is filled with a fluid at all times, whether it be a mining solution, groundwater, or the neutralizing solution. This is different from a more traditional underground operation such as Cigar Lake where there is physical excavation of the orebody, leaving a temporary air-filled space. Although the uranium ore is high-grade by global standards it is not entirely massive in nature. As such, the uranium will be leached in a 'honeycomb' texture leaving behind a structure of partial intact rock mass with the remaining area being filled by fluid. This retains the pressure balance of the mining zone with the adjacent water-saturated rock masses. In terms of void space creation and collapse of the overlying strata, modelling has demonstrated that only 0.05% by volume of desilicified material immediately overlies the ore zone and would be subject to collapse (Appendix 7C, Attachment K). This low volume and percentage are determined to not be of significant seismic concern. 2. Hydraulic fracturing. EIS Section 2.2.1.4.2 Wellfield Operation provides a comparison of ISR mining pressures to conventional fracking pressures used in the oil and gas industry. Conventional fracking pressures used in the oil and gas industry can vary; however, common pressures to induce fracturing can range up to 15,000 psi and require injection of fracking fluids of up to 16,000 liter per minute over periods of three to four days. Fracking fluids are comprised of a slurry of water, proppant (generally silica sand), and chemical additives to support and maintain the open fracture system after fracking is conducted.	

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								Conversely, ISR mining for the Project is planned at nominal pressures of 100 psi, intermittent pressures of up 250 psi, and average flow rates of 30 liters per minute within a recovery well. The ISR mining method proposed for the Project is markedly different than fracking. For example, looking at intermittent pressures alone, ISR pressures are anticipated to be 60 times lower than fracking pressures. 3. Permeability enhancement techniques. EIS Section 2.2.1.4.3 Permeability Enhancement outlines the three types of techniques being considered for the Project: mechanical, Propellant, and hydraulic options. Propellants are classified as a low hazard explosive (S.1 special-purpose explosives, low hazard explosives, per Explosive Regulations, section 36). Propellants technically do not explode (like classic mine explosives which detonate) but rather burn through a process called deflagration. Deflagration means the material burns slower than the speed of sound, thus no shock waves are generated. Propellant permeability enhancement methods reach injection pressures of up to 8,000 psi and are near instantaneous over periods of milli seconds. Neither ISR mining or permeability enhancement is expected to produce mining-induced seismicity. Under normal operating conditions there is no expected mining-induced seismicity. See also Bounding Scenario 4 Failure of the Freeze Wall in Section 14." **References:** Barghwal H. and M. van der Baan. 2020. Microseismicity observed in an underground mine: Source mechanisms and possible causes. Geomechanics for Energy and the Environment. Volume 22, May 2020. Hasegawa, H.S., R.J. Wetmiller, and D.J. Gendzwill. Induced seismicity in mines in Canada-An overview. Pure Appl Geophys. (1989) 129:423–53. doi: 10.1007/978-3-0348-9270-4_10. Hedley, D.G.F. 1992. Rockburst handbook for Ontario hardrock mines. CANMET Special Report SP92-1E, 305 p. Hudyma, M.R. Analysis and Interpretation of Clusters of Seismic Events in Mines. PhD thesis. University of Western Australia Perth (2008). Hudyma, M.R., L. Brown and O. Carusone. 2017. Seismic Hazard in Canadian Mines. Conference Proceedings. CIM AGM - May 2017, Montreal, Canada. Ortlepp, W.D. 1992. Invited Lecture: The design of support for the containment of rockburst damage in tunnels – An engineering approach. Proceedings of Rock Support and Underground Construction, (Editors: P.K. Kaiser and D.R. McCreath), Rotterdam, A.A. Balkema, pp. 593-609. Sedghizadeh, M. van den Berghe and R. Shcherbakov. 2023. Statistical and clustering analysis of microseismicity from a Saskatchewan potash mine. Frontiers in Applied Mathematics and Statistics. March 2023.	

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IR-64	-	ECCC CNSC	Fish and fish habitat	Section: 7.4.2.2, Potential Effect #2: Terrain Morphology and Stability – Operation Appendix 7-A, Appendix K (p. 12)	Context: The Proponent stated that the geological assessment predicted maximum vertical displacement in altered sandstone immediately above the mining area (17.5 cm). A very minor change in elevation at ground surface (of less than 7.5 cm) was predicted within a discrete and localized area overlying the ore body. The modelling work is considered to provide a worst-case bounding scenario. If subsidence were to occur over the lifetime of the Project, or in the years following mining, the extent of vertical displacement is not expected to exceed that predicted in the modelling, which is based on an assumed volume extraction. Rationale: ECCC notes that the thickness of the ore zone has an average thickness of 5 m with a range of 2 to 17 m, and is 25-50 m wide and that the overburden rock above the ore zone measures about 400 m. Therefore, it is not clear how the Proponent determined that the surface expression of a subsidence on the surface if it occurs will be limited to 7.5 cm and localized. A subsidence greater than 7.5 cm, implies that the void in the ore zone will be narrower, and will affect the amount of water migrating through the zone. It was the recommendation of the consultant who conducted the work in Appendix K that more accurate material properties should be used for future modelling.	Explain: • Will this be revisited with updated data based on extraction feasibility results? • How will the surface expression of a subsidence will be limited to 7.5 cm and localized? Suggestions for mitigation and follow-up measures: ECCC recommends that the Proponent consider implementing remediation measures immediately after mining to prevent subsidence from occurring in the first place.	This response has not been accepted. CNSC staff expect Denison to include within the EIS a summary of the results of RESPEC's most recent numerical modelling study that suggests negligible ground subsidence associated with the proposed volumetric extraction as this is an important consideration for designing an appropriate implementation plan for subsidence control and remediation measures.	Additional geomechanical modelling undertaken by Denison subsequent to the filing of the draft EIS, with refined, more granular inputs is included as Appendix K (RESPEC, 2024) to Appendix 7-A of the EIS. This report replaces earlier reporting. A brief summary of the RESPEC (2024) approach and results has been included in Section 7.4.2.2 of the revised Draft EIS. In summary, based on the modelling results presented therein, Denison does not anticipate the need for remediation measures, with the surface subsidence being negligible (on the order of millimetres) within the context of changes in terrain as it relates to decommissioning objectives. For clarity, the text added to Section 7.4.2.2 of the revised Draft EIS is as follows: "To aid in advancing the Project, a study was undertaken to evaluate the geomechanical stability of rock mass within the Phoenix deposit, overlying sandstones, and underlying basement rock following ore extraction with ISR and including the presence of the proposed freeze wall. The geomechanical study is presented as Appendix K of Appendix 7-A. Specifically, a full-scale 3D model of northeast extent of the ore zone, and specifically the northern half-length of Zone A shown in Figure 7.3-3, was developed to evaluate stress redistribution in the case of failure of remnant rock from rock mass removal. Average material properties were assumed for hydrostratigraphic units in the Pheonix deposit and surrounding rock, including hydrostratigraphic units shown in Figure 7.3-3. In the numerical model, instantaneous and random rock removal representing 30% by volume and 3% by volume for the high-grade ore zone and low-grade ore zone, respectively, was assumed. Quantified in the model was the competency of the remnant rock based on the predicted stress field and the potential for tensile fracturing of the rock. The modelling results indicated that the highest predicted failure volumes in remnant rock are associated with the ore zone (41%), but that predicted failure volumes decrease substantively to 8-26% in the immediately surrounding clay zones, and are very limited (0.02%) in the overlying sandstones, including within the desilicified zone, and underlying basement rock. In addition, no (0%) failure was predicted within the freeze wall itself. Importantly, associated vertical displacement of host rock into the mined cavity is predicted to be limited to values of no more than 49 cm in the ore zone and decrease to 0-7 cm only 4-5 m from the low-grade ore zone. Overall, predicted failure conditions are limited to 5-8 m of the extent of the low-grade ore zone and there is limited potential instability in the freeze wall. Subsidence at ground surface from displacement of host rock was predicted to be negligible. The average vertical displacement at ground surface is 2.5 mm." Additionally, and for consistency with the information presented in the updated Appendix K of Appendix 7-A, surface subsidence estimates have been updated in the Executive Summary, Sections 7, 9 and 16 of the revised draft EIS from "7.5 cm" to "2.4 to 2.8 mm".	Yes Revised Draft EIS Executive Summary, Section 7, Section 9 and Section 16 (subsidence estimate clarification) Revised Draft EIS Section 7.4.2.2. Appendix K, Appendix 7-A.
IR-65	-	CNSC	Geology and Groundwater	Section 7.4.2.2	Context: It is stated the maximum subsidence is 7.5cm based on modeling with an assumed volume extraction. Has subsidence from dewatering/pumping and from lack of inflow of groundwater due to freeze wall been considered?	Please provide additional details for any dewatering/pumping induced subsidence.	This response has not been accepted. CNSC staff expect Denison to include within the EIS a summary of their response to IR-65 to establish their basis for a low probability of pumping and/or	Per the comment the following text has been added to Section 7.4.2.2 of the revised Draft EIS. The potential for subsidence related to changes in fluid balance within the freeze wall during Operation was also considered. The freeze wall will provide hydraulic containment	Yes Revised Draft EIS, Section 7.4.2.2

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					Rationale: Surface facilities and wells may be impacted if there is unaccounted for subsidence.		dewatering subsidence. Please provide proposed text for the revised EIS, for SME review and acceptance.	between the internal wellfield and the external regional groundwater system with each well pattern maintaining a 1.7% 'bleed' to maintain hydraulic gradients towards recovery wells. This results in an isolated hydrogeological environment within the freeze wall, separate from the regional groundwater system but considered an unconfined aquifer within the freeze wall, being open to atmosphere. The "extra" water pumped (i.e., the water pumped in excess of injection) will be derived from stored groundwater within the sandstone units above the ore zone, and from the underlying paleoweathered zone, within each phase of Operation that is surrounded by freeze walls. The volume of stored water was estimated using the calibrated groundwater flow model (Appendix 7-C), which contains 3D volumes for the saturated soil and rock within each of the walled phases, including appropriate porosity values. These volumes of stored water were compared to the volume pumped within each phase of operation, over the expected period of extraction based on the mining plan. The stored volume of water was calculated to be 3.4 (Phase 1) to 9.7 (Phase 4) times the estimated excess pumped volume. In other words, there is ample stored water within each walled phase to supply the excess pumped volume. The excess pumping creates a hydraulic gradient toward the ore zone within each walled phase and help vertical spreading of the UBS during operations. If monitoring during operations indicates water levels are falling quicker than anticipated, additional water could be added within the walled phase, within the Upper Sandstone Aquifer. Given the above, a fluid balance (or flow rate balance) was conducted as part of wellfield planning to inform Feasibility Study production rates within the mining zone contained within the confines of the freeze wall. Freeze studies concluded a no flow boundary once closure of the freeze wall is established along the perimeter of the mining area. Additional modelling within the mining area, including groundwater (FEFLOW) and production (Goldsim) modelling, were applied and although a net increase in volume is anticipated over the life of mine, a net draw is maintained on a well pattern basis to maintain 'bleed' and inward hydraulic gradient during active mining operations. To maintain fluid balance and not draw down the water table in the overlying sandstone units, additional sources of water from groundwater wells outside the freeze wall will be injected inside of the freeze wall as part of normal drilling operations during wellfield development and will be accounted for in the balance. This ensures potential for subsidence related to water table drawdown in the upper sandstone units is mitigated. Operating parameters rely on a relative net water balance for successful operations and would not support a significant drawdown of the water table owing to ground subsidence concerns.	
IR-66	-	CNSC	Geology and Groundwater	Section 7, Table 7.5-1, Row 1, Column 6	Context: Column 6 in Table 7.5-1 indicates the mitigation measures for a valued component. For Row 1, Geology, there is no description of mitigation measures but only that contingency plans will be developed if based on monitoring. Rationale: Subsidence may impact wells and surface infrastructure.	Please provide additional details on monitoring and contingency plans related to the geological environment (e.g., subsidence), including triggers for implementing such plans.	This response has not been accepted. Denison claims that the expected risk from subsidence is negligible. Granted that updated models by RESPEC indicate negligible ground subsidence, in practice, modelled and actual subsidence measurements usually vary. Therefore, CNSC staff still deem it necessary to include additional details on subsidence monitoring and contingency plans (including triggers for implementing these). Moreover, since Denison plans to survey well collar elevations	The response below has been added to Section 7.8.1 of the revised Draft EIS, and a reference to these details added to Section 7.4.2.2. "Initial wellfield construction primarily consisting of earthworks to level the pertinent wellfield phases will be guided by Lidar surveys to provide a consistent datum prior to the installation of any well type (monitoring, injection, recovery, freeze) within the wellfield. The subsequent installation of any well type is located on a 'easting' and 'northing' basis guided by a differential global positioning system (DGPS) with accuracy of within 5 cm. Although DGPS systems can measure a point in the vertical or 'Y' direction with a comparable level of accuracy to the 'X' and 'Y', the vertical datum of any installed well will be further validated by use of stadia rods, which have accuracy to within 5 mm.	Yes Revised Draft EIS, Sections 7.8.1, 7.4.2.2, and 16.2.1, and Executive Summary Section 5.3.1.

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							notwithstanding the negligible ground subsidence modelled by RESPEC, they might as well discuss the techniques that they plan to employ. Currently, it is not clear what method they plan to utilize to potentially detect elevation changes in well collars that cannot also be used to detect subsidence of the overall terrain. Denison has discussed the limitations (i.e., resolution) of Lidar, which is a good start. However, it must be noted that vertical accuracy and precision are more important considerations than spatial resolution for evaluating the applicability of subsidence monitoring techniques for this project, especially considering the size of the study area. CNSC staff also recommend that Denison further explore the applicability of methods such as DGPS, InSAR, and UAV-based Lidar change detection for their monitoring plan.	The top of collar elevation of all newly installed wells will be measured to a known datum located off the wellfield. As part of annual inspections well collar elevations will be measured on a regular basis and recorded relative to the prior years' measurements to determine the degree (if any) subsidence occurring within the well itself that may be attributable to sloughing or shifting of a well at depth. Measurements of the well collar elevations are a surveying industry standard tool for determination of any vertical movement within a well itself. Satellite system's such as InSAR may be utilized to complement the stadia rod measurements on an as needed basis; however, due to the negligible subsidence (<10 mm) anticipated the system is envisioned to have its limitations with emphasis and reliance placed on site specific measurements. The proposed monitoring program, as conceptually described above, will be documented more formally as part of the overall operations management program prior to establishment of the well field. The monitoring program will include a contingency plan whose objective would be to facilitate the timely identification of, and response(s) to, potentially emerging conditions whereby routine monitoring data indicate performance is not meeting expectations (e.g., levels of subsidence are outside the range of expectations). The contingency plan conceptually would identify performance objectives, key performance indicators and measurement endpoints, triggers that would describe conditions, when met, where a response is required and a tiered-response plan in which an emerging issue would be confirmed (or not), with successive levels of response, including investigation of cause and risk, investigation of strategies to mitigate risk and implementation of preferred risk mitigation."	
IR-67	-	CNSC	Geology and groundwater	Section 7.6.2.1 (Remediation Objectives)	Context: Metallurgical testing, including batch reaction, coreflood testing and column tests are mentioned frequently throughout Sections 2 and 7 of the EIS. Outside of the composition of restored solutions from coreflood tests #2B and 3C, results from these various tests are not reported in the EIS or any associated Appendices. Rationale: The results from metallurgical testing are important to a number of items discussed in the EIS, including (but not limited to): evolution of hydrochemistry during remediation, source of salts in Lower Sandstone Aquifer porewaters, process plans, industrial wastewater treatment, estimating composition and volume of process precipitates, and composition of mining fluids and leachate. In particular, the EIS posits that mining area decommissioning objectives are achievable based on metallurgical testing and provides these objectives in Table 2.3-3. CNSC staff need to understand the specifics of this metallurgical testing, given its importance for the development and justification for mining and remediation activities. Denison must also provide information demonstrating that the proposed	1. Please provide a summary of the results and the analysis of results of the metallurgical tests within the EIS, or provide the technical supporting document with this information, and ensure the documentation is appropriately referenced in the EIS. This should include sample information for cores (e.g., mineralogy, location, U content, depth), test conditions (e.g., duration, # of iterations, column length, flow rate, temperature, pressure, sample frequency, influent/effluent composition), as well as results and how they are pertinent to the development of ISR activities. 2. Please provide further clarification/justification on how	This response has not been accepted, as this information should be provided in the EIS. CNSC staff request that Denison either include a high-level summary of the results of the metallurgical tests (including the data) or include appendices to the EIS that contain the data provided in attachments IR-20, IR-67, IR-69 and cite these within the EIS. Please provide proposed text for the revised EIS, for SME review and acceptance.	The response to IR-67 from the initial round of FIRT review comments that included consideration of issues raised in IR-20, IR-67 and IR-69 has been included as Appendix F to Appendix 7-C of the revised Draft EIS. References to the new appendix (Appendix F of Appendix 7-C) have been made in Appendix 7-C and Section 7 of the EIS as appropriate. Appendix F of Appendix 7-C has been included within the revised Draft EIS documentation provided as part of the overall response to the second round of FIRT review comments.	Yes Appendix F (a new appendix) has been added to Appendix 7-C.

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					restoration actions and remediation targets are As Low As Reasonably Achievable (ALARA).	results from two singular coreflood tests (i.e., Coreflood #2B and Coreflood #3C) can justify large-scale remediation activities and targets following solution mining. 3. Please provide material demonstrating that the proposed restoration actions and remediation targets are ALARA.			
IR-70	-	CNSC ECCC	Fish and fish habitat Geology and groundwater	Section 7.6.2.2.3, Evaluation of Geochemical Reactive Transport Appendix 7-C, Section 4.4.2, Sub-Domain Model Hydrogeologic Parameters	Context: The EIS indicates that "changes to hydrogeological conditions within the mining area were considered during development of the 3D sub-domain model. Dissolution of ore within the active mining area is expected to enhance … hydraulic conductivity". In Section 4.7 (Prediction Uncertainty Analysis), predictive uncertainty scenarios are provided. For scenario 7, the hydraulic conductivity (K) of the ore zone was increased even further than initial model assumptions. The value used is not indicated in the text. Rationale: A hydraulic conductivity (K) value of 5x10-6 m/s, which is a factor of five (5) greater than the value assumed for the ore zone, was applied in the base case numerical model to account for this impact. It is unclear from the information provided in Section 7 of the EIS or associated Appendices what the basis of this five-fold increase in K value for the ore zone, and how this was judged to be conservative, or to adequately represent anticipated conditions. This parameter is important as it impacts the rate at which contaminants flow from the ore zone following mining activities. Due to of the dissolution of uranium, larger voids will likely be created, and the hydraulic conductivity may increase by more than a factor of 5 compared to pre-project material. Therefore, a variation of at least one or two orders of magnitude for hydraulic conductivity should be used in the sensitivity analysis. Having a representative, conservative value for hydraulic conductivity is essential for understanding groundwater as a pathway of contaminant transport to Whitefish Lake and potential impacts to aquatic life. The K value used in the predictive uncertainty analysis should be reported.	Please provide a more fulsome discussion on the anticipated impacts of mining on permeability of the ore zone due to mining activities in the EIS or in an Appendix. The value used for scenario 7 of the prediction uncertainty analysis should be provided. The scientific rationale for the use of a K value only a factor of five greater than the value assumed for the ore zone in the 3D regional model should be provided, alternatively, provide simulation results for a more conservative scenario. Specifically, this discussion should address the potential effects of mechanical permeability enhancement with tools, dissolution of ore, gas plugging, chemical plugging, plugging due to ion exchange, and mechanical plugging.	This response has not been accepted. In the discussion of K values for the Ore Zone in Section 2.3.1.7 of Appendix 7-C, Denison notes that available measurements are derived from permeameters and likely underestimate actual conditions because they do not account for macro-scale fracture flow in the ore zone. Section 4.4.2 of Appendix 7-C indicates that a hydraulic conductivity value of 5E-06 m/s (5 times greater than value assumed for the ore zone in the 3D regional-scale model) was assigned to represent mining post-decommissioning for the base case scenario. The description for Scenario #7 of the sensitivity analysis reads "higher hydraulic conductivity within the ore zone". In their response to IR-70, Denison states that for Scenario #7, "the hydraulic conductivity in the ore zone was raised to be a uniform value of 2E-07 m/s to represent the effective dissolution of any clay cap minerals". No information relating to permeability or hydraulic conductivity is provided in the IR-20/IR-67/IR-69 attachment outside of qualitative observations of increased permeability following leaching with lixiviant. The information provided to CNSC staff thus far indicates that hydraulic conductivity (K) values for the base case scenario was 5E-06 m/s, and 2E-07 m/s for the higher ore zone hydraulic conductivity scenario (Scenario #7). Clearly this interpretation is not logical given that 2E-07 < 5E-06. Furthermore, Denison's assertion that the post-mining conductivity of the ore zone is unimportant relative to the hydraulic conductivity of lower sediments and desilicified zone is not supported by the data presented in Table 4-6 of Appendix 7-C. The table below provides a summary of predicted groundwater concentrations for key COPCs (As, Se, U) for Scenarios 5, 6, and 7, as well as the relative	There are a number of second round IRs associated with the theme of 'failure scenarios' related to well breakage, hydraulic containment, and GW model parameters. Denison and its SMEs have interpreted these IRs to be asking effectively how far outside the bounds of the design basis will failure occur. Within that context, Denison and its SMEs believe the work done adequately describes expected effects for design basis, has sufficiently considered appropriate levels of conservatism and has tested assumptions with sensitivity cases so as to render the need for such failure analysis as envisioned by the review comment as unnecessary. Such analyses would be based on assumptions that would not be defensible and in Denison and its SMEs view would cause confusion. Our earlier responses to this and related IRs referred to the ore zone as being a relatively small portion of the Draft EIS-characterized source volume as being part of our rational for not considering it a critical element. As stated in the Draft EIS, the source volume was conservatively estimated assuming a flare zone above and below the ore zone, within the confines of the freeze-walled zones. To further expand on that, as described in Draft EIS, the source volume includes the ore zone (core and barrier layers), the underlying paleo-weathered zone, and the overlying Lower Sandstone Aquifer (i.e., the restored solution extends 50 m above and below the ore zone). As such, the ore zone represents 2.75% of the source zone fluid volume, and less than 6% of the source mass of uranium, for example. As such, mass contained within the ore zone represents a relatively small portion of the overall source. Further, the most transmissive portion of the source zone is within the lower sandstone aquifer, and the most persistent portion of the source zone is within the paleo-weathered bedrock horizons where matrix diffusion is expected to result in source persistence. The hydraulic conductivity varied within prediction uncertainty scenario #7, reflects a higher hydraulic conductivity for the barrier layers of the ore zone, rather than the ore zone core. This was considered the most relevant parameter to vary to reflect a higher potential for ore zone mass to enter the overlying altered and desilicified units. To further demonstrate the robust nature of this hydrogeologic setting, an additional sensitivity scenario was run in direct response to the IR. This transport simulation was performed with the conductivity of the ore zone set to 5e-5 m/s (10 times higher than the overlying lower sandstone aquifer and desilicified zone). Under this scenario, similar peak COPC concentrations reaching Whitefish Lake to the base case scenario are predicted. COPC concentrations in groundwater remain below groundwater quality screening criteria	No

<table>
<tr><th>Original IR#</th><th>Follow-Up IR #</th><th>SME</th><th>Project Effects Link</th><th>Reference to EIS, appendices, or supporting documentation</th><th>Context and Rationale</th><th>Information Requirement (IR)</th><th>Rationale for Status</th><th>Denison's Response</th><th>EIS Updates (Yes/No; if Yes, provide EIS Section number)</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>percent difference to values predicted by the base case scenario. For these COPCs, it appears that increased ore zone hydraulic conductivity brings about the same order of magnitude changes as does varying K values for the lower sandstone (LSS). As such, it is important that the parameterization for Scenario #7 of the sensitivity analysis is valid - Denison is requested to provide clarification on this matter.

From Table 4-6 of Appendix 7-C (p. 4.43). Relative percent difference compared to base case scenario shown in brackets. Values represent groundwater concentrations at Whitefish Lake.

<table>
<tr><td>Scenario</td><td>As, µg/L</td><td>Se, µg/L</td><td>U, µg/L</td></tr>
<tr><td>Base case</td><td>0.782</td><td>0.835</td><td>0.550</td></tr>
<tr><td>5 (highest combined K values for LSS and ISA)</td><td>0.982 (25.6%)</td><td>1.28 (53.3 %)</td><td>1.54 (180 %)</td></tr>
<tr><td>6 (highest K value for LSS)</td><td>1.10 (40.7%)</td><td>1.44 (72.4 %)</td><td>1.81 (229 %)</td></tr>
<tr><td>7 (increased ore zone K)</td><td>1.58 (102%)</td><td>1.47 (76.0 %)</td><td>0.769 (39.8 %)</td></tr>
<tr><td>Screening Criteria</td><td>5</td><td>2</td><td>15</td></tr>
</table>

The Proponent also should provide an explanation for the chosen parameter values for Scenario 7. Post-mining hydraulic conductivity (K) of the ore zone is consequential to understanding contaminant migration in groundwater.

It should also be noted that the fate and transport simulations of the COCs are highly dependent on groundwater flow in the desilicified zone and acceptance of this IR will depend on the response to IR-89. Additional modelling has been requested in response to IR-89 that considers higher K values in the desilicified zone. Such additional modelling would assist in assessing if ore zone permeability is</td><td>at Whitefish Lake and do not change the conclusions of the original analyses. Details of this additional scenario are included in Attachment IR-89-R1.

The table produced by the reviewer highlights changes of up to 200% between scenarios; however, that is to be expected since the results as presented simply reflect the variation between the scenarios based on scenario assumptions. All peak COPC concentrations in scenarios presented in the revised Draft EIS and additional scenarios presented in IR-89-R1 remain below groundwater quality screening criteria (except for a small number of constituents that have naturally elevated concentrations relative to criteria).</td><td></td></tr>
</table>

Original IR#	Follow-Up IR #	SME	Project Effects Link	Reference to EIS, appendices, or supporting documentation	Context and Rationale	Information Requirement (IR)	Rationale for Status	Denison's Response	EIS Updates (Yes/No; if Yes, provide EIS Section number)
							not important to the fate and transport of COPCs, as asserted by the Proponent.		
IR-71	-	CNSC	Geology and groundwater	Section 7.7.1, Climate Change Considerations	Context: The report states that in a scenario of increased precipitation and decreased/constant evaporation, climate change may result in greater flows in the Wheeler River drainage system and increased recharge to groundwater, which would correspond to increased groundwater discharge to Whitefish Lake. Additionally, it is also stated that climate change was evaluated qualitatively. Rationale: It is not clear why the impacts of increased evapotranspiration associated with higher average temperatures were not considered, even though these are likely outcomes of temperature increases due to climate change in areas such as the Prairies (Climate trends and projections - Canada.ca). It is also not clear why climate change considerations were not assessed quantitatively.	Please provide a discussion on potential effects of increased evapotranspiration, as well as decreased groundwater recharge for the study area. Provide justification for performing qualitative assessment of impacts of climate change rather than a quantitative one.	This response has not been accepted. The effect of climate change on groundwater recharge in Prairies or Canada is generally uncertain due to the large degree of uncertainty in the modelling of future recharge although future changes in temperature and precipitation are expected to alter groundwater recharge (through changes to runoff, evapotranspiration, and snow accumulation). While CNSC staff accepts the response on potential effects of increased evapotranspiration, as well as decreased groundwater recharge for the study area, no justification has been provided on why quantitative analysis was not completed to address the effect of climate change on groundwater recharge.	In response to the comment, the following text has been added to the revised Draft EIS, Section 7.7.1. "Quantification of the effects of climate change were not specifically addressed because the case of reduced groundwater recharge (i.e., the most relevant parameter which could change within the groundwater flow system), and thus a lower driving force for transport, was considered less conservative than the scenarios tested." The text above has been added to Section 7.7.1 of the revised Draft EIS based on the following. To confirm this assumption, (two) additional modelling sensitivity scenarios were run where groundwater recharge was varied by +/- 20%, which recognizes the uncertainty in future climatic conditions. The 20% range of recharge variability is conservatively estimated based on predictions from Environment Canada (climatedata.ca – Key Lake; Precipitation will increase by 11 to 15%, and temperature will increase by 2.5 to 4.6°C) and is consistent with the range of variability that others (e.g., Erler et. al, 2019) have found for the foreseeable future (i.e., end of century). Details of these additional scenarios are included with Attachment IR-89-R1. Both scenarios did not appreciably change peak COPC concentrations in groundwater reaching Whitefish Lake relative to the base case conditions, and all constituent concentrations remain below groundwater quality screening criteria. Consequently, climate change is not considered to change the overall groundwater risk as presented in the EIS documentation provided to date. **References:** *Erler, A. R., Frey, S. K., Khader, O.,d'Orgeville, M., Park, Y.J., Hwang, H. T., et al.* (2019). Evaluating climate change impacts on soil moisture and groundwater resources within a Lake affected region. Water Resources Research, 55, 8142–8163. https://doi.org/10.1029/2018WR023822	Yes Revised Draft EIS Section 7.7.1.
IR-72	-	CNSC	Geology and groundwater	Section 7.8.2, Groundwater Monitoring	Context: Monitoring seems to consider COPCs from surface facilities, and excursion of pumped mine fluid in the Lower Sandstone Aquifer. There does not appear any discussion on how the proposed monitoring program considers potential excursions of brine from freeze wells. Rationale: It is unclear how potential excursions of brine from freeze wells will be monitored. Would this be through the fiber optic cables installed within the freeze well network? Or would it be achieved in the monitoring well clusters? If this is the case, how would an excursion of brine from a freeze well be differentiated from an excursion of mining solution?	Please provide further information regarding how potential excursions of brine from freeze wells will be monitored as part of the proposed groundwater monitoring program.	This response has not been accepted. CNSC staff request that Denison discuss the potential for excursions of brine from freeze wells and that they include a summary of plans to monitor these using key indicators of freeze wall brine migration, such as electrical conductivity (EC) and chloride (CaCl2), in the EIS (even at a high level if these are still being currently developed). Please provide proposed text for the revised EIS, for SME review and acceptance.	In consideration of the review comment, the following text has been added to the revised draft EIS to address this IR. Section 7.8.2: "One additional parameter, chloride, has been included as a key parameter. It is possible that mobilized chloride concentrations are higher in the injected fluids than in groundwater; however, this is not the primary intent of including this parameter in the routine monitoring. Rather, calcium chloride brine makes up fluids that maintain the freeze wall. Thus, a change in the concentration of chloride - and EC - may indicate that a loss of freezing capacity has occurred in the freeze wall, representing an excursion, and delineate the extent of brine migration. However, loss of freezing is considered as an accident and malfunction, and loss of freezing is expected to be signaled much earlier by	Yes. Revised Draft EIS, Sections 7.8.2 and 7.8.2.2.2, Executive Summary Section 3.4.2.1.

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								operational monitoring (e.g., pressure changes in the cooling circuit) than through monitoring of water quality." Section 7.8.2.2.2: (The text in italics has been added) "The groundwater monitoring network during Operation will focus on groundwater conditions within and on the outside perimeter of the freeze wall, and evaluation of changes in groundwater quality including detection of excursions from potential loss of freezing capacity."	
IR-75	-	CNSC	Geology and Groundwater	Appendix 7-A, Appendix K	Context: The geomechanical study showed that the stability of the remnant ore zone and surrounding rock mass is highly sensitive to the magnitude of the material properties. To quantify this risk, the Proponent conducted a sensitivity analysis to assess the influence that material properties have on the stability of key stratigraphic layers. The results of the sensitivity analyses suggest that small variations in the cohesion magnitude and angle of internal friction may significantly influence the stability of the altered sandstone, ore zone, and upper and lower clays. Rationale: By considering the potential uncertainties and risks in association with the geomechanical study and the empirically derived rock mass strength parameters and the non-site specific physical parameters of different rock formations used for the modeling, the Proponent's consultant suggests to define a laboratory testing program to address data gaps in the current geotechnical data and increase confidence in the material properties, and use more accurate material properties to model the phased extraction of uranium-enriched rock and assess the associated risks for cavity collapse and failure in the steel casing. CNSC staff concurs with these suggestions.	Please provide a plan to implement recommendations for further detailed geomechanical studies to reduce the uncertainties and risks in association with the stability and deformation analyses of ore zone rock matrix and its overlying rock mass formations and assess their impacts on the mine operation.	This response has not been accepted. As stated in the original comment, the geomechanical study (Appendix K of Appendix 7-A of EIS, RESPEC 2021) showed that the stability of the remnant ore zone and surrounding rock mass is highly sensitive to the magnitude of the material properties. The results of the sensitivity analyses suggest that small variations in the cohesion magnitude and angle of internal friction may significantly influence the stability of the altered sandstone, ore zone, and upper and lower clays. Although the Proponent has conducted additional numerical modelling by adding the desilicified sandstone into the model with conservative mechanical properties for this zone, the mechanical properties of other materials are basically same as the original modelling (i.e., empirically derived average material properties of key stratigraphic layers). The new modelling (RESPEC 2023, i.e., Attachment IR-21) does not address the uncertainties associated with the non-site specific physical and mechanical parameters of different rock formations used for the modeling. Some mechanical parameters used appear to be inadequate, e.g., the mechanical properties of overburden and rock-mass modulus of desilicified sandstone. The use of isotropic in-situ stress state is non-conservative. No sufficient justification/rationale is provided on the excavation of 30 percent of rock by volume from the high-grade ore zone to which 50% was used in the RESPEC (2021), which could have significant impact on the modelling results. In addition, Figure 2 of Attachment IR-21 does not show the desilicified sandstone although it is stated that the	There are a number of second round IRs on the theme of effectively 'failure scenarios' related to well breakage, hydraulic containment, and GW model parameters. Denison and its SMEs have interpreted these IRs to be asking effectively how far outside the bounds of the design basis will failure occur. Within that context, Denison and its SMEs believe the work done adequately describes expected effects for design basis, has sufficiently considered appropriate levels of conservatism and has tested assumptions with sensitivity cases so as to render the need for such failure analysis as envisioned by the review comment as unnecessary. Such analyses would be based on assumptions that would not be defensible and in Denison and its SMEs view would cause confusion. Material Properties and the Desilicified Sandstone: An update to the geomechanical study (RESPEC, 2024) is presented as Appendix K to Appendix 7-A, that clearly shows the Desilicified Sandstone in Figure 2a and 2b (versus the previous version of the report; Annex 1, Attachment IR-21 starting on page 134/419). In the modelling, sandstone that has been hydrothermally altered includes the Altered Sandstone and Desilicified Sandstone. Details on how the Altered and Desilicified Sandstones were delineated is provided as part of IR-83. The Desilicified Sandstone was included in the updated modelling to provide a more conservative approach from prior models. Cohesion values were set to '0' to demonstrate a conservative approach. Material properties for the Altered Sandstone and other stratigraphy remained unchanged from prior models as these values are deemed appropriate based on site-specific knowledge and comparable to other Athabasca Basin uranium deposits of similar settings. Excavation of rock mass: Random rock removal was adopted to represent the in-situ leaching process in the numerical model and included the instantaneous removal of 30% of the rock mass by volume from the high grade zone and 3% volume from the low grade zone. The volume of rock removed in the model is consistent with values achieved through site specific long-term testing of high and low grades cores at an accredited lab facility. As the high and low grade zones of the deposit encompass several stratigraphic layers, these values incorporated into the model represent a conservative approach. Denison believes it has fulfilled its requirements for the EIS as outlined in the EA guidance provided by the province and federal government, including CEAA 2012, and that the FIRT has been provided with the appropriate level of detail on this topic for concluding the EA process. Notwithstanding that, Denison recognizes that further information may be required as the Project moves past the EA and into the licensing and permitting phases. To	No

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							desilicified sandstone is considered in the modeling. Also see CNSC's disposition to Denison's response to IR-83.	support licensing, Denison will provide further detailed geomechanical studies to reduce the uncertainties and risks in association with the stability and deformation analyses of ore zone rock matrix and its overlying rock mass formations and assess their potential impacts on the mine operation and closure. We also highlight the role of the Project's decommissioning plan and associated cost estimate as a core document guiding Project aspects in the post-decommissioning period in general, and the mining area decommissioning objectives in particular. As the Project advances, the details of the decommissioning plan will naturally become more refined and will build on experience gained during operations, including mining, monitoring, and additional laboratory studies. The decommissioning plans are built on a 'decommission tomorrow' scenario and the financial guarantees will be developed in consideration of potential well breakages.	
IR-76	-	CNSC	Geology and Groundwater	Appendix 7-A, Appendix K (p. 12)	Context: Based on the consultant's report, the modeled vertical strain is approaching or exceeding the tensile and compressive yield limits for steel casing. Rationale: Failure of steel casing may result in process loss or alter groundwater flow and quality.	Please provide additional details on how casing integrity will be monitored and potential effects mitigated.	This response has not been accepted. CNSC staff request that Denison include summary of the potential for steel casing failure and plans for monitoring and mitigating its effects (such as the response to IR-76) within the EIS, for SME review and acceptance.	With regards to steel casing failure and plans for monitoring and mitigating its effects, the following is noted: Mitigation of steel casing failure is accomplished by the injection and recovery well designs and operational monitoring of the wellfield. The well design is already described in the revised draft EIS in Sections 2.2.1.4.1 and 2.2.1.4.2. Each well will have double containment: mining solution will travel inside an inner casing with the outer casing acting as secondary containment for the mining fluids. See below for operational monitoring discussion. Potential for steel casing failure: Conditions with respect to the potential for steel casing failure are addressed in IR-75. An additional hazard scenario has been added to the revised Draft EIS (Annex 1, IR-213 on page 76/419), to further address the potential for failure conditions associated with the steel piping. The new hazard scenario was added to Table 3-2 in Appendix A of Appendix 14-A (Accidents and Malfunctions Assessment) as Scenario 2.4 Well Casing Yield and/or Damage. For reference and based on hazard screening analysis provided in Appendix A of Appendic 14-A, this scenario is evaluated to be a low likelihood scenario (2) with moderate consequence (score 3) for an overall risk ranking of low, and accordingly was not advanced for further, more detailed analysis beyond initial risk screening. The scenario is viewed as a low likelihood scenario due to the proposed multilayer design of the injection / recovery well design. Monitoring: The following details of monitoring of injection and recovery wells will be added to Section 2.8 of the revised Draft EIS: "Well casing integrity will be monitored in a rigorous fashion, thereby allowing Denison to respond to any steel casing failures in a timely manner. A network of monitoring wells installed within the freeze wall area will be equipped with pressure instrumentation for the determination of the vertical strain/stresses placed on the formation. This monitoring network is designed to detect if these strains may be deviating from their acceptable levels and beyond the design tolerance prior to failure. The injection and recovery wells will also be equipped with continuous monitoring devices for pressure and temperature that can detect a breach in the well casing if one were to occur. These data will be transmitted to the processing plant for remote monitoring through a master control system. Through the master control system, operators will be capable of controlling	Yes Revised Draft EIS, Section 2.8

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								pumphouse production lines remotely. Wellfield monitoring will facilitate detection of any issues with the injection and recovery wells. As a further preventative measure, annual mechanical integrity testing is conducted on the wells to ensure their containment and compliancy. Active monitoring will allow for operational shutdown of the individual well in the instance that conditions that could lead to a failure are indicated to prevent loss of process related chemicals into the freeze wall area".	
IR-78	-	CNSC ECCC	Fish and fish habitat Geology and groundwater	Appendix 7-A, Section 3.5.2, Porosity Appendix 7-C, Section 2.3.2.1, Porosity Values	Context: This section of the report outlines the estimated/assumed effective porosity values. The only reference provided is for permeameter testing on rock core samples (Scibek, 2019). Additionally, the report states that "As tracer test results to estimate effective porosity were unavailable at the time of modelling, effective porosity values for the sandstone bedrock and basement units were sourced from literature values", where literature values are effective porosities from the Cigar Lake study (AECL, 1994), situated approximately 40 km NE of Wheeler River. No on-site Wheeler River field data was used to justify this value. Additionally,, in the Cigar Lake study, the authors reported that, because results from tracer tests and pumping tests were unavailable, "a practical approach was adopted, i.e., to use the porosity values obtained from laboratory measurements made on core samples, and to assume that those numbers were close to the average field kinematic (effective) porosity values". Rationale: The source of reported effective porosity values is unclear from Section 3.5.2 in Appendix A (e.g. literature review, field work, laboratory work). In Section 2.3.2.1 of Appendix 7-C, there is a lack of clarity regarding the effective porosity data used in the numerical model. It appears that no site-specific data derived from tracer tests or pumping tests is used in the numerical model. Given that effective porosity directly correlates to seepage velocity and by extension transport time and distribution of COPCs in groundwater, it is an important parameter. Given its relative importance for contaminant fate and transport, effective porosity should be based on field measurements, or at the very least accounted for in the sensitivity analysis.	1. Please provide the reference for the data substantiating the assumed effective porosity values reported in Appendix 7-A and used in the numerical model in Appendix 7-C. 2. Please provide information on how the site-specific effective porosity values from tracer tests or pumping tests, were considered in the numerical models. Section 2.2.1.4 of the EIS asserts that tracer tests were carried out in 2021 – this information should thus be available for improving/updating models. Alternatively, provide a sensitivity analysis for the effective porosity in the Desilicified Zone, or contaminant transport simulation results with more conservative effective porosity values.	This response has not been accepted. Effective porosity is an important parameter to understanding groundwater flow and contaminant transport. The Proponent states that "As tracer test results to estimate effective porosity were unavailable at the time of modelling, effective porosity values for the sandstone bedrock and basement units were sourced from literature values", including porosities from the Cigar Lake study (AECL, 1994), situated approximately 40 km NE of Wheeler River. No on-site Wheeler River field data was used to explain this value. Additionally, in the Cigar Lake study, the authors reported that, because results from tracer tests and pumping tests were unavailable, "a practical approach was adopted, i.e., to use the porosity values obtained from laboratory measurements made on core samples, and to assume that those numbers were close to the average field kinematic (effective) porosity values". In response to the IR, the Proponent explained and supported their methodology for selecting a value for effective porosity. This method included consideration of literature values and a regional analogue at Cigar Lake. ECCC notes that a tracer test was conducted, the results of which were not considered in the selection of the effective porosity parameter. If field test data is available that is potentially relevant to determining effective porosity, it should be included in the EIS when discussing effective porosity. The field test data should also be made available for ECCC to review, to confirm the conclusions reached by the Proponent. ECCC acknowledges that other sources of information can be useful when explaining the most appropriate value for effective porosity such as	There are a number of second round IRs associated with the theme of 'failure scenarios' related to well breakage, hydraulic containment, and GW model parameters. Denison and its SMEs have interpreted these IRs to be asking effectively how far outside the bounds of the design basis will failure occur. Within that context, Denison and its SMEs believe the work done to date adequately describes expected effects for design basis, has sufficiently considered appropriate levels of conservatism and has tested assumptions with sensitivity cases so as to render the need for such failure analysis as envisioned by the review comment as unnecessary. Such analyses would be based on assumptions that would not be defendable and in Denison and its SMEs view would cause confusion. The forced gradient tracer test undertaken by Petrotek (2022) was designed to evaluate the degree of capture that could be achieved using injection and extraction wells oriented in a star pattern within a relatively small (i.e., 5 to 10 m radius surrounding GWR-040) portion of the ore zone. Based on the purpose and relatively small scale of the test, Denison and its SMEs do not consider the test conditions/results to be representative of groundwater migration pathways post-decommissioning. Further, the tracer test was performed after permeability enhancement efforts (e.g., MaxPerf, Gas Gun and Kraken tools) which are designed to enhance the effective porosity beyond the natural state. Effective porosity values from this testing were never published and were not considered relevant to the scale of the EA modelling based on the small scale of the evaluation, and the impact of permeability enhancement measures. However, effective porosity values derived from the peak arrival time at extraction wells were computed to range from 1 to 7%, which is in line with the effective porosity value assigned for the ore zone pre-mining (i.e., 1%); higher values are expected within the ore zone post-mining which will result in increased travel times. The discussion above has been summarized in the revised Draft EIS, in Section 4.5 of Appendix 7-C. Additionally, it is noted that effective porosity values applied in the groundwater flow and transport models were selected to be consistent with the available literature, including those applied by AECL at Cigar Lake (AECL, 1994) as follows. "A forced gradient tracer test undertaken by Petrotek (2022) which was designed to evaluate the degree of capture that could be achieved using injection and extraction wells oriented in a star pattern within a relatively small (i.e., 5 to 10 m radius surrounding GWR-040) portion of the ore zone. The tracer test was performed after permeability enhancement efforts (e.g., MaxPerf, Gas Gun and Kraken tools) which are designed to enhance the effective porosity beyond the natural state. Effective porosity values were derived from the peak arrival time of the injected potassium chlorate solution at extraction wells, utilizing the recorded distance and hydraulic conductivity values estimated from pumping tests performed after permeability enhancement efforts.	Yes, Appendix 7-C, Section 4.5

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							literature values and regional analogues, as per the Proponent's IR response. However, field test results should be presented in the EIS and considered as a part of such an explanation. If the Proponent feels that not utilizing field test data is the most accurate approach when selecting an effective porosity value, then this conclusion should be reached with consideration of the field test data as a part of the evaluation. Provide a discussion of how the effective porosity values are selected, including a discussion of how field test results were considered. This information is necessary to confirm that the selected effective porosity values are valid. This also relates to IR-52.	Effective porosity values ranged from 1% (GWR-038) to 7% (GWR-041). The lower value (i.e., 1%) supports the effective porosity assigned within the deep sandstone units (e.g., Lower Sandstone Aquifer) as it is interpreted to reflect areas where permeability enhancement was unsuccessful. The higher value (i.e., 7%) provides a lower bound on the effective porosity for the ore zone post-mining; higher values are expected within the ore zone post-mining which will result in increased travel times." Despite the above, and in consideration of the review comment, an additional conservative sensitivity geochemical reactive transport scenario was performed to evaluate a lower effective porosity within the paleo-weathered zone (PWZ). The PWZ is simulated to be the area wherein mass is most persistent and so reducing the effective porosity within this zone allows initial source mass to migrate out of the paleoweathered zone toward receptors faster. For this scenario, the effective porosity was lowered by a factor of 10 for this unit to reflect a more fracture-dominated transport condition, with limited matrix diffusion. Slightly higher peak concentrations were simulated for a number of COPCs (including As, Cd, Co, Cu, Ra-226, Se, and Zn) relative to base case concentrations, but all peak concentrations remained below groundwater quality screening criteria beneath Whitefish Lake. Details of the scenario are provided in Attachment IR-89-R1 for reference. The results of the additional simulation confirm our understanding that uncertainty in effective porosity does not change the outcome of the scenarios already reported within the EIS documentation, nor in conclusions based thereon.	
IR-81	-	CNSC	Geology and groundwater	Appendix 7-A, Section 4.3.3, Hydrochemistry by Hydrostratigraphic Unit	Context: The report states in the description of hydrochemistry of the Lower Sandstone Aquifer that, "On the basis of groundwater chemistry and tritium values in that groundwater, the authors (of the Cigar Lake analogue study in 1994) concluded that the groundwater reflected a younger water component that had penetrated to depth along hydraulically active fractures/faults. The same conclusion is made here (in the Wheeler River EIS) for the Phoenix study area – meaning that fracture/fault conditions are such that some areas of the MFa are characterized by younger/recharge groundwaters". Rationale: Tritium results for most wells in the Lower Sandstone Aquifer (MFa) reported in Table 4-1 of Appendix 7-A exhibit tritium concentrations <15 Bq/L for the 2020 sample, and 0.1 or <0.1 Bq/L for the 2021 sample. Tritium in modern precipitation typically varies from 1 – 3 Bq/L. Conclusions made in the text are not supported by data, especially given that tritium values are not reported in the EIS for local precipitation or surface water. This is important in reinforcing the assumption from the conceptual model that modern meteoric water circulates at depth in the Lower Sandstone Aquifer.	Provide a further discussion on the interpretation of tritium in groundwater, rather than echoing conclusions from the Cigar Lake analogue study. Consideration should be given to the assertion that modern meteoric water circulates at depth in the Lower Sandstone Aquifer. Collection and analysis of stable isotope (e.g., δ2H, δ18O) samples is a cost-effective solution which would greatly improve understanding of groundwater hydrology and support the development of a conceptual model.	This response has not been accepted. CNSC staff agree with the interpretations drawn from the information presented in the response to IR-81. However, it remains that the EIS does not contain an assessment of the tritium data presented, aside from the text quoted in the original IR-81 relating to Section 4.3.3 of Appendix 7-A. As such, CNSC staff request that Denison revise the EIS to include a high-level summary of the tritium data presented in the response to IR-81, being (i) the data is limited in value to conceptual model development, (ii) conclusions from tritium data at Cigar Lake at not reproducible with the current dataset, and (iii) Denison will continue to monitor tritium to further evaluate the usefulness in refining the conceptual model. Please provide proposed text for the revised EIS, for SME review and acceptance.	The discussion of tritium has been added as Appendix L of Appendix 7-A of the revised Draft EIS. Text referring to Appendix L of Appendix 7-A has been updated in the following Sections: Section 4.2.2. of Appendix 7-A: "Groundwater Ageing: Tritium Values". This new subsection has the following text, summarizing what is presented in Appendix L to Appendix 7-A "The potential for analysis of tritium concentrations in groundwater to support ageing of groundwater and the development of the CSM for the Wheeler River program was evaluated using the available analytical data and information on tritium concentrations in precipitation. The analysis is presented in Appendix L. It was concluded that, beyond supporting recent groundwater recharge in the overburden and the upper sandstone aquifer – discussed further below (Section 4.3.3) - tritium concentrations in groundwater do not provide a robust means of ageing groundwater in the subsurface for the Wheeler River Project. Tritium concentrations in groundwater will continue to be measured as part of the routine groundwater sampling, to further evaluate the usefulness of this approach for refining the conceptual site model developed for the Wheeler River Project." Section 4.3.3 of Appendix 7-A, subsection: "Local Groundwater Flow System". The following text has been added:	Yes Appendix L of Appendix 7-A. Appendix 7-A Section 4.2.2 and 4.3.3 Revised Draft EIS, Section 7.8.2

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								"Recharge Conditions: Analysis of tritium values in groundwater from the Local Groundwater flow system is presented in Appendix L. Results suggest that groundwater in this flow system has been recently recharged, in the last approximately 12-25 years, but that residence times can be longer in localized areas of the flow system". Revised draft EIS Section 7.8.2: "In addition to the above parameters, tritium concentrations will also be measured in groundwater to further analyze the potential to age groundwater in the subsurface."	
IR-83	-	CNSC	Geology and Groundwater	Appendix 7-A, Section 7.4.2.2 and Appendix K	Context: Leaching of uranium from the ore zone will generate voids within the ore zone, which could fail and collapse. Failure of the voids would cause displacement in overlying rocks, which will lead to the eventual ground subsidence. Based on the developed geological model, a geomechanical study was conducted to assess potential maximum vertical displacement in the overlying rock formations and predict the ground subsidence. While a layer of altered sandstone is modeled above the ore zone, the desilicified zone, a zone that is comprised of completely to partially unconsolidated sands and has very low rock quality, high fracture intensity, and high friability, and low strength in the area overlying and east of the Phoenix deposit, appears not to have been included in the model for geomechanical modeling. The evaluated displacement/deformation in the overlying rock formation and the resulted ground subsidence would not be conservative without including the desilicified zone. Rationale: Stability of the ore zone rock matrix and the potential displacement/deformation in the overlying rock formations when voids in the extracted ore zone collapse are critical for protecting the overlying aquifers, preventing substantial ground subsidence, safeguarding casing integrity, and mitigating plug-off of the remaining ore as well as efficiently mining extraction. The deformed zone in the overlying rock formations will change in hydraulic conductivity that will impact on the assessment of potential effects on groundwater flow and contaminant transport in the zone. Therefore, the rock mass behavior including and above the ore zone should be adequately understood and the potential displacement/deformation should be assessed and quantified with adequately defined geological model.	Please provide details whether and how the desilicified zone is considered in the geomechanical modeling of the detailed strip model. Such details should include figures and the linkage between the geomechanical model including the determination of strength parameters of the desilicified zone and the geological model including information on the core delineation of the desilicified zone.	This response has not been accepted. As stated in the CNSC's disposition to Denison's response to IR-75, Figure 2 of Attachment IR-21 (RESPEC 2023) does not show the desilicified sandstone although it is stated that the desilicified sandstone is considered in the numerical modeling. Therefore, the extent of desilicified sandstone modelled is not clear. It is also not clear where the vertical plane represented by Figure 2 is cut from Figure 1. The linkage between the geomechanical model represented by Figure 2 in RESPEC (2023) and the geological model in EIS S07 is not provided. Please provide the requested information.	The RESPEC (2024) study is provided as Appendix K to Appendix 7-A and has been updated to show the desilicified zone in Figures 2a) and 2b). The material properties of the desilicified zone are given in Table 1 of Appendix K, and represent conservative values for the purpose of collapse / subsidence analysis. The vertical plane represented in Figure 2a) is now explicitly shown as part of Figure 2a). To clarify the linkage between the models presented in the geomechanical study and the regional hydrogeology Conceptual Site Model (CSM) developed in Appendix 7-A and associated groundwater flow and transport model presented in Appendix 7-C, the following text was added to the revised Draft EIS as a preface to Appendix K of Appendix 7-A (page K.1 of Appendix 7-A). "The information presented in Appendix K was based on the same geologic information as was used herein to develop the regional hydrogeology CSM for the Project. A clarification is provided, however, on differences in terminology for the desilicified zone used between the two reports. Herein, the desilicified zone was delineated using rock core RQD, friability and fracture frequency (Section 3.4.4). Specifically, to delineate the desilicified zone in the hydrogeology CSM, core with a friability of 3 or greater was interpreted to be hydrothermally altered sandstone of high relative porosity and permeability in comparison to the unaltered Athabasca Supergroup Sandstones, through substantive loss of matrix silica content (10% or more; Sorba and Tetland, Personal Communication). In the RESPEC (2024) report, differentiation was made with respect to the level of desilicification of the altered sandstones using the terms "Altered Sandstone" and "Desilicified Zone". The "Altered Sandstone" was delineated using the same friability criteria as was used in the hydrogeology CSM to define the desilicified zone (i.e., a friability of 3 or more). The "Desilicified Zone" was delineated in RESPEC (2024) using a friability of 4, which represents extreme desilicification of the rock matrix (loss of matrix silica of up to 30% or more; Sorba and Tetland, Personal Communication). The zones of extreme desilicification were differentiated from the rest of the Altered Sandstone and ascribed very conservative average material properties presented in Table 1 of Appendix K. These average material properties included zero cohesion. As the objective of the geomechanical study was to evaluate the potential for bedrock collapse within the freeze wall above the ore zone, it was important to differentiate these zones of no cohesion for a worst-case scenario assessment.	Yes Appendix K to Appendix 7-A.

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								Thus, the linkage between the two studies is as follows: the combined Altered Sandstone and Desilicified Zones shown in Figure 2a and 2b of Appendix K correspond to the "Desilicified Zone" shown in this report as Figures 9, 10. 12, and 29." **<u>References:</u>** Sorba, C. and Tetland, M. Discussion of Project geology and minerals in once open fractures. Oral communication, Chad Sorba and Mikkel Tetland, Denison Mines to the Ecometrix team."	
IR-84	-	CNSC	Geology and Groundwater	Appendix 7-C	**Context:** It is stated in Section 2.5.2.4 (p. 2.35, Appendix 7-C) that "In addition to calibrating to water level elevations targets, the model was calibrated to estimates of groundwater discharge to Whitefish Lake. A match between simulated and observed flows helps to support that groundwater recharge rates are reasonable, and to provide validation for water budget assessments. Baseflow calibration targets were developed using point streamflow measurements collected upstream and downstream of Whitefish Lake. Figure 2-10 (p. 2.26, Appendix 7-C) shows the locations of the baseflow calibration targets, and Table 2-7 (p. 2.35, Appendix 7-C) illustrates the model-simulated groundwater discharge rates in relation to the estimated range of baseflow from stream measurements. The simulated baseflow to Whitefish Lake is in good agreement with the estimated representative baseflow". **Rationale:** It is not clear in Figure 2-10 (p. 2.26, Appendix 7-C) where the point streamflow measurements were conducted upstream and downstream of Whitefish Lake. Additionally, it is not clear how the groundwater discharge to Whitefish Lake is simulated, since the model domain does not cover the whole Whitefish Lake.	1. Please clarify in Figure 2-10 where the point streamflow measurements were conducted upstream and downstream of Whitefish Lake. 2. Please clarify how the groundwater discharge to Whitefish Lake is simulated considering that the model domain does not cover the whole Whitefish Lake.	This response has not been accepted, as the issue has not been sufficiently clarified. 1. In Appendix 7-C of the EIS, Figure 2-10 shows that Whitefish Lake is between SA-5 and SA-6, not SA-2 and SA-6. Additionally, under the heading "Surface Water Stations" of Table 2-7 are "SA-6 **to** SA-2", not "SA-6 **and** SA-2". 2. Figure 2-10 does not show SA-7. Surface water flow direction should be illustrated to help understand the relative location of upstream and downstream. Additionally, under the heading of "feature monitored" of Table 2-7 is "flow from LA-6 to Whitefish Lake". Figure 2-10 shows LA-2, but no LA-6.	The reviewer is perhaps confused about what is being referred to as Whitefish Lake in the reporting, and this may be due to the placement of the label for the lake on the referenced figures. Whitefish Lake consists of two lobes. A northern lobe and southern lobe, separated by a narrow segment where station SA-6 is located. To avoid the label for Whitefish Lake interfering with information presented on multiple figures, the label appears overlying the northern portion Whitefish Lake. However, the northern portion of the lake is upstream and distant from the ore zone. There is no discharge of groundwater from the ore zone to the northern portion of Whitefish Lake, and that is why it is not discussed within the EIS. Conversely, the southern portion of Whitefish Lake (i.e., between SA-6 and SA-2) is the area of primary interest with respect to potential environmental effects due to groundwater discharge, as that portion overlies the interpreted desilicified zone. The southern portion of the lake is entirely within the groundwater model domain and receives groundwater discharge from both the east and west directions. As such, simulated discharge to the lake can be directly compared to the measured increase in stream baseflow between the monitoring station upstream (SA-6) and downstream (SA-2) of the portion of Whitefish Lake which is of interest. For brevity, we have referred to the southern portion (i.e., also referred to as LA-5) as "Whitefish Lake" in the modelling assessment (Appendix 7-C). The revised draft EIS has been revised by updating the label location for Whitefish Lake on the figure, and adding a bold outline of the portion of the lake we are referring to as "Whitefish Lake". In addition, have updated the text within Table 2-7 to clarify that the "Feature Monitored" is the "Flow through the Southern portion of Whitefish Lake as indicated on Figure 2-10".	Yes Appendix 7-C, Section 2.5.2.5 (Table 2-7) and Figure 2-10
IR-86	-	CNSC	Geology and Groundwater	Appendix 7-C	**Context:** It is stated in Section 2.7.3 (p. 2.41, Appendix 7-C) that "Both the pumping demand and the recharge changes were incorporated into a transient simulation performed using the calibrated groundwater flow model. The model simulation was started at the beginning of mine construction, with initial conditions taken from the calibrated model. The simulation period was extended for 40 years to include the entire period of construction, operation, and decommissioning, and extending through 17 years post decommissioning". **Rationale:** It is not clear what is the difference between the	Please clarify the parameters, boundary conditions and any other aspects as used in the transient model that are different from the calibrated model.	This response has not been accepted. The response is acceptable, but the information as explained in the response should be incorporated in the appropriate sections of Appendix 7-C. Please provide proposed text for the revised EIS, for SME review and acceptance.	The text in Appendix 7-C, Section 2.7.2, of the draft EIS has been updated with the following paragraph: "The calibrated, steady-state model was used as the basis for the transient model used to evaluate drawdown during operations. Only conditions immediately at the mining zone were altered within the transient model to reflect the proposed changes during mine operation. All boundary conditions that drive regional groundwater flow were unchanged for the transient model, and all hydrogeologic properties outside of the mining area were left unchanged. Changes made to the hydrogeologic properties were implemented transiently to represent the phased implementation of the freeze wall. Groundwater recharge changes were made to reflect alterations to surficial land use and the implication	Yes Appendix 7-C, Section 2.7.2

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					calibrated model and transient model in terms of parameters (such as the K values for the mining zone), boundary conditions, etc.			to groundwater recharge, and transient pumping boundary conditions were added to simulate the planned pumping demand for camp and ISR water requirements. The transient version of the model was used to evaluate changes to the groundwater discharge occurring at Whitefish Lake."	
IR-88	-	CNSC	Geology and Groundwater	Appendix 7-C	**Context:** The conceptual hydrogeological model includes upper sandstone aquifer, intermediate sandstone aquitard, and lower sandstone aquifer. The desilicified zone above the ore zone have enhanced hydraulic conductivity. The boundary condition for the lower sandstone aquifer on the west (upstream) side was assigned to have specified head, which provide source of water for the lower sandstone aquifer. As a result of the conceptual model setup, the upper sandstone aquifer is hydraulically active and the groundwater residence time within the upper sandstone aquifer is relative short. In contrast, the lower sandstone aquifer (and the ore zone) is hydraulically inactive, and the groundwater residence time in the lower sandstone aquifer is relatively long (as shown in the particle tracking results in Figure 7.6-2 (p. 7-71, main EIS report), and the simulated plume for chloride in Figure 7.6-7(p. 7-86, main EIS report)). It is stated in Section 2.6.4 (Appendix 7-C) that "As noted above in section 2.6.3, it is estimated that 99% of the groundwater discharge to Whitefish Lake is derived from groundwater that has only flowed through shallow deposits (i.e., Overburden and Upper Sandstone Aquifers). Contribution of deep groundwater flow through the Desilicified Zone within the Intermediate Sandstone Aquitard is estimated to be < 1% of the groundwater discharging to Whitefish Lake". This simulation result is reflective of the conceptual model. Section 7.3.3.3 (p. 7-42) states that "The Lower Sandstone Aquifer is characterized spatially by two types of groundwater. The first groundwater type is most like that observed in the Local Flow System. This reflects hydraulically active fractures and fault systems that allow fresh recharge water to penetrate and mix with deeper waters in the aquifer. The second type of groundwater is within the zone of thermal alteration around the ore zone ……". The hydraulic connectivity of the ore zone with the upper sandstone aquifer has important implication on the groundwater restoration. The ore zone is not hydraulically active locally because it is enclosed by a clay zone before the mining operation. But if it is located within a hydraulically active area, or	It is recommended to conduct the following work to demonstrate if the mined-out zone is hydraulically active: 1. Determine the groundwater residence time in the lower sandstone aquifer and compare it with the simulated residence time in the numerical model. 2. Conduct additional particle tracking to demonstrate where groundwater originating from the mined-out zone flow towards (forward tracking) and where groundwater flowing towards the mined-out zone originates from. This would help determine why groundwater in the mined-out zone is not hydraulically active. 3. Conduct sensitivity analysis to investigate the effect of higher K values for the intermediate sandstone aquitard and the K and porosity values of the mined-out zone on the plume migration.	This response has not been accepted, as the following point was not adequately addressed: 1. It is recommended that groundwater residence time in the lower sandstone aquifer be estimated and compared with the simulated residence time in the numerical model. Otherwise further justification should be provided why this is not possible. Groundwater residence time can be estimated using isotopes (the reference below is an example paper in this regard). Reference: Martin Kralik (2015), How to Estimate Mean Residence Times of Groundwater. Procedia Earth and Planetary Science, Volume 13, Pages 301-306.	We believe that the reviewers' question on residence time is a function of a misunderstanding of the figures presenting the groundwater plume evolution, and the portions of the model which represent the lower sandstone, ore zone, and paleoweathered zone on Figures 4-6, 4-7, 4-8, and 4-9 of Appendix 7C. This includes an apparent misunderstanding of the conservative distribution of the source area assumed to contain "Restored solution" post-decommissioning (see Figure 4-1, Appendix 7-C). To avoid cluttering the time-snapshot sequence figures (Figures 4-6 to 4-9), the location of the hydrogeologic units is labelled on Figure 4-6 only. As indicated on this figure, the most persistent portion of the source area for all constituents is contained within the paleoweathered zone (PWZ). The source is persistent within the PWZ due to the lower hydraulic conductivity of this weathered basement rock. The portions of the source area containing restored solution (refer to Figure 4-1) overlying the PWZ in Figures 4-6 to 4-9, are shown to contain significantly lower concentrations over time and eventually return to inflowing background concentrations. To clarify the above within the revised Draft EIS, the following has been added to Section 7.6.2.2.3: "The area simulated to be a source of contaminant mass Post-Decommissioning includes the Ore Zone, the overlying Lower Sandstone Aquifer (i.e., 50 m above the Ore Zone), and the underlying Paleoweathered bedrock (Section 7.6.2.1). As indicated in Figure 7.6-7, elevated concentrations of even conservative COPCs persist within the Paleoweathered zone due to its lower hydraulic conductivity (i.e., it takes longer for COPCs to be flushed out of this zone)." For addition reference the following are noted. Isolation of Ore Zone: There is no simulated isolation of the ore zone or the lower sandstone aquifer. In contrast, the mass contained within the ore zone is simulated to freely exit that zone and migrate through the overlying desilicified zone, as is the source mass that originates within the overlying lower sandstone units. Residence times within the lower sandstone aquifer include both the time for advective transport as well as the time for sorbed mass to de-sorb and re-join the advective-dispersive transport. The desorption process continues over time, with the mass of a given constituent partitioned to groundwater from this process continually decreasing (i.e., as sorbed mass overall decreases), resulting in a source tail effect within the lower sandstone, ore zone and within underlying PWZ. Regardless, to demonstrate the robust nature of the hydrogeologic setting, an additional transport simulation was performed wherein the effective porosity of the paleoweathered	Yes Revised Draft EIS, Section 7.6.2.2.3

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					on a groundwater flow pathway that is hydraulically active, the mined-out zone (with much larger porosity and hydraulic conductivity) could become active hydraulically after mining operation is finished. Figure 7.6-7 (p. 7-86, main EIS report) shows that the chloride plume is most persistent within the mined-out mining area. This seems to indicate the mined-out zone is hydraulically inactive after the mining operation is finished. It is stated in Section 7.3.3.2 (p. 7-37, main EIS report) that "Exploration boreholes drilled in the Phoenix area, where left unplugged, have the potential to provide preferential flow paths between the Overburden and Upper and Lower Sandstone Aquifers. Exploration holes were reportedly grouted approximately 10 to 20 m above and below the ore zone, resulting in open holes remaining throughout the overlying materials. These portions of the open holes may act as open conduits for groundwater flow through the 400 m of Athabasca Group Sandstone." So, there is possibility that the unplugged borehole could increase the hydraulic connection between the upper and lower sandstone aquifer. **Rationale:** It is important to understand if the larger area containing ore zone is hydraulically active. Additional confidence would be gained if there is any other evidence that support that the area containing the ore zone is not hydraulically active, and groundwater residence time in the lower sandstone aquifer surrounding the ore zone is comparable with the simulated results. Table 2-4 (p. 2.16, Appendix 7-C) shows the effective porosity (0.01-0.05) of the ore body. Figure B7 (p. B.8, Appendix 7-C) shows that the calibrated K values for the mined-out zone is 1x10-6 m/s. Section 3.5.2 (p. 3.24, Appendix 7-C) states that "The same average linear velocity was assumed for the mining area (source zone), following from the discussion in Section 4.4.2, where the hydraulic conductivity value in this zone following mining was set to 5x10-6 m/s, and a porosity of 0.2 is assumed for the ore zone (Table 4-2)". It is not clear what the justification is for the selection of the porosity and K values for the mined-out area, and whether they are conservative. It is also not clear, what the potential impact on the groundwater flow and COPCs transport would be If the mined-out zones collapse.			zone was reduced by an order of magnitude to allow the initial source mass to migrate out of the paleoweathered zone toward receptors 10-times faster. The results of that simulation are discussed as part of the response to IR-78 and do not change the outcome of the scenarios already reported within the EIS documentation, nor in conclusions based thereon. Details of the scenario are presented as part of Attachment IR-89-R1. With respect to the use of isotopes, although potentially informative, the isotope methods presented in Kralik (2015), are for the most part impractical, in that they require substantive volumes of water (e.g.> 200 L of water), and thus would be required to be applied in a very targeted fashion to address very specific matters. This is worthy of consideration, but outside of the scope of the EIS. The use of stable isotopes of oxygen and hydrogen in water (δ2H, δ18O) were determined to offer little value for CSM development for the Project in terms of source of groundwater. Determining water source and groundwater ageing in the study area was discussed in the first-round response to IR-81 (Annex 1, IR-81 starting on page 216/419). Tritium concentrations in groundwater are considered potentially informative to the CSM and will be measured as part of ongoing groundwater monitoring for the Project as outlined for IR-81.	
IR-89	-	ECCC	Fish and fish habitat	Appendix 7-C, Numerical Modelling: Post-	**Context:** The Proponent states that a hydraulic conductivity value of 5x10-6 m/s was uniformly assigned to the model layers representing the Desilicified Zone. They additionally state that	1. Provide an in-depth rationale for choosing a value of 5x10-6 m/s as the base case for the hydraulic	This response has not been accepted.	In our SME's experience, traditional "sensitivity analysis" where individual parameters are arbitrarily varied by within a subjective range can produce simulations which are	No

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				Decommissioning Evaluation, Section 2.3.1.4, Desilicified Zone	this value is consistent with packer and pumping tests screened in this unit that have interpreted hydraulic conductivity values ranging from 1x10-6 to 3x10-5 m/s (Appendix C), with a geomean of 6.0x10-6 m/s. 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 fish and fish habitat. **Rationale:** The Desilicified Zone is a critical layer in the hydrogeological model as it represents a key potential pathway of contaminants to Whitefish Lake. The base case hydraulic conductivity value (5x10-6 m/s) is even lower than the geometric mean, not to mention the highest value found. When simulating geochemical processes and contaminant transport within this important pathway a more conservative approach should be employed. Modifying this parameter will affect travel times and distribution of COPC in the subsurface.	conductivity, in both the PH REdox EQuilibrium (PHREEQC) and Finite-Element Ground Water Flow (FEFLOW) models. 2. Provide a rationale for keeping the sensitivity analysis within one order of magnitude considering the lack of physical data on the Desilicified Zone. Alternatively, provide contaminant transport simulation results with more conservative hydraulic conductivity (e.g., more than 3x10-5 m/s) values in the Desilicified Zone. See also related: IR-96.	The Proponent used calibration-constrained uncertainty analysis to establish boundaries when conducting sensitivity analysis of hydraulic conductivity in the groundwater model. For sensitivity analysis to adequately manage uncertainty, parameter values that are outside of those determined by calibration-constrained uncertainty analysis should be used. There always exists some degree of uncertainty in using hydrogeologic data as a complete representation of a regional groundwater system. This uncertainty can be accounted for by broadening parameter ranges in a sensitivity analysis. Limiting sensitivity analysis to calibration-constrained values implies that available field data is a perfect and complete representation of the broader groundwater system, which may not be an accurate assumption. Considering the limitations of available physical data in the Desilicified Zone, a more conservative sensitivity analysis is required in order to adequately assess how contaminants may flow towards Whitefish Lake. Please also see follow-IR-89-R1, and AD-66 in the Advice to Proponent table.	inconsistent with the field-observed data. Such simulations should not be part of an EIS, as they can provide misleading results. Calibration-constrained uncertainty approach does not assume the data or the representation of the system are perfect or complete. Calibration-constrained models do not require a perfect fit to all the observed data, which is a recognition that there is measurement noise and structural noise present in every model. In addition, potential error in that data was accounted for by rounding the observed water levels to the nearest 0.1m (i.e., the data were not considered "perfect") and allowing a general fit to all data (i.e., residuals are present at each observation point). Further, the analysis does not consider the data provide a "complete representation of the broader groundwater system" nor does it imply the data provides a "perfect and complete representation of the broader groundwater system". Instead, the calibration-constrained approach tests sets of parameters within a broad range, wherein only parameters which are well informed by available observation data are constrained, while parameters not constrained by calibration data are allowed to vary more freely (i.e., to the degree that they do not otherwise impact the well-informed parameters). For the uncertainty assessment presented in the draft EIS, hydraulic conductivity parameters along the flow path between the ore zone and Whitefish Lake were allowed to vary within a 4-order of magnitude range (i.e., $1x10^{-8}$ to $1x10^{-4}$ m/s) to find alternative parameter sets that achieve a reasonable match to observation data. With this approach, values are not varied independently, but rather parameter combinations are sought that explore the potential 4-order of magnitude range for parameters, while maintaining a match to field-observed conditions. The most conservative of the calibrated scenarios obtained through the calibration-constrained approach presented within the EIS (i.e., those which achieved acceptable calibration statistics) were chosen for additional transport simulations. The scenarios tested hydraulic conductivity values for the desilicified zone as high as $3.7x10^{-5}$ m/s (realization 7 – predictive uncertainty case 5), which is two times higher than any measured value within this hydrogeologic unit, and 7.4 times higher than the base case calibration. Hydraulic conductivity values as high as $8.1x10^{-5}$ m/s were also tested within portions of the lower sandstone aquifer. In addition, the simulation documented as part of IR-55 presents a model wherein the hydraulic conductivity of the desilicified zone is $1x10^{-4}$ m/s, which is 20 times higher than the base case. In summary, we reaffirm that we have already provided an ample demonstration of the potential range of outcomes which are supported by the observation data at the site.	
IR-89	IR-89-R1	ECCC	Fish and fish habitat	Appendix 7-C, Numerical Modelling: Post-Decommissioning Evaluation, Section 2.3.1.4, Desilicified Zone	**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	Expand the sensitivity analysis of hydraulic conductivity outside of calibration constrained parameters to account for the lack of physical data in the Desilicified Zone.		See the Response to IR-89 for discussion regarding the calibration-constrained uncertainty analysis approach. As stated, we believe that asking for scenarios outside of the range supported by the available monitoring data is inappropriate as it suggests that unrepresentative, potentially misleading scenarios should be tested, documented, and presented as potential outcomes. We do not believe that should be part of an EIS.	No

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				IR-89 Response from Denison	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.			While we do not support development of un-calibrated scenarios for inclusion within the EIS, additional scenarios that did not violate field observation data were evaluated as part of this response and presented as Attachment IR-89-R1. These scenarios further demonstrate the robust nature of the hydrogeologic setting, which has been shown to have a high assimilative capacity. Additional groundwater flow and transport modelling scenarios were performed in response to: 1. IR-55, wherein the hydraulic conductivity of the Intermediate Sandstone Aquitard was increased to a maximum value of 1.0E-7 m/s, and other parameter values, including the hydraulic conductivity of the Desilicified Zone, were increased to maintain a calibrated condition. 2. IR-70, wherein a higher hydraulic conductivity within the Ore Zone post-decommissioning was tested. This is an uncertain parameter which is unconstrained by calibration data. 3. IR-71, wherein uncertainty in future groundwater recharge rates were evaluated by varying rates by +/- 20%. Future groundwater recharge is an uncertain parameter which is unconstrained by calibration data. 4. IRs 78 & 88, wherein the effective porosity of the Paleoweathered zone was reduced by an order of magnitude to allow the initial source mass to migrate toward receptors 10-times faster. Effective porosity of the Paleoweathered zone is an uncertain parameter which is unconstrained by calibration data. 5. IR-96, wherein the transverse dispersivity was reduced to 1m to be consistent with ratios of longitudinal-to-transverse dispersivity published in the literature (e.g., Gelhar et al.; 1992) based on anisotropic settings. Transverse dispersivity is an uncertain parameter which is unconstrained by calibration data. The results of these simulations are presented as part of an attachment, however in summary all scenarios produced concentrations of primary COPCs at Whitefish Lake that are below the Groundwater Quality Screening Criteria established. Exceptions include pH, iron and manganese due to naturally high background levels, as reported within the EIS. The scenarios presented do not change the outcome of the scenarios already reported within the EIS documentation, nor in conclusions based thereon. Thus, we did not see the need to modify the EIS.	
IR-96	-	CNSC	Geology and groundwater	Appendix 7-C, Section 4.4.4, Sub-Domain Model Transport Boundary Conditions	**Context:** From the text, "Transport parameters were specified for diffusion (1x10-9 m2/s), longitudinal dispersivity (10 m along the plume trajectory), and transverse dispersivity (5 m)". The source of this information is not provided in Appendix 7-C. It is unclear if the values used are defaults in the modelling software, from literature, from small-scale laboratory tests, or are site-specific values determined through tracer tests. **Rationale:** The use of a calibrated flow model does not imply that the solute transport model is calibrated. The transport parameters (such as effective porosity, dispersivity and reactive	1. Please provide the source of the numerical value used for diffusion and longitudinal and transverse dispersivity, and provide justification if default values by the model code were used. 2. Please provide a discussion on the influence of large-scale heterogeneity on dispersion and	This response has not been accepted. CNSC staff appreciate the comprehensive information provided relating to longitudinal dispersivity and variation based on scale. However, it should be noted that guidance from Gelhar et al. (1992) and the BC MOE (2012) indicate that horizontal transverse dispersivity values should be approximately 1 order of magnitude lower than longitudinal dispersivity values, and vertical transverse dispersivity values should be	As with all parameters, the values applied in the modelling analyses were intended to provide appropriate, but conservative transport predictions. It is the opinion of Denison and its SME that the dispersivity values applied are appropriate, conservative and supported by the literature values, as highlighted within the previous response to this IR (Annex 1, Attachment IR-96 starting on page 251/419). We acknowledge that Gelhar et al. (1992) recommend a 1 order of magnitude lower horizontal transverse dispersivity value, and a 2-order-of-magnitude lower vertical transverse dispersivity value, but note that such recommendation was based on observations of horizontal plume migration within overburden sand aquifers with highly anisotropic conditions (i.e., Borden and Cape Cod), which is **not** representative of the current setting. In their paper they state: "The vertical transverse dispersivity is seen to be much smaller than the horizontal transverse	Yes Appendix 7-C, Section 4.4.4

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					transport parameters) can only be calibrated by matching simulated and observed spatial and/or temporal distributions of a solute. Sensitivity analysis indicates that decreasing longitudinal and transverse dispersivities by a factor of two resulted in exceedances of groundwater criteria for both selenium (Se) and cobalt (Co). Given the clear influence of these values on contaminant transport, it is important that transfer parameter values are justified in the solute transport model. In addition, the influence of large-scale heterogeneity on dispersion and solute transport predictions should be discussed, to identify any uncertainty in the model predictions, and provide confidence that the applied model is adequately representing groundwater flow and solute transport. Further guidance on solute transport modelling can be found in BC MOE (2012) [1]. **Reference**: [1] British Columbia Ministry of the Environment (BC MOE). 2012. Guidelines for Groundwater Modelling to Assess Impacts of Proposed Natural Resource Development Activities. Report no. 194001, 385 p.	solute transport predictions in the modelling report. See also related: IR-89.	approximately 2 orders of magnitude lower than longitudinal dispersivity. For the model presented in the EIS, transverse dispersivity is represented by a singular value of 5 meters, with the supporting rationale that the Gelhar et al. (1992) identified 5 meters as a representative value. It is important to note that the Gelhar et al. (1992) paper considered 5 meters to be representative for horizontal transverse dispersivity and identified that vertical transverse dispersivity is smaller than horizontal transverse dispersivity. Additionally, it is important to note that Petrotek (2021) used a transverse dispersivity of 1 m in their numerical models of the ore zone aquifer. CNSC staff thus request that Denison provide further information relating to why horizontal and vertical transverse dispersivity are represented using a singular value, and how this value is considered appropriate to represent both dimensions. **Reference:** Petrotek 2021. Groundwater Model Report Phase 1, Phoenix Deposit Wheeler River Project. Prepared for Denison Mines. December 2021.	dispersivity, apparently reflecting the roughly horizontal stratification of hydraulic conductivity encountered in permeable sedimentary materials". The BC MOE Guidance (2012) is considered to be a derivative of the Gelhar paper and does not add any further value. **Transverse** dispersivity refers to spreading of the plume in the directions perpendicular to the primary advective (i.e., groundwater flow) direction. As noted in the previous response to this IR (Annex 1, Attachment IR-96 starting on page 251/419)., the transverse dispersivity value of 5 m is supported by Gelhar et al. (1992) for the scale of this site. If a 10:1 ratio of longitudinal to transverse dispersivity were implemented, a much higher longitudinal dispersion coefficient would be suggested (and supported by Gelhar et al. (1992)), which would result in even lower breakthrough concentrations at Whitefish Lake. Recognizing this, we submit that the values applied within the scenarios documented as part of the EIS are already conservative. **Vertical and Horizontal transverse** dispersion were treated as being equivalent (i.e., as having the same value) for this site as the dominant plume transport occurs within the desilicified zone, which is interpreted to be, and simulated, as isotropic. In isotropic media, transverse spreading should be allowed to occur equally in any transverse direction; this differs in anisotropic media, where vertical transverse spreading of the plume is lower than horizontal transverse spreading due to restricted vertical connections (i.e., joints in fractured rock, or sediment layers in sedimentary media). Further, during the vertical migration through the desilicified zone, transverse dispersion is in the X, and Y cartesian coordinates; we have no reason to expect dispersion in either of these directions is preferential, and therefore the horizontal and vertical transverse dispersivity values should be the same. The above discussion, supporting the dispersivity values used in the numerical modelling for the EIS, has been summarized (and references provided) in Section 4.4.4 of Appendix 7-C of the revised Draft EIS, as follows. "A literature value was applied for diffusion as migration to Whitefish Lake is advection-dominated such that diffusion along the flow path would not appreciably enhance transport timing. The longitudinal dispersivity value is consistent with the expected dispersivity within a sandstone unit for a plume of 0.9 to 1.7 km (Gelhar et al, 1992; Schulze-Makuch, 2005; Chapman et al., 2014; Martin, 2019). Alternative literature (e.g., Neuman, 1995) suggests an even larger value. Elements of transverse dispersivity (i.e., horizontal and vertical), which are typically differentiated due to anisotropic hydraulic conductivity settings, are uniformly applied for this site as a reflection of the interpreted isotropic conditions within desilicified hydrogeologic units." Regardless, to demonstrate the robust nature of the hydrogeologic setting, an additional geochemical reactive transport simulation was performed with a longitudinal dispersivity of 10, and a transverse dispersivity of 1 for both the horizontal and vertical directions. The results of that simulation indicate that with lower transverse dispersion the concentrations reaching Whitefish Lake would be higher than the base case for some COPCs. All simulation constituents were below the groundwater quality screening criteria	

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								within the 10,000 year simulation. Details of the scenario are presented as part of Attachment IR-89-R1.	
IR-100	-	HC	Indigenous Peoples' health / Socio- economic conditions	Section 8, (p. 8-195) Section 8.5.3, Table 8.5-2, (p. 8-226)	Mercury is excluded as a COPC in the assessment. Inadequate consideration of mercury and methylmercury in fish and other country foods, and use of incorrect Hg-related health guideline values can underestimate the risks to human health among country food consumers. **Context:** Section 8 states "Mercury has not been identified as a COPC for the Project as it is currently not present in the receiving environment (i.e., background condition) at detectable concentrations and will not be produced as part of the mine process; therefore, it will not be discharged to the aquatic environment. However, it is understood that potential nutrient enrichment-related effects are possible and can be linked to increases in mercury in the environment" (p. 8-195). Table 8.5-2 shows that there is mercury present in the tissues of Northern Pike and White Sucker sampled in the waterbodies within the local study area and in Russell Lake. These fish are regularly consumed by nearby communities according to the ERFN 2017 dietary survey. In Section 8.5.3, fish tissue concentrations are compared to Health Canada's human health risk- based maximum permissible mercury concentration (0.5 µg/g wet weight), which is applicable to most species of commercially sold fish rather than country foods. **Rationale:** It is recommended that mercury be listed as a COPC considering it is in fact present in fish tissue under existing conditions, the significant consumption of fish by the local Indigenous communities, and its toxicological significance to human health. Further, the Health Canada provisional tolerable daily intake (pTDI) value of 0.2 µg/kg/bw/day (Health Canada, 2007) is a more appropriate reference level when evaluating consumption of mercury in fish by Indigenous people, as it allows for the consideration of food consumption patterns in the risk assessment that differ from the general population and is protective of the most sensitive sub-group (i.e., developing foetus). It is important to note that methylmercury, rather than	1. Include mercury (including methylmercury) as a COPC in the assessment given the baseline presence of mercury in sampled fish, the potential increase of methylmercury in receiving waters due to nutrient enrichment resulting from the Project, the significant fish consumption by the local population and that country foods, particularly fish, are an important source of dietary exposure to mercury. 2. Assess health risks from fish consumption by calculating hazard quotients for baseline and predicted methylmercury levels in country foods using Health Canada's pTDI for methylmercury (Health Canada, 2007). 3. Clarify whether mercury data represented throughout the EIS represents total mercury, inorganic mercury or methylmercury. **Suggestions for mitigation and follow-up measures:** Health Canada recommends including methylmercury in the list of COPCs to be monitored in fish throughout all project phases. See also related Advice to the Proponent: AD-31.	This response has not been accepted. Health Canada does not support the responses to points 1 and 2 of IR-100. 1. The response to IR-100 point 1 indicates that mercury (including methylmercury) was not included as a COPC in the assessment because mercury is not associated with the local geology and therefore not expected to be released in the effluent at measurable levels, and because prediction of methylmercury production, based on a variety factors, is not practical. Health Canada continues to recommend that mercury (including methylmercury) be included in the assessment given 1) the detected presence of mercury in fish under baseline conditions, and 2) the high consumption rates of fish and other country foods by Indigenous land users, particularly intensive land users such as the Trapper receptor. 2. The response to IR-100 point 2 continues to state that the HC maximum level (ML) for mercury of 0.5 µg/g (or 0.5 ppm) will be used to assess risks to human health from fish consumption during monitoring. The use of the HC ML for mercury is not appropriate in this case as it was developed for retail fish using consumption rates for the Canadian general population. Health Canada's provisional tolerable daily intake (pTDI) values of 0.20 µg/kg bw/day day for young children and women of childbearing age (Health Canada, 2007) are more appropriate reference levels when evaluating consumption of mercury in fish by Indigenous people, as it allows for the consideration of food consumption patterns in the risk assessment that differ from those used to develop the ML for retail fish and is protective of the most sensitive sub-group (i.e., developing fetus). For instance, the HC Human Health Risk Assessment of Mercury in Fish and Health Benefits of Fish Consumption (Health Canada, 2007)	1. The EA scope does not include quantifying current risks that don't have project activity connections. Per CSA N288.6 *Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills*, Section 6.2.5.4 "**The goal is to identify and describe the contaminants and physical stressors that are relevant to the site and operations and that require further quantitative evaluation**. The contaminants identified for further evaluation are then referred to as COPCs. These decisions are based on information gathered during site characterization." Mercury was not identified as a project issue based on mining and milling methods and though it is understood that mercury is a ubiquitous earth element at trace levels it is not identified as uniquely being associated with the local geology; as such, Denison does not believe it is appropriate to quantify existing risk when there is no incremental project risk. Public or existing concerns about mercury do not make this topic an EA question. At this time there is no way to accurately predict potential methylation rates. While the draft EIS (Section 8) highlights increased sulphate concentrations downstream of the Site during period of effluent discharge as a potential factor related to increased methylation (in the presence sulphate reducing bacteria in sediment), it is one of several factors in combination that would need to occur. For example, the IR highlights nutrient enrichment as a contributing factor –significantly increased primary productivity via enrich resulting in high levels of organic carbon in sediments (through algal senescence, deposition, decomposition). This could in fact be a contributing factor, but no such nutrient enrichment has been predicted in the draft EIS as no incremental Project-related nutrient source has been identified. Additionally, the draft EIS does not raise a concern that the Project would cause anoxia in study area lakes, another prerequisite for methylation driven by sulphate reducing bacteria. Denison and its SME's believe that the treatment of mercury in the draft EIS is appropriate given the level of risk related to the Project. Denison acknowledges the concerns that have been raised by the Indigenous Communities of Concern through its engagement process, as well as those by the FIRT, and in response to those concerns has committed to implementing a mercury monitoring program. In addition to Denison's future monitoring programs, there are provincial fish consumption guidelines for consumers available at: https://pubsaskdev.blob.core.windows.net/pubsask-prod/76439/76439-Mercury_in_SK_Fish_-_Guidelines_for_Consumption_-_2015.pdf. The guidelines in Saskatchewan for Russell Lake indicate the recommended number of meals per month for northern pike for the general and sensitive population. Further, the Eastern Athabasca Regional Monitoring Program (https://www.earmp.ca/) provides information on community monitoring programs which includes analysis of mercury in fish tissue. In the most recent 2022 EARMP report mercury was measured in lake trout and lake whitefish and the conclusions were that mercury levels were low (ranging from <0.01 mg/L to 0.5 mg/kg) and it was concluded that fish are safe to eat. Monitoring will continue as part of the program (EARMP+2022+2023+Community+Report.pdf (squarespace.com)). 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, which is	No

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					inorganic mercury, is generally the predominant mercury species present in fish and is also the most toxicologically significant form. The assumption of 100% of mercury in fish and other country food items being present as methylmercury ensures that the potential health risks are not underestimated. It is unclear, however, if the mercury data presented throughout the EIS represent total mercury, inorganic mercury or methylmercury.		currently employs 40 g as an estimate of daily fish intake by adults who are at the high end of fish intake. This rate is below the rate of consumption for intensive land users for the Project, which is ~500g of fish per day, meaning that the HC ML may not be protective of all land users/receptors. Health Canada reiterates its recommendation to assess health risks from fish consumption by calculating hazard quotients for baseline and predicted methylmercury levels in country foods using Health Canada's pTDI values for methylmercury (Health Canada, 2007).	consistent with that observed in the EARMP. This would indicate that based on baseline conditions fish are considered safe to eat, and no further baseline assessment is warranted. 2. As previously indicated, it is currently not practical to calculate hazard quotients for baseline and predicted methylmercury levels in country foods as there is no information on baseline methylmercury and no way to realistically predict the project related methylmercury. Denison has previously committed to a mercury monitoring program which will include assessment of mercury and methylmercury in fish tissue. That information can feed into future hazard quotient calculations if warranted. 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 has committed to a monitoring and follow-up program, which will include measurements of fish health for comparison to baseline data and regulatory criteria (i.e., Canadian Tissue Residue Guidelines for the Protection of Wildlife Consumers of Aquatic Biota [e.g., CCME 2000], MDMER [Government of Canada 2022], CSA N288.4-19 (CSA Group 2019), and applicable United States Environmental Protection Agency criteria (e.g., US EPA 2021). At a minimum, this will include collection of representative fish species from multiple trophic levels and size classes to investigate the bioaccumulation potential of non-radiological (e.g., molybdenum, selenium, mercury, methyl mercury and other metals) and radiological parameters. Fish will also be assessed for their general health condition through assessment of condition and growth metrics consistent with those described in current or updated MDMER EEM technical guidance (e.g., Environment Canada 2012) (See commitments register – commitment #s 834 and 844). **References:** Health Canada. 2007. Human Health Risk Assessment of Mercury in Fish and Health Benefits of Fish Consumption. March.	
IR-101	-	ECCC CNSC	Fish and fish habitat Fish and fish habitat	Section 8.1.1.3, Section 8.2.1.3 Aquatic Environment	**Context:** In Section 8.1.1.3 Spatial and Temporal Boundaries the Project Area, Local Study Area (LSA) and Regional Study Area (RSA) are established as they pertain to surface water quantity. The same is done in Section 8.2.1.3 for surface water quality. In Section 8.1.1.3 Figure 8.1-4, the locations of the Project Area, LSA, RSA and surface water features and monitoring stations are provided. However, the locations of wetlands located near the Project area and within the LSA and RSA have not been provided. The location of wetlands within or near the Project footprint, as well as the other wetlands existing within the LSA can be confirmed from Part II_S9 Terrestrial Environment, Section 9.2.3.3 Figure 9.2.-8, including the wetland classifications. There appears to be at least one shallow open water wetland and several bogs located within the Project Area. There is no consideration of wetlands or potential effects to wetland hydrology, surface	1. Provide baseline information regarding wetland characterization within the Project Area and LSA, including: locations, wetland type, size, water surface elevation, depth, water flow pathways, and the presence of wildlife receptors including presence of fish/fish habitat within the Aquatic Environment section of the draft EIS. If this information is available in annexes or baseline studies, summarize it within the main body of the Aquatic Environment section of the draft EIS with references to respective documents for review.	This response has not been accepted for the following reasons: 1. The response (#1(d)) by the proponent states that "Surface elevations for the wetland have been assessed and the information is summarized below and in the Attachment IR-101 Figure 1 Elevations of wetland features in the LSA" but it is not indicated that this information will be placed in the EIS. CNSC staff requests proponent to include the information provided in response #1(d) and Attachment IR-101 Figure 1 (Elevations of Wetland Features in the LSA) and Attachment IR-101 Figure 2: (Denison Wheeler River Project SSA and Wetland Feature Distribution) in the EIS.	1. This information has been incorporated into the EIS as Appendix 8-F. 2. Denison is committed to conducting surface water quality and sediment quality in wetlands within the LSA and specifically in wetlands directly adjacent to the Operation prior to construction commencing for the purposes of collecting baseline to further assess the effectiveness of mitigation measures. 3(a). Section 8.3 has been updated and specifically sections 8.3.1, 8.3.1.2, 8.3.3, 8.3.4.1, 8.3.4.2 (8.3.4.2.2 and 8.3.4.2.3, 8.3.4.2.5), 8.3.5, 8.3.7, 8.3.9 to include consideration of wetlands as aquatic habitat features within the context of their potential to provide fish and fish habitat. Sections 9.2.4.2.1, 9.2.6.2.1, 9.2.6.4.1, 9.2.7.3, and 9.2.9 have been updated to be aligned with Section 8. 3(b). Section 8.3 has been updated and specifically sections 8.3.1, 8.3.1.2, 8.3.3, 8.3.4.1, 8.3.4.2 (8.3.4.2.2 and 8.3.4.2.3, 8.3.4.2.5), 8.3.5, 8.3.7, 8.3.9 to include consideration of wetlands as aquatic habitat features within the context of changes to water quality and	Yes Appendix 8-F (added as a new appendix in support of Section 8 of the revised Draft EIS) Revised Draft EIS, updates to sections 8.3.1, 8.3.1.2, 8.3.3, 8.3.4.1, 8.3.4.2 (8.3.4.2.2 and 8.3.4.2.3, 8.3.4.2.5), 8.3.5, 8.3.7, 8.3.9, Sections 9.2.4.2.1, 9.2.6.2.1, 9.2.6.4.1,

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					water or sediment quality throughout the aquatic environment assessments. There is no baseline information regarding wetlands and their status as fish habitat and ecological function, or assessment of potential effects to flow rates, water levels, water quality, sediment quality, or biota. **Rationale:** There is currently not enough information provided for ECCC to provide advice on the potential risks of the proposed Project to wetland hydrology, surface water and sediment quality within the LSA. This pathway of effects is important to assess in terms of potential effects to wetland habitat availability and quality due to changes in flow rates, water levels, water quality, sediment transport, sediment quality and potential effects to terrestrial and aquatic receptors. It is necessary to evaluate if changes in groundwater and surface water runoff flows and routing will affect water levels and habitat availability within wetlands. Potential effects from COPCs and radionuclides to surface water and sediment, or potential effects to ecological receptors within wetlands have not been evaluated.	2. Provide baseline information on wetland surface water and sediment quality characterization for wetlands within the Project footprint. 3. Provide an assessment of potential effects to wetlands within the LSA and potential effects to ecological receptors during all phases of the proposed Project. 4. Provide further information on mitigation measures and monitoring that would be applied for the protection of wetlands.	2. The Proponent stated in response #2 (a) and (b) that ''surface water quality and sediment quality in wetlands were not specifically sampled in the wetland complexes adjacent to the Project footprint during the original baseline assessment.'' CNSC staff requests the proponent to provide justification why they have relied on measurements upstream and downstream of the wetlands over direct measurements in the wetland areas. It is recommended to conduct direct measurements in the wetland areas. 3. The information provided did not satisfy the IR. Additional information regarding the potential impacts to wetlands due to changes in surface water quality and sediment quality should be included within Section 8.3 of the main EIS. This is needed to fully understand the scope of potential effects to the aquatic environment. a. Update Section 8.3 to include additional information on predicted water and sediment quality impacts to wetlands from the Proponent's response to directly consider wetlands as fish and fish habitat for the purpose of assessing water quality impacts. b. Update Section 8.3 to provide an assessment of potential effects to wetlands from water and sediment quality changes within the LSA. 4. It is stated in response #4 that "[…] Updated baseline information on wetland depths and water-levels may be useful in providing a frame of comparative reference to potential changes during the operation, decommissioning and post-decommissioning phases of the project" and CNSC staff agrees with the proponent and recommend collection of monitoring information on the wetland areas.	sediment quality within the LSA due to the Project. Sections 9.2.4.2.1, 9.2.6.2.1, 9.2.6.4.1, 9.2.7.3, and 9.2.9 have been updated to be aligned with Section 8. 4. Denison is committed to conducting surface water quality and sediment quality in wetlands within the LSA and specifically in wetlands directly adjacent to the Operation prior to construction commencing for the purposes of collecting baseline to further assess the success of mitigative measures.	9.2.7.3, and 9.2.9 for alignment with Section 8.
IR-102	-	ECCC CNSC	Fish and fish habitat Fish and fish habitat	Section 8.1.3.1 Appendix 8-C, including Appendix II, Table 1 (p. 2)	**Context:** Only one measured-results dataset for baseline stream flow exists that is relevant to the Project data from the Water Survey of Canada (WSC) station for Wheeler River (06DA005), and the Proponent used constructed records. The Proponent states that data from 06DA005 was used to extend local hydrometric station records and calculate baseline water quantity metrics. However, this was done through a complex	1. Provide more information on the extension of Project hydrometric station data using WSC station 06DA005. 2. Discuss the accuracy of any correlations/relationships and	This response has not been accepted for the following reasons: 1. Given the limitation of data availability extension of flow records based on the nearest active WSC hydrometric station (Wheeler River (06DA005)) is acceptable although other methods are not shown	This response is provided in Attachment IR-102	Yes Appendix 8-C – the Attachment IR-102 added as Appendix III.

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					combination of daily data correlation or monthly unit area runoff relationship, with or without offset, where some stations were based off constructed records instead of the real long-term dataset at 06DA005 (see Section 8.1.3.1 and Appendix II of Appendix 8-C, Table 1, p.2 (PDF p. 569)). Appendix 8-C references previous reports in its own appendices, but no equations are shown and there is no description of the accuracy of the fit, or explanation for not referring back to the one dataset (WSC station). Subsequent statistics calculated from these constructed records (e.g., 7Q10 needed for SK water licenses) would be affected by this uncertainty. **Rationale:** Fish habitat can be altered by changes to depositional and erosional patterns in streams. Confidence in the Proponent's estimate of baseline water quantity, and by extension Project effects to fish habitat, cannot be established without a complete description of the method applied, as well as a discussion of its accuracy.	justify any deviations from simple unit area runoff relationships in the estimation of baseline water quantity values for the Project hydrometric stations. Constructing records from records that are themselves constructed is not recommended. 3. If baseline water quantity metrics need to be revised, discuss (if any) resulting changes to the effects assessment.	to be explored by the proponent including rainfall-runoff modelling techniques (such model can be calibrated at 06DA005 thus computed flow at subbasins or sub watershed can be estimated with good degree of confidence), drainage area ratio method, etc. CNSC staff recommends proponent to consider aforementioned methods or similar or provide justification why other methods were not considered. 2. In Attachment IR-102 Figure 1 to 7 show the plots of measured versus the estimated daily flows using the relationship developed for extension of daily flows at SA-1, SA-2, SA-3, SA-4, SA-5, SA-6, SB-3, LA-1 and LA-5. CNSC staff however finds it difficult to determine the predictive accuracy of the relationships based on visual comparisons. Therefore, CNSC staff requests that the proponent provide quantitative measures of prediction accuracy, for example in the form of Root Mean Square Error, correlation coefficient, etc., for the Equations presented in Table 1 of Attachment IR-102. In addition, CNSC staff requests that the proponent provide clarification on whether the current relationships are only limited to baseline characterization or will also be considered for estimation of design flows at SA-4 and SA-5 for culvert/crossing design for the access road. 3. Response to third part of the IR to be re-assessed when proponent addresses the above two comments ([1] and [2]).		
IR-103	-	ECCC CNSC	Fish and fish habitat Fish and fish habitat	Section 8.1.3.4 Climate Change Influenced Extreme Events	**Context:** The Proponent notes that Intensity duration frequency (IDF) curves are used to estimate the size of water management structures around a site and that the IDF curves are often specific to climate monitoring stations. The Proponent used the IDF_CC Tool 5.0 developed by the Institute for Catastrophic Loss Reduction (2021) which generates Intensity Duration Frequency (IDF) curves at ungauged locations in order to estimate future IDF curve values under influences of climate change. This tool generates sub-daily values at ungauged locations by interpolation and distance weighing from gauged locations.	Provide the gauged stations used to generate the sub daily duration values found in Table 8.1-6: Baseline of Intensity Duration Frequency data.	This response has not been accepted. In the Context and Rationale of AD-15 in the Annex 1 – Denison Response, ECCC recommends that the Proponent consult CSA PLUS 4013:19 (2019) *Technical guide: Development, interpretation and use of rainfall intensity-duration-frequency (IDF) information: Guideline for Canadian water resources practitioners* regarding the consideration of future changes in short-duration precipitation extremes**.** In IR-103, ECCC indicated that in order to assess the accuracy of the Intensity duration frequency (IDF)	Please see Attachment IR-103	No

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					Rationale: IDF trends exhibit random behavior at some locations and correlated behavior at other locations. The choice of gauged locations will infer the statistics for the ungauged locations, including the IDF trends. Without identification of the gauged locations, it is not possible to assess if the modelled data is realistic or not. If the modelled data is not accurate the design of water management structures on the site may not be sufficient resulting in the potential for impacts to the Project from flooding or extreme weather events.		curves, ECCC required that the Proponent provide the gauged stations generating the values for the modelled data. The Proponent provided the closest gauged stations, however, the future short duration precipitation values were based on statistical relationships fitted between local scale observed extreme precipitation and modelled simulations extremes. Additionally, on page 15-19 of the draft EIS states that: "Denison will apply adaptive management that includes monitoring climate factors so that they can proactively mitigate or prevent adverse climate effects on the Project." Denison did not provide details on how climate factors will be considered within their adaptive management plans. **Rationale:** Estimates of future short duration precipitation that are based on statistical relationships fitted between local scale observed extreme precipitation and modelled simulations extremes, such as the approach used by the Proponent, are unlikely to provide reliable projections. This is because the amount of information regarding changes in local-scale observed extreme precipitation contained in short records is not sufficient to constrain a regression (model the statistical relationship) between local and larger scale simulations (Li et al., 2019; ECCC 2022). An alternative approach is to base future projections on a comprehensive assessment that integrates climate science understanding and model projections over a large region. The recent Canadian Standards Association (CSA 2019) guidance on IDF for Canadian Water Resources practitioners provides such an assessment. In terms of adaptive management, the Proponent should clearly outline what climate factors will be monitored to mitigate or prevent adverse climate-related effects. This should include information on when and how the climate factors would be monitored and under what circumstances particular adaptive management approaches would be applied. In order to assess the Proponent's adaptive management strategies for future extreme		

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							precipitation events, ECCC requests that the Proponent consult the CSA (2019) guidance when using future IDF projections in the Project design and provide revised estimates of the potential future changes in short-duration precipitation extremes over the Project's duration. 1. Provide revised estimates of the potential future changes in short-duration precipitation extremes over the Project's duration as relevant to the Project design. 2. Demonstrate how the CSA (2019) guidance will be incorporated in the Project design when developing and considering future IDF projections and estimates of the potential future changes in short-duration precipitation extremes. **References** CSA Group. (2019). Technical guide: Development, interpretation and use of rainfall intensity- duration-frequency (IDF) information: Guideline for Canadian water resources practitioners. *CSA PLUS 4013 :19*. https ://www.csagroup.org/store/produc t/2703080/ ECCC (2022). Draft Technical guide related to the Strategic Assessment of Climate Change: Assessing climate change resilience. https ://www.strategicassessmentclima techange.ca/28896/widgets/117114/documents/7 7106 Li, C., Zwiers, F., Zhang, X., & Li, G. (2019). How much information is required to well constrain local estimates of future precipitation extremes? *Earth's Future*, 11-24.		
IR-104	-	ECCC	Fish and fish habitat Fish and fish habitat	Section 8.1.3.4.2 Probable Maximum Precipitation (PMP) Events Appendix 8C	**Context and Rationale:** The Proponent notes: "The probable maximum precipitation (PMP) event is a design standard value for an extreme rainfall event. The PMP event does not have an estimated return period but is instead based on the theoretical maximum amount of water that a storm could produce based on the maximum persisting dew point." The Proponent provides a PMP value of 489.3 mm, which is	1.Provide a revised PMP value (using up to date data) or justify the use of a PMP that is based on data and methodologies from 1999 as opposed to a more recent time series analysis. 2. Describe the alternative	This response to part 1. has not been accepted. There are an additional 24 years of meteorological datasets since the 1999 study thus all historical rainfall extremes including those since 1999 study should be considered to estimate up to date PMP at the Project site The proponent's justification on whether the 1999 or 1994 PMP estimates are	To provide comfort to the reviewer that the PMP of 493 that was retained for design purposes is appropriate, we have undertaken an analysis of the available empirical data available for the Max 1-day precipitation annual average historical data for Tomblin Lake, high carbon (RCP8.5) is provided with 90% confidence intervals. The data set used is from 1950 to 2016 and is historical measured precipitation data (https://climateatlas.ca/data/grid50k/074H06/maxdaypr_2030_85/line) . The period of 2023 to 2065 is considered a good representation of the period of mine life from construction through to early post-decommissioning (i.e. > 40 years).	No

<table>
<tr><th>Original IR#</th><th>Follow-Up IR #</th><th>SME</th><th>Project Effects Link</th><th>Reference to EIS, appendices, or supporting documentation</th><th>Context and Rationale</th><th>Information Requirement (IR)</th><th>Rationale for Status</th><th>Denison's Response</th><th>EIS Updates (Yes/No; if Yes, provide EIS Section number)</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>based on data and methodologies available in 1999, taken from the Atmospheric Environment Branch Report (1999), Report Number AHSD-R99-01. The Proponent references Appendix 8C for details. Appendix 8C contains no supplementary information other than what is already provided in Section 8.1.3.4.2.

The assumptions and methodologies presented in the report are the results of time series analyses available in 1999. As time series evolve so do the derived statistics. In order to assess potential flood risks and impacts to the Project from flooding, data that is current and representative of the changing climate is needed. The Proponent should explain why they've used data from 1999 rather than using up to date data, describe what alternative methods for determining PMP they have considered, and describe how they will support their use of 489.3 mm as a PMP, or describe how they will generate a refreshed PMP. The main factor that influences the statistical data output is the length of the time series hence the reason to keep the statistical data. The PMP values can be substantially (>10%) different if two decades of data is used in the statistical analysis.</td><td>methods for determining PMP values that were considered. Include descriptions of both "statistical" outcomes and "rational" outcomes as applicable.

Technical Discussion Required: Yes</td><td>current and conservative should be substantiated based on meteorological data analysis. An estimation of updated PMP is achievable by the proponent as meteorological data is freely available and accessible from ECCC and the proponent should provide a revised PMP.

The Proponent should also clarify how recent the data used to calculate the PMP or the time series is and explain the use of an older data set that will not produce as accurate of a PMP value as a more recent data set would produce, even when estimates are conservative.

Specifically, a. Explain the rationale for the use of the data set which was used to derive the PMP. B. Clarify if the PMP and/or the time series was calculated using more recent data.

This will allow for an accurate evaluation of the validity of results derived from the data sets selected by the Proponent.
.</td><td>As shown in Table 1, the maximum 1-day precipitation event from historical records for the area is 52 mm. This average is based on empirical collected data and not a simulated or predicted hindcast value. As, such the PMP that has been adopted for design basis measures is 9.6 x the maximum 1-day precipitation event that has been recorded since 1950 and is inclusive of data up to 2016. The predicted Ensemble data shows a reduction in the maximum 1-day precipitation event. Therefore, we assessed the maximum value of all 24 models that make up the ensemble values. For Tomblin Lake grid, the greatest maximum 1-day value was shown for the period of 2023 to 2065 was 96.1 mm, which is 5.2x less than the design basis PMP. Denison feels strongly that the presentation of this historical data provides clear indication that the design basis PMP is of a magnitude that will be reasonable for water management at the site during in the short-term and for the life of the mine.

Table 1: Maximum 1-Day Precipitation for the Tomblin
<table>
<tr><th rowspan="2">Statistic</th><th colspan="3">Maximum 1-Day Precipitation Event (mm)</th></tr>
<tr><th>Historical (1950-2013)</th><th>Predicted Ensemble (2023 to 2065)</th><th>Predicted (2023 to 2065)</th></tr>
<tr><td>Mean</td><td>23.82</td><td>25.91</td><td>32.35</td></tr>
<tr><td>SD</td><td>8.75</td><td>2.09</td><td>14.90</td></tr>
<tr><td>Min</td><td>9.40</td><td>21.00</td><td>13.20</td></tr>
<tr><td>Max</td><td>52.00</td><td>31.00</td><td>96.10</td></tr>
<tr><td>10% Confidence Interval</td><td>22.06</td><td>25.38</td><td>31.82</td></tr>
<tr><td>90% Confidence Interval</td><td>25.57</td><td>26.44</td><td>32.88</td></tr>
</table>
Despite Denison's reiteration that the PMP is adequate for the EA level design basis, Denison is committed to revisiting the estimates per CNSC's recommendations, as applicable, for the licensing phase of the Project.</td><td></td></tr>
<tr><td>IR-107</td><td>-</td><td>CNSC

ECCC</td><td>Aquatic environment</td><td>Section 8.2.3.3, Existing Surface Water Quality</td><td>Context: Under the methodology and metrics section (8.2.3.1) it is stated baseline water quality was sampled in 2016, 2018, and 2019. Looking at the data in Appendix A of Appendix 8D it seems that some waterbodies have little data available for baseline characterization. For example, Whitefish Lake only has 3 and 5 samples taken between its two sample stations, with sampling frequency seeming intermittent.

Rationale: The amount of data available for baseline water quality characterization does not seem sufficient to adequately characterize the baseline and the variation it would experience. An effective baseline characterization is vital to ensure water quality is indeed not being affected by the Project. In addition, it is not clear if data quality objectives were applied to determine baseline information was adequate.

To meet CEAA 2012 requirements, and CNSC expectations outlined in REGDOC 2.9.1, Environmental Principles Assessments and Protection Measures, the applicant is required to complete a</td><td>Please clarify which data quality objectives were used for the baseline characterization data. Please provide justification whether the number of datapoints collected with inconsistent frequency in baseline surface water characterization is sufficient to meet data quality objectives and to adequately characterize the baseline, and whether Denison is confident that the data collected is enough for a robust water quality baseline characterization.

Suggestions for mitigation and follow-up measures: CNSC recommends that additional water samples are collected and</td><td>This response has not been accepted.

From the baseline water quality data table (Table A-1 of Appendix 8D) it remains unclear that water quality was sampled on a monthly basis in 2016, 2018, and 2019, mainly due to Table A-1 referring to specific sampling dates, instead of an mean value of 12 samples/year. It is also unclear which federal requirements Denison is referring to using in their response. Staff are supportive of continued baseline monitoring to maintain an accurate dataset of baseline conditions.

CNSC and ECCC staff have the following expectations:
1. Provide the monthly monitoring data referenced in the response or indicate where it can be found within the EIS and its appendices.</td><td>The response to this IR is provided in Attachment IR-107.</td><td>No</td></tr>
</table>

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					characterization of the baseline environment. As described in REGDOC 2.9.1 Appendix B.2, Characterization of the Baseline Environment for Environmental Assessment Under CEAA 2012, the "baseline information should be sufficient to support the use of an aquatic dispersion model to conduct the site-specific ERA and to support an assessment of the effects of the environment on the facility or activity" In addition, the "applicant or licensee should include an assessment of any limitations or gaps in the quality and extent of baseline data and methods, as well as the method(s) by which they have been addressed."	analyzed at a consistent frequency to ensure a robust baseline	2. Confirm which federal requirements were used when assessing potential impacts through EA. 3. Confirm which data quality objectives were used to establish the baseline, provide references if available 4. Incorporate the additional available baseline data collected into the analysis and conclusions of the finalized EIS and ERA to increase the robustness of the established baseline.		
IR-108	-	ECCC	Change to an environmental component due to hazardous contaminants	Section 8.2.3.3 Aquatic Environment	**Context:** Tables 8.2-2 and 8.2-3 provide summaries of the baseline surface water quality in the LSA. No justifications for the selection of water quality guidelines have been provided. COPCs that require calculations based on other parameters such as hardness, pH, or temperature to derive guidelines (i.e., ammonia, cobalt, zinc, etc.) should be indicated within the table, with a note specifying the parameter values used in the calculations, so that thresholds may be confirmed. No baseline data for un-ionized ammonia has been provided, which is a Schedule 4 substance requiring monitoring under the MDMER. For cobalt, manganese, and vanadium, Federal Environmental Quality Guidelines (FEQGs) and/or CCME Canadian Water Quality Guidelines (CWQGs) for the Protection of Aquatic Life have not been included. A guideline of 26 mg/L has been provided for molybdenum as a Saskatchewan Environmental Quality Guidelines (SEQG), however the actual SEQG is 31 mg/L and the CCME CWQG is 0.073 mg/L. **Rationale:** In order to assess potential changes to surface water quality from Project related activities, ECCC requires that data on all parameters that require MDMER effluent and receiving environment monitoring be provided for assessment, including accurate water quality guidelines where available.	1. Update Tables 8.2-2 and 8.2-3 to include all COPCs that require effluent characterization and receiving environment monitoring under the MDMER. 2. Update Tables 8.2-2 and 8.2-3 to include missing or corrected water quality guidance thresholds, and information on values used to derive thresholds for COPCs that are dependent on general parameters.	This response has not been accepted. There are incorrect guidelines remaining in the updated tables, and the supporting information on parameter values used to derive benchmarks has not been provided. This information is required to understand potential changes to surface water quality from Project related activities and facilitate threshold confirmation. Use of the incorrect threshold could allow for effluent to be discharged at concentrations exceeding MDMER limits. See also follow-up IR-108-R1.	The response to this IR is provided as Attachment IR-108 and details can be found therein. Briefly, Tables 8.2-2 and 8.2-3 in Section 8 of the revised Draft EIS have been updated as requested.	Yes Revised Draft EIS, Section 8.2.3.3, Tables 8.2-2 and 8.2-3.
IR-108	IR-108-R1	ECCC	Change to an environmental component due to	Section 8.2.3.3 Aquatic Environment IR-108 Response from Denison	**Context:** Incorrect benchmark environmental quality guidelines and guidelines that cannot be verified remain within the updated Tables 8.2-2 and 8.2-3 provided in the Proponent's response. The Proponent provided an Aluminum Saskatchewan Environmental Quality Guidelines (SEQG) value of 0.005 mg/L in both tables. This is incorrect and appears to be the guideline for irrigation, not the guideline for protection of aquatic biota. The Proponent provided a Molybdenum SEQG of 26 mg/L in both tables. This value is incorrect. The correct SEQG for Molybdenum is 31 mg/L and the Canadian Water Quality Guideline (CWQG) is	1. Update Tables 8.2-2 and 8.2-3 to include footnotes with the concentrations of environmental modifying parameters such as pH, hardness and DOC used to derive guidelines for Aluminum, Cadmium, Copper, Lead, Manganese, Nickel and Zinc. 2. Update Tables 8.2-2 and		Please see response to IR-108 and Attachment IR-108.	Yes Revised Draft EIS, Section 8.2.3.3, Tables 8.2-2 and 8.2-3.

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					0.073 mg/L. The Proponent provided a Nitrate SEQG of 13.29 mg/L in both tables. This value is incorrect. The correct SEQG for Nitrate is 3 mg/L and the CWQG is 13 mg/L. **Rationale:** In order to verify the benchmark environmental quality guidelines that are calculated based on environmental modifying factors such as pH, hardness and dissolved organic carbon (DOC), the specific concentrations of these environmental modifying parameters used in the calculations must be provided. Additionally, incorrect benchmarks for Aluminum, Molybdenum, and Nitrate remain within the updated tables provided by the Proponent. No benchmark was provided for Manganese. It is not clear if Total Chromium or Hexavalent Chromium was measured as the table does not specify, and the benchmark provided was for Hexavalent Chromium. This information is required to understand potential changes to surface water quality from Project related activities and facilitate threshold confirmation. Use of the incorrect threshold could allow for effluent to be discharged at the wrong concentration.	8.2-3 to include the correct benchmark guideline value for Aluminum, Molybdenum and Nitrate. Include the concentrations of environmental modifying parameters needed for deriving guidelines. If the most stringent guideline value is not selected for use, provide a rationale for use of the chosen guideline. 3. Update Tables 8.2-2 and 8.2-3 to include the calculated guideline value for manganese and the environmental modifying parameter concentrations used to calculate the guideline. A benchmark environmental quality guideline has not been provided for Manganese, however a chronic CWQG guideline exists that can be derived based on environmental modifying parameter concentrations. Update Tables 8.2-2 and 8.2-3 to specify if Total Chromium or Hexavalent Chromium was measured. See also related IR-115-R1.			
IR-109	-	ECCC	Change to an environmental component due to hazardous contaminants	Section 8.2.4.1.1 Aquatic Environment	**Context:** In this section it is stated "Treated water from the IWWTP will be pumped to the three Effluent Monitoring and Release Ponds (each 3,300 m3). These ponds will be designed to hold effluent for 72 hours for testing before discharge to the environment" (p. 8-75). It is unclear what procedure will be followed if effluent in monitoring ponds does not meet discharge requirements following testing. Additionally, it is also stated that "Treated water in the Effluent Monitoring and Release Ponds will be monitored prior to release to a surface waterbody or injected into groundwater via deep well injection." However, the MDMER pursuant to the Fisheries Act requires all mine effluent and seep. From the mine site that contain deleterious substances be discharged through a final discharge point.	Provide further information regarding management of effluent in monitoring ponds that does not meet the requirements for discharge under the MDMER.	This response has not been accepted. There are statements made throughout the EIS that "Treated water in the Effluent Monitoring and Release Ponds will be monitored prior to release to a surface waterbody or injected into groundwater via deep well injection." However, the Proponent has confirmed that all treated effluent will be discharged to Whitefish Lake through a final discharge point to ensure it meets *Metal and Diamond Mining Effluent Regulations* (MDMER) requirements. It is not clear why the above statement regarding effluent release to groundwater via deep well	Section 8 (including Sections 8.2.4.1.1, 8.2.6.1, 8.3.6.1, and 8.4.6.1) of the revised Draft EIS has been revised to remove text on effluent release to groundwater via deep well injection, such that the text now reads. "Treated water in the Effluent Monitoring and Release Ponds will be monitored prior to release to Whitefish Lake."	Yes Revised Draft EIS, Sections 8.2.4.1.1, 8.2.6.1, 8.3.6.1, and 8.4.6.1

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					Rationale: In order to fully understand effluent management, more information is required regarding the procedure for managing effluent in monitoring ponds that does not meet discharge requirements. It is unclear how effluent that does not meet discharge requirements will be managed if it needs re-treatment and re-testing prior to discharge. ECCC reminds the Proponent that Project effluent from all final discharge points must meet federal legislation requirements.		injection has been included in the EIS when this is not part of the confirmed effluent discharge management plan. The Proponent should update the EIS to remove text regarding effluent release to groundwater via deep well injection or provide explanation as to why this information has not been excluded from the EIS to clarify if this is an intentional part of the Project design or if this was an accidental inclusion. The Proponent should update the EIS to remove text regarding effluent release to groundwater via deep well injection or provide additional explanation. Please provide proposed text for the revised EIS, for SME review and acceptance.		
IR-110	-	ECCC	Change to an environmental component due to hazardous contaminants	Section 8.2.4.1.1 Aquatic Environment Appendix 8-E, Section 2.1	**Context:** It is stated that the diffuser at the final effluent discharge point will be located in approximately 3m of water. However, in Figure 8.2-5 displaying the location of the proposed diffuser and lake bathymetry, the diffuser location seems to be located in 2-2.5m of water. A similar image in Figure 1 Section 2.0 of Appendix 8-E also indicates that the diffuser seems to be located in 2-2.5m of water. Additionally, while thermal effects are unlikely, this cannot be confirmed until a more detailed diffuser design is provided for review. **Updated Rationale:** The Proponent should confirm the location and depth of the proposed diffuser in order to confirm that modelling predictions for effluent discharged into the receiving environment are accurate. A review of the final discharge design is necessary to confirm the location and depth of the proposed diffuser and modelling predictions for effluent discharged into the receiving environment.	Provide confirmation of the diffuser depth and location. ECCC requests the opportunity to review the finalized diffuser design once it is available.	This response has not been accepted. ECCC requests confirmation that the finalized diffuser design will be available for review once it is completed as reviewing it will be necessary to confirm the location and depth of the proposed diffuser and modelling predictions for effluent discharged into the receiving environment.	It is noted that basic design criteria (e.g., depth, location, port configuration) have been provided in the Draft EIS (Section 8.2) and Appendix 8-E on which modeling was based. While some minor adjustments may be made during preparation of the final diffuser engineering design, the level of mixing predicted in the assessment will be maintained (minimally). The final designs will follow standard engineering practice and be stamped and signed by a professional engineer. As for Denison's understanding of the regulatory process, the finalized diffuser design information will be included in Denison's license to operate application that will be submitted to the CNSC. Such information will also be provided to the province as part of the provincial approvals process. Should CNSC, or the province, choose to provide this information to ECCC that is their discretion, but Denison doesn't believe it is within their purview (or appropriate) to make commitments on behalf of others, nor act outside the normal licensing/ approvals processes.	No
IR-113	-	ECCC	Change to an environmental component due to hazardous contaminants	Section 8.2.4.2.3 and Section 8.4.7.6, Aquatic Environment	**Context:** No quantitative assessment of climate change has been conducted. Representative concentration pathways (RPC) projections for climate change have not been integrated with near-and far-field modelling to assess impacts to surface water quality or sediment quality in the future. **Rationale:** Changes in air and water temperatures, precipitation, snow melt, ice formation, etc., due to climate change can all influence COPC concentrations in surface water and sediment. It is not possible to assess the potential impacts from climate	Provide a quantitative analysis of the potential impacts of predicted COPCs from mine effluent to surface water and sediment quality with climate change scenarios for the Project lifespan incorporated into modelling. Include modelling predictions regarding the influence of changes to air and water temperatures,	This response has not been accepted. Based on the information provided it is not possible to assess the resiliency of the Project to potential adverse effects from climate change and potential impacts to surface water and sediment quality. The Proponent should review the guidance documents available on the Strategic Assessment of Climate Change (SACC) website with regards to climate change resilience and provide a	Please refer to Attachment IR-113_IR-113-R1 for the response.	No

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					change on predicted surface water and sediment COPC concentrations with the current information.	precipitation, snow melt, ice formation, etc., on COPC concentrations in surface water and sediment.	quantitative analysis of the potential impacts of predicted COPCs from mine effluent to surface water and sediment quality with climate change scenarios for the Project lifespan incorporated into modelling. Include modelling predictions regarding the influence of changes to air and water temperatures, precipitation, lake levels, flow rates, etc., on COPC concentrations in surface water and sediment. The Proponent should refer to the SACC website for guidance on conducting this quantitative analysis. See also follow-up IR-113-R1.		
IR-113	IR-113-R1	ECCC	Fish and fish habitat	Section 8.2.4.2.3 and Section 8.4.7.6, Aquatic Environment IR-113 Response from Denison	**Context:** The Proponent states the following, "The PMP is very conservative (e.g., assumes effectively a full year of precipitation in one event) under both existing and future conditions (climate change)". This statement suggests that the PMP value utilized considers future climate changes such as possible changes in the frequency or intensity of extreme precipitation events. **Rationale:** As noted by the Proponent, increases in extreme rainfall are anticipated with a warmer climate. For precipitation extremes across Canada, the relative change in event frequency is expected to be larger for more extreme and rarer events. Given that the extreme precipitation is expected to intensify in the future (Kunkel et al. 2013), the Proponent should consider how these potential changes will influence design values such as PMP.	Clarify if climate change has been considered in the PMP value provided. If it has not been considered, discuss how potential increases in PMP have been and/or need to be considered in the Project design. Reference Kunkel, K., Karl, T. R., Easterling, D. R., Redmond, K., Young, J., Yin, X., & Hennon, P. (2020). Probable maximum precipitation and climate change. *Geophysical Research Letters*, 1402-1408.		Please refer to Attachment IR-113_IR-113-R1 for this response.	No
IR-114	-	ECCC CNSC	Change to an environmental component due to hazardous contaminants	Section 8.2.4.2.3 and Section 8.2.4.2.4	**Context:** Tables 8.2-9, 8.2-10 and 8.2-13 demonstrate predicted maximum effluent concentrations of COPCs and maximum predicted receiving environment concentrations in the near- and far-field. General parameters such as temperature, pH, conductivity, etc. that would require Project thresholds and monitoring under the MDMER have not been provided in this table. Lead, nickel, TSS and un-ionized ammonia were not provided, despite all being Schedule 4 substances with maximum monthly concentrations under the MDMER. Aluminum, iron, nitrate, thallium, and manganese have not been provided despite being required parameters under Schedule 5 Section 4 of the MDMER for effluent characterization. For zinc, it is unclear how guidelines have been calculated when CCME thresholds can only be derived with hardness values <250 mg/L. Additionally, water quality thresholds appear to have been calculated using estimated effluent concentrations rather than	1. Update all tables to include all COPCs with required monitoring under the MDMER including acute and chronic thresholds. 2. Ensure all selected water quality thresholds are derived using baseline receiving environment concentrations and use water quality guidelines that are protective of aquatic biota. 3. Provide baseline data on the concentrations of methylmercury in surface water, sediment and fish tissues (i.e., large- bodied sports fish and small-bodied	This response has not been accepted. The Proponent has not updated all tables to include missing data for mercury, aluminum, total suspended solids, iron, thallium, manganese, nitrate, and phosphorous, all of which are COPCs with monitoring requirements under the MDMER. The Proponent has not updated tables to include predictions of total hardness concentration in effluent and the receiving environment or acute water quality thresholds, and water quality thresholds have not been derived using baseline receiving environment concentrations. All water quality thresholds should be derived from receiving environment parameters to determine if	Please see Attachment IR-114. Briefly, Tables 8.2-9, 8.2-10 and 8.2-13 have been updated in the revised Draft EIS as requested.	Yes Revised Draft EIS, Sections 8.2.4.2.3 and 8.2.4.2.4, Tables 8.2-9, 8.2-10 and 8.2-13

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					receiving environment baseline concentrations. Mercury has been identified as a COPC of interest to Indigenous groups for the proposed Project. Table 8.2-8 indicates that background concentrations of mercury in LA-5 are low, and predicted effluent concentrations are also low. However, no information has been provided on background methylmercury concentrations or expected atmospheric deposition of mercury from Project related emissions. Predicted effluent concentrations of 3915 mg/L of sulphate are quite high, and sulphate is known to increase mercury methylation rates in aquatic environments. **Rationale:** A review of all modelling results for all COPCs under the MDMER will assist ECCC in understanding the potential risks to the receiving environment. ECCC recommends the use of the most stringent guidelines for the protection of aquatic biota. All water quality thresholds should be derived from receiving environment parameters to determine any baseline receiving environment and effluent COPC exceedances of water quality thresholds. Increased sulphate availability can lead to increased methylation rates of mercury and methylmercury in sediment and surface water. Methylmercury is a toxin that can bioaccumulate within the food chain and present risks to aquatic biota and wildlife consuming aquatic biota. Potential changes to methylmercury concentrations in water quality, sediment and fish tissues should be assessed due to the proposed sulphate loadings in effluent. Additionally, in accordance with the MDMERs, Denison will be required to demonstrate that their effluent quality meets the limits in the MDMER. Denison is expected to provide the predicted effluent quality for lead, nickel, and un-ionized ammonia to demonstrate compliance with the MDMERs.	forage fish) in the LSA and RSA receiving environment to establish a baseline prior to potential Project impacts. 4. Provide an assessment of risk from methylmercury to ecological receptors due to changes in sulphate concentrations in effluent, and potential deposition of mercury from Project related atmospheric emissions in the receiving environment.	any baseline receiving environment and effluent COPCs exceed water quality thresholds. Please: 1. Update all tables to include missing data for mercury, aluminum, total suspended solids, iron, thallium, manganese, nitrate and phosphorus. 2. Update tables to include predictions of total hardness concentrations (in mg/L $CaCO_3$) in effluent and the receiving environment. 3. Update tables to include acute water quality thresholds to ensure COPCs do not have the potential to be acutely lethal at the end-of-pipe. 4. Ensure that all selected water quality thresholds are derived using baseline receiving environment concentrations and use water quality guidelines that are protective of aquatic biota.		
IR-115	-	ECCC	Fish and fish habitat	Section 8.2.4.2.3 Aquatic Environment Appendix 10-A (ERA), Section 3.1.1.1	**Context:** Table 8.2-8 demonstrates baseline concentrations of COPCs in LA-5 South Whitefish Lake, their respective water quality guidelines from applicable sources, and proposed Project thresholds. General parameters such as temperature, pH, conductivity, etc. that would require Project thresholds and monitoring under the MDMER have not been provided in this table. Lead, nickel, Total Suspended Solids (TSS) and un-ionized ammonia were not provided, despite all being Schedule 4 substances with maximum monthly concentrations under the MDMER. Aluminum, iron, nitrate, thallium, and manganese have not been provided despite being required parameters under Schedule 5 Section 4 of the MDMER for effluent characterization. Water quality thresholds appear to have been calculated using estimated effluent concentrations rather than receiving	1. Update Table 8.2-8 to include all COPCs with required monitoring under the MDMER. 2. Ensure all selected water quality thresholds are derived using baseline receiving environment concentrations and are at levels protective of aquatic life. 3. Provide additional information to justify the use of the selected water quality guideline for molybdenum.	This response has not been accepted. Items 1. And 3. In the Proponent's response adequately responded to the IR. However, the water quality thresholds in item two have not been derived using baseline receiving environment concentrations and not all COPCs which require monitoring under the MDMER have been included in the updated table. Additionally, the Proponent did not account for changes in baseline hardness concentrations in the receiving environment due to the deposition of effluent. Water hardness is an environmental modifying factor which can influence the toxicity of COPCs in the aquatic	Please see Attachment IR-115_IR115-R1. Briefly, Table 8.2-8 has been updated in the revised Draft EIS as requested.	Yes Revised Draft EIS, Sections 8.2.4.2.3 Table 8.2-8

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					environment baseline concentrations. The water quality objective selected for molybdenum is the 31 mg/L SEQG rather than the CCME guideline of 0.073 mg/L. **Rationale:** ECCC recommends the use of guidelines that will ensure the protection of aquatic biota. All water quality thresholds should be derived from receiving environment parameters to determine any baseline receiving environment and effluent COPC exceedances of water quality thresholds.		environment, therefore requiring the mentioned COPCs as well as background concentrations of total hardness in the receiving environment to accurately determine potential effects of COPCs upon the receiving aquatic environment. The Proponent should also provide rationale to support that all selected water quality thresholds are derived using baseline receiving environment concentrations and are at levels protective of aquatic life. See also follow-up IR-115-R1.		
IR-115	IR-115-R1	ECCC	Fish and fish habitat	Section 8.2.4.2.3 Aquatic Environment Appendix 10-A (ERA), Section 3.1.1.1 IR-115 Response from Denison	**Context:** In the Proponent's response to item two, it is mentioned that the derived water quality thresholds used in Table 8.2-8 and in the assessment (Section 8.2.4.2.3, Aquatic Environment; Appendix 10-A (ERA), Section 3.1.1.1) are based on hardness concentrations found in effluent. The Proponent mentions that hardness derived from IWWTP discharge will consider IWWTP discharge on the receiving environment and provide "a reasonable estimate of expected hardness in effluent". However, this does not consider induced hardness (i.e., hardness concentration increases in the receiving environment over the lifecycle of the Project) from effluent contributions as a Project effect; the receiving environment baseline concentrations of hardness have been altered due to inputs from Project effluent. Providing only one estimate of expected effluent hardness in the receiving environment is not an appropriate means of conducting the effects assessment. Additionally, the following COPCs have not been included in the updated table provided in the Proponent's response: un-ionized ammonia, aluminum, iron, manganese, thallium and total dissolved solids (TDS). It is noted that these COPCs are also subject to monitoring requirements under the *Metal and Diamond Mining Effluent Regulations* (MDMER). **Rationale:** Background concentrations of un- ionized ammonia, aluminum, iron, thallium, manganese and TDS are required to determine potential effects to the environment. The Proponent will also require this information to satisfy their obligations under the MDMER. The purpose of the surface water quality assessment is to determine if changes to the receiving environment over the	1. Update Table 8.2-8 to include the following COPCs: un-ionized ammonia, aluminum, iron, manganese, thallium and total dissolved solids (TDS). 2. Update Table 8.2-8 to include background concentrations of total hardness (in mg/L $CaCO_3$) in the receiving environment. 3. Provide rationale that all selected water quality thresholds are derived using baseline receiving environment concentrations and are at levels protective of aquatic life. See also related IR-108-R1		Please see Attachment IR-115_IR115-R1. Briefly, Table 8.2-8 has been updated in the revised Draft EIS as requested.	Yes Revised Draft EIS, Sections 8.2.4.2.3 Table 8.2-8

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					project lifecycle will have significant adverse effects on biota. Changes from baseline in hardness concentrations in the receiving environment due to the deposition of effluent is a Project related effect and therefore providing a single baseline water quality threshold which is applicable only to one set of conditions is not an appropriate method to evaluate impacts across a shifting hardness baseline. Water hardness is an environmental modifying factor, various concentrations of hardness influence the toxicity of other COPCs in the aquatic environment. Using water quality thresholds that have been derived from high effluent hardness concentrations will not be protective of aquatic biota, particularly in the early stages of the project lifecycle when receiving environment water quality will be similar to baseline water quality.				
IR-124	-	ECCC	Change to an environmental component due to hazardous contaminants	Section 8.4.4.2.3, Aquatic Environment	**Context:** Table 8.4-7 provides maximum concentrations of surface water COPCs in sediment. The following COPCs, which are required to evaluate the risk from effluent to sediment quality, were not evaluated: 1. COPCs that have monitoring requirements in receiving environment surface water and effluent under the MDMER, 2. COPCs that exceed water quality guidelines in effluent, and, 3. COPCs that have baseline concentrations that exceed sediment quality thresholds in the receiving environment. **Rationale:** Due to the lack of information on COPCs with baseline concentrations that exceed sediment quality guidelines, and COPCs that require monitoring under the MDMER, a determination on risk to sediment quality and aquatic biota cannot be made.	1. Provide the information on baseline exceedances of COPCs in sediment. 2. Provide an assessment of risk for any COPCs that have baseline exceedances of sediment quality thresholds in the receiving environment. 3. Provide an assessment of risk from any COPCs that require monitoring in the receiving environment and effluent under the MDMER. Please include any COPCs in effluent that will exceed water quality guidelines.	This response has not been accepted. An updated risk assessment for COPCs that requires monitoring under the MDMER with effluent concentrations that exceed guidelines has not been completed. This information is necessary to facilitate the determination on risk to sediment quality and aquatic biota. See also follow-up IR-124-R1.	1. Section 8.4.3.2.3 of the Draft EIS did not identify any constituents where baseline sediment quality exceeded sediment quality guidelines. Table 8.4-3 and Table 8.4-7 of the revised Draft EIS were updated to include sediment quality guidelines as recommended. 2. The were no instances where constituent concentrations in the baseline sediment samples were greater than their respective of sediment quality guidelines; therefore, no further action is needed to address this part of the IR. 3. This is not applicable. No additional COPCs need to be carried forward in the environmental risk assessment as the concentrations of COPCs in effluent do not exceed water quality guidelines (see Table 3-1 in the ERA in Appendix 10-A). All relevant constituents identified in Schedule 4 and Schedule 5 in MDMER were considered in the ERA screening with the exception of cyanide and mercury which are not identified as present in the effluent (see IR-100 regarding mercury). Phosphorus and nitrate will be present in the effluent at low levels and estimates of these constituents via the near-field water quality model indicate that levels will remain well below criteria protective of aquatic life in the Whitefish Lake environment (see Tables 8.2-10 and 8.2-13 of Section 8).	Yes Revised Draft EIS Section 8, Table 8.4-3, Table 8.4-7 Appendix 8E
IR-124	IR-124-R1	ECCC	Change to an environmental component due to hazardous contaminants	Section 8.4.4.2.3, Aquatic Environment IR-124 Response from Denison	**Context:** In the Proponent's response it is stated, "Schedule 5 parameters will be monitored as per the MDMER once under this regulation (i.e., meeting regulated criteria of discharge to the environment [50 m3/day). Please refer to Table 8.2-13 of attachment IR-114. In these cases, COPCs including Schedule 4 parameters were below screening criteria." If concentrations of Schedule 5 parameters in effluent exceed water quality thresholds, these parameters are necessary for ECCC to examine in the risk assessment to determine the potential for effluent to be acutely lethal and for adverse effects to aquatic biota. These parameters will also be required to be characterized under Section 4, 5 and 7 of the MDMER. As per CSA N288.6-22 Section 7.2.5.2.1,	Provide an assessment of risk from any MDMER Schedule 5 parameters that are required to be characterized in effluent and in surface water quality in the receiving environment and that have effluent concentrations that will exceed water quality guidelines derived from environmental baseline conditions.		See response to IR-124 and revised Draft EIS Section 8, Table 8.4-3 and Table 8.4-7 and supporting updated documentation in Appendix 8E.	Yes Revised Draft EIS Section 8, Table 8.4-3, Table 8.4-7 Appendix 8E

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					"Screening of environmental concentrations of chemical and radiochemical substances released to the environment should be performed to identify COPCs for further evaluation in the risk assessment. Both measured concentrations and concentrations calculated from release rates may be used in the screening analysis. The screening concentrations should be compared to screening criteria, and chemicals that exceed screening criteria should be identified as COPCs." As per CSA N288.6-22 Section 7.2.5.4.2, "If COPCs exceed the screening level for one medium, they should be carried forward into the EcoRA for all media that are likely to contribute to exposure. For example, for a given COPC, if a water screening benchmark is exceeded, the same COPC should be carried forward for sediment if its concentration was above the detection limit." Additionally, updated Table 8.2-13 of attachment IR-114 has been found to be insufficient due **to** maximum concentrations in surface water for mercury, aluminum, total suspended solids, iron, thallium, manganese, nitrate and phosphorus being absent and the use of incorrect water quality thresholds. **Rationale:** Due to the lack of information on COPCs with concentrations that exceed water quality thresholds in effluent, a determination on risk to sediment quality and aquatic biota cannot be made.				
IR-126	-	ECCC	Aquatic species	Section 8.5.3 Appendix 10-A (ERA), Section 5.3.1.1.8	**Context:** The Proponent has used the US Environmental Protection Agency (US EPA) guidelines for the assessment of selenium fish tissue concentrations in Section 8.5.3 of the draft EIS and in the Environmental Risk Assessment (ERA) in Appendix 10-A (ERA) of Section 10. **Rationale:** ECCC's Federal Environmental Quality Guidelines of 6.7 ug/g dry weight fish whole body tissue for selenium should be used, as it is more protective than the US EPA guidelines.	Update the selenium fish tissue assessment in the draft EIS and the Wheeler River ERA (Appendix 10-A (ERA) in Section 10) as needed using ECCC's FEQG.	This response has not been accepted. The selenium fish tissue assessment has not been updated to reflect the ECCC Federal Environmental Quality Guidelines (FEQG). A predicted effluent concentration of 0.042 mg/L of selenium has been provided for the Project (updated Tables 8.2-9 and 8.2-10 Attachment IR-114 Denison's Response). ECCC acknowledges that the Proponent prefers the use of the US EPA guidelines due to the ability to perform fish tissue muscle TRV, however, Environmental Effects Monitoring (EEM) would require a study on fish tissue selenium whole- body or egg-ovary concentrations. The current baseline data will not be comparable to future EEM studies using fish tissue muscle concentrations of selenium and US EPA guideline methodology. There is currently EEM guidance under development for conducting selenium fish tissue sampling in fish populations that will utilize the FEQG which applies	The EIS assessed selenium in fish in terms of muscle tissue because the available baseline data were for muscle tissue. Since the review comment highlights the EEM program and the fish tissue selenium study component more specifically we note that the MDMER (2023) allows use of muscle tissue in the EEM study of selenium in fish (see Schedule 5, 12(1)(e)(iv). It is further noted that Denison has committed to a pre-operational EEM study and will conduct that study in accordance with the regulation and available federal guidance. The pre-operational EEM study will include a study respecting selenium in fish tissue. Regarding the EIS, Denison and its SME stand by the current assessment approach, using muscle tissue. Nevertheless, to address the reviewer's concern, we have calculated whole-body concentrations from the predicted selenium in muscle (Table B.5 of the revised draft EIS Appendix 10-A), using EPA (2021) conversion factors. The resulting whole-body concentrations do not exceed either EPA (2021) or ECCC (2022) guidelines for whole-body tissue, which are 8.5 µg/g dw and 6.7 µg/g dw, respectively, and therefore the conclusions of the risk assessment are unchanged. No change to the EIS is warranted.	No

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							to fish tissue egg-ovary and whole-body concentrations of selenium. Additionally, the Proponent has made a commitment to utilize the most stringent guidelines available. Based on the Project's proposed effluent concentrations of selenium, fish tissue sampling will be required as part of the EEM monitoring for the Project. The ECCC FEQG is the guideline applied to these studies, and the current use of this guideline will facilitate the comparison to future monitoring studies. Furthermore, the Proponent has not provided sufficient explanation in their response for the use of the less stringent US EPA guideline compared to the more conservative FEQG. The Proponent should explain their use of the US EPA guidelines over the ECCC FEQG or update the selenium fish tissue assessment in the draft EIS and the Wheeler River ERA as needed using ECCC's FEQG. As noted in IR-126, please update the selenium fish tissue assessment in the draft EIS and the Wheeler River ERA (Appendix 10- A (ERA) in Section 10) as needed using ECCC's FEQG. If the FEQG will not be used, provide further rationalization for the use of the US EPA guidelines when creating the study on fish tissue selenium concentration in the EEM.	<table><tr><th>Fish Species</th><th>Lake</th><th>Muscle ug/g fw</th><th>Muscle ug/g dw</th><th>Whole ug/g dw</th></tr><tr><td>N. Pike</td><td>Ref</td><td>1.89E-01</td><td>7.56E-01</td><td>5.95E-01</td></tr><tr><td></td><td>WL North</td><td>1.86E-01</td><td>7.44E-01</td><td>5.86E-01</td></tr><tr><td></td><td>WL Mid</td><td>1.57E+00</td><td>6.28E+00</td><td>4.94E+00</td></tr><tr><td></td><td>WL South</td><td>1.51E+00</td><td>6.04E+00</td><td>4.76E+00</td></tr><tr><td></td><td>McGowan</td><td>1.02E+00</td><td>4.08E+00</td><td>3.21E+00</td></tr><tr><td></td><td>Russell</td><td>8.12E-01</td><td>3.25E+00</td><td>2.56E+00</td></tr><tr><td>W. Sucker</td><td>Ref</td><td>1.46E-01</td><td>5.84E-01</td><td>4.60E-01</td></tr><tr><td></td><td>WL North</td><td>1.43E-01</td><td>5.72E-01</td><td>4.50E-01</td></tr><tr><td></td><td>WL Mid</td><td>1.74E+00</td><td>6.96E+00</td><td>5.48E+00</td></tr><tr><td></td><td>WL South</td><td>1.66E+00</td><td>6.64E+00</td><td>5.23E+00</td></tr><tr><td></td><td>McGowan</td><td>1.06E+00</td><td>4.24E+00</td><td>3.34E+00</td></tr><tr><td></td><td>Russell</td><td>8.06E-01</td><td>3.22E+00</td><td>2.54E+00</td></tr></table> Notes: dry wt = fresh wt / (1-0.75) [EPA (2021)] whole = muscle / 1.27 [EPA (2021)] **<u>References:</u>** MDMER. 2023. Metal and Diamond Mining Effluent Regulations. SOR/2002-222. Last amended June 9, 2023. Minister of Justice. EPA. 2021. 2021 Revision to: Aquatic Life Ambient Water Quality Criterion for Selenium 2016. EPA 822-R-21-006. U.S. Environmental Protection Agency. ECCC. 2022. Federal Environmental Quality Guidelines. Selenium. Environment and Climate Change Canada.	
IR-130	-	CNSC	Physical stressors (noise and vibration) on wildlife	Section 9, Terrestrial Environment	**Context:** Sensory disturbances such as noise have been identified as stressors for selected wildlife (Ungulates, Furbearers, and Woodland Caribou), birds and amphibians in the Project area. However, there is no consideration of impacts from vibrations on these species. Also, impacts of noise and vibration on reptiles have not been assessed in the Project area. **Rationale:** While noise has been qualitatively assessed for selected wildlife, birds, and amphibians, there is no consideration of project-related vibrations as a sensory disturbance/physical stressor. Sensitive terrestrial species (specifically, herpetofauna, amphibians, invertebrates, and caribou) can be impacted by vibrations emanating from the operation of heavy machinery, blasting activities, and other anthropogenic activities at the Project site.	Please provide a discussion of impacts of physical stressors (specifically vibrations) on wildlife, birds, and amphibians in the Project area. Specific mitigation measures and/or monitoring for impacts from project-related vibrations should be considered, as appropriate. Also, include reptiles in the assessment of project-related noise and vibrations as sensory disturbance/physical stressor, or a justification for their exclusion.	This response has not been accepted. Denison has agreed to update the final EIS (Sections 9.3 and 9.4) to include vibration as a physical stressor to fauna in the project area. Please provide proposed text for the revised EIS, for SME review and acceptance.	The text in Section 9 of the attached revised Draft EIS includes vibration as a physical stressor on fauna. Vibration is identified in Section 9.3.3.3.2 in the context of information from Indigenous and local knowledge and engagement page 9-198 and Section 9.3.6.4.1 page 9-276 in the context of residual effects on caribou. Vibration within the context of effects related to sensory disturbance has been added to Section 9.3.4.2.1, pages 9-213, and 9-214 of the revised Draft EIS, as follows. Section 9.3.4.2.1 page 9-213 "Habitat alteration through sensory disturbance effects (such as noise, **<u>vibration</u>**, dust deposition, and artificial light) is expected to result in reduced habitat quality and effectiveness near Project components and infrastructure reaching beyond the Project Area into the Wildlife LSA."	Yes Revised Draft EIS, Section 9.3.4.2.1, pages 9-213, and 9-214

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					Also, impacts of physical stressors (noise and vibration) on reptiles were not assessed. These species should be included in this assessment due to their sensitivity to noise and vibrations.			Section 9.3.4.2.1 page 9-214 (two instances) "Habitat alteration through sensory disturbance effects (such as noise, **vibration**, dust deposition, and artificial light) will result in reduced habitat quality and effectiveness near Project components and infrastructure reaching beyond the Project Area into the Wildlife LSA."	
IR-134	IR-134-R1	ECCC	Wildlife and Wildlife habitat	Section 9, Terrestrial Environment	**Context:** The Proponent has committed to conduct pre-construction and pre-clearing surveys for multiple species, however the timing and methods for the surveys were not provided. Knowing the survey methodology for pre-construction and pre-clearing for little brown myotis and northern myotis is important for assessing cumulative impacts, effectiveness of adaptive management strategies as well as determining how bat species were considered in the EIS. **Rationale:** ECCC can determine whether the methodology the Proponent will use to collect data is appropriate and if the methodology would contribute to a more complete understanding cumulative effects and adaptive management strategies. A clear outline of how timing has been considered and incorporated into the methodologies is required to understand how sensitive periods for bats, such as roosting, have been considered in the EIS. An understanding of the methodologies and how these sensitive periods are being considered is required to evaluate the effectiveness of mitigation strategies and adaptive management strategies which are being developed by the Proponent.	The information provided by the Proponent regarding the roosting dates and potential habitat for bats is complete, however, the information related to the pre-construction and pre-clearing surveys is missing details on important habitat features for bat species at risk. As two Species at Risk Act (SARA) schedule 1 listed bat species, little brown myotis (Myotis lucifugus) and northern myotis (Myotis septentrionalis) have been identified in the Project area, effects need to be identified, avoided, lessened and monitored.		For clarification, the pre-construction and pre-clearing surveys will consist of wildlife sweeps conducted by qualified biologists within 7 days prior to any clearing activity at a specific location, and a 100 m buffer, within the Project Footprint. The wildlife sweeps will not be species-specific surveys focused on species at risk but will to be based on timing of Project related activities (i.e., will be completed in advance of site clearing activities). These surveys are intended to identify sensitive wildlife features such as hibernacula, dens, nests, cavities, mineral licks, that would require specific mitigation measures to avoid or minimize adverse effects on identified features and are not species-specific. The methods associated with these pre-construction and pre-clearing sweeps will be tailored to species at risk (including myotis species) that may potentially be using habitats at certain times of the year. Depending on the results of these sweeps, appropriate mitigation measures will be developed and implemented. This is a risk-based approach with the intent of reducing the potential of important wildlife features being adversely affected during vegetation or land disturbance activities. The wildlife sweeps would be conducted within 7 days prior to disturbance activities, year-round, so that sensitive features can be identified, and appropriate mitigation measures (e.g., avoidance, timing delay) can be developed and implemented, as appropriate.	No
IR-137	-	ECCC	Migratory birds, Wildlife and Wildlife Habitat, Vegetation and Wetlands	Section 9.2.1.3, Spatial and Temporal Boundaries for Vegetation and Ecosystems, Listed Plant Species and Wetlands Section 9.3.1.3.1, Spatial Boundaries for Ungulates, Furbearers and Woodland Caribou 9.4.1.3.1, Spatial Boundaries for Raptors, Migratory Breeding Birds, and Bird Species at Risk	**Context and Rationale:** The CNSC's Generic Guidelines for the Preparation of an EIS Pursuant to the Canadian Environmental Assessment Act, 2012 states that: "The EIS will describe the spatial boundaries, including local and regional study areas, for each VC to be used to assess the potential adverse environmental effects of the Project and provide a rationale for each boundary. Spatial boundaries will be defined taking into account the appropriate scale and spatial extent of potential environmental effects, community knowledge and Indigenous knowledge, current or traditional land and resource use by Indigenous groups, ecological, technical, social and cultural considerations." The information provided in the EIS does not enable a biologically relevant assessment of the Project's effects. The Proponent did not provide rationale for the selection of study areas for individual vegetation, wildlife or migratory bird valued components (VC). Different VCs may have different spatial boundaries for the LSA and/or RSA. For wildlife and bird VCs, the LSA is defined as a 1.7-km buffer from the Project area, and the	Provide a biologically relevant rationale for the delineated study boundaries (LSA and RSA) for all different valued components. Include the following information: • Descriptions of how the RSA and LSA boundaries were derived for all VCs. Specific to boreal caribou: Project Footprint: • Include a 500-m buffer of area of maximum physical disturbance to represent functional habitat loss for boreal caribou LSA: • Include a description of how the LSA takes into	This response has not been accepted. A biologically relevant explanation for the chosen RSA for caribou was not provided. It is not clear if the RSA is representative of the SK1 range for factors such as variability and biophysical features. Describe how the RSA used in the draft EIS is an accurate representation of the SK1 boreal caribou range. This clarification is necessary to ensure the RSA is representative of the entire SK1 Caribou range, including the natural variability of the landscape, and to assess any project effects that may be affected by an inaccurate RSA. It is also required to verify the Proponent's assessment of cumulative impacts to caribou. See also AD-56 in the Advice to Proponent table.	The SK1 conservation unit as envisioned by the province is not meant to represent a biologically relevant area based on our understanding of this through discussion with the province as implied by the review comment. Per ECCC (2020) information available to delineate boreal caribou ranges varies in certainty and therefore caribou ranges are categorized into three types: conservation units (low certainty), improved conservation units (medium certainty) and local population units (high certainty). ECCC (2020) also recognizes that there will be changes to conservation units and improved conservation units as more information becomes available. The SK1 conservation unit is a conglomerate of various habitats and ecosites types (rocky shield, sandy plains and varying topography of the Athabasca Plain ecoregion in the northwest and Churchill River Upland ecoregion in the southeast). Denison and its SME believe the approach utilize in the analysis provides an appropriate scale on which to consider local caribou populations relative to the Project. The EA guidelines do not require the proponent to do a range-wide assessment, nor does the delineation of the SK1 range imply that such an assessment is an appropriate scale on which to consider effects. As we understand it, the delineation of SK1 and SK2 is a function of the separation of more southern productive habitat types vs more northern ones, and even that distinction (though maybe useful and appropriate from a planning perspective) is arbitrary from a life history point of view since it is known that animals move between the ranges freely.	Yes Appendix 9-F incorporated (added) into the revised Draft EIS Appendices

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					RSA is defined as a 6.6-km buffer around the LSA. There is no information on how the spatial boundaries were derived. Specific to Woodland Caribou, boreal population (hereafter referred to as boreal caribou): <u>Project Footprint</u>: In a scientific assessment of critical habitat (Environment Canada, 2011) [1] ECCC demonstrated that the application of a 500-m buffer to mapped anthropogenic features best represents the combined effects of increased predation and avoidance on caribou population trends at the national scale. Adding a 500-m buffer to the Project footprint is required to represent functional habitat loss. The draft EIS does not appear to use a buffer for their Project area. The draft EIS (Section 9.3.1.3.1) states: "Project Area: the area within which the Project and all components/activities are located (i.e., the area of maximum physical disturbance). The Project Area covers 169.6 ha and is not VC-specific, but consistent throughout the EA." (p. 9-168) <u>LSA</u>: The defined LSA for boreal caribou has to consider avoidance of disturbed areas, predator access to undisturbed areas, reduction in connectivity and sensory disturbance. This required information is not detailed in the draft EIS. Adverse effects of Projects including predator and prey access to undisturbed areas, reduction in connectivity, and sensory disturbance to individual boreal caribou can vary and extend several kilometers depending on Project activities and ecological context. At minimum, the LSA should capture the above-mentioned effects. For boreal caribou, the Project footprint should be defined as the immediate area to be cleared, plus a 500-m buffer to represent functional habitat loss. Following this guidance, the LSA should be defined as a buffer of the Project footprint with the 500-m buffer. <u>RSA</u>: The Amended Recovery Strategy for Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada states: *Mitigation of adverse effects from individual projects/activities will require a coordinated approach and management of cumulative effects within and among ranges. A cumulative effects assessment is essential to position the proposed project/activity in the context of all current and future development activities. The cumulative effects assessment will:* • *Assess the impact of all disturbances (anthropogenic and natural) at the range-scale;*	account boreal caribou avoidance of disturbed areas, predator access to undisturbed areas, reduction in connectivity and sensory disturbance to individuals. <u>RSA</u>: • Include a description of how the RSA used in the draft EIS is an accurate representation of the SK1 boreal caribou range; **or** • Re-do the assessment with the RSA at the scale of the range See also related IRs: IR-154 and IR-156.		As per accepted environmental assessment methodology, the spatial boundaries were established to capture the extent of the expected/likely adverse effects, both direct and indirect, on the various valued components, that were expected as a result of the Project. The Project Footprint was delineated as the maximum extent of physical, direct disturbance resulting from the Project. The LSA was delineated to capture the extent of all direct, and most indirect effects of the Project on the wildlife VCs, including woodland caribou. The RSA was delineated to capture the extent of all potential Project indirect effects, in consideration of the life-requisites and behavior of the various VCs being assessed (i.e., a habitat-based assessment) including ungulates (e.g., woodland caribou) which are known to have large home ranges. The RSA was also delineated in the context of the cumulative effects assessment. Further the RSA is considered representative, as it includes habitat (ecosite types) that are found throughout the SK1 range. In particular, the habitat (and its potential to support woodland caribou, as classified by the Saskatchewan Ministry of Environment) in the RSA is relatively consistent with the remainder of the habitat in the SK1 range. To help display habitat suitability an appendix to Section 9 of the revised Draft EIS (Appendix 9-F) has been developed and is provided with the IR response package and revised Draft EIS submission. The reader is referred specifically to Figure 2-1 in revised Draft EIS Appendix 9-F as it concerns the above reference to habitat in the SK1 range. These study areas are appropriate, in that they capture the extent of the likely adverse effects of the Project on the VCs, to provide an ecologically relevant determination as to the likely adverse effect on the regional population of all assessed VCs, including woodland caribou (i.e., no dilution of the effects over the entire SK1 range – although this has been provided for context). The 500 m buffer around a physical disturbance was considered in the context of the extent of sensory disturbance, to allow Denison to determine the geographical extent of an effect (i.e., limited to the LSA, limited to the RSA) to allow the appropriate characterization of the effect to inform the determination of significance. Cumulative effects occur when the adverse effects of the Project, overlap in time and space, with the adverse effects from other projects and activities. As such, the RSA is the appropriate scale to appropriately conduct a defensible cumulative effects assessment – i.e., the effects of projects that are beyond the RSA spatial extent would not likely result in residual effects that could act cumulatively with the Project's effects, and consideration of effects that do not overlap spatially or temporally, are not cumulative, by definition. For the reviewer's context and consideration, refer to Attachment IR-137 for a summary of the Wheeler River Project's expected direct footprint (74.8 ha) and Project Area (area of maximum disturbance; 169.9 ha) compared to expected landscape disturbances from: a proposed underground uranium mining project in the Athabasca Basin (NexGen's Rook I Project), an underground mining project which recently completed the Saskatchewan EA process (Foran's McIlvenna Bay Project), and an open pit mining project which recently completed the federal EA process (Generation PGM's Marathon Palladium Project).	

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					• *Monitor habitat conditions, including the amount of current disturbed and undisturbed habitat, and amount of habitat being restored;* • *Account for planned disturbances; and* • *Assess the distribution of disturbance in large ranges for risk of range retraction in parts of the range.* The proposed Project's cumulative effects for boreal caribou are possible at the scale of the SK1 boreal caribou range. The RSA used for boreal caribou for this Project is only 40,173.6 ha, compared to the SK1 range, which is 18,034,870 ha. As such, it is too small to capture cumulative effects to this species and does not follow the Scientific Assessment to Support the Identification of Critical Habitat for Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada (Environment Canada, 2011) or the Amended Recovery Strategy for Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada. **Reference**: [1] Scientific Assessment to Support the Identification of Critical Habitat for Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada (Environment Canada, 2011).			Attachment IR-137 contains Table IR-137-1 and Figure IR-137-1; we also refer the reviewer to Section 2.2.8 Project Area and Figure 2.2-28 in the revised draft EIS for an overview of the Project spatial areas. Denison suggests that the FIRT's review of terrestrial environment IR responses be framed within the context of the Project's spatial boundaries. **<u>References:</u>** Environment and Climate Change Canada (ECCC). 2020. Amended Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. xiii + 143pp. Saskatchewan Ministry of Environment (ENV). 2023. Woodland Caribou in the Boreal Shield (SK1): Background Information.	
IR-142 IR-159 IR-167	IR-142-159-167-R1	ECCC	Wildlife and Wildlife Habitat	**Reference to EIS:** Section 9.3.3.3, Baseline Studies Section 9.3.5 Mitigation Measures IR 142, 159, and 167 Responses from Denison	**Context:** The Proponent has committed to conduct pre-construction and pre-clearing surveys for multiple species, however the timing and methods for the surveys were not provided. **Rationale:** Knowing the survey methodology for pre-construction and pre-clearing surveys across multiple species is important because the Proponent is intending to collect data so that ECCC can determine whether the methodology used to collect the data is appropriate and if the methodology would contribute to understanding cumulative effects and adaptive management. Understanding how timing has been considered and incorporated into the methodologies is required to understand how sensitive periods, such as nesting, breeding, foraging and migration, have been considered in the EIS. An understanding of the methodologies and how these sensitive periods are being considered is required to evaluate the effectiveness of mitigation strategies and adaptive management being developed by the Proponent for each species mentioned in IR-142, IR-159 and IR-167.	Provide survey methodology and timing for all preconstruction and pre-clearing surveys, including avian and species at risk surveys (caribou, wolverine).		As noted in the August 2023 IR responses, site clearing and other works that involve disturbance of vegetation and/or soil will be completed during least-risk timing windows for migratory birds and SAR (i.e., winter), where practical, to avoid disturbance during sensitive time periods. However, in the event that site clearing activities or other works are anticipated to occur during a sensitive timing window for migratory birds and SAR, the pre-disturbance wildlife sweeps would be conducted by qualified biologists at least 7 days prior to any scheduled vegetation/land disturbance. The biologist would search the proposed area to be cleared, plus a 100 m buffer, for sensitive wildlife features that may be used by avian SAR (e.g., nests and/or nesting cavities), woodland caribou, and bats (e.g., roosting sites/cavities). The wildlife sweeps will not be species-specific surveys focused on species at risk per se, but will be based on timing of Project related activities (i.e., will be completed in advance of site clearing activities). These surveys are intended to identify sensitive wildlife features such as hibernacula, dens, nests, cavities, mineral licks, that would require specific mitigation measures to avoid or minimize adverse effects on identified features and are not species-specific. Nevertheless, the methods associated with these pre-construction and pre-clearing sweeps will be tailored to species at risk that may potentially be using habitats at certain times of the year. For example, methods will include searching prominent topographic features such as rock outcropping or downed forest trees and debris where wolverine may establish denning sites. In the event the sweeps are conducted during the winter period, methods related to snow tracking would identify wolverine presence based on tracks and potential denning sites in the snow pack within ravines or drainages within the forested areas within the study areas (as per Resources Inventory Committee 1999). Additionally, methods will include searching for potential roost trees for bat species, as per protocols included in the Wildlife Habitat Features Field Guide (BC Ministry of	No

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								Environment and Climate Change Strategy, Ecosystems Branch 2019). Depending on the results of these sweeps, appropriate mitigation measures will be developed and implemented. If sensitive wildlife features are found, they will be documented (e.g., photographs, GPS location recorded). The data collected would inform the development and implementation of appropriate mitigation measures (e.g., appropriate set-back distances for Project activities and/or consideration of timing windows as per SK MOE (2017), in consideration of applicable laws and regulations (e.g., Migratory Birds Conservation Act, Wildlife Act), as appropriate. **<u>References:</u>** B.C. Ministry of Environment and Climate Change Strategy Ecosystems Branch. 2019. Wildlife Habitat Features Field Guide (Kootenay Boundary Region). October 2019. Pp. 119 Resources Inventory Committee. 1999. Inventory Methods for Medium-Sized Territorial Carnivores: Coyote, Red Fox, Lynx, Bobcat, Wolverine, Fisher and Badger. Standards for Components of BC's Biodiversity No. 25. Ministry of Environment, Lands and Parks. Saskatchewan Ministry of Environment (SK MOE). 2017. Saskatchewan Activity Restriction Guidelines for Sensitive Species. https://publications.saskatchewan.ca/api/v1/products/79242/formats/89555/download (accessed July 2021).	
IR-143	-	ECCC	Wildlife and Wildlife habitat	Section 9.3.3.3, Baseline Studies	**Context and Rationale:** The baseline caribou data is insufficient to understand potential Project impacts to this species. Presence/absence detection was provided by camera traps, incidental observations, winter track and pellet survey. Additional information and analyses on caribou use of the landscape during all life stages of the Project area is required to assess impacts and to determine significance of impact from the Project to caribou.	Provide details on the baseline caribou data including: • Revision of map 9.3-8 to include all observations, categorized by type, season and year (see also IR-145); and • Description of seasonal use of the LSA, RSA and caribou range. • Description of Project areas used by caribou. • Description of future studies planned to assess habitat use by caribou. Include specific details on how many additional years of aerial surveys will be completed to assess the caribou baseline conditions. Utilizing additional data noted above and specified in IR-145,	This response has not been accepted. The information provided by the Proponent is insufficient to understand potential Project impacts and appropriate mitigation that would be required. Information on important habitat features and how caribou are using the landscape is required to complete an accurate assessment of the Project impacts to caribou habitat and habitat use. In the absence of this information, ECCC will assume a conservative estimate that all habitat features are high value and are used for important life functions. Although the Proponent provided a map showing telemetry points (provided by the Province of Saskatchewan), this map doesn't have sufficient detail to assess habitat use and important biophysical features of the Project area. These details are necessary to assess habitat use and important biophysical features of the Project area.	In the Proponent's and its SME's view, the information provided in the habitat-based environmental assessment is considered to adequately describe the baseline conditions of woodland caribou and allow the assessment of likely adverse effects of the Project on woodland caribou, using accepted environmental methods and approaches. To further address the reviewer's comment, we have prepared additional figures (below) to consider the Project study areas and Project footprint + 500 m area; however, these are provided as supplemental information and will not change the assessment presented in the draft EIS. The baseline data and telemetry points (i.e., best data available at the time) were used to document the habitat use (by type and season) at an appropriate scale and detail to inform the assessment of the Caribou VC in terms of: alteration/loss of habitat; change in movement patterns; and change in mortality – the likely effects selected to inform and focus the assessment. Based on the baseline field data from 2017 to 2021, of the 397 observations recorded, woodland caribou were primarily observed in Jackpine-blueberry/lichen (BS3) ecosite type (n=268 observations) or in association with black spruce treed bog (BS17) ecosite (n=83). In the remaining observations, woodland caribou were found associated with waterbodies/ rush sandy shore (BS26) ecosite (n=17), black spruce-blueberry/lichen (BS7) ecosite (n=10), black spruce-jack pine/feather moss (BS9) ecosite (n=6) , anthropogenic/disturbed (AN) sites (n=6) and Jackpine-blueberry/lichen (BS3) / Black spruce-blueberry/lichen (BS7) ecosite (n=5) followed by Jack pine – black spruce / feathermoss (BS4) ecosite (n=1) and Labrador tea shrubby bog (BS18) ecosite (n=1). These	Yes Appendix 9-F incorporated (added) into the revised Draft EIS Appendices

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						explain how caribou use of the area could be affected by the Project throughout all seasons and life stages (e.g., calving, post-calving, rutting, wintering). See also related: IR-152.	See follow-up IR-143-144-R1 and IR-143-145-R1.	observations within these ecosite types are presented in Figure 9.3-8 in revised Draft EIS. According to the habitat potential classifications of these ecosite types identified by the Saskatchewan Ministry of Environment, these ecosites are considered to have the potential (at some point in time) to develop into moderate/high suitability habitat for woodland caribou (as shown in Figure 3). As defined in the Range Plan for Woodland Caribou in Saskatchewan; Boreal Plain Ecozone- SK2 Central Caribou Administration Unit, habitat potential refers to the ability or capability of a habitat type to support a wildlife species for its various life cycle requirements. Potential does not consider the current state of the habitat (e.g., recently burned, harvested or industrial development), but its optimal state." (Saskatchewan Ministry of Environment 2019). As is illustrated, the majority of these data points illustrated in Figure 2-2 and Figure 2-3 in revised Draft EIS Appendix 9-F are located beyond the LSA and to the north and east of the Project Area. Figure 2-3, Figure 2-5, and Figure 2-7 in revised Draft EIS Appendix 9-F illustrate the location of caribou observations in relation to the indicates habitat life requisite attributes (forage, refuge, and calving) based on the information received from the SK MOE (2024) at the Project Area, LSA, and RSA scales. Figure 2-4, Figure 2-6, and Figure 2-8 in revised Draft EIS Appendix 9-F illustrate the location of caribou observations in relation to the indicates habitat life requisite attributes (forage, refuge, and calving) based on the information received from the SK MOE (2024) at the Project Footprint + 500 m scale. Knowledge holders confirmed that woodland caribou utilize the area and might be encountered in the Terrestrial RSA (19-LK-ERFNTrap-134.149; 19-LK-ERFNTrap-134.151), and that local trappers encounter caribou regularly at their traplines in winter and see them during summer (19-LK-ERFNTrap-134.151). They have not observed any changes in densities and suggest that the same number of caribou have been found in the area over the years (19 -LK-ERFNTrap-134.156). Caribou are reported to calve near the Wheeler River, which has lots of heavy muskeg in the area (16-EN-ERFN-100.15). Knowledge holders identified the area east of Highway 914 and northeast of Russell Lake, between Russell Lake and McDougall Lake (corresponding with Omnia winter tracking transects #5 and #9; see revised draft EIS Appendix 9-B, Omnia Terrestrial Environment Wildlife and Vegetation Baseline Inventory Figure 2.6-1) as an area where caribou are commonly observed in the winter. "There are tall trees here, some small hills with protected valley areas, and it seems sheltered. There is caribou moss in this area" (19-LK-ERFNTrap-134.154). Caribou are known to travel through areas of younger forest and burns to get to preferred habitat types (19-LK-ERFNTrap-134.152), such as more mature forests and areas with abundant lichen growth. "Caribou […] eat low bush cranberries and lichen; lichen takes many years to grow and recover" (18-EN-ERFN-5.76). Caribou have been observed to use areas of younger forest stands with regenerating pine. In years with deep snow or when there is a hard crust on the snow, they may eat the tips of fresh growth off the younger pine trees (19-LK-ERFNTrap-134.155). We reiterate that the additional information collated and displayed in the maps provided to support this IR response is consistent with and does not contradict anything presented in the draft EIS documentation. The habitat potential for life history use areas summarized	

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								here were incorporated in the draft EIS approach of delineating 'available habitat' based on ecosite classification for woodland caribou in the Project study areas. In combination with this, in the draft EIS we assumed caribou presence year-round which was assumed to include all life requisite attributes (forage, refuge, calving). The basis for the draft EIS's assessment of potential project and cumulative effects on woodland caribou was adequate and the additional information provided to the reviewer here does not result in any changes to the conclusions of the EIS. In closing, we note that the Saskatchewan Environmental Assessment Review Panel and Environmental Assessment Branch have completed their review of the Wheeler River Project draft EIS plus Denison's response to technical review comments and there are no outstanding concerns with the caribou assessment. Denison has been working closely with the Province of Saskatchewan's, Woodland Caribou Team Lead, Habitat Ecologist and Conservation Specialists and fully anticipates ongoing oversight and approvals from the Ministry of Environment related to caribou through the Caribou Management Framework, EA decision conditions related to offsetting, the broader provincial process for project permitting, and the ongoing regulatory role of the Ministry of Environment for mining projects in Saskatchewan. Denison is committed to continuing to work with the province in this regard.	
IR-144	-	ECCC	Wildlife and Wildlife habitat	Section 9.3.3.3, Baseline Studies – map 9.3-8	**Context and Rationale:** The mapping of caribou observations during baseline studies provided in Figure 9.3-8, "Caribou Sign Observations in the Wildlife Study Areas," is insufficient to enable conclusions to be drawn. ECCC is not able to review the spatial aspect of caribou observations without a map of all available observations. Additional information is available, as stated in Section 9.3.3.3.3: *"A total of 200 observations were made between 2017 and 2019 and recorded as either caribou sign (i.e., tracks, pellets, and evidence of feeding activity based on ground feeding craters and arboreal feeding evidence) or photographs (collected through the wildlife camera study) to document caribou presence in the LSA and RSA. Most observations occurred in the Terrestrial RSA, with observations concentrated in the north and southeast portions.* *Three observations occurred in the southeast portion of the Wildlife LSA, and no caribou sign was observed in the Project Area. Figure 9.3-8 provides an overview of some caribou sign observed during the baseline studies."*	Update map 9.3-8 to show all caribou observations during baseline studies, broken down by type of observation (camera, incidental, pellet, track) and season/year when the observation was made. Include additional data from the Province of Saskatchewan (see also IR-145) to help characterize caribou use on a spatial map.	This response has not been accepted. The information provided by the Proponent is insufficient to understand potential Project impacts to this species and characterize the risk to determine impacts from the Project to caribou and appropriate level of offsetting mitigation that would be required. The revised map 9.3-8 shows seasonal use, however, it is challenging to see the overlapping features. The map does not allow the reader to get a good understanding of the seasonality of the data. Due to the fact that caribou use different habitat types in differing ways over the course of a year, seasonality of the data will allow for a deeper understanding of habitat use. The scale provided on the current map does not allow for a proper assessment of seasonal use, including differentiation of habitat use. Individual maps by season and survey type with larger scale insets that show areas with overlapping points would help to clarify the map and allow for a greater understanding of spatial and temporal features of caribou habitat. See follow-up IR-143-144-R1.	In the Proponent's and its SME's view, the baseline surveys in combination with information from other sources related to caribou were appropriate to adequately inform the habitat-based environmental assessment. The data collected and the analysis completed to inform the environmental assessment represent the best-available information on caribou relative to the Project, which has been updated to include up-to-date caribou habitat potential mapping for the SK1 range obtained in December 2023. Based on the baseline field data from 2017 to 2021, of the 397 observations recorded, woodland caribou were primarily observed in Jackpine-blueberry/lichen (BS3) ecosite type (n=268 observations) or in association with black spruce treed bog (BS17) ecosite (n=83). In the remaining observations, woodland caribou were found associated with waterbodies/ rush sandy shore (BS26) ecosite (n=17), black spruce-blueberry/lichen (BS7) ecosite (n=10), black spruce-jack pine/feather moss (BS9) ecosite (n=6) , anthropogenic/disturbed (AN) sites (n=6) and Jackpine-blueberry/lichen (BS3) / Black spruce-blueberry/lichen (BS7) ecosite (n=5) followed by Jack pine – black spruce / feathermoss (BS4) ecosite (n=1) and Labrador tea shrubby bog (BS18) ecosite (n=1). These observations within these ecosite types are presented in Figure 9.3-8 in the revised Draft EIS. According to the habitat potential classifications of these ecosite types identified by the Saskatchewan Ministry of Environment, these ecosites are considered to have the potential (at some point in time) to develop into moderate/high suitability habitat for woodland caribou (as shown Figure 2-2 in revised draft EIS Appendix 9-F). As defined in the Range Plan for Woodland Caribou in Saskatchewan; Boreal Plain Ecozone- SK2 Central Caribou Administration Unit, habitat potential refers to the ability or capability of a habitat type to support a wildlife species for its various life cycle requirements. Potential does not consider the current state of the habitat (e.g., recently burned, harvested or industrial development), but its optimal state." (Saskatchewan Ministry of	Yes Appendix 9-F incorporated (added) into the revised Draft EIS Appendices

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								Environment, 2019). As is illustrated, the majority of these data points illustrated in Figure 2-2 and Figure 2-3 in revised draft EIS Appendix 9-F are located beyond the LSA and to the north and east of the Project Area. Figure 2-3, Figure 2-5, and Figure 2-7 in revised draft EIS Appendix 9-F illustrate the location of caribou observations in relation to the indicates habitat life requisite attributes (forage, refuge, and calving) based on the information received from the SK MOE (2024) at the Project Area, LSA, and RSA scales. Figure 2-4, Figure 2-6, and Figure 2-8 in revised draft EIS Appendix 9-F illustrate the location of caribou observations in relation to the indicates habitat life requisite attributes (forage, refuge, and calving) based on the information received from the SK MOE (2024) at the Project Footprint + 500 m scale. We reiterate that the additional information collated and displayed in the maps provided to support this IR response is consistent with and does not contradict anything presented in the draft EIS documentation. The habitat potential for life history use areas summarized here were incorporated in the draft EIS approach of delineating 'available habitat' based on ecosite classification for woodland caribou in the Project study areas. In combination with this, in the draft EIS we assumed caribou presence year-round which was assumed to include all life requisite attributes (forage, refuge, calving). The basis for the draft EIS's assessment of potential project and cumulative effects on woodland caribou was adequate and the additional information provided to the reviewer here does not result in any changes to the conclusions of the EIS. In closing, we note that the Saskatchewan Environmental Assessment Review Panel and Environmental Assessment Branch have completed their review of the Wheeler River Project draft EIS plus Denison's response to technical review comments and there are no outstanding concerns with the caribou assessment. Denison has been working closely with the Province of Saskatchewan's, Woodland Caribou Team Lead, Habitat Ecologist and Conservation Specialists and fully anticipates ongoing oversight and approvals from the Ministry of Environment related to caribou through the Caribou Management Framework, EA decision conditions related to offsetting, the broader provincial process for project permitting, and the ongoing regulatory role of the Ministry of Environment for mining projects in Saskatchewan. Denison is committed to continuing to work with the province in this regard.	
IR-143-144-R1	IR-143-144-R1		Wildlife and Wildlife Habitat	Section 9.3.3.3, Baseline Studies IR-143 and 144 Responses from Denison	**Context:** In the IR-143 response, the Proponent states: "As described in the EIS, caribou may use open fen and treed bog habitat types for calving during the spring/summer period. Information from Indigenous Knowledge (IK) was included in the EIS, including potential calving areas in the Terrestrial RSA." The Proponent provided a revised Map 9.3-8 to display these features. **Rationale:** While the revised Map 9.3-8 shows seasonal use, it is challenging to see the overlapping spatial and temporal features. The map is not adequate for fully understanding the seasonality	Provide individual maps by season and survey type or with larger scale insets that show areas with overlapping spatial and temporal features.		Denison obtained and appropriately considered all publicly available data/information, including information on caribou and habitat in the SK1 range obtained from Saskatchewan Environment, which as updated caribou habitat potential in December 2023, as well as the Recovery Strategy for Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada (ECCC 2020) to adequately inform the environmental assessment to appropriately determine the residual effects and their significance on caribou, as per accepted environmental assessment methodology. The baseline surveys for caribou were appropriate to adequately inform the habitat-based environmental assessment, considering the low suitability of the habitat expected to be disturbed by the Project and the low caribou use indicated. The data collected and the	Yes Appendix 9-F incorporated (added) into the revised Draft EIS Appendices

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					of the data. The scale provided does not allow for a proper assessment of seasonal use, including differentiation of habitat use such as calving, movement or wintering habitats. Some habitats, based on use, may be more used for more critical functions than others and this information cannot be adequately assessed based on the information provided.			analysis used to inform the environmental assessment represent the best-available information on caribou relative to the Project. Figure 9.3-8 in revised draft EIS shows the EA study areas and the caribou observed within the ecosite types, while Figure 2-2 in revised Draft EIS Appendix 9-F shows the EA study areas and the caribou observed within the ecosite types as classified and delineated by the Ministry of Environment as per their protocol (in terms of the caribou habitat potential; low, moderate, high). These figures include larger scale insets to provide greater detail in relation to the location of the woodland caribou observations in context to the habitat (ecosite) types and the habitat suitability (as classified by Saskatchewan Environment) within the Study Areas. Based on the baseline field data from 2017 to 2021, of the 397 observations recorded, woodland caribou were primarily observed in Jackpine-blueberry/lichen (BS3) ecosite type (n=268 observations) or in association with black spruce treed bog (BS17) ecosite (n=83). In the remaining observations, woodland caribou were found associated with waterbodies/ rush sandy shore (BS26) ecosite (n=17), black spruce-blueberry/lichen (BS7) ecosite (n=10), black spruce-jack pine/feather moss (BS9) ecosite (n=6) , anthropogenic/disturbed (AN) sites (n=6) and Jackpine-blueberry/lichen (BS3) / Black spruce-blueberry/lichen (BS7) ecosite (n=5) followed by Jack pine – black spruce / feathermoss (BS4) ecosite (n=1) and Labrador tea shrubby bog (BS18) ecosite (n=1). These observations within these ecosite types are presented in Figure 9.3-8 in the revised Draft EIS. According to the habitat potential classifications of these ecosite types identified by the Saskatchewan Ministry of Environment, these ecosites are considered to have the potential (at some point in time) to develop into moderate/high suitability habitat for woodland caribou (as shown Figure 2-2 in revised draft EIS Appendix 9-F). As defined in the Range Plan for Woodland Caribou in Saskatchewan; Boreal Plain Ecozone- SK2 Central Caribou Administration Unit, habitat potential refers to the ability or capability of a habitat type to support a wildlife species for its various life cycle requirements. Potential does not consider the current state of the habitat (e.g., recently burned, harvested or industrial development), but its optimal state." (Saskatchewan Ministry of Environment 2019). As is illustrated, the majority of these data points illustrated in Figure 2-2 and Figure 2-3 in revised Draft EIS Appendix 9-F are located beyond the LSA and to the north and east of the Project Area. Figure 2-3, Figure 2-5, and Figure 2-7 in revised Draft EIS Appendix 9-F illustrate the location of caribou observations in relation to the indicates habitat life requisite attributes (forage, refuge, and calving) based on the information received from the SK MOE (2024) at the Project Area, LSA, and RSA scales. Figure 2-4, Figure 2-6, and Figure 2-8 in revised Draft EIS Appendix 9-F illustrate the location of caribou observations in relation to the indicates habitat life requisite attributes (forage, refuge, and calving) based on the information received from the SK MOE (2024) at the Project Footprint + 500 m scale.	

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								We reiterate that the additional information collated and displayed in the maps provided to support this IR response is consistent with and does not contradict anything presented in the draft EIS documentation. The habitat potential for life history use areas summarized here were incorporated in the draft EIS approach of delineating 'available habitat' based on ecosite classification for woodland caribou in the Project study areas. In combination with this, in the draft EIS we assumed caribou presence year-round which was assumed to include all life requisite attributes (forage, refuge, calving). The basis for the draft EIS's assessment of potential project and cumulative effects on woodland caribou was adequate and the additional information provided to the reviewer here does not result in any changes to the conclusions of the draft EIS. In closing, we note that the Saskatchewan Environmental Assessment Review Panel and Environmental Assessment Branch have completed their review of the Wheeler River Project draft EIS plus Denison's response to technical review comments and there are no outstanding concerns with the caribou assessment. Denison has been working closely with the Province of Saskatchewan's, Woodland Caribou Team Lead, Habitat Ecologist and Conservation Specialists and fully anticipates ongoing oversight and approvals from the Ministry of Environment related to caribou through the Caribou Management Framework, EA decision conditions related to offsetting, the broader provincial process for project permitting, and the ongoing regulatory role of the Ministry of Environment for mining projects in Saskatchewan. Denison is committed to continuing to work with the province in this regard. **<u>References:</u>** Environment and Climate Change Canada (ECCC). 2020. Amended Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. xiii + 143pp.	
IR-145	-	ECCC	Wildlife and Wildlife habitat	Section 9.3.3.3, Woodland Caribou	**Context and Rationale:** The Proponent has not provided sufficient information on how caribou use the landscape, including identification of areas for different life stages of caribou (calving, post-calving, rutting and wintering). The University of Saskatchewan published a report entitled Population and habitat ecology of boreal caribou and their predators in the Saskatchewan Boreal Shield. This report contains information on habitat types that are used during different life stages. Additionally, Appendix H of the Amended Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada 20202 [1] details habitat characteristics required by boreal caribou to carry out life processes necessary for survival and recovery. The scientific literature review (Section 9.3.3.3.1) on Woodland Caribou states: "While calving areas have not been documented	1. Provide, based off existing literature or available data and the Amended Recovery Strategy for Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada: • information on known important habitat features or biophysical attributes in Project areas for different caribou life stages (calving, post-calving, rutting, wintering), • a map(s) of the type and spatial extent of important caribou habitat features or biophysical attributes of the	This response has not been accepted. The map provided by the Proponent lacks spatial and temporal details needed to complete an assessment of habitat importance to caribou relative to the Project. The Proponent did not provide information or mapping on known important habitat features, habitat quality or biophysical attributes and mapping was not provided at the different scales as requested in the IR. ECCC recommends that the Proponent provide mapping of important caribou habitat features, such as those used for calving, wintering, and movement to assess how caribou utilize the landscape and assess potential impacts to caribou	Denison obtained and appropriately considered all publicly available data/information, including information on caribou and habitat in the SK1 range obtained from Saskatchewan Environment, which as updated caribou habitat potential in December 2023, as well as the Recovery Strategy for Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada (ECCC 2020) to adequately inform the environmental assessment to appropriately determine the residual effects and their significance on caribou, as per accepted environmental assessment methodology. The baseline surveys for caribou were appropriate to adequately inform the habitat-based environmental assessment. The data collected and the analysis used to inform the environmental assessment represent the best-available information on caribou relative to the Project. Based on the baseline field data from 2017 to 2021, of the 397 observations recorded, woodland caribou were primarily observed in Jackpine-blueberry/lichen (BS3) ecosite type (n=268 observations) or in association with black spruce treed bog (BS17) ecosite (n=83). In the remaining observations, woodland caribou were found associated with	Yes Appendix 9-F incorporated (added) into the revised Draft EIS Appendices

Original IR#	Follow-Up IR #	SME	Project Effects Link	Reference to EIS, appendices, or supporting documentation	Context and Rationale	Information Requirement (IR)	Rationale for Status	Denison's Response	EIS Updates (Yes/No; if Yes, provide EIS Section number)
					within the SK1 range, it is recognized that caribou may use open fen and treed bog habitat types for calving during the spring/summer period. In Saskatchewan, caribou habitat used during the calving season in the SK2 range demonstrated a strong selection for treed muskegs, but avoidance of jack pine, mixed hardwood stands, and roads (Dyke 2008)." ECCC is not able to verify the Proponent's effects assessment without sufficient information on important habitat or biophysical attributes for caribou within the study areas. [1] https://www.canada.ca/en/environment-climate-change/services/species-risk-public-registry/recovery-strategies/woodland-caribou-boreal-2020.html#toc0	study areas as defined in Appendix H of the Recovery Strategy, ○ mapping should be at the RSA/LSA level as well as larger-scale mapping at the scale of the Project footprint. 2. Assess the potential direct and indirect effects based on additional information on caribou from bullet A above. See also related IRs: IR-143 and IR-152. **Suggestions for mitigation and follow-up measures:** ECCC recommends that the Proponent contact the Province of Saskatchewan to enquire about obtaining caribou telemetry data in the Project area. The data can be analyzed to determine important habitat features in the Project area.	due to impacts to these areas. Knowing detailed data on caribou habitat use will contribute to identifying mitigation measures and potential offsetting. In the absence of telemetry data, mapping of habitat quality, based on a combination of known ecosites and known important biophysical features will provide a reasonable alternative, where known important caribou habitat features cannot be mapped. The provision of information on habitat use and biophysical features will facilitate the verification of the Proponent's effects assessment. See follow-up IR-143-145-R1.	waterbodies/ rush sandy shore (BS26) ecosite (n=17), black spruce-blueberry/lichen (BS7) ecosite (n=10), black spruce-jack pine/feather moss (BS9) ecosite (n=6) , anthropogenic/disturbed (AN) sites (n=6) and Jackpine-blueberry/lichen (BS3) / Black spruce-blueberry/lichen (BS7) ecosite (n=5) followed by Jack pine – black spruce / feathermoss (BS4) ecosite (n=1) and Labrador tea shrubby bog (BS18) ecosite (n=1). These observations within these ecosite types are presented in Figure 9.3-8 in the revised Draft EIS. According to the habitat potential classifications of these ecosite types identified by the Saskatchewan Ministry of Environment, these ecosites are considered to have the potential (at some point in time) to develop into moderate/high suitability habitat for woodland caribou (as shown in Figure 3). As defined in the Range Plan for Woodland Caribou in Saskatchewan; Boreal Plain Ecozone- SK2 Central Caribou Administration Unit, habitat potential refers to the ability or capability of a habitat type to support a wildlife species for its various life cycle requirements. Potential does not consider the current state of the habitat (e.g., recently burned, harvested or industrial development), but its optimal state." (Saskatchewan Ministry of Environment 2019). As is illustrated, the majority of these data points illustrated in Figure 2-2 and Figure 2-3 in revised Draft EIS Appendix 9-F are located beyond the LSA and to the north and east of the Project Area. Figure 2-3, Figure 2-5, and Figure 2-7 in revised Draft EIS Appendix 9-F illustrate the location of caribou observations in relation to the indicates habitat life requisite attributes (forage, refuge, and calving) based on the information received from the SK MOE (2024) at the Project Area, LSA, and RSA scales. Figure 2-4, Figure 2-6, and Figure 2-8 in revised Draft EIS Appendix 9-F illustrate the location of caribou observations in relation to the indicates habitat life requisite attributes (forage, refuge, and calving) based on the information received from the SK MOE (2024) at the Project Footprint + 500 m scale. We reiterate that the additional information collated and displayed in the maps provided to support this IR response is consistent with and does not contradict anything presented in the draft EIS documentation. The habitat potential for life history use areas summarized here were incorporated in the draft EIS approach of delineating 'available habitat' based on ecosite classification for woodland caribou in the Project study areas. In combination with this, in the draft EIS we assumed caribou presence year-round which was assumed to include all life requisite attributes (forage, refuge, calving). The basis for the draft EIS's assessment of potential project and cumulative effects on woodland caribou was adequate and the additional information provided to the reviewer here does not result in any changes to the conclusions of the EIS. In closing, we note that the Saskatchewan Environmental Assessment Review Panel and Environmental Assessment Branch have completed their review of the Wheeler River Project draft EIS plus Denison's response to technical review comments and there are no outstanding concerns with the caribou assessment. Denison has been working closely with the Province of Saskatchewan's, Woodland Caribou Team Lead, Habitat Ecologist and Conservation Specialists and fully anticipates ongoing oversight and approvals from the Ministry of Environment related to caribou through the Caribou Management Framework,	

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								EA decision conditions related to offsetting, the broader provincial process for project permitting, and the ongoing regulatory role of the Ministry of Environment for mining projects in Saskatchewan. Denison is committed to continuing to work with the province in this regard.	
IR-143 IR-145	IR-143-145-R1	ECCC	Wildlife and Wildlife Habitat	Section 9.3.3.3, Baseline Studies IR-143 and 145 Responses from Denison	**Context:** Information presented on boreal caribou in the study areas in the Proponent's response is insufficient to: • characterize and determine the risk of Project impacts, • and • calculate the appropriate level of offsetting required. Information on important habitat features and how caribou are using the landscape is required to complete an assessment of the Project impacts. Although the Proponent provided a map showing telemetry points (provided by the Province of Saskatchewan), the map lacked sufficient detail to assess habitat use and important biophysical features of the Project area. The IR-145 response states: "Available habitat was determined as the ecosites in which caribou / caribou sign were detected most frequently during the baseline studies, and the EIS used a precautionary approach by assuming caribou use of these areas during all seasons and life stages." As a part of the analysis, calving areas are particularly important to delineate if information is available as a key part of all life stages. In the draft EIS, the habitat types that are considered non-habitat for caribou are open bogs (BS20), leatherleaf shrubby fens (BS22), graminoid fens (BS24), open fens (BS25), rush sandy shorelines (BS26), sedge sandy shorelines (BS27) and waterbodies. **Rationale:** Woodland caribou are known to use treed bog and open fen (Section 9.3.3.3.1 of the draft EIS), however open fens and bogs are excluded from the identified available Woodland Caribou habitat, based on not detecting presence or not detecting presence as frequently. Mapping of important caribou habitat features is required to assess important potential impacts to caribou. In the absence of	1. Provide maps at the Project Development Area (PDA)/Local Study Area (LSA)/Regional Study Area (RSA) scale showing caribou habitat quality. 2. Provide maps at the PDA/LSA/RSA scale showing areas with the appropriate biophysical attributes for calving and other life stages, such as important wintering habitats and movement corridors. Indicate the source of telemetry data (i.e., University of Saskatchewan and/or the Province of Saskatchewan).		Denison obtained and appropriately considered all publicly available data/information, including information on caribou and habitat in the SK1 range obtained from Saskatchewan Environment, which as updated caribou habitat potential in December 2023, as well as the Recovery Strategy for Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada (ECCC 2020) to adequately inform the environmental assessment to appropriately determine the residual effects and their significance on caribou, as per accepted environmental assessment methodology. Figure 9.3-8 in revised Draft EIS shows the study areas and the caribou observed within the ecosite types, while Figure 2-2 in revised Draft EIS Appendix 9-F shows the EA study areas and the caribou observed within the ecosite types as classified and delineated by the Ministry of Environment as per their protocol (in terms of the caribou habitat potential; low, moderate, high). Based on the baseline field data from 2017 to 2021, of the 397 observations recorded, woodland caribou were primarily observed in Jackpine-blueberry/lichen (BS3) ecosite type (n=268 observations) or in association with black spruce treed bog (BS17) ecosite (n=83). In the remaining observations, woodland caribou were found associated with waterbodies/ rush sandy shore (BS26) ecosite (n=17), black spruce-blueberry/lichen (BS7) ecosite (n=10), black spruce-jack pine/feather moss (BS9) ecosite (n=6) , anthropogenic/disturbed (AN) sites (n=6) and Jackpine-blueberry/lichen (BS3) / Black spruce-blueberry/lichen (BS7) ecosite (n=5) followed by Jack pine – black spruce / feathermoss (BS4) ecosite (n=1) and Labrador tea shrubby bog (BS18) ecosite (n=1). These observations are presented in Figure 9.3-8 in revised Draft EIS. According to the habitat potential classifications of these ecosite types identified by the Saskatchewan Ministry of Environment, these ecosites are considered to have the potential (at some point in time) to develop into moderate/high suitability habitat for woodland caribou (as shown Figure 2-2 in revised Draft EIS Appendix 9-F). As defined in the Range Plan for Woodland Caribou in Saskatchewan; Boreal Plain Ecozone- SK2 Central Caribou Administration Unit, habitat potential refers to the ability or capability of a habitat type to support a wildlife species for its various life cycle requirements. Potential does not consider the current state of the habitat (e.g., recently burned, harvested or industrial development), but its optimal state." (Saskatchewan Ministry of Environment 2019). As is illustrated, the majority of these data points illustrated in Figure 2-2 and Figure 2-3 in revised Draft EIS Appendix 9-F are located beyond the LSA and to the north and east of the Project Area. Figure 2-3, Figure 2-5, and Figure 2-7 in revised Draft EIS Appendix 9-F illustrate the location of caribou observations in relation to the indicates habitat life requisite attributes (forage,	Yes Updates to Figure 9.3-8 and Appendix 9-F has been incorporated into the revised Draft EIS Appendices

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					telemetry data, mapping of habitat quality, based on a combination of known ecosites and known important biophysical features will provide a reasonable alternative where known important caribou habitat features cannot be mapped.			refuge, and calving) based on the information received from the SK MOE (2024) at the Project Area, LSA, and RSA scales. Figure 2-4, Figure 2-6, and Figure 2-8 in revised Draft EIS Appendix 9-F illustrate the location of caribou observations in relation to the indicates habitat life requisite attributes (forage, refuge, and calving) based on the information received from the SK MOE (2024) at the Project Footprint + 500 m scale. We reiterate that the additional information collated and displayed in the maps provided to support this IR response is consistent with and does not contradict anything presented in the draft EIS documentation. The habitat potential for life history use areas summarized here were incorporated in the draft EIS approach of delineating 'available habitat' based on ecosite classification for woodland caribou in the Project study areas. In combination with this, in the draft EIS we assumed caribou presence year-round which was assumed to include all life requisite attributes (forage, refuge, calving). The basis for the draft EIS's assessment of potential project and cumulative effects on woodland caribou was adequate and the additional information provided to the reviewer here does not result in any changes to the conclusions of the EIS. In closing, we note that the Saskatchewan Environmental Assessment Review Panel and Environmental Assessment Branch have completed their review of the Wheeler River Project draft EIS plus Denison's response to technical review comments and there are no outstanding concerns with the caribou assessment. Denison has been working closely with the Province of Saskatchewan's, Woodland Caribou Team Lead, Habitat Ecologist and Conservation Specialists and fully anticipates ongoing oversight and approvals from the Ministry of Environment related to caribou through the Caribou Management Framework, EA decision conditions related to offsetting, the broader provincial process for project permitting, and the ongoing regulatory role of the Ministry of Environment for mining projects in Saskatchewan. Denison is committed to continuing to work with the province in this regard.	
IR-148	-	ECCC	Wildlife and Wildlife habitat	Section 9.3.4.2.1, Alteration and/or Loss of Habitat	**Context and Rationale:** ECCC analyzes disturbance for caribou at the range level, in this case within the SK1 range. However, the Proponent did not provide an adequate assessment of total disturbance at the range level. The draft EIS (Section 9.3.4.2.1 p. 9-211) reads: "The SK1 Boreal Shield Woodland Caribou Management Unit has relatively low levels of anthropogenic disturbance and was exposed to large fire disturbances in the past 40 years (ECCC 2019). Environment and Climate Change Canada (2019) identified this caribou population as being self-sustaining at a threshold of 40% undisturbed habitat with the total anthropogenic disturbance not exceeding 5% of their habitat. The current anthropogenic disturbance levels (without areas burnt by past forest fires) for the study areas are below this threshold (with the exception of the already disturbed Project Area) and are estimated as: 24.8 ha (14.6%) for the Project Area, 168 ha (3.5%) for the Wildlife LSA, and 599 ha (1.5%) for the Terrestrial RSA."	Provide the following in order to support analysis of habitat disturbance: 1. Calculation of total disturbance including natural and anthropogenic disturbance at the range level. 2. Description of effects on existing habitat at the scale of the range (for < 40% undisturbed habitat in the SK1). Include: • an account (and GIS file if available) of existing habitat	This response has not been accepted, due to outstanding information related to #2. ECCC's role is to provide advice to the CNSC under the Species at Risk Act and/or the Migratory Birds Convention Act to support compliance with these pieces of legislation in their decision making. Having access to project study area shapefiles allows ECCC to do their due diligence in validating any overlapping Critical Habitat, important habitat features, species at risk ranges, migratory birds ranges and other potentially important local or landscape characteristics. Obtaining project shapefiles from proponents is standard practice for our analysis of environmental impacts of projects.	Firstly, Denison would like to clarify the chronology associated with this IR for the record. • The GIS files in question were not viewed as a requirement during the first round of comments. The reviewer asked Denison to provide GIS files for all existing habitat affected in SK1 (if available). • • Denison notes that the direct request for the Project footprint shape files was received from the CSNC via email on November 21, 2023 (email from Way to Switzer); however, the files were requested following a meeting between the Saskatchewan Ministry of Environment and ECCC where Project offsetting was being discussed (i.e., not in relation to the original IR topic). • Denison acknowledges that there was some confusion regarding the reviewer's request through the FIRT process versus the requests received to support offsetting and mitigation plans outside of the EA process. • Denison will provide the Project specific shapefiles to the CNSC separately from	Yes Updates to Figure 9.3-8 and Appendix 9-F have been incorporated into the revised Draft EIS Appendices

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					Analysis of habitat disturbance should be calculated at the range level in order to assess impacts and determine significance. Analysis should be consistent with the methodology described in the document Scientific Assessment to Support the Identification of Critical Habitat for Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada (Environment Canada, 2011) [1]. [1]https://publications.gc.ca/site/eng/401605/publication.html, p. 28/41	affected, using the following formula: (Project footprint + 500m buffer) – overlapping (permanent alteration(s) + 500m buffer) 3. A map of the SK1 range showing all disturbed and undisturbed habitat, including predicted disturbance (direct and indirect) resulting from the Project. 4. Description of whether the Project is expected to compromise the ability of the range to be restored to the undisturbed habitat threshold, and provide a rationale for the conclusion. See also related: IR-154.	ECCC requested for more detailed mapping at the level of the project footprint in order to be able to have higher confidence in our analysis relative to potential effects on caribou Critical Habitat. However, as the requested mapping was not provided by the Proponent, ECCC is required to make assumptions that could impact our determination of potential effects and possible offsetting requirements to mitigate impacts to caribou Critical Habitat (as per the Federal Recovery Strategy for Woodland Caribou). We are aware that the project footprint may change, which may result in changes to the final recommended offset amount. We are prepared to work with a draft file with the understanding that it is still being finalized. The fact that the landscape may change over time based on data available does not negate the fact that baseline analysis is still required to determine impacts on caribou, and we still require the study area shapefiles to continue with our general analysis of the study area, given the limited data that was provided by the proponent. Please provide the requested shape files.	this response table. For reference, the relevant data (including field observations in relation to ecosite types) have been collated into new maps. Figure 9.3-8 in the revised Draft EIS shows the EA study areas and the caribou observed within the ecosite types, while Figure 2-2 in Appendix 9-F of the revised Draft EIS shows the EA study areas and the caribou observed within the ecosite types as classified and delineated by the Ministry of Environment as per their protocol (in terms of the caribou habitat potential; low, moderate, high) in relation to the SK1 conservation unit.	
IR-149	-	ECCC CNSC	Wildlife and Wildlife habitat	Section 9.3.5.2, Additional Wildlife-specific Mitigation Measures	**Context:** The EIS describes that ongoing research is performed to inform the development of a Woodland Caribou Management Plan. This includes studies on the effectiveness of linear disruption features on predator/prey movements, and a field program for long-term reclamation planning. Moreover, it is stated that the Plan will include a detailed assessment of the need for habitat offsets. The draft EIS Section 9.3.5.2 states: "A wildlife monitoring plan and a Woodland Caribou Management Plan will be developed to address wildlife-specific mitigation measures based on proven and accepted mitigation following standard industry guidelines and BMPs. The plans will provide guidance to avoid or minimize potential adverse effects of the Project on wildlife and wildlife habitat, including monitoring and follow-up programs, as appropriate. It will be in place during all phases of the Project and will be subject to ongoing review and revision as required. If monitoring identifies a need for additional or revised mitigation measures, a process of adaptive management (as described in the plan) will be triggered." **Rationale**: The draft EIS does not present sufficient species-specific mitigation measures for boreal caribou. ECCC is not able	Provide the Woodland Caribou Management Plan, to demonstrate effective mitigation of potential project effects, along with wildlife-specific mitigation measures for review. The Plan should be informed by and consistent with the Boreal Caribou Recovery Strategy and demonstrate that avoidance and minimization measures will be applied to mitigate for predicted Project effects to boreal caribou and its critical habitat prior to considering offsetting measures. That is, the Plan should follow the mitigation hierarchy and information should be provided as outlined below: 1. AVOID: Describe all measures that will be taken to avoid effects to	This response has not been accepted. The Conceptual Caribou Management Plan does not provide sufficient detail to understand if using the restoration trials as an offset will produce satisfactory habitat compensation to address the Project effects to caribou. Additional clarity on the Proponent's role in the Developing Eco-restoration Together program is required, such as how the outcomes of these programs will result in mitigation measures and offsetting requirements. Additional clarity on the scope of the program should also be provided so that ECCC can understand the objectives and deliverables of the program. See follow-up IR-149-R1A, IR-149-R1B and AD-71 in the Advice to Proponent table.	For context, the responses that have been provided to caribou IR-related elsewhere in this response table (IRs 37, 143, 143-144-R1, 143-145-R1, 144, 145, 148, 151, 155, 156) have relevance to the this, and other IR responses, and it is recommended that all of this information be considered in its entirety. The afore-referenced IR responses include descriptions of additional data that have been obtained and collated and analyses and interpretation that have been completed in relation to the presence of caribou and suitable habitat in Project study areas. At time therefore, Denison and its SME believe there are no material data/information gaps the prevent or constrain the analysis of Project and cumulative effects, defining the appropriate mitigation measures, and establishing the required offset within the provincial offsetting framework. With respect to data gaps, the following is noted: • As described herein, additional data have been obtained and presented in Appendix 9-F. These data help to link caribou data, habitat/ecosite data and habitat suitable into the analysis. It is noted based on the new perspectives the overall conclusions of the caribou assessment are unchanged. While it is acknowledged that data may be lacking on the range level, Denison as a Project proponent is not responsible for and need not a complete a range assessment for the purpose of a Project-specific cumulative effects assessment. With respect to mitigation measures, the following is noted:	No

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					to assess potential residual impacts to caribou without specific mitigations. Since the Woodland Caribou Management Plan is still under development, it is difficult to judge whether the measures will be adequate to mitigate and/or offset potential project effects on Woodland caribou and its critical habitat.	boreal caribou and avoid the destruction or alteration boreal caribou critical habitat. 2. MINIMIZE: Describe all measures that will be taken to minimize the effects to boreal caribou and minimize the destruction of boreal caribou critical habitat. 3. RESTORE ON-SITE: describe the measures that will be taken to restore disturbed areas of the Project, related to construction, operation and maintenance, on boreal caribou critical habitat, remaining after considering the avoidance and minimization measures. 4. Characterize the risk of the adverse effects that are likely to result from the Project on boreal caribou and its critical habitat after avoidance minimization, and onsite restoration measures have been considered. 5. OFFSET: Describe the measures that will be implemented outside the Designated Project area to mitigate adverse effects, destruction or alteration of boreal caribou critical habitat by the Designated Project during construction and operation. 6. Characterize the risk of the adverse effects that are likely to result from the Project on boreal caribou and its critical		• Denison and its SME have re-considered the mitigation measures presented in the EIS documentation to date in light of updated caribou-related information and does not see that further mitigation measures are needed at this time. With respect to offset, the following is noted: • Denison continues to work collaboratively with Saskatchewan Ministry of Environment (MOE) on their requirement for an offset for adverse effects on caribou habitat. Denison has advanced the Project-related Caribou Management Framework within the context of the province's offsetting framework. The updated document is provided with this second round IR submission. With respect to monitoring, the following is noted: • Denison has committed to monitor for the presence of woodland caribou primarily within the Project Footprint as well as other areas within the Terrestrial RSA based on accepted methods that will be developed as part of its wildlife monitoring follow-up program as part of the implementation of its Environmental Management System. As it is understood, aerial surveys to document presence and habitat use are not permitted by the Saskatchewan Ministry of Environment at this time, Denison conceptually proposes to document the presence of woodland caribou using remote cameras placed strategically within representative habitat types within the Terrestrial RSA and a wildlife observation tracking log (based on the Project-wide implementation of the current wildlife card system Denison has in place). As Denison works collaboratively with the Saskatchewan Ministry of Environment to finalize the Caribou Management Framework, further details on monitoring in conjunction with the offset commitment will be developed. In direct response to the questions raised in the review comment the following is noted: • Denison continues to work collaboratively with Saskatchewan Ministry of Environment (MOE) on their requirement for an offset for adverse effects on caribou habitat. Denison has advanced the Project-related Caribou Management Framework within the context of the province's offsetting framework. The MOE has reviewed the draft framework and has provided Denison a notification of their support. Subject to finalization and provincial acceptance, the framework will provide the means to address/offset all residual adverse effects (i.e., those remaining after the application of the proposed mitigation measures) of the Project on caribou that are under provincial jurisdiction. • We also note that the Eco-restoration Together (ERT) program is no longer considered within the context of the Project-related Caribou Management Framework that outlines the offset plans that Denison has been working closely with Saskatchewan MOE to develop. The ERT program will focus primarily on site restoration techniques for decommissioning. The offset requirements that are being developed are those that will fulfill provincial requirements under their offsetting program scheme. • Further, Denison has committed to monitoring the effects on wildlife, as per the Wildlife Management Plan. The findings of the monitoring programs are expected	

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						habitat after avoidance, minimization, onsite restoration, and offset measures have been considered. Describe all relevant uncertainties on the effectiveness of the measures to address adverse effects on boreal caribou and the rationale for the selected measure, in light of the mitigation hierarchy. See also related IRs: IR-157.		to inform Denison, through an adaptive management process, of the need, if any, for additional mitigation measures.	
IR-149	IR-149-R1A	ECCC	Wildlife and Wildlife Habitat	Section 9.3.5.2, Additional Wildlife specific Mitigation Measures Proponent response to IR-149 IR-149 Response by Denison	**Context:** Much of the information presented in the Conceptual Caribou Management Plan is qualitative in nature and does not present specific details regarding a quantitative assessment of impacts following measures to avoid, minimize, and restore on-site and then assess residual effects and determine the offset required to counterbalance the remaining impacts. This is required to understand if offsetting is sufficient to address impacts to caribou. The Proponent also does not provide details on methods that will be used for pre- disturbance wildlife clearance surveys. ECCC is aware that that the Proponent will be participating in restoration trials as part of the 'Developing Eco-restoration Together' program. **Rationale:** ECCC requires the quantitative details on the assessment of impacts to be included within the Conceptual Caribou Management Plan to adequately assess how the Proponent has applied the mitigation hierarchy. Details on the methods that will be used for pre- disturbance wildlife clearance surveys will also be required to verify that the Proponent has adequately considered how they have avoided, mitigated, or restored impacts to caribou. While ECCC understands that the Proponent will be participating in restoration trials as part of the 'Developing Eco-restoration Together' program, however, more clarity on the Proponent's role in the program and the scope of the program is required. Details such as how the outcomes of these programs will result in mitigation measures and offsetting requirements and additional clarity on the scope of the program should also be provided so that ECCC can understand the objectives and deliverables of the program.	1. Provide a quantitative assessment of impacts following measures to avoid, minimize and restore on-site and then assess residual effects and determine the offset required to counterbalance the remaining impacts. 2. Provide details on methods to be used for pre- disturbance wildlife clearance surveys. 3. Provide details on the Proponent's role in the Developing Eco-restoration Together program and how that work may be used in offsetting requirements. 4. Provide the scope (i.e., quantitative habitat amount) of the Eco-restoration Together program.		Please see response to IR-149. In addition, in direct response to IR-149-R1A the following is noted. 1. Denison continues to work collaboratively with Saskatchewan Ministry of Environment (MOE) on their requirement for an offset for adverse effects on caribou habitat. Denison has advanced the Project-related Caribou Management Framework within the context of the province's offsetting framework. The MOE has reviewed the draft framework and has provided Denison a notification of their support. Subject to finalization and provincial acceptance, the framework will provide the means to address/offset all residual adverse effects (i.e., those remaining after the application of the proposed mitigation measures) of the Project on caribou that are under provincial jurisdiction. 2. For clarification, the pre-construction and pre-clearing surveys will consist of wildlife sweeps conducted by qualified biologists within 7 days prior to any clearing activity at a specific location, and a 100 m buffer, within the Project Footprint. The wildlife sweeps are intended to identify sensitive wildlife features such as hibernacula, dens, nests, cavities, mineral licks, that would require specific mitigation measures to avoid or minimize adverse effects on identified features and are not species-specific but will be based on timing of Project related activities (i.e., will be completed in advance of site clearing activities). This is a risk-based approach with the intent of reducing the potential of important wildlife features being adversely affected during vegetation or land disturbance activities. The methods associated with these pre-construction and pre-clearing sweeps will be tailored to species at risk (including woodland caribou) that may potentially be using habitats at certain times of the year. For example, in the event the sweeps are conducted during the winter period, methods would include snow tracking to identify woodland caribou presence based on tracks and feeding craters observed within the study areas, based on survey protocols provided by the Government of Saskatchewan (2014). This effort would also be combined with use of remote cameras that have been in place throughout the Terrestrial RSA for the past several years, and the photos captured from the cameras can be used to further verify caribou presence with the study areas. The wildlife sweeps would be conducted within 7 days prior to disturbance activities, year-round, so	No

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								that sensitive features can be identified, and appropriate mitigation measures (e.g., avoidance, timing delay) can be developed and implemented, as appropriate. Further, Denison has committed to monitoring the effects on wildlife, as per the Wildlife Management Plan. The findings of the monitoring programs are expected to inform Denison, through an adaptive management process, of the need, if any, for additional mitigation measures. 3. The Eco-restoration Together program is no longer considered within the context of the Project-related Caribou Management Framework that outlines the offset plans that Denison has been working closely with Saskatchewan MOE to develop. The offset requirements that are being developed are those that will fulfill provincial requirements under their offsetting program scheme. 4. The Eco-restoration Together program is no longer considered within the context of the Project-related Caribou Management Framework that outlines the offset plans that Denison has been working closely with Saskatchewan MOE to develop. The offset requirements that are being developed are those that will fulfill provincial requirements under their offsetting program scheme. **<u>References:</u>** Government of Saskatchewan. 2014. Snow Track Survey Protocol. Fish and Wildlife Branch, Ministry of Environment. 8 pp.	
IR-149	IR-149-R1B	ECCC	Wildlife and Wildlife Habitat	Section 9.3.5.2, Additional Wildlife specific Mitigation Measures Proponent response to IR-149 IR-149 Response by Denison	**Context:** Section 4.2.2 of the Conceptual Caribou Mitigation plan states: "locating excessive noise generating activities such as the concrete batching operation as far away from sensitive wildlife locations as possible;". However, no specific mitigation measures are mentioned for impacts to caribou due to noise generated from the Project air strip. **Rationale:** Noise from the air traffic using the air strip will also generate excessive noise that can impact caribou. Additional information on the timing and frequency of air traffic, as well as specific mitigations related to impacts from air traffic, including mitigations related to frequency and timing of flights, will be necessary to evaluate impacts to caribou due to air strip noise.	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.	No
IR-151	-	ECCC	Wildlife and Wildlife habitat	Section 9.3.6.4	**Context and Rationale:** In the analysis of residual and cumulative effects for woodland caribou, information and analyses on impacts to connectivity and movement across the landscape is lacking.	1. Using available reports and data, provide an analysis of impacts to landscape connectivity for woodland caribou at the LSA and Range scales. 2. Determine whether the Project is expected to result in a reduction of connectivity within or between the ranges and provide a rationale	This response has not been accepted. There is insufficient information to support the Proponent's conclusion that there are no impacts to landscape connectivity. Additional information on habitat quality, caribou use of the landscape for different life stages, and important habitat features within the study area is required to understand effects of the Project on habitat connectivity.	The woodland caribou found in the SK1 range are non-migratory, in the sense that barren-ground caribou are. Rather based on information received from the Saskatchewan Ministry of Environment it is understood that they utilize a variety of habitat types across both the SK1 and SK2 ranges and are distributed and move broadly across the landscape. To date, western science has not identified any known "corridors" used specifically by woodland caribou in the SK1 range. As such, the Project will not hinder or exclude woodland caribou from moving across the landscape within the SK1 range; rather, they will be able to move around the Project Footprint unimpeded through the habitat types that are available.	Yes Appendix 9-F incorporated (added) into revised Draft EIS Appendices

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						for the conclusion. Describe how movement corridor(s) may be affected by Project activities and infrastructure.	Provide maps of caribou habitat quality and an assessment of Project impacts to high quality habitat including habitat that may be associated with landscape connectivity.	Knowledge holders confirmed that woodland caribou occur in the Terrestrial RSA (19-LK-ERFNTrap-134.149; 19-LK-ERFNTrap-134.151), and that local trappers encounter caribou regularly at their traplines in winter and see them during summer (19-LK-ERFNTrap-134.151). They have not observed any changes in densities and suggest that the same number of caribou have been found in the RSA over the years (19 -LK-ERFNTrap-134.156). Caribou are reported to calve near the Wheeler River, which has lots of heavy muskeg in the area (16-EN-ERFN-100.15). Knowledge holders identified the area east of Highway 914 and northeast of Russell Lake, between Russell Lake and McDougall Lake (corresponding with Omnia winter tracking transects #5 and #9; see revised draft EIS Appendix 9-B, Omnia Terrestrial Environment Wildlife and Vegetation Baseline Inventory Figure 2.6-1) as an area where caribou are commonly observed in the winter. "There are tall trees here, some small hills with protected valley areas, and it seems sheltered. There is caribou moss in this area" (19-LK-ERFNTrap-134.154). Caribou are known to travel through areas of younger forest and burns to get to preferred habitat types (19-LK-ERFNTrap-134.152), such as more mature forests and areas with abundant lichen growth. "Caribou […] eat low bush cranberries and lichen; lichen takes many years to grow and recover" (18-EN-ERFN-5.76). Caribou have been observed to use areas of younger forest stands with regenerating pine. In years with deep snow or when there is a hard crust on the snow, they may eat the tips of fresh growth off the younger pine trees (19-LK-ERFNTrap-134.155). English River First Nation and SVS (2022) compiled an IK study documenting current and past land use, knowledge of the land, and participants' perspectives on potential Project effects, as well as cumulative effects from past mining and other developments. The report identified a wildlife corridor used by several species, including woodland caribou. The corridor runs between Cree Lake (approximately 40km southwest of the Terrestrial RSA and Russell Lake (in the southern portion of the Terrestrial RSA (Feature 1001-09; ERFN and SVS 2022). The report identified a caribou calving area: Feature 1009-07 covering large portions of the Terrestrial RSA with the exception of the most western, northern, and eastern extents. This area is also described as offering good caribou habitat year-round (ERFN and SVS 2022). In September 2011, Environment Canada gathered Aboriginal Traditional Knowledge from Indigenous groups across Canada to support their recovery efforts for boreal woodland caribou (ERFN 2011). In the report, most interviewees stated that caribou lost their calving areas to fires and they moved elsewhere to have their calves. It is more difficult to find the caribou now (ERFN 2011). Figure 2-2 in revised Draft EIS Appendix 9-F shows the location of woodland caribou observed during the baseline field program in association with the ecosite types classified by the Saskatchewan Ministry of Environment as having the potential to develop into low, moderate or high quality habitat to support woodland caribou. As shown in the figure, the majority of the caribou location data points are located beyond the Project Footprint and to the northern and eastern portions of the RSA. Based on the information presented in Figures 2-3 to Figure 2-8 provided in Appendix 9-F, related to the life requisite habitat potential for calving, forage and refuge habitat, as characterized by the SK MOE (2023), the majority of the ecosite types within the RSA are	

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								relatively uniform with no discernable differences in habitat quality across the region. As such, there are no definitive differences in habitat quality (i.e., these ecosite types provide the same quality of habitat for use by woodland caribou). Further, there are no barriers preventing woodland caribou from moving throughout the Terrestrial RSA through the habitat types that offer a similar level of quality for the various life requisites for this species. In this context, potential Project-related effects on connectivity are not expected. **References:** English River First Nation (ERFN). 2011. English River First Nation: English River First Nation, ATK (Aboriginal Traditional Knowledge) Summary Report. Compiled by Environment Canada. English River First Nation (ERFN) and Shared Value Solutions (SVS). 2022. Wheeler River Project – Summary of Traditional Knowledge Study Results – English River First Nation. Prepared for English River First Nation. March 2022.	
IR-155	-	ECCC	Wildlife and Wildlife habitat	Section 9.3.6.4.1, Alteration and/or Loss of Habitat	**Context and Rationale:** In Section 9.3.6.4.1 of the draft EIS, the Proponent presents figure 9.3-14 and table 9.3-22, which "depicts available woodland caribou habitat in the Project study areas" and provide a summary of available Woodland Caribou Habitat in the Project Area, Wildlife Local Study Area, and the Terrestrial Regional Study Area. The Proponent does not provide a biologically relevant explanation on the ecosites that are considered available woodland caribou habitat. According to the amended recovery strategy for Caribou, all habitat within SK1 range has been designated as critical habitat. To align with best current knowledge and the amended recovery strategy, the map and table should show the biophysical attributes, as outlined in Appendix H of the recovery strategy.	1. Provide a biologically relevant explanation about how available caribou habitat was determined or determine available habitat based on new data from the province of Saskatchewan (See IR-145). 2. Consider referencing Appendix H of the Amended Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada 2020 to define important biophysical features.	This response has not been accepted. The Proponent's response to IR-155 states "Available woodland caribou habitat was identified in the draft EIS to comprise the ecosites with observations of caribou and caribou sign during the baseline studies. This was done without seasonal differentiation because it was assumed that caribou may use these ecosites during all seasons and life stages." The methodology used to determine available caribou habitat does not accurately represent use of the documented habitat. The trail camera and pellet survey methods used do not satisfy the IR as they may lead to an underestimation of available caribou habitat. Trail camera and pellet surveys are not normally used to determine available habitat, as they only show presence. Using observations within ecosites to determine what is available habitat for caribou may lead to an underestimation of available habitat. Some smaller or rare ecosites may not have been sampled, leading to their exclusion as available habitat. Additionally, trail cameras were only placed on linear features, which are not representative of the whole landscape. Survey locations and camera trap	Denison has created a series of maps utilizing existing habitat (ecosite) data in combination with the habitat potential classifications from the Saskatchewan Ministry of Environment in response to this and related IRs, as outlined below (see Appendix 9-F). Figure 2-2 in Appendix 9-F of the revised draft EIS shows the location of woodland caribou observed during the baseline field program in association with the ecosite types as classified by the Saskatchewan Ministry of Environment as having the potential to develop into low, moderate or high quality habitat to support woodland caribou. These habitat potential categories are based on the overall habitat suitability ranking for the life history requirements, including forage, refuge, and calving habitat (Saskatchewan Ministry of Environment 2019). Figures 2-3, Figure 2-5, and Figure 2-7 in the revised draft EIS Appendix 9-F illustrate the location of caribou observations in relation to the indicates habitat life requisite attributes (forage, refuge, and calving) based on the information received from the SK MOE (2024) at the Project Area, LSA, and RSA scales. Figures 2-4, Figure 2-6, and Figure 2-8 in the revised draft EIS Appendix 9-F illustrate the location of caribou observations in relation to the indicates habitat life requisite attributes (forage, refuge, and calving) based on the information received from the SK MOE (2024) at the Project Footprint + 500 m scale.	Yes Appendix 9-F incorporated (added) into the revised Draft EIS Appendices

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							placement may not provide an accurate representation of the study area or the SK1 range. To adequately determine available caribou habitat, ECCC requires a new habitat-based analysis that captures important biophysical features outlined in Appendix H of the Amended Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada 2020.		
IR-156	-	ECCC	Wildlife and Wildlife habitat	Section 9.3.6.4.1 Section 9.3.7.3.1	**Context and Rationale:** In Section 9.3.6.4.1 of the draft EIS, the Proponent identified that 142 ha of available caribou habitat within the Project footprint will be directly impacted or lost, while an additional 1,165 ha will be indirectly impacted by Project activities such as sensory disturbance. They assessed the residual and cumulative effect of alteration to habitat for woodland caribou as not significant: "The residual effect of alteration and/or loss of available woodland caribou habitat is not expected to result in a change that will alter caribou habitat integrity to the point where it would not be able to sustain the regional woodland caribou population. Therefore, the effect is assessed as not significant." Section 9.3.7.3.1 of the draft EIS states: "It is not expected that the cumulative effects of alteration and/or loss of habitat will alter the integrity of woodland caribou habitat within the Terrestrial RSA to the point where it is not sustainable or available to contribute to ecological functions. Therefore, the cumulative effects resulting from the Project's residual effect interacting with residual effects from other projects and activities is predicted to be not significant." For the residual effect of alteration and/or loss of available caribou habitat (Section 9.3.6.4.1, Table 9.3-24), the Proponent assessed the magnitude as low, the geographic extent as local, the duration as long-term, the frequency as frequent, the reversibility as fully reversible, the context as high and the likelihood as likely. The rationale provided by the Proponent is insufficient to determine the accuracy of these assessments, given the lack of data and the small size of the assessment area. ECCC does not support the residual effects assessment of low magnitude, given the uncertainties related to seasonal use by caribou in the Project area and the current level of disturbance in the SK1 range. For the cumulative effect of alteration and/or loss of available caribou habitat (Section 9.3.7.3.3 , Table 9.3-30), the Proponent assessed the magnitude as moderate, the geographic extent as beyond the RSA, the duration as long-term, the frequency as	Provide a revised assessment of residual and cumulative effects, taking into consideration that the disturbance within the SK1 range is above the disturbance management threshold required for survival and recovery of the species. See also related IRs: IR-137 and IR-154.	This response has not been accepted. Based on the Amended Recovery Strategy for the Woodland Caribou (*Rangifer tarandus caribou*), Boreal Population, in Canada 2020, the SK1 range is currently at its disturbance threshold. All remaining habitat in this range is considered to be critical habitat. As the development of this Project will result in loss of critical habitat for boreal caribou, the Project will have an impact on boreal caribou. The assessment does not contain adequate information on habitat quality or representativeness of the RSA to the SK1 range. The Proponent did not consider disturbance in the regional context, therefore their conclusions are not based on the best available information. Considerations of disturbance in a regional context is required to accurately represent residual and cumulative effects to caribou within the SK1 range. The Proponent has not provided sufficient information to support their conclusion of a "not significant" impact to boreal caribou as the Recovery Strategy wasn't fully considered. Since all remaining habitat in this range is critical habitat, the Project will negatively affect critical habitat necessary for the survival and recovery of the species. The Proponent should provide a revised assessment of residual and cumulative effects, taking into consideration the Recovery Strategy and that the disturbance within the SK1 range is at the disturbance management threshold, and Projects impacts to critical habitat.	It is Denison's and its SME's understanding that the SK1 range is not at its disturbance threshold (60% undisturbed) based on the most recent information that we are aware of from the province that was confirmed in November of 2023. As at that date, it was estimated that the disturbance, almost exclusively due to natural factors (fire), was at 53% (SK ENV 2023). This is material to the consideration of both potential Project-related and cumulative effects that are reviewed below. Denison used a conservative approach in that the EA assumed that all habitat types were suitable and available to caribou and were used by caribou during all seasons in support of caribou life requisites - which is highly conservative considering the indicated low caribou population levels within the LSA and RSA. The EA for the Project considered that the habitat types in the Project Footprint and the RSA have largely been disturbed, primarily by past fire events. This has been acknowledged and documented by local knowledge keepers. In September 2011, Environment Canada gathered Aboriginal Traditional Knowledge from Indigenous groups across Canada to support their recovery efforts of boreal woodland caribou (ERFN 2011). Forest fires are considered the main threat to woodland caribou in the English River area, and most interviewees stated that caribou lost their calving areas to fires and they moved elsewhere to have their calves. It is more difficult to find the caribou now (ERFN 2011). Figure 2-1 in revised Draft EIS Appendix 9-F shows the location of woodland caribou observed during the baseline field program in association with the ecosite types as classified by the Saskatchewan Ministry of Environment as having the potential to develop into low, moderate or high quality habitat to support woodland caribou in relation to the SK1 range. These habitat potential categories are based on the overall habitat suitability ranking for the life history requirements, including forage, refuge, and calving habitat for caribou (Saskatchewan Ministry of Environment 2019). The disturbance of the SK1 conservation unit has little relevance to the LSA and RSA, which were selected to inform and focus the EA for the Project, as per accepted EA methodology. As described in Section 9.3.7, existing habitat disturbances due to past and ongoing anthropogenic development have altered the Terrestrial RSA resulting currently in 1.5% of habitat loss in the Terrestrial RSA. The Project is likely to add another 0.4% of anthropogenic disturbance (considering the Project Area of 169.6 ha) to the disturbance resulting in up to 1.9% of total anthropogenic disturbance in the Terrestrial RSA. While the Terrestrial RSA currently provides 30,541.63 ha (76.1%) of habitat that are currently available for woodland caribou (Section 9.3.7), which is located within the SK1 Boreal Shield Woodland Caribou Management Unit. Environment and Climate Change Canada	Yes Appendix 9-F incorporated (added) into the revised Draft EIS Appendices

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					frequent, the reversibility as fully reversible, the context as high, the likelihood as likely, the significance as not significant and the level of confidence as moderate. The rationale provided by the Proponent is insufficient to determine the accuracy of these assessments, given the lack to data presented for caribou and the small size of the RSA, compared to the SK1 region. ECCC does not support the conclusion of the cumulative effects assessments or for the level of confidence. The Amended Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada 2020 states that the range is currently at the 60% disturbance management threshold. Therefore, any activity likely to result in the alteration or destruction of critical habitat may impact on the species survival and recovery. In addition, the Proponent's assessment was based on information that was lacking data on calving, wintering and rutting areas, and connectivity and caribou movements. The absence of considerations of the regional context of disturbance does not provide a conclusion based on best available information.			(2020) identified the caribou population in the SK1 conservation unit as being self-sustaining at a threshold of 40% undisturbed habitat and recommended that total anthropogenic disturbance in the SK1 Boreal Shield range should not exceed 5% with the remainder (i.e., 55%) being attributed to natural disturbance (while maintaining a minimum of 40% undisturbed habitat in the range). Based on 2010-2015 mapping, Environment and Climate Change Canada (2020) calculated that approximately 58% of the SK1 Boreal Shield range is currently affected by past forest fires and 3% of the range is affected by anthropogenic disturbances. Based on the federal assessment and recent preliminary disturbance assessment from ENV, an estimated 53% of SK1 is considered disturbed, with 47% undisturbed (ENV 2023), indicating that the land use and overall disturbance in the conservation unit remains below the recovery strategy disturbance threshold. The size of the SK1 Boreal Shield range is estimated at 18,034,870 ha (ECCC 2020), resulting in an estimated additional Project-related disturbance of 0.001% at the scale of the SK1 Boreal Shield Woodland Caribou Management Unit. The incremental increase of the disturbance at the SK1 Range is 0.001%, but for context that habitat is primarily disturbed and regenerating as a result of past fire disturbance, which is not anticipated to be suitable habitat for caribou in the next 40-50 years. As such, the contribution of the Project effects to the cumulative effects on woodland caribou within the SK1 conservation unit are deemed to be negligible. **<u>References:</u>** Environment and Climate Change Canada (ECCC). 2020. Amended Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada. Species at Risk Act Recovery Strategy Series. Environment and Climate Change Canada, Ottawa. xiii + 143pp. Saskatchewan Ministry of Environment (ENV). 2023. Woodland Caribou in the Boreal Shield (SK1): Background Information.	
IR-157	-	ECCC	Wildlife and Wildlife habitat	Section 9.3.9 Ungulates, Furbearer and Woodland Caribou Summary	**Context and Rationale:** The Proponent has committed to developing a Woodland Caribou Management Plan, which will include a "detailed assessment for the need for habitat offsets." The Woodland Caribou Management Plan will support ECCC's review of the Proponent's assessment of residual effects following mitigation and offsetting. This plan should consider ECCC's Operational Framework for Use of Conservation Allowances (ECCC, 2012). ECCC is available to assist the Proponent in the determination of appropriate offsets that would balance against Project adverse effects after the application of measures to avoid, minimize and restore on-site are adopted. Based on the Amended Recovery Strategy for the Woodland Caribou (Rangifer tarandus caribou), Boreal Population, in Canada	Provide the Woodland Caribou Management Plan for review. The plan should clearly demonstrate efforts to avoid and minimize any Project effects and restore on-site any disturbed areas prior to the consideration of offsetting. Details on how severity of disturbance and vulnerability of the species were considered should be explained. See also related: IR-149. **Suggestions for mitigation and follow-up measures:** ECCC notes	This response has not been accepted. The Proponent provided a conceptual Woodland Caribou Monitoring Plan, however, this plan does not include an assessment of the Proponent's determination of the required amount of habitat offset. ECCC currently recommends a minimum offset multiplier of 4:1 (offset outcome: residual adverse effect) for a project that has a low severity impact of adversely affecting a low vulnerability ecological component. This is a benchmark ratio applied to a project that is in the lower end of the risk spectrum; for example, for a project with a low severity impact adversely affecting a low	Please see response to IR-149. In addition, in direct response to IR-157 the following is noted. Denison continues to work collaboratively with Saskatchewan Ministry of Environment (MOE) on their requirement for an offset for adverse effects on caribou habitat. Denison has advanced the Project-related Caribou Management Framework within the context of the province's offsetting framework. The MOE has reviewed the draft framework and has provided Denison a notification of their support. Subject to finalization and provincial acceptance, the framework will provide the means to address/offset all residual adverse effects (i.e., those remaining after the application of the proposed mitigation measures) of the Project on caribou that are under provincial jurisdiction. Further, Denison has committed to monitoring the effects on wildlife, as per the Wildlife Management Plan. The findings of the monitoring programs are expected to inform	No

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					2020, anthropogenic impacts to local caribou populations experience a lag effect, which occurs over extended periods. This lag effect needs to be adequately considered when proposing offsets. ECCC is available to assist the Proponent in understanding how critical habitat is described in the Recovery Strategy and the determination of appropriate offsets that would balance against Project effects based on the predicted impacts to caribou habitat.	that the Woodland Caribou Management Plan should clearly explain efforts to address Project effects, including any contribution to cumulative adverse effects, after it has been determined that all options in the previous steps of the mitigation hierarchy (i.e., avoidance, and minimization,) have been fully considered and applied. In the Woodland Caribou Management Plan, provide details on how the factors outlined in the Operational Framework for Use of Conservation Allowances (ECCC, 2012) were considered in determining the offsetting amounts, including the severity of disturbance and vulnerability of the caribou population. Important factors including time lag (the amount of time from restoration work to when the habitat would be considered caribou habitat) would also need to be considered. ECCC typically recommends a minimum offset multiplier of 4:1 (offset outcome: area disturbed). This is a benchmark ratio applied to a project that is in the lower end of the risk spectrum, such as one with a low severity impact adversely affecting a low vulnerability ecological component. In general, the minimum 4:1 multiplier accounts for time-lags to restoration, uncertainty in outcomes, a precautionary approach, and the adverse impact itself in its specific context. Offset multipliers are variable and determined by project-specific circumstances and associated risks and uncertainties.	vulnerability ecological component. In general, the minimum 4:1 multiplier accounts for time-lags to restoration, uncertainty in outcomes, a precautionary approach, and the adverse impact itself in its specific context. Offset multipliers are variable and determined by project-specific circumstances and associated risks and uncertainties. The Proponent provided a conceptual Woodland Caribou Monitoring Plan, however, this plan does not include an assessment of the Proponent's determination of the required amount of habitat offset. ECCC currently recommends a minimum offset multiplier of 4:1 (offset outcome: residual adverse effect) for a project that has a low severity impact of adversely affecting a low vulnerability ecological component. This is a benchmark ratio applied to a project that is in the lower end of the risk spectrum; for example, for a project with a low severity impact adversely affecting a low vulnerability ecological component. In general, the minimum 4:1 multiplier accounts for time-lags to restoration, uncertainty in outcomes, a precautionary approach, and the adverse impact itself in its specific context. Offset multipliers are variable and determined by project-specific circumstances and associated risks and uncertainties. Based on the Amended Recovery Strategy for the Woodland Caribou (*Rangifer tarandus caribou*), Boreal Population, in Canada 2020, anthropogenic impacts to local caribou populations experience a lag effect, which occurs over extended periods. This lag effect needs to be adequately considered when proposing offsets. In the absence of sufficient data or information required to validate the level of risk that this Project is likely to have on the species recovery, the implementation of the mitigation hierarchy and offsetting measures to address Project adverse	Denison, through an adaptive management process, of the need, if any, for additional mitigation measures.	

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							effects, ECCC's views are based on the precautionary approach. Thus, ECCC preliminary analysis regarding the likelihood of this Project having an adverse effect on boreal caribou recovery is identified as moderate to high, resulting in a precautionary offsetting requirement that should be in terms of amount, much greater than 4:1. The assumptions of ECCC's risk assessment include: • The biophysical attributes required for boreal caribou recovery (i.e. habitat for calving, post-calving, rutting, winter and travel) are present within the study area and will be directly or functionally lost, • Sensory disturbance arising from project activities (e.g. air traffic) will cause functional habitat loss for boreal caribou within important habitat areas required for different life stages. Additionally, lack of information supporting the Proponent's offsetting plans creates uncertainty and thereby warrants a higher offset ratio. ECCC is available to provide information to the Proponent on how critical habitat is described in the Recovery Strategy and the determination of appropriate offsets that would balance against Project effects based on the predicted impacts to caribou habitat.		
IR-158	-	ECCC	Migratory birds	Section 9.4.1.2, Key Indicators and Measurable Parameters	**Context and Rationale:** In Section 9.4.1.2 the Proponent outlined key indicators for "Migratory Breeding Birds" which includes Waterbirds and Waterfowl, Upland Game Birds and Migratory Songbirds. These are broad categories, which do not allow for assessment of the variation in habitat requirements or ecology of individual species or guilds. **Updated Rationale:** The Proponent should identify additional focal species that can serve as indicator species by representing anticipated impacts to a broader guild of species. Indicator species should be demonstrably sensitive to the potential effect of interest, and suitable for inferring effects on other species. Species may be grouped into guilds for assessment based on similarities in ecology or vulnerability to Project effects, such as species at elevated risk of collision with vehicle traffic.	Identify focal species/guilds for each key indicator species within the Migratory Breeding Birds valued components. Provide an updated analysis of Project effects on migratory birds.	This response has not been accepted. The Proponent did not identify focal species for each key indicator species within the Migratory Breeding Birds valued components. This information is needed to accurately review the Proponent's assessment of impacts and mitigation measures in order to assess the accuracy of the Proponent's conclusions and provide expert advice on the mitigation measures.	The information provided in the Draft EIS did include a discussion of bird guilds/focal species in the Existing Environment, see Section 9.4.3.2 Migratory Breeding Birds. For example, Section 9.4.3.2 states, "The Migratory Breeding Birds VC is represented by three KIs: waterbirds and waterfowl, upland game birds, and migratory songbirds. Therefore, this section describes the existing environment for these three groups in the Wildlife LSA and Terrestrial RSA. For organizational purposes, the Migratory Breeding Birds VC was identified as an overarching group that was then divided into several guilds (i.e., the three KIs). It is acknowledged that upland game birds are not migratory but were included as one of the three KIs in this VC to reduce repetition." For further clarity, the following text has been added to Section 9.4.6.3 of the revised Draft EIS.	Yes Sections 9.4.6.3 and 9.4.6.3.1

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					By identifying focal species or guilds for each key indicator species within the Migratory Breeding Birds Valued Components (VCs), ECCC would be able to accurately review the Proponent's assessment of impacts and mitigation measures in order to assess the accuracy of the Proponent's conclusions and provide expert advice on the mitigation measures.			"In a 2016 paper assessing the niche characteristics of western boreal birds the authors state "*Our results suggest that most boreal bird species have adopted generalist strategies in order to persist within the heterogeneous and unstable environments typical of northern boreal forests*" (Mahon et al. 2016). As such, we have taken a broad niche-based approach to split the migratory songbirds KI for more informative effects assessment, while recognizing that niche specificity of boreal birds is typically broad." The residual effects evaluation, therefore, assesses Project-related effects on these three groups "(and niches within the migratory songbirds group), and provides an indicator species for each of these three groups, with indicator species in the migratory songbirds group assigned for each of the identified niches." Section 9.4.6.3.1 in the revised Draft EIS has also been updated so that discussion regarding guilds/focal species was carried forward within the effects assessment and specifically within the context of the habitat-based assessment to link habitat related effects to bird species identified in the study areas. The following text was added under the heading Waterbirds and Waterfowl: "The Common Merganser has been chosen as an indicator species for the Waterbirds and Waterfowl KI to represent anticipated impacts to this KI." The following text was added under the heading Upland Game Birds: "The Spruce Grouse has been chosen as an indicator species for the Upland Game Birds KI to represent anticipated impacts to this KI." The following text was added under the heading Migratory Songbirds: "The Migratory Songbirds KI has been divided into three broad niche groups based on ecological similarities and the results of a study characterizing niche preference of western boreal birds (Mahon et al. 2016): forest birds, open habitat (e.g., marshland and grassland) birds and lowland habitat (e.g., bogs and fens) birds. Indicator species have been chosen for each of these niche groups to represent anticipated impacts to these niche groups within the Migratory Songbirds KI and are based on habitat affinities identified by Mahon et al. (2016) and their documented presence in the Wildlife LSA. Ruby-crowned Kinglet was chosen to represent the forest birds niche group, Wilson's Warbler was chosen to represent the open habitat niche group, and Dark-eyed Junco was chosen to represent the lowland habitat birds group." The following text was also under the heading Migratory Songbirds: "While loss of habitat types is anticipated to affect migratory songbirds, due to the generalist strategy of most boreal bird species (Mahon et al. 2016) the loss of different habitats may affect bird groups differently. Loss of forested habitat is anticipated to have the most pronounced effect on the forest birds group, while loss of open habitat and lowland (bog and fen) habitat is anticipated to have the most pronounced effect on the open habitat birds group and the lowland habitat birds group, respectively."	

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								For reference it is noted that no focal species/guilds were initially included as part of the VC determination as the approach used in the EA was focused on the key habitat types (i.e., habitat-based assessment) that all migratory bird species, regardless of guild, would be expected to use on a seasonal or year-round basis depending on the species. For example, it is recognized that waterbirds and waterfowl use different habitat types as part of their individual life requisites, in that they all require open water for foraging but may nest in either upland or wet meadow or aquatic habitats. Upland game birds typically use a variety of upland forest ecosite types, whereas migratory songbirds will be found in all ecosite types throughout the RSA. As such, the EA considered the potential effects on all available habitat types used by these key indicator species and appropriate mitigation measures have been proposed and will be implemented which will address all migratory bird species regardless of focal species/guild. Nevertheless, as indicated above, discussion of focal species/guilds has been carried forward more directly into the effects assessment. It is noted that this discussion does not change the mitigation measures proposed, nor the conclusions of the assessment.	
IR-159	-	ECCC	Migratory birds	9.4.3.2.3 Baseline Studies – Migratory Songbirds Appendix 9-B, Section 2.10.2, Results	**Context and Rationale:** Information presented in the draft EIS is insufficient to accurately predict Project impacts to breeding birds. The Proponent collected a single year of breeding songbird point counts and aerial waterfowl surveys (including avian species at risk). A single year of surveys in which birds may be unusually scarce or abundant could severely compromise interpretation of post-construction monitoring data. Additionally, data presented in the draft EIS is from 2017 and ECCC advises that more recent data is needed for a comprehensive baseline to verify Project impacts. Data from the Saskatchewan Conservation Data Centre (HABISask), the Saskatchewan Breeding Bird Atlas and the Boreal avian Modelling project contain information on avian densities and avian species at risk that could supplement field data. The national standard for major projects recommends a minimum of two years of field surveys to be provided, so that temporal variability can be considered when comparing post-construction against baseline records and other available data. **Updated Rationale:** ECCC recommends that for major projects, a minimum of two years of field surveys should be provided so that temporal variability can be considered when comparing post-construction against baseline records and other available data. More recent data is needed due to landscape changes that may have occurred since 2017 as well as cumulative effects that have occurred in that time. Additionally, if there was an unusually high population density of birds in 2017 due to extraneous circumstances, Project effects may be attributed to a non-existent decline in the population when the discrepancy can	Supplement breeding bird point count data and aerial waterfowl data collected during 2017 with additional pre-construction field data or existing post-2017 data/modelling to provide a comprehensive baseline that can be used to verify Project impacts during construction and operational phases.	This response has not been accepted. The Proponent's response indicated that their opinion is that the data presented in the draft EIS is sufficient and that no updates to the draft EIS are needed. However, a single year of baseline data from 2017 is insufficient to assess Project impacts during the follow-up and monitoring program. Although pre-construction surveys prior to clearing can give a very localized picture of the avian community, it does not provide a baseline within the Regional Study Area (RSA) of the bird community and will be of limited use for comparing construction and operational monitoring data to baseline conditions. Use of more recent data or supplemental data can account for interannual variation and any regional effects and will allow for a more accurate review of mitigation and follow-up measures. See follow-up IR-142-159-167-R1.	Denison and its SME continue to be of the opinion that the data on which the effects assessment is based are sufficient and fit for purpose as it concerns the EA process. The effects assessment was not based on the 2017 field survey data alone. The EA used an accepted, proven habitat-based EA approach to address the variability of population surveys. Further, the EA used all available, recent/relevant survey data collected in appropriately timed and executed methodologies, including IK. The supplemental avian data received from records from the Saskatchewan Breeding Bird Atlas downloaded through the NatureCounts web portal (Saskatchewan Breeding Bird Atlas 2017), which also includes data received as part of the Saskatchewan Boreal Monitoring Strategy program. These data represent bird observations from 24-point counts conducted on June 7 and June 9, 2019. Nine point-counts are located approximately 6.5 km east of the Project footprint, the majority of which are located in the BS3 ecosite type; 15 point-counts are located approximately 7.7 km south of the Project footprint, the majority of which are located in the BS3/BS7 ecosite type. During this survey effort, 24 migratory songbird species were documented. A summary of the total number of individuals observed for each species across all plots is provided in Appendix 9-F of the revised Draft EIS. While the supplemental data do provide further context for the RSA, they would not be expected to alter the findings or the mitigation measures proposed, nor the conclusions reached in the EA. The above does not preclude the implementation of further breeding bird surveys prior to site development and operations. Denison accepts the comment that additional, more recent information, as well as supplemental data as available, and will provide the basis for a more effective review of mitigation and follow-up measures as the Project moves forward. The details of such follow-up monitoring will be defined as part of the further consideration of planning related to follow up programs. For clarification the pre-clearance wildlife sweeps are intended to identify sensitive wildlife features (e.g., hibernacula, roosting habitat, dens, nests, mineral licks) that would require site-specific mitigation measures to limit or avoid adverse effects. The spatial scale of where these pre-construction sweeps would be completed could be expanded to include other areas beyond the Project Area but within the RSA.	Yes Appendix 9-F incorporated (added) into the revised Draft EIS Appendices

Original IR#	Follow-Up IR #	SME	Project Effects Link	Reference to EIS, appendices, or supporting documentation	Context and Rationale	Information Requirement (IR)	Rationale for Status	Denison's Response	EIS Updates (Yes/No; if Yes, provide EIS Section number)
					be due to natural variability. A more recent baseline will account for interannual variation and any regional effects and will allow for a more accurate review of mitigation and follow-up measures. Data from the Saskatchewan Conservation Data Centre (HABISask), the Saskatchewan Breeding Bird Atlas and the Boreal Avian Modelling project contain information on avian densities and avian species at risk that could supplement field data.				
IR-160	-	ECCC	Migratory birds	Section 9.4.3.2.3 Baseline Studies – Migratory Songbirds	**Context and Rationale:** ECCC advises that the results of the field studies need to be interpreted/analyzed in the context of the study area. The Proponent presents results on areas with highest richness and diversity but does not make a link to habitat that will be lost or experience indirect effects. **Updated Rationale:** Results regarding the effects of the Project, including a discussion on habitat types that will be lost or indirectly impacted during the life of the Project, and a discussion on the overall impact on the avian community including results from baseline studies as well as other supplemental information as per IR-159 are required to assess the validity of the Proponent's conclusions and should be used in effects assessment.	Provide results interpreted in the context of Project direct and indirect effects. Include discussion on the habitat types that will be lost or indirectly impacted during the Project and the overall impact on the avian community, using results from the analysis of baseline studies and other supplemental data (as per IR-159). Discussion should support the conclusions of the effects assessment. See also related IRs: IR-161 and IR-162.	This response has not been accepted. The Proponent did not provide the information requested in IR-159. This information is required to assess the accuracy of the effects assessment.	Table 9.4-15: Summary of Available Habitat for Migratory Songbirds in the Project Study Areas provides an overview of the ecosite types that are present with the Project Area, Wildlife LSA, and Terrestrial RSA that are available for use by all migratory bird species. Direct effects, specifically habitat loss, are calculated as the area of available habitat for migratory songbirds expected to be lost due to site clearing within the Project Area. Direct habitat loss has been mitigated by reducing the size of the Project Area to the extent practicable during Project design; however, available habitat is still predicted to be cleared during the Construction Phase. In the Project Area, 113.5 ha or 100% of available habitat is assumed to be removed and will not be available to the migratory songbird species for the duration of the Project. This represents the removal of 4.5% of available habitat within the Wildlife LSA and of 0.6% within the Terrestrial RSA (Table 9.4 16: Summary of Available Habitat for Migratory Songbirds, Direct Habitat Loss, and Habitat Alteration in the Study Areas). Further, revisions included in Figure 9.4-11: Available Habitat for Migratory Songbirds provides further context as to the habitat (ecosite) types within the Project Area that will be affected by Project activities. An additional 28.5% (719.4 ha) of available habitat for migratory songbirds in the Wildlife LSA may experience habitat alteration resulting from indirect Project effects, such as sensory disturbance. In the Terrestrial RSA, 3.5% of available habitat may experience habitat alteration (Table 9.4 16: Summary of Available Habitat for Migratory Songbirds, Direct Habitat Loss, and Habitat Alteration in the Study Areas). Mitigation measures outlined in Section 9.4.5 are anticipated to reduce the effects of alteration and/or loss of habitat on migratory songbirds, but not eliminate them.	Yes Revised Draft EIS, Table 9.4-15, Table 9.4-16 and Figure 9.4-11 have been updated
IR-162	-	ECCC	Migratory birds	Section 9.4.3.3, Bird Species at Risk	**Context and Rationale:** Not all avian species at risk present in the study area were included as Key Indicators in the avian species at risk (SAR) valued component (VC). Barn swallow and horned grebe were recorded in the study area, but not included as VCs. Additionally, bank swallow may inhabit the Project area. Impacts to Species at Risk Act Schedule 1 listed species need to be identified, avoided, lessened and monitored. In Section 9.4.3.3. the Proponent states: "It is acknowledged that the listed Barn Swallow (Hirundo rustica) and Horned Grebe (Podiceps auratus) could potentially occur in the Terrestrial RSA. Incidental observations occurred during the baseline studies (Appendix 9-B). To focus the effects assessment on a few key species (described in the following) it was decided to	1. Explain how nesting habitat requirements of barn swallow is represented by common nighthawk and olive-sided flycatcher as a VC or assess individually each SAR that overlaps with the Project and is likely to be affected. 2. Explain how nesting habitat requirements of horned grebe are represented by yellow rail and rusty blackbird as a VC, or assess individually each SAR that overlaps	This response has not been accepted. Part 1. Of the IR was accepted, however the answer for part 2. And 3. Of the IR are insufficient in order to understand the Proponent's rationale for using yellow rail and rusty blackbird to represent horned grebe. These species are all associated with wetlands, however, their specific habitat requirements and wetland types differ. Due to differing habitat selection and use, ECCC recommends that each selected VC is given an individual assessment with specific mitigation	As noted elsewhere in the IR responses, per accepted, proven EA methodology, Denison used a habitat-based methodology to determine the Project's effects on VCs, using an accepted Key Indicator methodology, and not every species, to focus and inform the EA. Nesting habitat requirements of the horned grebe are similar at a landscape level to those represented by yellow rail and rusty blackbird in that they are typically found associated with northern waterbodies and watercourses with various forms of emergent vegetation. At a site-specific scale, there are subtle differences in nesting habitat requirements, as summarized previously by ECCC in the Context and Rationale response. Given the nesting habitat requirements of these species, the available habitat types within the Denison study areas (e.g., Project Area, Wildlife Local Study Area, and the Terrestrial Regional Study Area) for use by these species include the following ecosite types: Labrador tea shrubby bog (BS18), graminoid bog (BS 19), graminoid bog/graminoid fen	No

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					use Olive-sided Flycatcher and Common Nighthawk to represent Barn Swallow as well, and to use Yellow Rail and Rusty Blackbird as a substitute for Horned Grebe. Unlike Horned Grebe, Yellow Rail and Rusty Blackbird are also listed provincially." Barn swallow, bank swallow and horned grebe may have different nesting habitat requirements than the representative species discussed in the draft EIS. An explanation of how differing species are representative of one another is required, or if an explanation cannot be provided, the species should be assessed individually. **Updated Rationale:** The management plans for these three species demonstrate the variability in their habitat selection. The Management Plan for the Yellow Rail (*Coturnicops noveboracensis*) in Canada (Environment Canada, 2013) states "Yellow Rails inhabit shallow wetlands and other wet areas with grass-like vegetation. They breed in wetlands such as damp hay fields or meadows, floodplains, bogs, upper levels of estuaries, salt marshes (Bookhout 1995, Alvo and Robert 1999, COSEWIC 2009), shallow prairie wetlands, and wet montane meadows (Peabody 1922, Sherrington 1994, Popper and Stern 2000). " The Management Plan for the Rusty blackbird (*Euphagus carolinus*) in Canada (Environment Canada 2015), states: "Rusty Blackbirds tend to select breeding sites with a combination of freshwater bodies with shallow water and emergent vegetation for foraging that are adjacent to wetlands with conifers or tall shrubs with cover for nesting (Matsuoka et al. 2010a, Matsuoka et al. 2010b, Greenberg et al. 2011)." The Management Plan for the Horned Grebe (*Podiceps auritus*), Western population, in Canada (ECCC, 2022) states: "The Horned Grebe breeds in small (generally 0.5 to 2 ha, but ranging from 0.24 to 18.2 ha), shallow (at least 20 cm deep, but on average 40 cm), and usually fishless, perennial wetlands, but they can also nest on larger lakes with shallow edges and sufficient emergent vegetation. Breeding sites usually contain at least 40% open water with beds of emergent vegetation, such as sedges (Carex spp.), rushes (Juncus spp.) and cattails (Typha spp.) (Faaborg 1976, Kuczynski et al. 2012, Routhier 2012, Stedman 2018)." Due to differing habitat selection and use, ECCC recommends that each selected VC is given an individual assessment with specific mitigation measures. This will allow for a more accurate review of the chosen mitigation measures.	with the Project and is likely to be affected. 3. Assess individually each SAR that overlaps with the Project and is likely to be affected. See also related IRs: IR-160 and IR-161.	measures to allow for a more accurate review of the chosen mitigation measures.	(BS19/BS24), open bog (BS 20), leatherleaf shrubby poor fen (BS22), willow shrubby rich fen (BS23), graminoid fen (BS24), open fen (BS25), and waterbodies and lakes. The habitat-based methodology of the environmental assessment adequately and appropriately addresses effects on these habitat types and the associated migratory bird species that could potentially use these habitat types. Further assessment of each species would not be expected to affect or alter the findings of the habitat-based environmental assessment. The characterization of the alteration and/or habitat loss residual effect considers the Project effects on available habitat used by these three migratory breeding birds within the Wildlife LSA and Terrestrial RSA. As outlined in Table 9.3 18, 0.05% of the Project Area, 11.5% of the Wildlife LSA, and 24.2% of the Terrestrial RSA provide habitat types that are potentially available to these three migratory breeding bird species. Direct habitat loss is calculated as the area of available habitat lost due to site clearing within the Project Area. Direct habitat loss has been mitigated by reducing the size of the Project Area to the extent practicable during Project design; however, available habitat is still predicted to be cleared during Construction. In the Project Area, 0.09 ha or 100% of available habitat is assumed to be removed and will not be available to these species for the duration of the Project (Table 9.3 19). This considers that the Project Area has previously been disturbed (i.e., almost 15% of the Project Area is disturbed by anthropogenic activities) and includes only 0.02 ha (0.01%) of landscape covered by waterbodies. This relates to a removal of 0.02% of available habitat within the Wildlife LSA and 0.001% in the Terrestrial RSA. An additional 93.9 ha (17.0%) of available habitat in the Wildlife LSA may experience habitat alteration resulting from indirect Project effects, such as sensory disturbance (Table 9.3 19). This area of indirect effect represents 1.0% of available habitat in the Terrestrial RSA that may experience habitat alteration.	

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IR-164	-	ECCC	Migratory birds	Section 9.4.4.2.1, Alteration and/or Loss of Habitat – Migratory Breeding Birds	**Context and Rationale:** The discussion on impacts to migratory songbirds presented by the Proponent is not sufficient to understand the impacts on various guilds of birds (e.g., aerial insectivores, forest birds, wetland birds, habitat specialists). As per IR-158, focal representative species/guilds should be used as key indicators (KI) in the Migratory Breeding Birds Valued Component. A greater level of detail on Project impacts to migratory songbirds with differing habitat requirements is needed for a fulsome assessment of effects. **Updated Rationale:** A greater level of detail, including a discussion on impacts to different focal species and/or guilds within the Migratory Breeding Birds Valued Component, is required for a more fulsome assessment of effects and identification of mitigation measures. Additionally, mapping detailing important features or habitat types that will be lost due to the Project for different guilds of migratory birds will be required to assess Project effects. This information will be required in order for the Proponent to apply adaptive management, and for ECCC to review the adequacy of these management plans.	1. Provide further discussion on impacts to different focal species/guilds within the Migratory Breeding Birds Valued Component. 2. Provide mapping of important features or habitat types that will be lost due to the Project for different guilds of migratory birds.	This response has not been accepted. The Proponent did not provide the information requested in the previous Information Requirement. The discussion of impacts to different focal species/guilds within the Migratory Breeding Birds VC and mapping of important features or habitat types lost for these guilds of birds is required for the Proponent to apply adaptive management, and for ECCC to review the adequacy of these management plans.	As noted elsewhere in the IR responses, as per accepted, proven EA methodology, Denison used a habitat-based methodology to determine the Project's effects on VCs, using an accepted Key Indicator methodology, and not every species, to focus and inform the EA. Further, the approach used in the EA was focused on the key habitat types that all migratory bird species, regardless of guild, would use. The EA considered the potential effects on all available habitat types used by these key indicator species and appropriate mitigation measures have been proposed and will be implemented which considered all migratory bird species regardless of focal species/guild. Direct habitat loss is based on the removal of habitat (ecosites) during site clearing within the Project Area. Direct habitat loss has been mitigated by reducing the size of the Project Area to the extent practicable during Project design; however, available habitat is still predicted to be cleared during the Construction Phase. In the Project Area, 113.5 ha or 100% of available habitat is assumed to be removed and will not be available to the migratory songbird species for the duration of the Project. This represents the removal of 4.5% of available habitat within the Wildlife LSA and of 0.6% within the Terrestrial RSA (Table 9.4 16: Summary of Available Habitat for Migratory Songbirds, Direct Habitat Loss, and Habitat Alteration in the Study Areas). Further, revisions have been made to Figure 9.4-11 in the revised draft EIS provides further context as to the habitat (ecosite) types within the Project Area that will be affected by Project activities. No important wildlife features were identified within the Project Area during the baseline surveys, although several raptor nests were found within the Wildlife LSA and Terrestrial RSA (see Figure 9.4-6 in the revised draft EIS:). The pre-clearance wildlife sweeps will be completed to identify important wildlife features (e.g., hibernacula, roosting habitat, dens, nests, mineral licks) that would require site-specific mitigation measures to limit or avoid adverse effects.	Yes Revised Draft EIS, updates to Figure 9.4-6 and Figure 9.4-11
IR-165	-	CNSC ECCC	Birds (all species)	Section 9.4.4.2.2 Section 9.4.5.2.4, Avian Deterrence and Prevention of Entrapment Appendix 10-A (ERA)	**Context:** On p. 9-364 of the EIS, it is stated that exposure to hazardous materials through contact with contaminated waste ponds could affect avian health and contribute to mortality. However, the ERA places the avian receptors only in waterbodies and locations outside of the Project area (see Figure 5-2 in the ERA), i.e., Whitefish Lake, McGowan Lake, the inlet to Russell Lake, and Kratchkowsky Lake. Further, there are insufficient details on the potential effects of the water quality in the water management and treatment facilities on birds, species at risk, and other wildlife, including the risk of bioaccumulation of contaminants. The Proponent should assess potential effects of water quality from these areas using applicable CCME guidelines. **Rationale:** It is unclear whether the ecological risk assessment based on the chosen exposure locations is protective and conservative for avian species potentially exposed to contaminated waste ponds on the Project site.	Please perform an ecological risk assessment with avian receptors located at the contaminated waste ponds, including: 1. Describe and analyze the possibility of birds, species at risk and other wildlife using the water or waste management facilities and provide an analysis to determine if there is a risk to wildlife that may access these areas. 2. Identify the potential toxicity of water management ponds to aquatic migratory birds and species at risk (SAR). 3. Describe what measures will be	This response has not been accepted. Please provide an explanation for the appropriateness and conservatism of using the Canadian Council of Ministers of the Environment (CCME) water quality guidelines (WQG) for the protection of livestock for avian receptors, or update the tables provided in Attachment IR-165 using the CCME Water Quality Guidelines for the Protection of Aquatic Life. In order to protect migratory birds from the quality of water in the water management pond, it is recommended that the use of the CCME water quality guidelines for the protection of aquatic life to assess potential impacts to aquatic birds from water management facilities because they are more protective than the CCME water quality guidelines for livestock with lower acceptable levels for contaminants. The water quality	The CCME livestock guidelines are intended to protect both birds and mammals. As per the CCME "Protocols for Deriving Water Quality Guidelines for the Protection of Agricultural Water Uses (Irrigation and Livestock Water)", the livestock guidelines are based on toxicological datasets and follows toxicological dataset requirements for derivation of the guidelines. Livestock are defined in the Protocol as "any terrestrial animal kept for economic profit or personal use (e.g., cattle, pigs, poultry, waterfowl, etc.)". The Protocol identifies that aquatic organisms such as fish should be addressed by the water quality guidelines for protection of aquatic life. The IR is asking about avian receptors located at the water management ponds . It is not appropriate to assess avian receptors (which are considered riparian and/or terrestrial) against guidelines for the protection of aquatic life (which are considered to be fish, aquatic plants, aquatic invertebrates, etc.). As identified in the Protocol, the livestock guidelines consider the potential for bioaccumulation in the animal. Additionally, for each species, the livestock guidelines are based on the data from the most sensitive livestock species, and the sensitivities of life stages are considered as well. As such, the livestock guidelines are considered sufficiently protective in the unlikely case that avian birds land on and drink from the process water pond or the effluent monitoring and release ponds. The previous response to IR-165 (Attachment IR-165) outlined the numerous mitigation measures Denison plans to implement to minimize the potential for avian exposure to pond water,	No

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					While mitigation measures such as physical, visual, and/or auditory deterrents are proposed in Section 9.4.5.2.4, the possibility of avian species coming into contact with waste ponds cannot be excluded based on the available information in the EIS. The possibility of birds, species at risk, and other wildlife accessing the water management and treatment facilities for drinking water or other purposes is not discussed in the draft EIS.	taken if the waters are found to be toxic to migratory birds and SAR. **Suggestions for mitigation and follow-up measures:** CNSC recommends that Denison ensure adequate mitigation measures are implemented to minimize the potential for avian exposure to pond waters.	guidelines for the protection of aquatic life should also be used to compare predicted contaminant concentrations in water management ponds. The FIRT is unable to verify predicted Project impacts to migratory birds using water management ponds as the selected CCME Water Quality Guidelines for livestock do not accurately reflect the exposure levels and pathways experienced by waterfowl and shorebirds.	as well as additional visual and auditory deterrent techniques. As such, no additional changes are needed to address this IR. **<u>References:</u>** CCME. 1999. Protocols for Deriving Water Quality Guidelines for the Protection of Agricultural Water Uses (Irrigation and Livestock Water).	
IR-169	-	ECCC	Migratory birds	Section 9.4.6.3, Residual Effects Evaluation for Migratory Birds, Table 9.4-15 and Map 9.4-11	**Context and Rationale:** The analysis of available habitat types for migratory songbirds appears incorrect. In their interpreted ecosite mapping, the Proponent identified 25 different ecosite types. In their table 9.4-15 and map 9.4-11, the Proponent only lists 8 ecosite types that are available migratory songbird habitat. Section 9.4.6 Residual Effects Evaluation for Migratory Songbirds reads: "Considering the baseline data (Appendix 9-B), migratory songbird habitat is described in the following text without species-specific differentiation and referred to as available habitat for migratory songbirds. Based on the baseline study results, 66.8%, 52.2%, and 50.7% of the Project Area, Wildlife LSA, and Terrestrial RSA, respectively, are assumed to provide available habitat for migratory songbirds (Table 9.4-15)." All Project areas, except some anthropogenic features and open water, would be considered available habitat for migratory songbirds. Although some ecosite types may have lower density and diversity, it is expected that all ecosites provide migratory songbird habitat.	1. Explain how information in Table 9.4-15 and map 9.4-11 were derived. 2. Explain why other habitat types were not considered as available habitat for migratory songbirds.	This response has not been accepted. In their response to IR-169, the Proponent states, "As per accepted methodology, to appropriately focus the habitat- based effects assessment, as per accepted EA methodology, the most frequently used habitat types (i.e., the ecosites experiencing the highest species richness, highest mean number of breeding songbird pairs, and highest species diversity) within the Project study areas were included as "available habitat" as shown in draft EIS Table 9.4-15 Summary of Available Habitat for Migratory Songbirds in the Project Study Areas and Figure 9.4-11 Available Habitat for Migratory Songbirds." The methodology used to determine available habitat is not appropriate. The methodology used by the Proponent would be appropriate for the identification of higher quality habitat, but not as a representation of all available habitat. The methods used to determine available habitat may underrepresent rare ecosite types that were not sampled or were sparsely sampled, including ecosite types that may be important for species at risk. Avian habitat mapping/analyses should be corrected to reflect all available habitat to understand the location of habitat and the presence/absence of species. Repeat the analysis of available habitat to include all habitats used by birds, or a. Change mapping and analyses to indicate that areas identified are ecosites with the highest frequency of use, or	Text in Section 9.4.6.3 (pages 9-405 and 9-406) of the revised Draft EIS has been revised as follow: . "For the purposes of this assessment, all habitat types within the RSA could potentially be used by migratory songbirds for foraging or breeding opportunities. ~~Based on the baseline study results, 66.8%, 52.2%, and 50.7% of the Project Area, Wildlife LSA, and Terrestrial RSA, respectively, are assumed to provide available habitat for migratory songbirds (Table 9.4-15)."~~ Updates to Tables 9.4-15 and 9.4-16, as well as Figure 9.4-11 have been completed in the revised Draft EIS to include all habitat (ecosite) types. The information provided the revised tables and figure is too extensive to include in this IR response table and they can be referenced in the updated version of Section 9 of the revised Draft EIS that was included as part of the overall response package to the second round of FIRT IRs. Although of interest, these observations with the RSA would not be expected to alter the findings or the mitigation measures proposed, nor the conclusions reached in the EA.	Yes Revised Draft EIS Section 9.4.6.3, updates to Table 9.4-15 and Table 9.4-16, as well as updates to Figure 9.4-11.

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							b. Change mapping and analyses to show relative habitat use.		
IR-170	-	ECCC	Migratory birds	Section 9.4.6.4, Residual Effects Evaluation for Bird SAR, Table 9.4-19	**Context and Rationale:** The table and map presented by the Proponent do not appear representative of all available habitat for common nighthawk (CONI). Although CONI do preferentially use open areas such as gravel (often an anthropogenic disturbance) and regenerating forest, as identified in the draft EIS, they also use rock outcrops that can be within forested areas. As this area lies within the pre- Cambrian shield, there are likely rock outcrops that are also available habitat. As aerial insectivores, CONI select nesting areas in close proximity to wetlands or lakes where there is abundant forage. **Rationale:** Habitat requirements and preferences for all species at risk is required for developing effective mitigations and adaptive management.	1. Provide an updated table and map that considers all available habitat for common nighthawk. 2. Additionally, as part of environmental management plans the Proponent should include species-specific mitigations that are biologically relevant to all the species at risk for all Project phases and components.	This response has not been accepted. Part 1 of the IR was addressed, however, part 2 has not been addressed. ECCC requires this information to properly assess potential the mitigations and adaptive management for Common Nighthawk.	Based on the baseline field survey observations (n=38) for common nighthawk, the majority of observations (n=20) were in association with anthropogenic (disturbed) ecosite types, while the remainder (n=10) were associated with the jack pine-blueberry/black spruce-blueberry/lich (BS3/BS7) ecosite. Updates to Figure 9.4-7, Figure 9.4-12 and Table 9.4-19 of the revised draft EIS have been completed to include all habitat (ecosite) types. See separate response to IR-170: Available Habitat for Common Nighthawk. Figure 9.4-12 in the revised draft EIS has been replaced in the EIS with a revised figure that includes all ecosite types. Mitigation measures that would pertain to common nighthawks are included in Section 9.4.5.2.1 Work Timing Windows and Habitat Disturbance, which state that site clearing and other works that involve disturbance of vegetation and/or soil will be conducted outside of the nesting season, whenever practicable. The nesting season for the Raptors, Migratory Breeding Birds, and Bird Species at Risk VCs in Saskatchewan spans a period from March 15 to August 31. Further, in the event site clearing is necessary within this time frame, pre-clearance wildlife sweeps will be completed where common nighthawks are suspected of nesting; if an occupied nest is found, applicable activity restriction guidelines would be implemented (as per SK MOE 2017). **<u>References:</u>** Saskatchewan Ministry of Environment (SK MOE). 2017. Saskatchewan Activity Restriction Guidelines for Sensitive Species. https://publications.saskatchewan.ca/api/v1/products/79242/formats/89555/download (accessed July 2021).	Yes Revised Draft EIS, updates to Figure 9.4-7, Figure 9.4-12, and Table 9.4-19
IR-174	-	ECCC	SAR – Bats	Appendix 9-B, Denison Mines Corporation Wheeler River Project, Terrestrial Environment, Wildlife and Vegetation Baseline Inventory, Section 2.1.4 Acoustic Bat Surveys	**Context:** The Proponent conducted acoustic surveys for bats and confirmed presence of two Species at Risk Act (SARA) schedule 1 listed bat species in the Project area, little brown myotis (Myotis lucifugus) and northern myotis (Myotis septentrionalis). However, the Proponent did not do an effects assessment of either of these bat species. **Rationale:** Although bats are present in the study area, no work was done to identify hibernaculum or maternal roosting sites. All species at risk that are expected to be present in the Project area should be assessed and species-specific mitigations detailed.	1. Conduct an effects assessment for little brown myotis and northern myotis, including the likelihood that tree clearing during the bat roosting period, is likely to 'kill', 'harm', or 'harass' Little Brown Myotis and Northern Myotis and its ability to carry out its life processes. 2. Describe and map locations of suitable myotis hibernacula and/or maternal roost habitat within the Local Study Area and Regional Study Area and explain how these habitats may be affected by Project activities.	This response has not been accepted. Items 1., 3. And 4. of IR-174 are accepted, however, item 2. Of IR-174, which asked for mapping of suitable myotis habitat, was not addressed. Mapping of suitable habitat or results from baseline studies is required to understand Project impacts to Species At Risk (SAR) bat species. This may include providing mapping of bat acoustic results, including locations along with frequency of detections. See also IR-134 and follow-up 134-R1.	Acoustic bat surveys were completed between July 22 and 23, 2019 with 61 survey points sampled across five ecosite types. The location of the survey points, species detected, and frequency of detections are included in Figure 2 9 of Appendix 9-F of the revised draft EIS. The EA used a habitat-based approach to predict the effects of the Project on bat species. Further, in the event that site clearing is necessary, pre-clearance wildlife sweeps will be completed and appropriate mitigation will be developed and implemented. The pre-construction and pre-clearing surveys will consist of wildlife sweeps conducted by qualified biologists within 7 days prior to any clearing activity at a specific location, and a 100 m buffer, within the Project Footprint. The wildlife sweeps will not be species-specific surveys focused on species at risk but will to be based on timing of Project related activities (i.e., will be completed in advance of site clearing activities). These sweeps are intended to identify sensitive wildlife features (including hibernacula or potential roosting sites for myotis species) that would require specific mitigation measures to avoid or minimize adverse effects on identified features and are not species-specific. The methods associated with these pre-construction and pre-clearing sweeps will be tailored to species	Yes Appendix 9-F incorporated (added) into the revised Draft EIS Appendices

<table>
<tr><th>Original IR#</th><th>Follow-Up IR #</th><th>SME</th><th>Project Effects Link</th><th>Reference to EIS, appendices, or supporting documentation</th><th>Context and Rationale</th><th>Information Requirement (IR)</th><th>Rationale for Status</th><th>Denison's Response</th><th>EIS Updates (Yes/No; if Yes, provide EIS Section number)</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>3. Describe what mitigation measures will be taken to avoid the breeding period for bats.

4. Describe any pre-construction/pre- clearing surveys will be conducted to identify any hibernaculum and maternal roosting sites. Describe how monitoring will support adaptive management.</td><td></td><td>at risk (including myotis species) that may potentially be using habitats at certain times of the year. Depending on the results of these surveys, appropriate mitigation measures will be developed and implemented. This is a risk-based approach with the intent of reducing the potential of important wildlife features being adversely affected during vegetation or land disturbance activities. The wildlife sweeps would be conducted within 7 days prior to disturbance activities, year-round, so that sensitive features can be identified, and appropriate mitigation measures (e.g., avoidance, timing delay) can be developed and implemented, as appropriate.</td><td></td></tr>
<tr><td>IR-189</td><td>-</td><td>CNSC</td><td>Woodland Caribou Ecological Model</td><td>Appendix 10-A (ERA)</td><td>Context: In the ERA (p. C.12, section 2.3.6 Woodland Caribou) it is stated: "For the ecological model a diet comprised of 50% browse, 20% lichen and 30% macrophytes is assumed for the woodland caribou."

In the EIS, section 9.3.3.3.1, it is stated: "Research has shown that up to 70% of the year-round diet of caribou may consist of ground and arboreal lichens."

Rationale: It is unclear whether the assumptions in the ecological model in the ERA regarding Woodland caribou diet are conservative, given only 20% lichen intake in the model. Lichen is known to accumulate COPC such as metals and dust from the atmosphere.</td><td>Please provide additional evidence to support that those Woodland Caribou who may have higher consumption rates of lichen as part of their diet, will remain protected. This can be provided through including a second model that assumes 70% lichen in the diet.

See also related: IR-138.</td><td>This response has not been accepted. Please:

1. Provide a summary table of all hazard quotients for the second woodland caribou model assuming a diet of 70% lichen, 20% browse, and 10% macrophytes, for completeness.

2. Clarify if the Appendix 10-A (ERA) will be updated to include the second woodland caribou model.</td><td>1. Summary tables of all hazard quotients (HQs) and the maximum radiological dose for the second woodland caribou model assuming a high lichen diet (HLD) of 70% lichen, 20% browse, and 10% macrophytes (woodland caribou HLD) and the woodland caribou assuming a low lichen diet (LLD) of 50% browse, 20% lichen and 30% macrophytes (woodland caribou LLD) are provided below.

<table>
<tr><th rowspan="2">Biota</th><th rowspan="2">Location</th><th colspan="5">Maximum HQs during Project Phases</th></tr>
<tr><th>Arsenic</th><th>Cadmium</th><th>Cobalt</th><th>Chromium</th><th>Copper</th></tr>
<tr><td rowspan="2">WoodLand Caribou LLD</td><td>Reference (Kratchkowsky Lake)</td><td>3.70E-04</td><td>2.79E-04</td><td>1.62E-04</td><td>2.30E-04</td><td>2.74E-02</td></tr>
<tr><td>Whitefish Lake</td><td>3.85E-04</td><td>2.84E-04</td><td>1.66E-04</td><td>2.33E-04</td><td>2.83E-02</td></tr>
<tr><td rowspan="2">WoodLand Caribou HLD</td><td>Reference (Kratchkowsky Lake)</td><td>3.90E-04</td><td>3.28E-04</td><td>2.00E-04</td><td>3.72E-04</td><td>2.15E-02</td></tr>
<tr><td>Whitefish Lake</td><td>4.06E-04</td><td>3.33E-04</td><td>2.04E-04</td><td>3.76E-04</td><td>2.29E-02</td></tr>
<tr><th>Biota</th><th>Location</th><th>Molybdenum</th><th>Selenium</th><th>Uranium</th><th>Vanadium</th><th>Zinc</th></tr>
<tr><td rowspan="2">WoodLand Caribou LLD</td><td>Reference (Kratchkowsky Lake)</td><td>3.30E-04</td><td>4.63E-03</td><td>3.10E-04</td><td>7.79E-03</td><td>2.80E-03</td></tr>
<tr><td>Whitefish Lake</td><td>2.54E-03</td><td>7.65E-03</td><td>9.19E-03</td><td>8.98E-03</td><td>2.82E-03</td></tr>
<tr><td rowspan="2">WoodLand Caribou HLD</td><td>Reference (Kratchkowsky Lake)</td><td>4.50E-04</td><td>6.41E-03</td><td>4.20E-04</td><td>9.97E-03</td><td>3.53E-03</td></tr>
<tr><td>Whitefish Lake</td><td>2.43E-03</td><td>8.40E-03</td><td>1.66E-02</td><td>1.10E-02</td><td>3.54E-03</td></tr>
</table>

<table>
<tr><th rowspan="2">Biota</th><th rowspan="2">Location</th><th colspan="7">Maximum Radiological Dose During Project Phases (mGy/d)</th></tr>
<tr><th>Uranium-238</th><th>Uranium-234</th><th>Thorium-230</th><th>Radium-226</th><th>Lead-210</th><th>Polonium-210</th><th>Total Dose</th></tr>
<tr><td rowspan="2">WoodLand Caribou LLD</td><td>Reference (Kratchkowsky Lake)</td><td>3.34E-06</td><td>3.81E-06</td><td>6.25E-06</td><td>6.81E-04</td><td>1.20E-05</td><td>6.24E-03</td><td>6.95E-03</td></tr>
<tr><td>Whitefish Lake</td><td>8.19E-05</td><td>9.32E-05</td><td>7.30E-06</td><td>6.86E-04</td><td>1.20E-05</td><td>6.26E-03</td><td>7.14E-03</td></tr>
<tr><td rowspan="2">WoodLand Caribou HLD</td><td>Reference (Kratchkowsky Lake)</td><td>3.61E-06</td><td>4.12E-06</td><td>4.44E-06</td><td>6.05E-04</td><td>1.99E-05</td><td>1.09E-02</td><td>1.15E-02</td></tr>
<tr><td>Whitefish Lake</td><td>1.43E-04</td><td>1.62E-04</td><td>4.74E-06</td><td>6.09E-04</td><td>1.99E-05</td><td>1.09E-02</td><td>1.18E-02</td></tr>
</table>

Compared with the woodland caribou LLD, the predicted maximum HQs for the woodland caribou HLD generally increased by 5 to 81% with the exception of copper and molybdenum where the HQ decreased by 4 to 22% due to copper and molybdenum concentrations in lichen being lower than in browse. However, all HQs for woodland caribou HLD are below the benchmark of 1 for all non-radiological COPCs. The predicted maximum total radiological dose for the woodland caribou HLD increased by 65% compared to that for the woodland caribou LLD. However, the total dose for woodland</td><td>Yes

Appendix 10-A, New Section 6.2.1 added</td></tr>
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								caribou HLD is still far below the radiation dose benchmark of 2.4 mGy/d for terrestrial biota, as recommended in CSA N288.6-22. 2. Appendix 10-A (ERA) was updated to include the second woodland caribou model as part of the sensitivity analysis presented in Section 6.2, "Section 6.2.1 Woodland Caribou Diet". Additional text in this updated section is as follows: "The food source for the woodland caribou in the winter is terrestrial or arboreal lichens; terrestrial and aquatic vegetation are also food sources in the remainder of the year. For the ecological risk assessment, a low lichen diet (LLD) comprised of 50% browse, 20% lichen and 30% macrophytes was assumed to represent the year-round diet for woodland caribou (woodland caribou LLD). Research has noted that arboreal lichen could make up 70% of the caribou's winter diet (MNRW, 2006). To make sure that woodland caribou who may have higher consumption rates of lichen remains protected, a high lichen diet (HLD) comprised of 70% lichen, 20% browse and 10% macrophytes was assumed as a sensitivity scenario for woodland caribou who may have higher consumption rates of lichen (woodland caribou HLD)." For reference, the modelled results (shown above) have been included as Table 6-1 and Table 6-2 in Section 6.2.1. **References:** Ministry of Natural Resources and Wildlife (MNRW) Quebec Wildlife Sector, 2006. Gaspésie Woodland Caribou Recovery Plan (2002-2012). https://www.registrelep-sararegistry.gc.ca/virtual_sara/files/plans/rs_gaspesie_woodland_caribou_final_1007_e.pdf	
IR-190	-	HC	Change to an environmental component due to hazardous contaminants	Appendix 10-A (ERA), Table 3-8 (p. 3.31) and Table 3-9 (p. 3.36) Appendix 6, Table 5 (p. 16)	NO2 criteria is not being consistently compared. **Context**: Provincial and federal air quality criteria/screening values for NO2 have been used inconsistently. Table 3-9 in Appendix 10-A (ERA) uses the 2015 Saskatchewan Ambient Air Quality Standards (SAAQS) value of 300 µg/m3 to compare the maximum concentrations of NO2 at receptor locations for the 1-hour average period, while Table 5 of Appendix 6 uses the 2025 Canadian Ambient Air Quality Standards (CAAQS) of 79µg/m3 for the same average period time. **Rationale**: By utilizing the SAAQS screening value for NO2, the maximum concentrations at receptor locations exceed the 1-hour threshold solely during the decommissioning stage (Table 3-9). However, if the 2025 CAAQS are applied, the screening values would be exceeded at receptor locations for all project phases. It is best practice to use the more protective air quality standards to evaluate potential human health risks associated with project activities.	1. Compare the predicted maximum concentrations to the most protective applicable air quality standards available. Alternatively, provide a rationale as to why the SAAQS for NO2 were used rather than the more protective 2025 CAAQS to determine potential exceedances and screen for the need for additional mitigation measures. **Suggestions for mitigation and follow-up measures:** Health Canada recommends use of the standards from the 2025 CAAQS for NO2 in future mitigation and follow-up plans.	This response has not been accepted, as the rationale for not applying the CAAQS in the assessment is not accurate. Health Canada acknowledges the commitment to use the 2025 CAAQS for NO_2 in future mitigation and follow-up plans. However, the response to IR-190 did not compare the predicted maximum concentrations to the most protective applicable air quality standards available (i.e., CAAQS), and included the following rationale: *The CAAQS are applicable to measured ambient air concentrations over a three-year period and are not applicable to modelled results from a single facility;* and, *Use of the CAAQCs would require a three-year site specific data set.* The statement is incorrect. The CAAQS are national air quality standards, but they are not restricted to applications within the context of the Air Quality	Table 3-9 and Table 3-10 in the ERA (Appendix 10-A) have been updated to use the available Federal CAAQS for NO_2 and SO_2 as the screening criteria instead of the Provincial SAAQS. Accompanying text was also updated to acknowledge exceedances of the NO_2 1-hour CAAQS during all project phases instead of just during decommissioning. Additional text was added to Section 3.2.1.3.1 to acknowledge the number of hours in a year where exceedances of the CAAQS may occur. For reference purposes the following further information is noted. While Denison is committed to applying the CAAQS in future monitoring and mitigation programs, it is important to note that the CAAQS are not legally binding or enforceable standards under federal law. The AQMS (Air Quality Management System) that underpins CAAQS is not a regulation, but merely a cooperative arrangement between the federal and provincial governments that informs decision-making at the provincial level. As such, the current provincial air quality criteria remain the only legally enforceable standards that are applicable to the Project, until such time that the province chooses to fully adopt the CAAQS.	Yes Appendix 10-A Table 3-9, Table 3-10, Section 3.2.1.3.1 "Nitrogen Dioxide"

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							Management System (AQMS). The comparison with CAAQS may be considered in determining the nature and severity of the Project's impact on air quality levels and the resulting mitigation measures that may be required to maintain good air quality levels or to prevent an exceedance of the CAAQS. The CAAQS are generally calculated for specific multi-year averages and for a particular statistical form so that extreme and unpredictable events do not drive risk management. However, if the data is not available for comparison to a full CAAQS timeframe, Health Canada suggests using model results for at least one calendar year to allow for a basic comparison with the CAAQS statistical form. The modelling results should be able to indicate the frequency of CAAQS exceedances, which can be used in the discussion as to whether any anticipated human health impacts are anticipated. Please see the Advice to the Proponent table for further discussion on the use of CAAQS (AD-69), which also notes that, while being more conservative than the NAAQO, Saskatchewan & Alberta's screening value do not reflect the most recent science, which indicates that there is no apparent threshold for NO_2, meaning that health effects may occur at any level of exposure. See also follow-up IR 190-R1.		
IR-190	IR-190-R1	HC	Change to an environmental component due to hazardous contaminants	Section 6.1.3.2.2 (p. 6-21) Table 6.1-8 (p. 6-22); and, Table 6.1-9 (p. 6-22) Section 6.1.8 (p.6-44) IR-190 Response from Denison	Limitations with the proposed use of passive NO_2 monitoring would not allow comparison of measurement results to the 2025 CAAQS for 1-hour NO_2. **Context:** In response to IR-190, there was agreement to using the 2025 CAAQS for NO_2 in future mitigation and follow-up plans, which Health Canada supports. However, the proposed air quality monitoring and follow-up plans (Chapter 6.1.8) anticipate continued use passive NO_2 samplers, which do not measure hourly (1-hour) concentrations. Section 6.1.3.2.2 indicates that the assessment makes use of passive samplers to measure NO_2 at two sampling locations. The results from those samplers are presented in tables 6.1-8 and 6.1-9, for a ~30-day sampling period (i.e., a total concentrations for NO_2 in ambient air over ~30 days).	1.Provide additional details on proposed air quality monitoring for NO_2 that will allow for comparisons to both the 1-hour and annual 2025 CAAQS and how that will be used to support mitigation and follow-up plans. Distinguish between comparisons with measured and modelled monitoring data, as well as use of passive and active samplers. 2. If multiple approaches will be used to monitor NO_2 (e.g., use of passive and/or active samplers, modifications due to differences between project phases, etc.),		1. Air quality monitoring for NO_2 is proposed as monthly collection using passive samplers, during all Project phases. The objective of the program is to demonstrate compliance with provincial and federal ambient air quality standards including the CAAQSs. Monitoring data will also be compared against the modelled data provided in the EIS. Passive samplers will allow for direct comparison against the annual 2025 CAAQSs. To compare against the 1-hour CAAQSs Denison will use a commonly utilized averaging equation (such as the Ontario MECP averaging equation Air Dispersion Modelling Guideline for Ontario) to allow for conversion from the monitoring period to a 1-hour averaging period. Denison acknowledges that short-term peaks may not be captured through the passive sampling approach; however, Denison plans to first utilize passive sampling during site preparation and will consider based on an adaptive management process whether there is a need to switch to continuous monitoring. 2. See response to #1. Denison intends to use passive samplers for NO_2 monitoring. **References:**	No

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					While passive samplers provide measurement data for comparison to the annual 2025 CAAQS for NO_2, measurement data for the 1-hour NO_2 standard commonly requires use of an active sampler. **Rationale:** Health Canada encourages the monitoring of air contaminants when exceedances or near-exceedances of air quality criteria, standards and/or guidance values are predicted or reported, to: • determine the accuracy of predictions; • help verify whether standards are being met; and, • assist with implementing or modifying mitigation measures.	describe their intended contribution to the monitoring objectives and outcomes (e.g., determine the accuracy of predictions; assist with implementing or modifying mitigation measures).		Ontario MECP. 2017. AIR DISPERSION MODELLING GUIDELINE FOR ONTARIO [GUIDELINE A-11] Version 3.0. Air Dispersion Modelling Guideline for Ontario.	
IR-193	-	ECCC	Change to an environmental component due to hazardous contaminants	Appendix 10-A (ERA), Section 3.1.1.2 Section 8.2.4.2.3	**Context:** Appendix 10-A (ERA) Table 3-1 'Screening of Effluent Quality against Surface Water Quality Guidelines for the Wheeler River ERA' does not include acute water quality thresholds for all COPCs compared against predicted effluent quality. For example, it is stated that the final effluent quality discharge target for uranium is 0.057 mg/L. However, the CCME water short term (acute) water quality guidelines for the protection of aquatic life is 0.033 mg/L. The proposed effluent discharge target for uranium exceeds the acute water quality guidelines, indicating effluent may pose the risk of being acutely lethal to aquatic biota at end-of-pipe. All water quality thresholds should be derived from receiving environment parameters, and there are discrepancies between the values used in Appendix 10-A (ERA) Table 3-1 and the values presented in Tables 8.2-8 and 8.2-10 in Section 8.2.4.2.3 of the draft EIS. No selected screening value for TSS has been calculated from baseline conditions. Un-ionized ammonia, which is a regulated Schedule 4 substance under the MDMER, has not been included. **Rationale:** A review of all modelling results for all COPCs under the MDMER will assist ECCC in understanding the potential risks to the receiving environment.	1. Provide acute and chronic water quality thresholds for all required COPCs with monitoring required under the MDMER. 2. Ensure all water quality thresholds are derived from receiving environment baseline parameters and that these thresholds are consistently applied throughout the draft EIS.	This response has not been accepted, as the Proponent has not included un-ionized ammonia, mercury and phosphorous in Table 3-1 in Appendix 10-A or provided acute and chronic water quality thresholds for all COPCs, including those with monitoring required under the MDMER, in Table 3-1 in Appendix 10-A (ERA). Water quality thresholds derived from receiving environment baseline parameters have not been consistently applied throughout the draft EIS. It is unclear from the current information provided if predicted effluent concentrations exceed acute water quality guidelines, indicating effluent may pose the risk of being acutely lethal to aquatic biota at end of pipe. The Proponent should: 1. Update Table 3-1 in Appendix 10-A to include un-ionized ammonia, mercury and phosphorous. Update the risk assessment to incorporate these parameters as needed. 2. Update Table 3-1 in Appendix 10-A and Tables 8.2-8 and 8.2-10 in Section 8.2.4.2.3 of the draft EIS to include both acute and chronic water quality thresholds derived from receiving environment baseline parameters and in accordance with IR-114.	1.) The ERA in Appendix 10-A is focused on chronic long-term exposure due to routine effluent release during the Project Phases. As such the screening criteria used were chronic criteria. It is acknowledged that effluent quality will not be allowed to exceed acute guidelines. Acute guidelines are now provided in the updated Table 8.2-10 as presented in Attachment IR-114 and in the Final Draft EIS. This table (Table 8.2-10) also includes guidelines for unionized ammonia, phosphorous and mercury. Phosphorus will be present in the effluent at low levels and the near-field water quality model indicates that levels will remain well below criteria protective of aquatic life in the Whitefish Lake environment. Mercury is not identified as present in the effluent (see response to IR-100). No updates to Table 3-1 in Appendix 10-A are needed. 2.) Tables 8.2-8 and 8.2-10 have been updated as requested. Please refer to Attachment IR-114 and Attachment IR-115 and Section 8.2.4.2.3 of the updated EIS. No updates to Table 3-1 in Appendix 10-A are needed. The guidelines were derived using baseline environmental conditions such as baseline hardness, DOC, pH, etc.	Yes Revised Draft EIS, Section 8, Tables 8.2-8 and 8.2-10
IR-194	-	ECCC	Aquatic species	Appendix 10-A (ERA), Section 3.1.1.2 and Section 3.1.2.3	**Context:** In the ERA, COPCs should be selected for further assessment based upon the following factors: 1. COPC concentrations in effluent that exceed selected water quality guidelines for the protection of aquatic biota, and	1. As noted in IR-114, provide the information on predicted effluent quality for COPCs with required monitoring under the MDMER.	This response has not been accepted, as the Proponent has not updated the ERA to assess elevated baseline concentrations to delineate potential Project effects from background conditions.	1. See response to IR-114. Additional information has been provided for COPCs with requirement for monitoring under Schedule 5 of MDMER. Note that predicted effluent quality for all Schedule 5 parameters, with the exception of mercury, nitrate, and phosphorous were provided in Table 3-1 of the ERA in Appendix 10-A (these constituents were not identified as COPCs in the ERA).	Yes Appendix 8E, Table 8.2-9, Table 8.2-10

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					2. Baseline COPC concentrations in the LSA that exceed selected surface water and sediment quality guidelines for the protection of aquatic biota. However, only COPCs that had concentrations in effluent that exceeded guidelines were assessed further. Baseline concentrations of COPCs in sediment were not considered. In addition to this, not all COPCs that require monitoring under the MDMER had predicted effluent concentrations. From Section 8.2.3.3 Table 8.2-2 of the Aquatic Environment Report, it appears Aluminum in McGowan Lake and Whitefish Lake South and North, and pH in Whitefish Lake North exceed water quality guidelines. Predicted effluent concentrations or near-field surface water concentrations for Aluminum and pH are not provided. **Rationale:** It is not possible to determine if there is risk from effluent to the receiving environment and aquatic receptors based on the current information provided.	2. Provide the information on predicted maximum receiving environment surface water concentrations for COPCs with required monitoring under the MDMER in IR-114. 3. Update the ERA to assess the risk of any additional MDMER COPC concentrations in effluent that exceed water quality guidelines. 4. Update the ERA to assess the risk of COPCs that had elevated baseline water and sediment quality concentrations in the receiving environment.	The Proponent's response states: "The ERA followed the guidance in CSA N288.6-22 which does not require COPCs with elevated baseline concentrations to be considered COPCs for further quantitative assessment in the ERA. Clause 6.2.5.9 indicates that constituents with naturally elevated concentrations should be excluded from further consideration as a COPC." Section 6.2.5.9 of N288.6-22 is specific to the Human Health Risk Assessment, and this statement does not apply to the Ecological Risk Assessment (EcoRA). Section 7 of N288.6-22 is specific to the development of the EcoRA methodology, and in Section 7.2.5.2.6 of N288.6-22 it states: "In addition to screening of effluent and emissions data, concentrations measured in environmental media should be considered, as determined in the EMPs. Maximum concentrations measured in soil, receiving water, or sediment should be compared to screening criteria." Therefore, COPCs that had elevated baseline water and sediment quality concentrations in the receiving environment should be assessed in the ERA. Additionally, in Section 7.2.5.4.2 of N288.6-22 it is stated: "If COPCs exceed the screening level for one medium, they should be carried forward into the EcoRA for all media that are likely to contribute to exposure. For example, for a given COPC, if a water screening benchmark is exceeded, the same COPC should be carried forward for sediment if its concentration was above the detection limit." Therefore, if baseline exceedances occur in one media types, they should be carried forward for all media types in the ERA. It is not possible to determine if there is risk from effluent to the receiving environment and aquatic receptors based on the current information provided. Negative effects to biota from naturally elevated background concentrations of COPCs can be exacerbated by additional input of COPCs from Project effluent into the receiving environment. It is important to	2. Information on predicted maximum receiving environment surface water concentrations for COPCs with required monitoring under the MDMER is in the updated EIS (Tables 8.2-10 and 8.2-13 and Appendix 8E. Please refer to Attachment IR-115. 3. This is not applicable. No additional COPCs need to be carried forward in the ERA as the concentrations of COPCs in effluent do not exceed water quality guidelines (see Table 3-1 in the ERA in Appendix 10-A). All constituents identified in Schedule 4 and Schedule 5 were considered in the ERA screening with the exception of cyanide and mercury which are not identified as present in the effluent (see IR-100 regarding mercury). Phosphorus and nitrate will be present in the effluent at low levels and estimates of these constituents via the near-field water quality model indicate that levels will remain well below criteria protective of aquatic life in the Whitefish Lake environment (see Tables 8.2-10 and 8.2-13 of Section 8). 4. The CSA guidance referenced by the reviewer in this IR (Section 7.2.5.2.6 of N288.6-22) is for exposure situations and not for baseline. The text in Section 7.2.5.2.6 of N288.6-22 is saying that measured concentrations in environmental media should be screened in addition to effluent and emissions data. This is referring to measured concentrations in the environment since they will reflect the impact from releases from the facility. This is not referring to baseline concentrations without influence from effluent. Section 7.2.5.3.1 and 7.2.5.3.2 of N288.6-22 recommend that the most restrictive of applicable federal or provincial guidelines be used as the screening criteria, and screening criteria should not be below a reasonable upper end of background. Additionally, the reviewer points to Section 7.2.5.4.2 to indicate that if a COPC exceeds screening criterion in one medium it should be assessed for all media that are likely to contribute to exposure. This guidance was followed in the ERA – all COPCs identified in water were also assessed in sediment and vice versa, as well as additional food chain pathways. Again, the intent of this clause is for exposure situations and not specific to baseline conditions. The ERA did consider in the screening assessment constituents that had elevated baseline that were also present in the effluent. Aluminum, cadmium, iron, and lead exceeded water quality guidelines in baseline and were considered in the ERA screening; however, only cadmium was identified for further assessment since its concentration in the effluent exceeded its water quality guideline. Table 8.2-4 in the EIS provides a summary of baseline water quality exceedances. Note that the only iron exceedance was in SA-1 which is downstream of McGowan Lake (see Figure 8.2-4) and outside of the direct influence on the Project. Section 8.4.3.2.3 of the EIS did not identify any constituents where baseline sediment quality exceeded sediment quality guidelines. The screening followed the process identified in Figure 3-1 of the ERA (Appendix 10-A) as well as N288.6-22 guidance. No changes to the ERA or EIS are warranted to address Part 4 of this IR.	

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<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>characterize and assess those potential effects and delineate potential Project effects from background conditions.

Please:
1. Update Table 3-1 in Appendix 10-A to include un-ionized ammonia, mercury and phosphorous. Update the risk assessment to incorporate these parameters as needed.

2. Update the ERA to assess the risk of COPCs that had elevated baseline water quality concentrations in the receiving environment: aluminum, iron, and lead.</td><td></td><td></td></tr>
<tr><td>IR-195</td><td>-</td><td>ECCC</td><td>Change to an environmental component due to hazardous contaminants</td><td>Appendix 10-A (ERA), Section 3.1.2.1</td><td>Context: Figure 3-2 depicts modelled concentrations of COPCs in the receiving environment surface water during all Project phases. Effluent discharge rates during Operations and Decommissioning are not anticipated to differ significantly. However, COPC concentrations seem to decrease rapidly after the end of the operations period despite effluent releases continuing into the decommissioning phase.

Rationale: There has been no information provided on predicted changes in effluent COPC concentrations and discharge rates during the decommissioning phase. It remains unclear how COPC concentrations would decrease so quickly following the end of operations.</td><td>1. Provide further information on modelled maximum COPC concentrations for each individual Project phase with estimated timing for peak concentrations to appear in the receiving environment.

2. Provide further information on predicted effluent quality during the Project decommissioning phase.

3. Update ERA figures and conclusions as needed.</td><td>This response has not been accepted. Although the Proponent addressed items 2 and 3, further information on maximum predicted concentrations of COPCs in water quality during various Project stages and how hydrological processes affect COPC concentrations from Project effluent is required based on the information provided in the Proponent's response to validate the Proponent's predictions.

The Proponent has provided updated tables with modelled maximum COPC concentrations in water and sediment by individual Project phase but did not include the environmental quality guidelines for COPCs which were included in the original tables. The Proponent's response confirmed the predicted effluent quality during the decommissioning phase. In their response the Proponent states: "Therefore, the modelled maximum COPC concentrations in water are the same for operations and decommissioning phases (which is considered conservative), the same peak concentrations appear annually due to the variation of the monthly local inflow. Since COPCs are accumulated in sediment, the modelled maximum COPC concentrations in sediment appear at the end of each individual Project phase, which are year 20 for the operations and year 25 for the decommissioning in Figure 3-3."

The figures provided in the response support this statement, however, maximum predicted</td><td>The maximum predicted concentrations of COPCs in water are seen over a relatively short period on the scale shown in the relevant figures as noted by the reviewer due to the short water retention time of the modelled lakes. As shown in the table below, the modelled lakes (excluding the reference lake) are small in size, with lake areas ranging from 0.10 to 1.49 km^2 and with average depths ranging from 1.0 to 5.5 m. Based on the area, depth and outflow of the modelled exposure lakes, the calculated retention times of the lakes ranged from 0.88 to 51.61 days. These short retention times explain the relatively rapid increase and subsequent decrease in concentrations of COPCs in the lakes during periods of effluent discharge and periods where there is no effluent discharge, respectively.

Waterbody Morphometry for Modelled Lakes
<table>
<tr><th>Waterbody</th><th>Average Depth (m)</th><th>Area (km^2)</th><th>Average Outflow (L/s)</th><th>Retention Time (day)</th><th>Retention Time (month)</th></tr>
<tr><td>Reference Kratchkowsky Lake</td><td>2.9</td><td>0.80</td><td>331.2</td><td>80.66</td><td>2.69</td></tr>
<tr><td>Whitefish Lake North</td><td>1.6</td><td>0.26</td><td>1379.3</td><td>3.53</td><td>0.12</td></tr>
<tr><td>Whitefish Lake Middle</td><td>1.1</td><td>0.10</td><td>1398.5</td><td>0.88</td><td>0.03</td></tr>
<tr><td>Whitefish Lake South</td><td>1.0</td><td>0.32</td><td>1414.3</td><td>2.65</td><td>0.09</td></tr>
<tr><td>McGowan Lake</td><td>5.5</td><td>1.49</td><td>1832.3</td><td>51.61</td><td>1.72</td></tr>
<tr><td>Russell Lake Inlet</td><td>3.0</td><td>0.75</td><td>2390.3</td><td>10.92</td><td>0.36</td></tr>
</table>
Updated information has been added to Appendix 10-A, including Table 3-3, Table 3-5, Figure 3-2 and Figure 3-3, as well as Table 1-1 of Appendix A of Appendix 10-A.

The revised text in Section 3.1.2.1 (Appendix 10-A) is as follows:</td><td>Yes

Appendix 10-A, Section 3.1.2.1, Table 3-3, Figure 3-2, Figure 3-3

Appendix 10-A, Section 3.1.2.2, Table 3-5

Appendix 10-A, Section 3.1.2.3

Appendix 10-A, Appendix A, Table 3-1</td></tr>
</table>

Original IR#	Follow-Up IR #	SME	Project Effects Link	Reference to EIS, appendices, or supporting documentation	Context and Rationale	Information Requirement (IR)	Rationale for Status	Denison's Response	EIS Updates (Yes/No; if Yes, provide EIS Section number)
							concentrations of COPCs in receiving water quality occur within a year of operations commencing. COPC concentrations in water also return to baseline within one year after decommissioning is complete. However, maximum predicted concentrations of COPCs in sediment quality do not occur until the end of the Project lifecycle due to accumulation over time, which is expected. **Rationale:** It is unclear how maximum predicted concentrations of COPCs in water quality occur so quickly and decrease so quickly after Project operations commencement and decommissioning respectively. Further information on the hydrological processes that facilitate this is necessary to validate predictions. Provide further information regarding maximum predicted concentrations of COPCs in water quality during various Project stages and how hydrological processes (i.e. flows, retention time, etc.) facilitate the fast increase and decrease of COPC concentrations from Project effluent. This information should be included in Appendix 10-A, Section 3.1.2.1.	"The modelled maximum COPC concentrations in water during decommissioning phase were the same as that during operations (Table 3 3). The peak concentrations of arsenic and polonium-210 appear annually in June, and the peak concentrations of all other COPCs appear annually in March due to the variation of the monthly local inflow during the effluent discharge period (Figure 3 2). It is noted that the maximum predicted concentrations of COPCs in water occurred over short periods of effluent discharge and subsequently decrease relatively quickly during periods when there is no effluent discharge. This is related to the short retention time of the modelled lakes. As shown in Table 3-1 in Appendix A, the modelled lakes (excluding the reference lake) are small, with lake areas ranging from 0.10 to 1.49 km^2 and with average depths ranging from 1.0 to 5.5 m. Based on the area, depth and outflow, the calculated retention times ranged from 0.88 to 51.61 days. As noted, the short retention times result in rapid increases and decreases of concentrations of COPCs in response to effluent discharge and then its cessation. Since COPCs accumulate in sediment, the peak concentrations of all COPCs in sediment appear at the end of each individual Project phase, which are year 20 for the operations and year 25 for the decommissioning phase, as shown in Figure 3 3." The revised text in Section 3.1.2.3 (Appendix 10-A) is as follows: "The maximum vanadium concentration in sediment is 37.2 mg/kg dw in Whitefish Lake (LA-5), which exceeds its sediment quality guideline of 35.1 mg/kg dw by approximately 6% (REF value from Burnett-Seidel and Liber, 2013). Therefore, vanadium was identified as a COPC in sediment."	
IR-197	-	ECCC	Aquatic species	Appendix 10-A (ERA), Section 3.2	**Context:** It remains unclear if atmospheric deposition from Project related emissions has been incorporated into modelling for the ERA and surface water and sediment quality assessments. **Rationale:** While expected Project air emissions are unlikely to have direct impacts on the aquatic receiving environment and aquatic biota, this Project effect pathway may have indirect effects through accumulation of COPCs over time or deposition of contaminants that are not expected in effluent, which should be evaluated with predicted emissions data incorporated into water quality modelling predictions.	Incorporate atmospheric deposition from Project-related emissions into water quality modelling and assess any Project related effects to aquatic receptors from this pathway.	This response has not been accepted, as the Proponent has not provided a valid explanation for not incorporating atmospheric deposition from Project-related air emissions into water quality modelling and assessing Project-related effects to aquatic receptors from this pathway. In the Proponent's response it is stated: "Consistent with CSA N288.1-20, Clause 5.1.5, atmospheric depositions to large water bodies such as lakes, are considered negligible; therefore, the air to surface water pathway has been excluded for the ecological risk assessment. The rationale for exclusion of atmospheric deposition to lakes and rivers is explained in detail in Section G9, Appendix G of the COG DRL Guidance Document (Hart, 2019)." However, both of these documents explicitly apply to human dose rate calculations and models for human end-points from radiation effects of radionuclides; they do not cover non- human biota nor non-	Atmospheric deposition to large waterbodies is explicitly excluded in the CSA N288.1 model. This assumption is valid for both human and ecological assessments. The N288.1 standard indicates in Section 1.5 of the Scope that the models can be used to support dose calculations for non-human biota. The N288.1 rationale is that atmospheric input to water is very small relative to direct input to water. This conclusion applies to assessment for both human and ecological assessments, as well as radionuclides and non-radionuclides. The rationale in the IR response applies. However, calculations have been done for the Project to confirm the expectation that atmospheric input to water will be negligible. The following calculation shows for the Project that the atmospheric input of uranium to Whitefish Lake (LA-5) is very small relative to the direct input to water via effluent.	Yes Appendix 10-A, Appendix A, Section 2.2

<table>
<tr><th>Original IR#</th><th>Follow-Up IR #</th><th>SME</th><th>Project Effects Link</th><th>Reference to EIS, appendices, or supporting documentation</th><th>Context and Rationale</th><th>Information Requirement (IR)</th><th>Rationale for Status</th><th>Denison's Response</th><th>EIS Updates (Yes/No; if Yes, provide EIS Section number)</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>radionuclide COPCs or chemical toxicity of radionuclides. Atmospheric deposition rates to large water bodies may be negligible for dose rates to human biota as they are not likely to be directly impacted or in the near-field vicinity. However, this may not be the case for aquatic receptors directly within the receiving environment.

A sufficient explanation for exclusion of atmospheric deposition of COPCs to surface water from Project activities has not been provided from an ecological perspective. This Project effect pathway may have effects on the aquatic receiving environment through accumulation of COPCs over time or deposition of contaminants that are not expected in effluent, which should be evaluated with predicted emissions data incorporated into water quality modelling predictions.
ECCC requires atmospheric deposition from Project-related emissions to be incorporated into water quality modelling and that the Proponent assess any Project-related effects to aquatic receptors from this pathway in order to assess potential effects on the aquatic receiving environment.

Incorporate atmospheric deposition from Project-related emissions into water quality modelling and assess any Project-related effects to aquatic receptors from this pathway. Review CSA N288.6, otherwise, provide valid rationale from an ecological perspective for the elimination of this potential Project effects pathway.</td><td>
<table>
<tr><td colspan="5">P01=X1/X0(a)</td></tr>
<tr><td>X1</td><td>Air Concentration (LA-5) U</td><td>3.45E-05</td><td>mg/m^3</td><td>EIS Appendix 6</td></tr>
<tr><td>X0(a)</td><td>Atmospheric Release Rate</td><td>6.83E+01</td><td>mg/s</td><td>EIS Appendix 6</td></tr>
<tr><td>P01</td><td>Transfer source to air</td><td>5.05E-07</td><td>s/m^3</td><td></td></tr>
<tr><td colspan="5">P02=X2/X0(w)</td></tr>
<tr><td>X2</td><td>Water Concentration (LA-5) U</td><td>5.74E-04</td><td>mg/L</td><td>From IMPACT Model</td></tr>
<tr><td>X0(w)</td><td>Effluent Release Rate (U)</td><td>5.78E-01</td><td>mg/s</td><td>U Effluent Concentration x Effluent Flowrate</td></tr>
<tr><td>P02</td><td>Transfer source to water</td><td>9.93E-04</td><td>s/L</td><td></td></tr>
<tr><td colspan="5">P12 = Vg (A/V)10^{-3}/(λs+λw)</td></tr>
<tr><td>Vg</td><td>Atmospheric deposition velocity</td><td>0.003</td><td>m/s</td><td>N288.1</td></tr>
<tr><td>Area</td><td>LA-5</td><td>96940</td><td>m^2</td><td>site-specific (Appendix A)</td></tr>
<tr><td>Volume</td><td>LA-5</td><td>106634</td><td>m</td><td>site-specific (Appendix A) (Area*Depth)</td></tr>
<tr><td colspan="5">λs = DR • ρ • Kd • (A/V)</td></tr>
<tr><td>DR</td><td>Sediment deposition rate</td><td>6.34E-08</td><td>mm/s</td><td>Assumption (2mm/yr)</td></tr>
<tr><td>ρ</td><td>sediment dry bulk density</td><td>0.11</td><td>kg/L</td><td>N288.1</td></tr>
<tr><td>Kd</td><td>partition coefficient</td><td>20000</td><td>L/kg</td><td>N288.1</td></tr>
<tr><td>λs</td><td>sedimentation loss rate constant</td><td>1.27E-07</td><td>s^{-1}</td><td></td></tr>
<tr><td colspan="5">λw = U • CA/V = Q/V</td></tr>
<tr><td>Q</td><td>Inflow into LA-5</td><td>1.379</td><td>m^3/s</td><td>site-specific (Appendix A)</td></tr>
<tr><td>V</td><td>Volume of LA-5</td><td>106634</td><td>m^3</td><td>Area*Depth</td></tr>
<tr><td>λw</td><td>loss via water flow rate constant</td><td>1.29E-05</td><td>s^{-1}</td><td></td></tr>
<tr><td colspan="5">P12 = Vg (A/V)10^{-3}/(λs+λw) 2.09E-01 m^3/L</td></tr>
<tr><td colspan="5">Water conc'n from air = X0(a)*P01*P12 7.20E-06 mg/L</td></tr>
<tr><td colspan="5">Water conc'n from effluent = X0(w)*P02 5.74E-04 mg/L</td></tr>
<tr><td colspan="5">% Contribution to Water from Air 1%</td></tr>
</table>

The following statement has been added to Section 2.2 in Appendix A to Appendix 10-A

"Atmospheric deposition to Whitefish Lake is considered negligible. This is consistent with the COG DRL guidance (COG, 2019) which shows that the transfer of constituents from the atmosphere to large bodies of water (including lakes and rivers) is considered negligible."

The calculation has also been added to Section 2.2 of Appendix A for reference.

<u>References:</u>

Hart, D. 2019. Derived Release Limits Guidance. COG-06-3090R4-I</td><td></td></tr>
<tr><td>IR-198</td><td>-</td><td>HC</td><td>Change to an environmental component due to radiological contaminants</td><td>Appendix 10-A (ERA) Appendix B, Tables B.7 and B.8 Ref. 19-2638

Appendix 10-A (ERA), Table 4-3 Ref. 19-2638 (p. 4.17)</td><td>Context: Section 10 Appendix 10-A (ERA) contains Table 4-3 (p. 4.17), which lists ingestion rates for traditional foods and includes the category "organs" for Mammals.

Tables B.7 and Table B.8 in Section 10 Appendix 10-A (ERA) Ref. 19-2638 provide the predicted concentrations of radionuclides for ecological receptors during the Project phases and during future centuries, respectively. They list the concentrations of radionuclides in moose and in moose organs, which is presented</td><td>1. Provide more clarification on how the mammalian organ ingestion rates are calculated (which animals and relative contribution percentages).

2. Provide a rationale for why concentrations of radionuclides were not assessed in organs of</td><td>This response has not been accepted, as the assessment should consider organ meats from different animals if these are consumed by local population, and estimated consumption rates should be confirmed.

The response to IR-198 presents the estimated radionuclide concentrations in moose and caribou organ meats (as mass concentrations), where the</td><td>Consistent with the requirements in CSA N288.6:22, the ERA undergoes a periodic review process every 5 years to ensure the assumptions are still valid and to improve modelling and reduce uncertainty. Based on current understanding of the ERFN diet, there is no need to include caribou organs as a separate organ. As indicated in the original IR Response in Attachment IR-198 (See Annex 1), approximately 80% of the organs consumed by ERFN is moose organs, and 20% is caribou organs. Note, that there was a units error in IR-198 Table 3: Estimated Tissue Concentrations of Moose Organs and</td><td>No</td></tr>
</table>

<table>
<tr><th>Original IR#</th><th>Follow-Up IR #</th><th>SME</th><th>Project Effects Link</th><th>Reference to EIS, appendices, or supporting documentation</th><th>Context and Rationale</th><th>Information Requirement (IR)</th><th>Rationale for Status</th><th>Denison's Response</th><th>EIS Updates (Yes/No; if Yes, provide EIS Section number)</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>as a single cumulative organ value. Other terrestrial and aquatic animals (such as the black bear and woodland caribou) that are a part of the traditional diet of nearby Indigenous communities have higher concentrations of radionuclides than moose, yet concentrations are not provided for organs of these species.

Rationale: While Health Canada is not aware of transfer factors to individual organs, or to organs in animals that are not ruminants, it would be beneficial to have a better understanding of radionuclide concentrations in the organs of other animals that may be consumed by local Indigenous communities.</td><td>animals (other than moose) that are consumed as country foods by Indigenous people harvesting in the area.</td><td>concentrations of certain radionuclides (U-238, U-234, Pb-210 and Po-210) in caribou organ meat are indeed estimated to be higher than in moose organ meat. However, the response also indicates that moose organ meat consumption represents the large majority of organ meat consumption (~80%), roughly offsetting the higher concentrations in caribou organs. When calculating tissue concentrations of radionuclides, the higher consumption rate of moose organ meat in comparison to caribou organ meat appears insufficient to compensate for the higher estimated concentrations of U-238, U-234, Pb-210 and Po-210 in caribou meat and as a result, exposures to these radionuclides from organ meat consumption may be underestimated. Health Canada recommends assessing moose and caribou organ meat separately (rather than using moose as a proxy) to confirm that COPCs including radionuclides from organ meat consumption have not been underestimated.

IR-198 also includes additional information on organ meat consumption rates for the La Plonge and Patuanak communities to estimate dietary exposure via organ consumption, but it is unclear how these relate to the values used in the Draft EIS and ERA (Appendix 10-A). Specifically, Page 4.16 of Appendix 10-A: Environmental Risk Assessment for Wheeler River (September 9, 2022) states:

"As a conservative approach for this assessment, the Patuanak diet was selected to represent the average traditional foods consumer in the HHRA"

However, Table 4-4 (p. 4.19) reports an annual organ meat consumption rate of 4.49 kg for the adult average traditional food consumer while the reported daily Patuanak consumption rate for organ meat is 16.2 g (Table 4-3; p.4.17), which equates to an annual rate of 5.91 kg. Health Canada recommends a rationale be provided for this discrepancy, and if necessary, the correct estimated rate and associated assessment calculations.

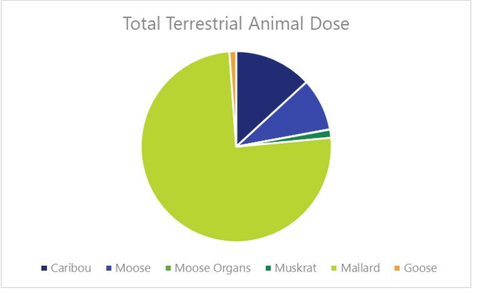
See also follow-up IR-198-R1.</td><td>Woodland Caribou Organs at McGowan Lake. The unit is Bq/kg fw, not mg/kg fw as shown in the table. The numbers in IR-198 Table 3 are correct for Bq/kg fw.

The reviewer is asking for clarification on the discrepancy between the annual organ meat consumption rate of 4.49 kg for the adult average traditional food consumer (Table 4-4) versus the reported Patuanak consumption rate for organ meat of 5.91 kg/yr (16.2 g/d) (Table 4-3; p.4.17). The ingestion rates that represent the Patuanak consumption rates from the ERFN study were modified as follows:

- Based on the ERFN study, the total Patuanak organ meat consumption rate was 5.91 kg/year which includes <u>all</u> organs. The ingestion rate was modified to remove organs that were not moose resulting in a moose organ ingestion rate of 4.49 kg/year.
- The total large mammal meat consumption rate was 12.95 kg/year (35.5 g/d). The ingestion rate for large mammals was increased to 14.38 kg/year to account for caribou organs in the caribou meat ingestion rate (caribou meat = 1.2 kg/year, caribou organ = 1.4 kg/year).
- The total ingestion rate for all country foods is 72.5 kg/year (199 g/d as per Table 4-3 in Appendix 10-A) which is consistent with the total Patuanak ingestion rate from the ERFN study.
- Based on the rationale in the above bullets no changes are needed to the diet.
As illustrated in the bullets above, caribou organ ingestion was not ignored, but was assessed as part of caribou meat ingestion.

To illustrate that the current assumptions used in the HHRA of ingestion of moose organs and caribou as meat only, a comparison is provided in the table below of human dose from moose organs, caribou assessed as meat, and caribou assessed as organs. The total dose to a person eating moose organs is the same order of magnitude as the total dose to a person eating caribou organs (note that this represents total dose, not incremental dose as shown in the ERA and is used for illustrative purposes only). Additionally, there is limited difference in the results whether caribou organ intake is assessed as meat or as organs. For some radionuclides (Ra-226, Po-210) the dose for caribou assessed as meat is higher and for other radionuclides (U-238, U-234, Th-230, Pb-210) the dose for caribou assessed as organs is higher.

<table>
<tr><th>Parameter</th><th>Unit</th><th>U-238</th><th>U-234</th><th>Th-230</th><th>Ra-226</th><th>Pb-210</th><th>Po-210</th></tr>
<tr><td>Moose organs Concentration</td><td>Bq/kg</td><td>6.13E-02</td><td>6.13E-02</td><td>3.04E+00</td><td>8.77E-02</td><td>7.15E+00</td><td>1.30E-02</td></tr>
<tr><td>Caribou meat Concentration</td><td>Bq/kg</td><td>1.41E-01</td><td>1.41E-01</td><td>1.11E-02</td><td>1.13E-01</td><td>1.80E+00</td><td>8.58E+00</td></tr>
<tr><td>Caribou organs Concentration (scaled from meat based on TF)</td><td>Bq/kg</td><td>2.49E-01</td><td>2.49E-01</td><td>3.04E+00</td><td>6.31E-02</td><td>5.66E+01</td><td>8.58E-02</td></tr>
<tr><td>Dose Coefficient (DCF)</td><td>Sv/Bq</td><td>4.90E-08</td><td>4.90E-08</td><td>2.10E-07</td><td>2.80E-07</td><td>6.70E-07</td><td>1.20E-06</td></tr>
<tr><td>Human Dose - Moose Organs (a)</td><td>mSv/a</td><td>1.35E-05</td><td>1.35E-05</td><td>2.87E-03</td><td>1.10E-04</td><td>2.16E-02</td><td>7.04E-05</td></tr>
<tr><td>Human Dose - Caribou Organs as Meat (b)</td><td>mSv/a</td><td>9.84E-06</td><td>9.84E-06</td><td>3.32E-06</td><td>4.50E-05</td><td>1.72E-03</td><td>1.47E-02</td></tr>
<tr><td>Human Dose - Caribou Organs (b)</td><td>mSv/a</td><td>1.74E-05</td><td>1.74E-05</td><td>9.10E-04</td><td>2.51E-05</td><td>5.40E-02</td><td>1.47E-04</td></tr>
<tr><td colspan="8">a) based on moose organ ingestion rate of 4.5 kg/a</td></tr>
<tr><td colspan="8">b) based on caribou organ ingestion rate of 1.4 kg/a</td></tr>
</table></td><td></td></tr>
</table>

Original IR#	Follow-Up IR #	SME	Project Effects Link	Reference to EIS, appendices, or supporting documentation	Context and Rationale	Information Requirement (IR)	Rationale for Status	Denison's Response	EIS Updates (Yes/No; if Yes, provide EIS Section number)
								Overall, caribou ingestion is not ignored in the HHRA, and whether or not they are assessed as meat or as organs makes little difference to the total dose from terrestrial animal ingestion, as the dose is dominated by ingestion of mallard as shown in the pie chart below. The caribou contribution to total dose is minimal since the total dose is well below the dose limit of 1 mSv/year; therefore, no changes are made to the ERA at this time. 	
IR-198	IR-198-R1	HC	Change to an environmental component due to radiological contaminants	Annex 1 Response to Information Requests (Denison Mining) – August 18, 2023 IR-198 Response from Denison – COPC Concentrations in Organs (*Pages 74, and 354-357 of 419*) Appendix 10-A (ERA)	*Environmental Risk Assessment for Wheeler River* (September 9, 2022) does not include an assessment of radionuclides based on their mass concentrations in country foods (the assessment is only based on radionuclide concentrations). **Context:** As part of the response to IR-198 estimated Pb-210 concentrations in moose organ and caribou organ of 7.15 and 49.4 mg/kg (ww) are reported, respectively. However, Appendix 10-A: *Environmental Risk Assessment for Wheeler River* (September 9, 2022) does not include an assessment of lead among the non-radionuclide COPCs. Using the organ meat consumption figure from the Patuanak community (16.2 g/day), exposure to Pb-210 from caribou organ meat is estimated at over 11 ug/kg bw per day (based on the response to IR-198) which would be close to 10 times greater than the 95th percentile dietary lead exposure estimates for the general Canadian population consuming retail foods. **Rationale:** While the abundance of radionuclides may pose a health risk with respect to radioactivity, their presence as chemical contaminants may also have an impact on health. This is demonstrated by the case of Pb-210 described above.	1. Provide a rationale on why radionuclide mass concentrations were not assessed for their impact to human health. 2. Provide an assessment of Lead (Pb) as a chemical contaminant (non-radionuclide) COPC to better understand potential health risks and inform management, mitigation, monitoring and/or follow-up planning.		1. Uranium was assessed as both a chemical constituent and a radionuclide constituent. The other radionuclides in the U-238 decay chain were assessed for their radiotoxicity and not their chemical toxicity. This is consistent with the PSL2 Assessment Report which indicates that because of uranium's relatively low specific activity, uranium is the only radionuclide (in the uranium and thorium decay chains) with greater potential to be more chemotoxic than radiotoxic; therefore, it is important to assess its chemical toxicity (GC & EC, 2006). To illustrate, the effluent quality of Pb-210 (as per Table 3-1 in Appendix 10-A) is 4.19E-01 mg/L. Using a specific activity of 2.86E+12 Bq/g for Pb-210 (www.wise-uranium.org/nucv.html), the mass concentration is 1.48E-10 mg/L. This is significantly lower than the lead concentration in the effluent of 3.00E-04 mg/L (as per Table 3-1 in Appendix 10-A) which is based on pilot tests with a safety factor added. As such, consideration of the mass concentration of Pb-210 is not needed. 2. The response to IR-198 (Attachment IR-198) erroneously provided the concentrations of Pb-210 in moose organ and caribou organ in units of mg/kg (ww). The corrected units that should have been provided for Pb-210 in moose organ and caribou organ tissues are in Becquerel per kilogram wet weight (**Bq/kg ww**); that is, the concentrations of Pb-210 in moose and caribou organs are 7.15 Bq/kg ww and 49.4 Bq/kg ww, respectively. The following illustrates that chemical lead (from Pb-210) in organs is not a health concern. The concentrations of Pb-210 in moose organs is 7.15 Bq/kg ww. Using a specific activity of 2.86E+12 Bq/g for Pb-210 (www.wise-uranium.org/nucv.html), the lead concentration in moose organs would be 2.5E-09 mg/kg ww. The daily dose for moose organ consumption would be 4.4E-10 µg/kg bw/day.	No

Original IR#	Follow-Up IR #	SME	Project Effects Link	Reference to EIS, appendices, or supporting documentation	Context and Rationale	Information Requirement (IR)	Rationale for Status	Denison's Response	EIS Updates (Yes/No; if Yes, provide EIS Section number)
					Due to their potential toxicological significance to human health, Health Canada recommends assessing arsenic, cadmium, lead and mercury as part of country food assessment, regardless of the method employed to determine COPCs.			Dose = 4.5kg/yr*yr/365d*2.5E-09mg/kg/70.7kg*1000ug/mg. The estimated lead exposure dose from Pb-210 in moose organs is far below the 95th percentile dietary lead exposure estimate for the general Canadian population consuming retail foods, and also well below the provisional lead TRV recommended by Health Canada of 0.5 µg/kg bw/day. Therefore, Pb-210 is expected to contribute a negligible amount of lead metal to total lead exposure. Lead as a non-radiological contaminant was considered in Table 3-1 in the ERA (Appendix 10-A) did not screen into the assessment and therefore it is concluded that the potential risks to consumers of country foods due to lead (and Pb-210) are negligible. The project includes an environmental monitoring program which will include analysis of country foods for trace metals, including lead. **References:** Government of Canada, Environment Canada. 2006. Priority Substances List Assessment Report. Releases of radionuclides from nuclear facilities (Impact on Non-human Biota). September.	
IR-199	-	ECCC	Change to an environmental component due to hazardous contaminants	Appendix 10-A (ERA), Sections 3.2.1 and 3.3.1, Wheeler River Project IMPACT Model	**Context:** Model calibrated concentrations of selenium, uranium, and lead- 210 are under-predicted compared to measured baseline concentrations for water quality in the IMPACT modelling based on Figure 3-2. Calibrated concentrations of cobalt are under-predicted and there is poor agreement between model calibrated and measured concentrations of arsenic, lead-210, polonium-210, and radium-226 for sediment quality in Figure 3-3. **Rationale:** It is unclear how poor agreement between model calibrated and measured baseline concentrations of COPCs impacts the near-field and far-field modelling predictions of COPCs during all Project phases. It is also unclear why measured concentrations of COPCS could not be used directly as model inputs when there was poor agreement.	1. Provide justification as to why model calibrated concentration inputs of COPCs were preferable for use in predictive modelling of water and sediment quality over measured baseline concentrations. 2. Provide a rationale detailing how under- or over-predicted model calibrated COPC concentration inputs influence IMPACT model predictions and uncertainty for water and sediment quality. Provide specific details on how this may impact the risk analysis for parameters that have been highlighted as having poor agreement between calibrated and measured concentrations (i.e., arsenic, selenium, uranium, lead-210, polonium-210, and radium-226).	This response has not been accepted, as the explanation and rationale provided by the Proponent is not sufficient to validate the model performance. Beyond the figures demonstrating modelled versus measured concentrations of COPCs in water and sediment provided in Appendix A, no quantitative statistical metrics validating model performance have been provided by the Proponent. It is also unclear if the geometric mean for each COPC at each monitoring station was calculated as individual inputs per station or if a single geometric mean for each COPC was calculated using all sampling data. Using a single geometric mean of all samples would result in not capturing the variation in concentrations of COPCs between sampling stations such as variation between different lakes. The Proponent's response provided no additional information that was not already in the EIS to the information request for specific details on how under- or over-predicted model calibrated COPC concentration inputs influence IMPACT model predictions and uncertainty for water and sediment quality. Without statistical metrics validating model performance, there is no quantitative evidence to	To clarify, the geomean shown for each COPC in Figure 3-2 (water) of the IMPACT Model report is for all the data in a series of lakes downstream of the future mine discharge. The measured data do not suggest any pattern of difference among lakes, nor would any such pattern be expected under baseline conditions. We want a baseline model that predicts a value for the downstream lakes in the range of measured data, as long as the measured data are reliable and not dominated by detection limit values. As discussed in Section 3.2.1 of the IMPACT Model report, the model meets this test. The geomean was considered appropriate as it is more representative of the central value of the data distribution. However, considering the data represents baseline conditions with many values below the detection limit, there is limited difference between the geomean and the arithmetic mean for the majority of constituents (see table below for summary statistics for baseline water concentration). Section 3.2.1 of the IMPACT Model Report (Appendix A to Appendix 10-A) was modified to provide more discussion on the selection of the geomean, as follows. "The geomean is generally more representative of the central value of the data distribution; however, considering the data represents baseline conditions with many values below the detection limit, there is limited difference between the geomean and the arithmetic mean for the majority of constituents."	Yes Appendix 10-A, Appendix A, Section 3.2.1

<table>
<tr><th>Original IR#</th><th>Follow-Up IR #</th><th>SME</th><th>Project Effects Link</th><th>Reference to EIS, appendices, or supporting documentation</th><th>Context and Rationale</th><th>Information Requirement (IR)</th><th>Rationale for Status</th><th>Denison's Response</th><th>EIS Updates (Yes/No; if Yes, provide EIS Section number)</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>support conclusions of model performance regarding the use of model calibrated concentration inputs of COPCs and conclusions on under- and over-predicted COPC concentration inputs influence on risk assessment conclusions. It is also unclear if the methodology for using the geometric mean of all samples for each COPC has eliminated variation between sample sites for modelling, and how this affects the conclusions of risk.

ECCC requires further information on how using geometric mean values of the measured baseline data influences variation between sites and model outputs, as well as quantitative statistical metrics validating model performance to verify the Proponent's conclusions.

Please provide:
1. Further information on how using geometric mean values of the measured baseline data influences variation between sites and model outputs.

2. Quantitative statistical metrics validating model performance to support conclusions on model calibrated concentration inputs of COPCs and risk assessment conclusions, with particular focus on influence of over- and under-predicted COPC concentration inputs. Include model performance benchmarks for comparison.</td><td>
<table>
<tr><th>Category</th><th>Parameter</th><th>Units</th><th>Total Count</th><th>Count (<RDL)</th><th>Minimum</th><th>Percentile_95th</th><th>Maximum</th><th>Arithmetic_Mean(a)</th><th>Geo</th></tr>
<tr><td>Major Ions</td><td>Chloride</td><td>mg/L</td><td>142</td><td>7</td><td><0.1</td><td>0.7</td><td>0.9</td><td>3.69E-01</td><td></td></tr>
<tr><td></td><td>Sulphate</td><td>mg/L</td><td>142</td><td>1</td><td><0.2</td><td>1.1</td><td>8.3</td><td>8.46E-01</td><td></td></tr>
<tr><td>Metals</td><td>Arsenic</td><td>mg/L</td><td>142</td><td>53</td><td><0.0001</td><td>0.0001</td><td>0.0003</td><td>1.05E-04</td><td></td></tr>
<tr><td></td><td>Cadmium</td><td>mg/L</td><td>142</td><td>90</td><td><1.00E-05</td><td>0.00003</td><td>0.00007</td><td>1.34E-05</td><td></td></tr>
<tr><td></td><td>Chromium</td><td>mg/L</td><td>142</td><td>142</td><td><0.0005</td><td><0.0005</td><td><0.0005</td><td>5.00E-04</td><td></td></tr>
<tr><td></td><td>Cobalt</td><td>mg/L</td><td>142</td><td>138</td><td><0.0001</td><td><0.0001</td><td>0.0002</td><td>1.01E-04</td><td></td></tr>
<tr><td></td><td>Copper</td><td>mg/L</td><td>142</td><td>139</td><td><0.0002</td><td><0.0002</td><td>0.0008</td><td>2.07E-04</td><td></td></tr>
<tr><td></td><td>Lead</td><td>mg/L</td><td>142</td><td>135</td><td><0.0001</td><td><0.0001</td><td>0.0012</td><td>1.16E-04</td><td></td></tr>
<tr><td></td><td>Molybdenum</td><td>mg/L</td><td>142</td><td>136</td><td><0.0001</td><td><0.0001</td><td>0.0013</td><td>1.23E-04</td><td></td></tr>
<tr><td></td><td>Nickel</td><td>mg/L</td><td>142</td><td>101</td><td><0.0001</td><td>0.0003</td><td>0.0006</td><td>1.24E-04</td><td></td></tr>
<tr><td></td><td>Selenium</td><td>mg/L</td><td>142</td><td>140</td><td><0.0001</td><td><0.0001</td><td>0.0002</td><td>1.01E-04</td><td></td></tr>
<tr><td></td><td>Uranium</td><td>mg/L</td><td>142</td><td>141</td><td><0.0001</td><td><0.0001</td><td>0.0002</td><td>1.01E-04</td><td></td></tr>
<tr><td></td><td>Vanadium</td><td>mg/L</td><td>142</td><td>110</td><td><0.0001</td><td>0.0002</td><td>0.0005</td><td>1.12E-04</td><td></td></tr>
<tr><td></td><td>Zinc</td><td>mg/L</td><td>142</td><td>95</td><td><0.0005</td><td>0.00278</td><td>0.02</td><td>9.82E-04</td><td></td></tr>
<tr><td>Nutrients</td><td>Ammonia as N</td><td>mg/L</td><td>142</td><td>104</td><td><0.01</td><td>0.0595</td><td>1.2</td><td>3.26E-02</td><td></td></tr>
<tr><td></td><td>Nitrate</td><td>mg/L</td><td>103</td><td>70</td><td><0.04</td><td>0.436</td><td>0.66</td><td>1.15E-01</td><td></td></tr>
<tr><td>Radionuclides</td><td>Lead-210</td><td>Bq/L</td><td>142</td><td>136</td><td><0.02</td><td><0.02</td><td>0.05</td><td>2.06E-02</td><td></td></tr>
<tr><td></td><td>Polonium-210</td><td>Bq/L</td><td>142</td><td>112</td><td><0.005</td><td>0.008</td><td>0.02</td><td>5.50E-03</td><td></td></tr>
<tr><td></td><td>Radium-226</td><td>Bq/L</td><td>142</td><td>98</td><td><0.005</td><td>0.00995</td><td>0.01</td><td>5.70E-03</td><td></td></tr>
<tr><td></td><td>Thorium-230</td><td>Bq/L</td><td>142</td><td>136</td><td><0.01</td><td><0.01</td><td>0.02</td><td>1.01E-02</td><td></td></tr>
</table>
(a) The majority of the results are less than the detection limit

Statistical measures of how individual baseline measurements deviate from the baseline prediction would not be indicative of model performance, since the model is not trying to predict this noise. What matters is how well the model predicts the downstream condition as reflected in the geomean of the data. This can be seen in Figure 3-2.

The "underpredictions" seen in Figure 3-2 (Se, U, Pb-210) are to be expected when the measured data are dominated by non-detects. The predicted value is consistent with measured data. There is no implication of any model error that would influence model predictions for the operational phase of the mine. The overpredictions seen in Figure 3-2 (Cd, Cu, V) would imply a conservatism of similar magnitude in the baseline + project predictions for water in the operational phase. As an example, the root mean square error (RMSE) for cadmium of the measured water quality data against the modelled prediction shown in Figure 3-2 is +/-1.31E-05 mg/L which indicates that the modelled concentration is within the range of the geomean of the measured data.

Similarly, the geomean shown for each COPC in Figure 3-3 (sediment) of the IMPACT Model report is for all the data in a series of lakes downstream of the future mine discharge. The overpredictions seen in Figure 3-3 (for As and Ra-226) would imply a conservatism of similar magnitude in the baseline + project predictions for sediment in the operational phase.

The relationship in the Wheeler River IMPACT model between water and sediment is based on existing operating uranium mines in northern Saskatchewan as described in the IMPACT Model Report (Appendix A to Appendix 10-A). Baseline conditions do not represent impacted conditions; therefore, it is not appropriate to calibrate the model to baseline conditions as we are most interested in impacted conditions. The test of model performance will be as the facility moves into operation and operational data is compared against modelled data.</td><td></td></tr>
<tr><td>IR-200</td><td>-</td><td>HC</td><td>Indigenous Peoples' health /</td><td>Section 10 (p. 4.10)</td><td>Indigenous consultation should be included in the Country Foods analysis.</td><td>1. Evaluate the suitability of using the 2017 EFRN survey results and</td><td>This response has not been accepted, as it did not provide the requested information to support the</td><td>IR-01 was provided by the ERFN as a member of the FIRT. Denison subsequently met with ERFN to better understand the specific concern raised. The comment was centered</td><td>No</td></tr>
</table>

Original IR#	Follow-Up IR #	SME	Project Effects Link	Reference to EIS, appendices, or supporting documentation	Context and Rationale	Information Requirement (IR)	Rationale for Status	Denison's Response	EIS Updates (Yes/No; if Yes, provide EIS Section number)
			Socio- economic conditions	Appendix 10-A (ERA), Table 4-4 (p. 4.19)	**Context**: The Proponent obtained country food consumption data through engagement with a single local fisher/trapper and from a dietary survey administered by CanNorth to the English River First Nations (ERFN) in 2017. However, the potential health risks to consumers of traditional food were only assessed using the data obtained from the CanNorth dietary survey. Section 10 of the EIS *states the following: "*The diet assumptions for the fisher/trapper are conservative and are based on engagement with a local fisher/trapper. The diet of the fisher/trapper is representative of one person, who consumes a unique composition and quantity of traditional foods (e.g., ingestion rate of 175 kg/yr of caribou, equivalent to approximately 2 to 3 servings per day). Most people fishing, hunting, and trapping in the Local Study Area and Regional Study Area would consume traditional foods more consistent with the average traditional foods consumer diet which was developed from the ERFN country foods study. In comparison, the ERFN country foods study in Section 10 Appendix 10-A (ERA) Table 4- 4 indicates a caribou ingestion rate of 2.6 kg/yr (1 to 2 servings per month) and a total game ingestion rate of 21.3 kg/yr*" (p. 4.10).* **Rationale:** Health Canada is in general agreement that the dietary habits of the local fisher/trapper may be an outlier and not necessarily representative of most of the local population. However, a rationale has not been provided to demonstrate whether and how the 2017 ERFN dietary survey results are representative of consumption patterns of local Indigenous communities. Also, it is unclear whether or how the ERFN dietary survey results account for the consumption patterns of vulnerable or more sensitive subgroups (e.g., heavy consumers, children and women of child-bearing age)	consider surveying additional community members (such as local hunters/trappers) to obtain more representative country food consumption rates for use in the traditional foods risk assessment, and for communicating the results to the communities. 2. Additionally, consider evaluating consumption patterns (and applicable TRVs) of sensitive or vulnerable populations (e.g., elders, toddlers, women of childbearing age) in the traditional food risk assessment and provide risk levels for these sub-groups separately. **Suggestions for mitigation and follow-up measures:** Health Canada recommends providing the community with the opportunity to validate the ERFN 2017 survey results.	assumption used in the traditional foods risk assessment. The response did state: *The 2017 report was authored by ERFN and as such there is no need for Denison to ask ERFN to validate their own report*. The dietary survey administered by CanNorth to the English River First Nations (ERFN) in 2017 was an important resource that contributed to the risk assessment; however, the ERFN's Information Request (IR-1) raised similar questions about the EIS's assumptions on Indigenous land use and diet, and the perception that feedback from the local ERFN trapper was not representative of the community's current and future land use. The response to IR-1 referenced meetings/discussions that were held with the ERFN to better understand how their community uses the area and their diet. The following contradictory clarification was provided in the response to IR-1: [The] *ERFN considers the ERFN Trapper's use of the area as representative of current and future land users and expects that the relationship to the Project area will be continued and strengthened through generations of future use.* See follow up IR-200-R1.	around the fact that the local land and resource harvester, referred to throughout the EIS as the ERFN Trapper, passed away before the draft EIS filing. The nation was concerned that the land use and occupancy of the ERFN Trapper may be lost or somehow downplayed since he has passed away and no longer resides near the Project site. In response to this, Denison updated text in the revised draft EIS to better reflect the totality of ERFN TK and land use information. The ERFN Trapper's land and resource use patterns and activities are considered by ERFN as representative of future ERFN uses in the area. We note that in IR-01 ERFN was not suggesting that the ERFN Trapper's diet was ***representative*** of all ERFN land users. The HC reviewer has erroneously connected parts of the response to IR-01 and IR-200 to suggest there is a gap in the EIS; Denison notes there is no contradictory information provided and outline clarifications here and in response to IR-200-R1. ERFN wrote and provided the 2017 dietary study (CanNorth 2017) and requested Denison use this information in the EIS. The CanNorth report is considered as a source of Indigenous Knowledge by the community. Denison has included both an ERFN diet as described in the 2017 report, and the ERFN Trapper's diet throughout the HHRA. There were five receptors in the human health risk assessment (HHRA): camp worker, seasonal resident, recreational fisher/hunter, fisher/trapper, and future permanent resident. The ERFN 2017 diet was included for a portion of the camp worker, seasonal resident, recreational fisher/hunter, and future permanent resident diets. The fisher/trapper diet was unique and provided by the ERFN Trapper whose trap lines and commercial fishing operations are located in the Project area. Importantly, the ERFN Trapper's diet was not a scaling up of the ERFN 2017 ingestion rates; rather, it was based on different dietary assumptions. For example, the ERFN Trapper rarely eats any country plants but eats a considerably larger amount of caribou and fish, whereas the ERFN 2017 diet has a wider representation of all food pathways. Other sensitive or vulnerable human health groups are addressed through the use of toxicity reference values (TRVs) that incorporate uncertainty factors to account for sensitive individuals. This is standard practice in development of TRVs for human health risk assessment. As such, differences in health status or subgroups were not considered separately. Denison will work with regulators and Indigenous nations and communities to refine future permanent resident characteristics through regular updates to the ERA as the Project advances as per the review cycle in N288.6. Denison encourages the CNSC to reach out to the ERFN FIRT representative to confirm Denison's understanding on the scope of IR-01 (Annex 1, IR-01 on page 1/419) and ERFN's acceptance of Denison's response to IR-01 and related discussions. **<u>References:</u>** CanNorth. 2017. English River First Nation Country Foods Study – Final Report (No. Project No. 2147). Canada North Environmental Services.	

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IR-200	IR-200-R1	HC	Indigenous People'' health / Socio- economic conditions	Section 10 (p. 4.10) Appendix 10-A (ERA), Table 4-4 (p. 4.19) IR-200 Response from Denison	The traditional foods risk assessment should be updated to include an "Intense Land User" scenario and consider all relevant sub-groups. **Context:** See 'Rationale for Status' in IR-200 **Rationale:** Health Canada notes that the response to IR-1 confirms that the use, diet and consumption rates used to assess the "Trapper" receptor are representative of "intensive land users" from the ERFN and possibly others. This change in the assumption is significant and should be integrated into the traditional foods risk assessment. Suggestions and follow-up measures have been provided to assist in responding to this information request, which benefits from the clarity provided in response to IR-1. Health Canada also notes that the response to IR-200 did not consider evaluating consumption patterns (and applicable TRVs) of sensitive or vulnerable populations (e.g., elders, toddlers, women of childbearing age) in the traditional food risk assessment and provide risk levels for these sub-groups separately.	1. Update assumptions used in the risk assessment to reflect the new information provided in response to IR-1. (e.g., the *ERFN Trapper's use of the area as **representative** of current and future land users*). 2. Update the risk assessment in the EIS and ERA for the "Trapper" receptor (i.e., Intensive Land Users) to account for the **representative** nature of their described diet (i.e., consumption rates and composition). 3. Update the rationale and decisions related to management, mitigation, monitoring and follow-up. Include a specific discussion for those COPCs that contribute to elevated health risks among "intensive land users" and those raised by Indigenous communities (i.e., selenium, mercury & cadmium). 4. Revise receptor's descriptor/title from "Trapper" to "Intensive land users" throughout the EIS and ERA to be consistent with proposed revisions made in response to IR-1. Consider evaluating consumption patterns (and applicable TRVs) of sensitive or vulnerable populations (e.g., elders, toddlers, women of childbearing age) in the traditional food risk assessment and provide risk levels for these sub-groups separately. Alternatively, provide a fulsome rationale to justify their exclusion.		1. Denison would like to clarify to the reviewer that the response to IR-01 does not in fact introduce new information to the EIS. As noted in the above response to IR-200, the intent of IR-01 was to provide updates to the EIS to better reflect the totality of ERFN TK and land use information. Both the ERFN 2017 (CanNorth 2017) and the ERFN Trapper's traditional food intakes have been included in the HHRA. 2. Denison has clearly outlined in the EIS, Section 10 and Appendix 10-A how each HHRA's receptor diet was derived, including that for the fisher/trapper. We reiterate that the ERFN provided the 2017 dietary study to Denison and requested Denison include this in the EIS. 3. The details of the Project's environmental management system are being developed to support Project permitting and licensing. This will include monitoring for various metals and radionuclides in a variety of media (e.g., fish, water, etc.). No updates to management, mitigation, monitoring and follow-up outlined in the revised draft EIS are required. Based on the criteria set out in Section 4 Table 4.3-1, Denison has committed to collaborating with English River First Nation and Kineepik Metis Local on a monitoring regime, suited to each of their interests and needs. As part of these programs, Denison and the Indigenous community of ERFN and KML will be sharing information in an agreed-upon fashion. Denison expects that important country foods harvested for food and cultural purposes (i.e., moose, fish species, etc.), surface water quality, and other areas of interest will form part of this monitoring program. 4. Denison has clearly outlined in the EIS, Section 10 and Appendix 10-A how each HHRA's receptor diet was derived, including that for the fisher/trapper. As indicated in the response to IR-200 above, other sensitive or vulnerable human health groups are addressed through the use of toxicity reference values (TRVs) that incorporate uncertainty factors to account for sensitive individuals. This is standard practice in development of TRVs for human health risk assessment. As such, differences in health status or subgroups were not considered separately. **<u>References:</u>** CanNorth. 2017. English River First Nation Country Foods Study – Final Report (No. Project No. 2147). Canada North Environmental Services.	No
IR-203	-	CNSC	Sediment Quality and Benthic Invertebrates	Appendix 10-A (ERA), Section 6.2 Future Centuries Sensitivity Analysis	**Context:** This section of the ERA states "If treated effluent was released at the maximum upper bound discharge rate, the modelled concentrations of all COPCs are expected to be below their corresponding sediment quality guidelines." It appears from	Please provide clarity on if cadmium and vanadium are expected to be over the sediment quality guidelines for the	This response has not been accepted. Although these potential sediment quality exceedances if treated effluent were to be released	After running the model to include the effluent released during the decommissioning period, the additional constituents that exceed sediment quality guidelines include vanadium for the expected case and cadmium for the upper bound case. Table 3-6 of the ERA (Appendix 10-A) has been updated to include the updated sediment quality	Yes

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					Figure 6-2: "Comparison of maximum concentrations of COPCs in sediment at expected and upper bound discharge rate" that cadmium and vanadium would be over their sediment quality guidelines indicated if maximum upper bound discharge rates are used. **Rationale:** It is not clear which is correct; the statement that no exceedances of sediment quality guidelines when considering the maximum upper limit effluent release, or the figures indicating there could be exceedances for cadmium and vanadium. This discrepancy in the ERA should be explained and corrected.	maximum upper bound discharge rate scenario.	at the maximum upper bound discharge rate are to be documented in the ERA, the response does not address the potential risk to receptors nor propose any mitigation measures. Please provide additional assessment/justification/mitigation measures for these predicted sediment quality exceedances.	predictions and the comparison against sediment quality guidelines. Vanadium was added as a COPC for the ERA since it exceeds a sediment quality guideline in LA-5 (Whitefish Lake). Section 6.2.2 of the ERA, figures and text were updated as well. For cadmium, the sediment quality exceeds the REF value but is below the NE2 value which is also a no-effect value. The predicted concentration of vanadium in sediment in LA-5 at the end of decommissioning is 37.2 mg/kg dw for the expected case and 68.5 mg/kg dw for the upper bound. This is a conservative prediction as it assumes effluent is released during decommissioning at the same flow and quality as during operations. The predicted sediment concentration for vanadium is higher than the REF value from Burnett-Seidel and Liber (2013) of 35.1 mg/kg dw and the LEL from Thompson et al (2005) of 35.2 mg/kg dw. Exceedances of a REF or LEL value are not indicative of adverse effects to aquatic organisms but do suggest that further investigation may be warranted. Exceedance of a REF value indicates that sediment downstream of the proposed discharge is elevated compared to natural background. The LEL represents a concentration in sediment that the majority of benthic organism can tolerate, whereas the SEL represents a concentration in sediment that the majority of benthic organisms cannot tolerate (Persaud et al., 1993). The predicted sediment concentration for vanadium in LA-5 is well below the SEL of 160 mg/kg dw; therefore, adverse effects to benthic organisms are not anticipated. Nevertheless, vanadium was carried forward as a COPC in the ERA and hazard quotients are provided in the updated Draft ERA (Appendix 10-A) for the expected case. No hazard quotients above 1 were identified. **<u>References:</u>** Burnett-Seidel, C., Liber, K., 2013. Derivation of no-effect and reference-level sediment quality values for application at Saskatchewan uranium operations. Environ. Monit. Assess. 185, 9481–9494.Persaud, D., Jaagumagi, R., Hayton, A., 1993. Guidelines for the Protection and Management of Aquatic Sediment Quality of Ontario. Ministry of Environment and Energy. Ontario. Thompson, P.A., Kurias, J., Mihok, S., 2005. Derivation and use of sediment quality guidelines for ecological risk assessment of metals and radionuclides released to the environment from uranium mining and milling activities in Canada. Environ. Monit. Assess. 110, 71–85.	Appendix 10-A, Table 3-6, Section 6.2.2.
IR-206	-	CNSC	Current use of lands and resources for traditional purposes Current use of lands and resources for traditional purposes	Section 11 Section 12 Section 15 Section 16	**Context:** Impacts to Lands and Resources Use have been identified by Indigenous Nations and communities. **Rationale:** Additional information is required to demonstrate whether Indigenous Nations and communities were engaged directly by Denison regarding the cumulative effects assessment, significance determination and residual effects, and thus the overall conclusions on potential adverse impacts of the Project on the potential or established Indigenous and/or treaty rights and effects of changes to the environment on Indigenous peoples, pursuant to paragraph 5(1)(c) of the CEAA 2012.	Please describe any outstanding or residual issues or concerns raised by Indigenous Nations and communities that Denison was unable to address. In addition, outline any plans to find solutions or continue discussions with the potentially impacted Indigenous Nations and communities.	This response has not been accepted. The IR response directs the FIRT to refer to the response for IR-28. However, this IR response does not directly respond to this IR in question. In IR-28, Denison does discuss how they plan to address the concerns raised by Indigenous Nations and communities, but Denison does not demonstrate whether Indigenous Nations and communities were engaged directly by Denison regarding the cumulative effects assessment, significance determination and residual effects.	In engagement activities in May of 2022 and October of 2023, the conclusions of the EIS inclusive of residual effects, cumulative effects, and significance determination were shared and engaged upon with Indigenous Nations and communities. This includes ERFN and KML. The Indigenous COIs ERFN and KML did not identify any outstanding concerns with these conclusions, or the potential of the Project to adversely affect Indigenous and/or treaty rights that could not be mitigated or accommodated by the Project. Denison has continued to engage with Indigenous Communities of Interest (COIs) along with other Indigenous communities who have expressed interest in the EIS process since filing its draft EIS. This has included engagement specific to the conclusions of the draft EIS	Yes Revised Draft EIS, Section 4

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							CNSC requires Denison to provide this information before the response can be accepted.	in May of 2022 and October of 2023. Through the provincial technical review process, the Federal Indigenous Review Team, and the public comments process, Denison has considered and responded to the issues and interests raised. This has included gaining a better understanding of the core issues and concerns of Indigenous communities and their desired involvement in the EIS review process going forward. A list of commitments and/ or mitigation measures arising from these processes, with specific details to each Indigenous Nation (or representative thereof), will be included in the revised EIS. For clarity, this will not include any private, confidential accommodations made under contractual agreements. Where not contained in confidential contractual agreements, any new mitigation or enhancement measures will be updated in the revised EIS. Further to this, Section 4 of the EIS will be updated to include a summary of engagement and associated outcomes, with additional details offered in the Indigenous Engagement Report. Denison has engaged with various Nations (or representatives thereof) in response to the public comment review process and will continue to do so throughout the assessment process.	
IR-209	-	CNSC	Indigenous Peoples' health / Socio-economic conditions	Section 12.1.4.2.1 (p. 12-22) Section 12.1.5 Section 12.1.6.2	**Context:** KML indicates that working at a mine camp could inhibit community members from participating in cultural activities and sharing them with family and community members, resulting in a loss of cultural knowledge and language, thus impact knowledge transmission (p. 12-22). **Rationale:** Denison addresses this by briefly identifying culturally sensitive policies which would eliminate residual effects (p. 12-30)	Please provide detailed proposed mitigation measure for KML's concerns related to loss of cultural knowledge and language should they work for Denison.	This response has not been accepted. Please provide validation that this proposed mitigation measure is considered suitable and has been accepted by KML.	Denison has continued to engage with Indigenous Communities of Interest (COIs) along with other Indigenous communities who have expressed interest in the Project process since filing its draft EIS. Through the provincial technical review process, the Federal Indigenous Review Team, and the public comments process, Denison has considered and responded to the issues and interests raised. This has included gaining a better understanding of the core issues and concerns of Indigenous communities and their desired involvement in the EIS review process going forward. Denison and KML are in agreement that all items identified in the FIRT and public comment process are considered as resolved. During the public comments process, KML raised concern for the loss of language, culture, and knowledge related to working at an industrial operation (KML and NVP Public Comment #94). KML has validated the process in which Denison and KML will communicate concerns and agree on appropriate mitigation measures. Specifically, the following response was provided to KML on November 22, 2023, and validated by KML on December 5, 2023. Also see comment No 37 in the Issues and Concerns Table in Appendix 4b. Denison respects the concern raised by KML regarding language and culture related to working at an industrial operation. Denison and KML will be working on specific items of interest to mitigate these types of concerns through private contractual arrangements, which may include specific mitigation and accommodation measures in this respect. Mitigation measures associated with potential effects to cultural continuity (including knowledge transfer and language) are described in Section 12.1.5 of the revised draft EIS and include: • Working with Indigenous COIs to understand culturally important periods relative to harvest times and cultural camps to facilitate Indigenous employees taking time off to participate in such activities; • Implementation of Denison's Indigenous Peoples Policy and advancement of reconciliation • Using a commuter rotation system has also shown to be effective in allowing Indigenous employees continued opportunities to spend time on the land, and important factor in	Yes Revised Draft EIS, Section 12.1.5

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								the transmission of knowledge and language (see Section 11 of the Draft for a description of potential effects to land use). In discussions with Indigenous Communities of Interest since the filing of the draft EIS, it has become apparent that Denison should add additional commitment / mitigation measure in relation to this area of interest, as follows: • Encouragement to speak languages of choice while at site, except during safety sensitive situations. Section 12.1.5 of the revised draft EIS was updated to include the additional commitment / mitigation measure in relation to culture and language, as follows: • Encouragement to speak languages of choice while at site, except during safety sensitive situations.	
IR-212	-	HC	Human health with respect to hazardous contaminants	Section 14 (p. 14-3) Appendix 16-C (p. 14 & 15)	The follow-up plan does not sufficiently describe how various parties will be engaged in the design, implementation, and review of monitoring programs. **Context:** Section 14 of the EIS states that "The overarching fear of contamination from the mine is woven in to almost every other concern noted by participants in the TK study. It is worth acknowledging this concern separately given the potential for mental health impacts related to people's experiences of fear and anxiety" (p. 14- 3). The commitment regarding monitoring and follow-up activities appears limited to *"shar[ing] information in a transparent manner with the General Public, and specifically those Communities of Interest and Nearby Land Users with whom Denison is regularly engaging about the Project. Such an information-sharing program would consider the involvement of the Regulators to make sure the information available addresses the issues identified as concerns"* (p. 14). **Rationale:** Country food safety is not regulated federally unless foods are sold commercially. Certain aspects of country food safety and availability may be covered by provincial regulators. It is unclear whether and how various levels of government and potentially affected communities would be involved in the development of the follow-up and monitoring program. It is also unclear what the information sharing program entails and how it would inform any adaptive management if monitoring results deviated from the prediction	1. Provide details of how local, provincial and federal authorities, and Indigenous Nations and communities will be engaged in developing the follow-up and monitoring program, including the information-sharing program. 2. Describe the steps that will be taken if there are any exceedances of established benchmarks or deviation from predictions. **Suggestions for mitigation and follow-up measures**: Health Canada recommends that the Proponent's plan for communicating follow-up results (environmental and country foods) aims at, among other things, responding to community concerns regarding country foods to minimize avoidance of this resource. This goes beyond a passive dissemination of information and developing a strategy based on dialogue and the direct involvement of communities in monitoring, surveillance, and risk communication activities.	This response has not been accepted as it does not provide sufficient detail on engagement and adaptive management. The response to IR-212 expresses interest and intent to working with local and Indigenous communities to develop follow-up and monitoring programs, supported by an overview of the intended approach. It also articulates that the detail of follow-up and monitoring plans will be developed as part of the licensing and regulatory phases of the Project's approval process. As previously indicated, country food safety is not regulated federally unless foods are sold commercially. Certain aspects of country food safety and availability may be covered by provincial regulators. As such, it is unclear whether and how various levels of government and potentially affected communities would be involved in the development of the follow-up and monitoring program for country foods. Additionally, the preliminary monitoring plan should include decision criteria/thresholds/benchmarks for initiating action and what those actions might entail (e.g., inspection of treatment processes, additional sampling, communication with local land users & residents, engagement with interested communities, etc.). HC reiterates its previous IR, with added clarification:	Given the stage of the Project, Denison believes the information provided in response to the original IR comment provided an appropriate level of feedback with respect to modes of engagement with local, provincial and federal authorities, and Indigenous Nations and communities around the sampling / monitoring (including important country foods harvested for food and cultural purposes). Based on the criteria set out in revised Draft EIS Section 4, Table 4.3-1, Denison has committed to collaborating with the Indigenous Communities of Interest English River First Nation and Kineepik Metis Local on a monitoring regime, suited to each of their interests and needs. Within the context of the IR Denison does not feel it is entirely appropriate to provide definitive information with respect to how engagement activities will occur given that a commitment to engage in a manner that best suits the individual communities has been made and that process continues to unfold. Nevertheless, additional information is provided below that Denison believes provides further clarity regarding ongoing and planned engagement. Additionally, concepts concerning decision making related to criteria/thresholds/benchmarks that may be used to trigger follow up actions are also discussed. 1. Denison understands the importance of engaging Indigenous Nations and communities with respect to items that matter to them. As recent as October 2023, Denison has engaged with Indigenous Communities of Interest about how the outcomes of the environmental assessment process become key areas of focus by the licensing and approvals regime – including in relation to environmental monitoring. All discussion and materials related to these engagement sessions can be found in Section 4. Further to this, Denison has planned a comprehensive and technical workshop with ERFN in March 2024, and expects to undertake the same for KML soon thereafter, focused very specifically on the aspects of items licensed or approved post-environmental assessment. This will include environmental monitoring and the relationship to country foods, including potential country foods to be monitored as part of monitoring programs. As the lifecycle regulator for the Project, Denison is required to provide information related to the outcome of these discussions into forthcoming updates in the IER to the CNSC. 2. Re decision criteria/thresholds/benchmarks – As with any aspect of routine monitoring that would be implemented at the Project site that provides information on operational performance, feedback mechanisms will be developed as part of the monitoring process so that appropriate actions can be taken in response to data as it becomes available (i.e.,	No

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							1. Provide details of how local, provincial and federal authorities, and Indigenous Nations and communities will be engaged in developing the follow-up and monitoring program, including the information-sharing program, for substances in country foods that may represent a potential health risk and/or are of concern to community members and land users (e.g., Mercury/Methylmercury, Selenium, Cadmium and Lead). 2. Describe the decision criteria/thresholds/benchmarks for these substances in country foods and steps that will be taken if there are any exceedances of established benchmarks or deviation from predictions.	routine monitoring will be developed in consideration of the adaptive management concept). Details regarding such feedback mechanisms, the basis of how subsequent actions would be triggered, and those actions would be defined as part of the development of monitoring programs as part of the Environmental Management Program during licensing, and in conjunction with engagement activities. With that in mind, a conceptual trigger-response mechanism framework related to sampling / monitoring of country foods is described for consideration that would be the basis of detailed plans developed in the next phase of Project approvals. • Conceptually, screening criteria would be defined in consideration of increasing trends measured in environmental media relative to background. • Where a screening criteria/threshold/benchmark was triggered, an investigation would be initiated to verify the result and to determine if the change in concentration is significant relative to background. This could include lab re-analysis, review of QA/QC data and field notes, reconnaissance, re-sampling or additional sampling and/or additional analyses. Potential causes of the increasing trend would be investigated to establish whether the trend was Project related, and the investigation may be informed by mine operations data (e.g., water treatment performance), climatic data, local and Indigenous knowledge, and background data from reference locations in the region. • If the investigation confirms that the criteria/threshold/benchmark criteria was triggered by the Project, additional analyses such as modelling, toxicity testing, increased sampling may be initiated (as appropriate) or assessment of human health risks may be warranted. • If, based on the additional investigation, modified or additional mitigation measure(s) are identified, such measures may need to be developed, implemented and monitored to address the specific issue identified as being of concern. Monitoring would be adapted to ensure it was capable of monitoring the performance of any mitigations implemented and to demonstrate the risk identified had been mitigated. It is envisioned that Denison would engage its Indigenous Communities of Interest in all aspects of the process. Members of the public and the provincial and federal governments would be engaged through with the formalized public information program, required by the CNSC.	
IR-216	-	CNSC	Human Health with respect to radiation exposure	Section 14.6.1 Section 14.6.7 Appendix 14-A	**Context:** Radiological doses to human receptors, including workers (i.e., driver(s) of the vehicles), from the Bounding Scenarios 1 (Vehicle Accident Including Rollover, Collision, Run Off Road) and 7 (Vehicle Accident Including Rollover, Collision, Run Off Road) have not been assessed. **Rationale:** An estimate of the effective doses to human receptors, including workers, are required to determine whether	Provide estimates (including calculations) of the potential radiological doses to human receptors, including workers, resulting from Bounding Scenarios 1 and 7.	This response has not been accepted. In order to accept this response, CNSC staff request that the proponent specify in the EIS that worker health, as it relates to accidents and malfunctions, will be addressed independently and part of the licensing process as required. Please provide proposed text for the revised EIS, for SME review and acceptance.	As indicated in the initial response to IR-216 it is Denison's intent to assess radiological dose to workers as part of the licensing process (see also Section 14.2 of the revised Draft EIS). As such Denison confirms that this will include the assessment of radiological dose to workers that may be associated with Bounding Scenarios 1 (Vehicle Accident and Aquatic Release of Radioactivity) and 7 (Vehicle Accident and Terrestrial Release of Radioactivity) of the Accident and Malfunctions Assessment (Section 14 of the revised Draft EIS). For clarity, the last paragraph of Section 14.2 of the revised Draft EIS has been revised as follows, noting that the bolded text is the addition that states the specific commitment requested in the IR.	Yes EIS Section 14.2

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					the expected doses meet the dose limits set out in the Radiation Protection Regulations.			"It is noted that some hazards related to worker safety were identified; however, worker safety (i.e., risks and consequences) is beyond the scope of this assessment. Consistent with Canadian Standards Association (CSA) N288.6-12 (CSA Group 2012), potential risks to nuclear energy workers will be addressed as part of the license application and will include the results of occupational hazard and exposure assessments and the Radiation Protection Program and Health and Safety Program. **Specifically, as it pertains to the consideration of accidents and malfunctions as presented herein, Denison will assess radiological dose to workers that may result from Bounding Scenarios (see definition in Section 14.5.6) involving vehicular accidents resulting in releases of radioactivity to the aquatic (see Section 14.6.1) and terrestrial (see Section 14.6.7) environments**." It is noted that this IR response does not change the outcome of the accidents and malfunctions assessment in the revised draft EIS and as indicated the additional work to characterize radiological dose to workers will be completed during licensing.	
IR-217	-	CNSC	Accidents and Malfunctions	Sections 14.6.1 and 14.6.2	**Context:** Highway 914 crosses the Wheeler River 10 km southwest of the access road junction. A vehicle accident, including a rollover, collision, or run off road, at or near the bridge could potentially result in a release of uranium concentrate and release of fuels and chemicals into the surface water at this location. Denison believes that a release of uranium concentrate and a release of fuels and chemicals at this location would bound the releases at any other water crossing along the transportation corridor. However, no information on what other water crossings along the transportation corridor exist and how bounding scenarios 1 and 2 would bound the risk of releasing uranium concentrate and fuels and chemicals at other crossings. **Rationale:** The release of uranium concentrate and fuels and chemicals at water crossings would contaminate the water body at the crossings and pose a risk to the environment and public health.	Please provide information on all water crossings along the transportation corridor and justification why bounding scenarios 1 and 2 would bound the effects of the accidental releases of uranium concentrate and fuels and chemicals at these crossings.	This response has not been accepted. The Proponent has provided information on all water crossings along the transportation corridor. However, it is insufficient for the justification why bounding scenarios 1 and 2 would bound the effects of the accidental releases of uranium concentrate and fuels and chemicals at these crossings.	The review comment is acknowledged, but there seems to be some confusion as to the context for the "bounding scenario" terminology used in the accident malfunction analysis. It is the release of the radioactivity (Scenario 1) and chemicals (Scenario 2) that form the basis of these bounding scenarios, and not the specific locations of their occurrence. It would not be possible (nor appropriate) to select a scenario that would necessarily bound all other scenarios in this regard, given the variability of conditions on the transportation route along Hwy 914 south from the project site to its junction with Hwy 165 and then Hwy 165 both east to Hwy 2 and west to Hwy 155. The alternative, that is selecting a host of locations in an attempt to capture such variability in conditions, would not be practical, nor is it necessary in Denison's and their SME's view. As noted in the original response, the location selected for the material releases evaluated in accident malfunction Scenarios 1 and 2 was chosen because it represents an important location to Indigenous, local resource users. The analyses of these scenarios provide examples of such releases to local receptors at the crossing identified in the report and contribute to the characterization of overall risk, the key endpoint in the accident and malfunction assessment. From that perspective the analyses would be expected to be generally representative of crossings along the transport route. As noted in the original response to IR 217, the approach in the accident and malfunction assessment is consistent with past practice for comparable assessments for uranium projects in the province. For clarity, the text in the attached revised Draft EIS has been revised as follows: **For Appendix 14-A:** **Section 5.1** – to be added to the end of the 4th paragraph, "*This location was the focus the evaluation as it represents an important location to resource users in the study area. The scenario provides an example of the consequences of such releases to local receptors – that is, the results of the assessment of the releases at this location would be expected to be generally representative of crossings along the transport route since the key endpoint in the assessment is overall risk, as defined for the assessment process as probability*	Yes Draft EIS Sections 14.6.1.1 and 14.6.4.2.1 Appendix 14-A Sections 5.1 and 5.2

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								multiplied by consequence. Appendix C to this report describes water crossings along the Project-related transportation route on Highway 914 south from the Project site to its junction with Highway 165 and Highway 165 east to Hwy 2 and west to Hwy 155. While the specific conditions at these crossings may differ in size or nature, the results of the analysis presented can generally be applied more broadly as indicated above. The approach used is consistent with past practice for comparable assessments for uranium projects in the province." **Section 5.2** – to be added to the end of first paragraph, "*As with Scenario 1, this location was also the focus the evaluation as it represents an important location to resource users in the study area but the results of the analysis presented can generally be applied more broadly to water crossings along the transport route from an overall risk perspective.*" **Section 14:** **Section 14.6.1.1** – to be added to the end of the 4th paragraph, "*This location was the focus the evaluation as it represents an important location to resource users in the study area. The scenario provides an example of the consequences of such releases to local receptors – that is, the results of the assessment of the releases at this location would be expected to be generally representative of crossings along the transport route since the key endpoint in the assessment is overall risk, as defined for the assessment process as probability multiplied by consequence. Appendix C to this report describes water crossings along the Project-related transportation route on Highway 914 south from the Project site to its junction with Highway 165 and Highway 165 east to Hwy 2 and west to Hwy 155. While the specific conditions at these crossings may differ in size or nature, the results of the analysis presented can generally be applied more broadly as indicated above. The approach used is consistent with past practice for comparable assessments for uranium projects in the province.*" **Section 14.6.2.1** – to be added to the end of the 1st paragraph, "*As with Scenario 1, this location was also the focus the evaluation as it represents an important location to resource users in the study area but the results of the analysis presented can generally be applied more broadly to water crossings along the transport route from an overall risk perspective.*" It is noted that this IR response does not change the outcome of the accidents and malfunctions assessment. Information that will be added to the EIS documentation as noted above is to add clarity to the reporting.	

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IR-218	-	CNSC	Accidents and Malfunctions	Sections 14.6.1.1 and 14.6.1.4	**Context:** Table 14.6-1 indicates that the average flow of Wheeler River south of Russel Lake is 17,340 L/s or 17.34 m3/s. This rate is used for uranium dissolution rate calculation. However, in section 14.6.1.4, it states that the average annual flow is 24.3 m3/s. In Table 14.6-3, the last two rows appear to be added wrongly. It also states that sediment quality results are shown in Table 14.6-5 for post-remediation conditions. During minimum flow conditions, the affected volume is expected to be smaller, resulting in a higher sediment concentration. In comparison, higher flow conditions are expected to result in a greater footprint and lower concentrations. However, in Table 14.6-5, the average sediments concentration and porewater concentration appear to be incorrect and switched between average flow and maximum flow. **Rationale:** Inconsistent/inaccurate information provided in the EIS.	Please clarify and correct the inconsistent information on average flow rate of Wheeler River at the crossing and incorrect information in Table 14.6-3, and average sediment concentration and porewater concentration under average and maximum flow conditions in Table 14.6-5.	This IR has not been accepted as there are two typos in Denison's response. In the column: Final EIS Update, the wording "Section 14.6.4.1" appears to be "Section 14.6.1.4"; for the Revisions to Appendix 14-A, the wording "average annual low of 24.3m^3/s (average flow)" should be "average annual low of 17.3m^3/s (average flow)". Please update this text.	Acknowledged. Based on the further comment, confirmation of the editorial revisions for Section 14 of the Draft EIS and Appendix 14-A are highlighted below. **Revisions to Section 14 of the EIS:** - The last two rows of Table 14.6-3 will be removed. - From Section 14.6.1.4 (not Section 14.6.4.1 as previously indicated), the second to last sentence in first paragraph to be revised as follows, "*The flow rates considered for this assessment were 5th percentile annual flows of 10.9 m3/s (minimum flow), the average annual flow of ~~24.3~~ 17.3 m3/s (average flow), and the 95th percentile annual flow of 24.67 m3/s (maximum flow).*" - Table 14.6-5 to be revised as shown in Attachment IR-218 (Annex 1, Attachment IR-218, pages 392/419). **Revisions to Appendix 14-A:** - From Section 8.1, second to last sentence in first paragraph to be revised as follows, "*The river flows considered for this assessment are the 5th percentile annual flow of 10.9 m3/s (minimum flow), the average annual flow of ~~24.3~~ 17.3 m3/s (average flow), and the 95th percentile annual flow of 24.67 m3/s (maximum flow).*" - Table 8-5 to be revised shown in Attachment IR-218 (Annex 1, Attachment IR-218, pages 392/419). It is noted that this IR response does not change the outcome of the accidents and malfunctions assessment. Information that will be added to the EIS documentation as noted above is for editorial purposes.	Yes Draft EIS Section 14.6.1.4 Appendix 14-A, Section 8.1 Appendix 14-A, Table 8-5
IR-219	-	CNSC	Accidents and Malfunctions	Sections 14.6.1.1.1 and 14.6.1.4.1; Sections 5.1.1 and 8.1 of Appendix 14-A	**Context:** When assessing the release characterization of Bounding Scenario 1, the Proponent assumed that 95% of the released uranium concentrate can be recovered from the release location without sufficient justification, and that different water column depths, i.e., 10 cm and 5 cm, and average water depth of 1.2 m at the release location were used without explanation. **Rationale:** As the recovery rate of the uranium concentrate would have an impact on the assessment of its potential effects, it is necessary to understand how the recovery rate and water level were selected for assessing this bounding scenario.	Provide further rationale for assuming 95% recovery rate and for using different water column depths for uranium concentrate release characterization.	This response has not been accepted as the Proponent's response does not include rationale for using different water column depths for uranium concentrate release characterization.	Acknowledged. With respect to water column depth, Denison confirms that only one water column depth was considered with respect to uranium concentrate recovery. The assumption of a 10 cm water column depth (Draft EIS Section 14.6.1.1.1, Appendix 14-A Section 5.1) is in reference to the bottom 10 cm of the water column where uranium concentrate that would be deposited on the river bottom is assumed to interact with the receiving environment (i.e., where uranium concentrate, dissolution is assumed to occur in the Wheeler River). The average depth of 1.2 m (Draft EIS Section 14.6.1.1.1, Appendix 14-A Section 5.1) is in reference to the assumed average depth of the river where the release is postulated to occur. Denison notes that the final sentence of Draft EIS Section 14.6.1.1.1 and Appendix 14-A Section 5.1 state ". . . *and a water column depth of 5 cm.*"; this statement is erroneous and has been amended in both locations in the revised Draft EIS to state ". . . *and a water column depth of 10 cm.*" It is noted that this IR response does not change the outcome of the accidents and malfunctions assessment. Information that will be added to the EIS documentation as noted above is for editorial purposes.	Yes Draft EIS Section 14.6.1.1.1 Appendix 14-A, Section 5.1

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IR-222	-	CNSC	Accidents and Malfunctions	Section 14.6.2.4	**Context:** Bounding Scenario 2 consists of the aquatic release of fuel and hazardous chemicals due to traffic accidents. The EIS states that amongst the fuels considered for this scenario, the consequences of the release of gasoline and solvents are bounded by the consequences associated with the release of diesel. Both gasoline and solvents are lighter with higher vapour pressure; therefore, they have a shorter half-life in the aquatic environment and a lesser tendency for adsorption to sediments and suspended solids in the water column. There is no other justification provided to show that the release of diesel can bound other chemicals such as sulfuric acid and sodium hydroxide that are heavier than diesel. **Rationale:** The release of either sulfuric acid or sodium hydroxide during accident could change the water PH significantly at the releasing location, which would post a negative impact on the local environment.	Please provide further justification that the consequences of the release of sulfuric acid and sodium hydroxide can be bounded by the consequences associated with the release of diesel.	This response has not been accepted as the Proponent states that: *"Through the hazard identification process (see Appendix 14-A Section 3.0 and Appendix A), the overall risk of the release of acids and bases was characterized as "moderate" and "ALARP" and as such consistent with the A&M assessment methodology was not carried forward further evaluation."* This is not the case. In Appendix A, Table 3, item 3.3 identifies that aquatic release of fuel, hazardous chemicals and reagents as having a high risk and further assessment is needed. If the Proponent believes the above statement is true, Appendix A in Appendix 14-A should be revised to reflect such a case.	Acknowledged. Table 3, Item 3.3 in Appendix A of Appendix 14-A has been revised to reflect the content of the original response (Annex 1, IR-222, page 82/419) whereby the release of acids and bases (chemicals and reagents) has a lower overall risk screening ranking than the release of diesel fuel. Complementary text has been added to Section 14 of the revised Draft EIS for consistency and clarity. The following revisions have been made in the revised Draft EIS: **Revisions to Appendix A of Appendix 14-A** Table 3, Item 3.3, the consequence and overall risk ratings for this scenario have been modified to reflect the distinction between the release of acids and bases (chemicals and reagents) and the release of diesel fuel and the following note has been added to the "Screening Decision / Rationale" column in Table, " As seen in the "S" column two consequence screening rankings were provided and consequently, two overall risk screening ranking are also provided. Acids and bases (chemicals and reagents) released to the aquatic environment are likely to dissolve relatively quickly and effects to local biota can be expected to be experienced on a local basis and over a shorter timeframe resulting in the screening consequence score of "major" (4) and an overall risk screening ranking of "moderate". There is little likely that mitigation can be applied in that scenario and therefore, the risk mitigation measures are limited to those that prevent accidents or reduce the probability to ALARP (thus the overall ranking of "ALAPRP, moderate"). The release of organic compounds (such as diesel) would have the potential for downstream transport as a compound in liquid phase distinct from that of the water and in this sense, this release produces a greater challenge of potential contamination over a relatively large spatial extent and timespan. For this reason, a screening consequence score of "catastrophic" (5) and an overall risk ranking of "high" was given. Per the rationale provided above, the "high" overall risk release of diesel fuel case was chosen as the representative case for Scenario 3.3 and carried forward for further assessment." **Revisions to Section 14.6.2.4:** The following has been added as the first paragraph of Section 14.6.4.2 of the draft EIS for clarity, "*For the purpose of assessing the potential effects on the aquatic environment from a release of fuels and hazardous chemicals the release of diesel fuel was chosen as a representative scenario, rather than other chemicals, such as acids and bases. The release of organic compounds (such as diesel) would have the potential for downstream transport as a compound in liquid phase distinct from that of the water in the receiving environment with potential contamination occurring over a relatively large spatial extent and timespan. In contrast, the release of acids and bases would dissolve in water relatively quickly and effects to local biota can be expected to be experienced on a more local basis and over a shorter timeframe.*" For reference, similar text has been added to Section 8.2 of Appendix 14-A.	Yes Appendix 14A, Appendix A, Section 3.0, Table 3, Item 3.3 EIS Section 14.6.4.2 Appendix 14-A, Section 8.2

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								It is noted that this IR response does not change the outcome of the accidents and malfunctions assessment. Information that will be added to the EIS documentation as noted above is to add clarity to the reporting.	
IR-225	-	CNSC	Human Health with respect to radiation exposure	Section 14.6.5.4 Appendix 14-A	**Context:** With the Bounding Scenario 5 (Process System and Piping Failure), the Proponent states that Denison ensures that the process is designed to include control measures to reduce the exposure to both workers and members of the public as low as achievable. The measures would ensure that the processing plant is adequately ventilated, and that spills or leaks are detected by loss of system pressure, observation, or flow imbalance. It is not indicated where these additional measures have been detailed/elaborated within the EIS. **Rationale:** Control measures to reduce the exposure to both workers and members of the public as low as achievable, that are identified in the assessment of Bounding Scenario 5, must be formally documented to ensure that they are carried over into the engineered design of the processing plant.	Provide details on how the control measures to reduce the exposure to both workers and members of the public, identified in the assessment of Bounding Scenario 5, have been formally documented and incorporated in the engineered design of the processing facility.	This response has not been accepted. In order to accept this response, CNSC staff request that the proponent specify in the EIS that any engineering design control measures identified in Bounding Scenario 5 will be included in the detailed design and will be provided for acceptance by the CNSC during Project licensing. Please provide proposed text for the revised EIS, for SME review and acceptance.	As noted in the original response to IR-225 (Annex 1, IR-225, page 83/419), any engineering design control measures identified in Bounding Scenario 5 will be included in the detailed design and will be provided for acceptance by the CNSC during Project licensing. Per this additional FIRT request, this commitment has been included in the text of Section 14.6.5.2 of the revised Draft EIS. It is also noted that additional mitigations have been added to those listed in Section 14.6.5.2 so that the list is consistent with those measures highlighted in Appendix 14-A - that is, these are not new measures; rather the list has been modified for consistency. Section 14.6.5.2 of the Draft EIS is presented below in its entirety for reference, with revised text highlighted in bolded font. "The following principal mitigating measures would be in place to reduce the probability of a release from the process piping and vessels: • visual inspections; • regular and preventive inspection, testing, and maintenance programs; • **personnel training and orientation**; • **development and implementation of the Occupational Health and Safety Program, including specific plans, procedures and PPE**; • emergency response planning; • **building ventilation**; and • full containment of the processing plant; and • **ambient monitoring**. **For reference, the engineering design controls identified as mitigating measures above will be included in the detailed design and will be provided for acceptance by the CNSC during Project licensing.**"	Yes EIS Section 14.6.5.2
IR-229	-	CNSC	Human Health with respect to radiation exposure	Section 14.6.6.4 Appendix 14-A	**Context:** With the Bounding Scenario 6 (Facility Fire and/or Explosion), the Proponent states that Denison would ensure that the design of the plant includes control measures to reduce the exposure to both workers and members of the public to levels that are as low as achievable. The measures would ensure that the processing plant is adequately ventilated. It is not indicated where these additional measures have been detailed/elaborated within the EIS. **Rationale:** Control measures to reduce the exposure to both workers and members of the public as low as achievable, that are identified in the assessment of Bounding Scenario 6, must be formally documented to ensure that they are carried over into the engineered design of the processing plant.	Provide details on how the control measures to reduce the exposure to both workers and members of the public, identified in the assessment of Bounding Scenario 6, have been formally documented and incorporated in the engineered design of the processing facility.	This response has not been accepted. In order to accept this response, CNSC staff request that the Proponent must specify in the EIS that any engineering design control measures identified in Bounding Scenario 6 such as ventilation will be included in the detailed design and will be provided to the CNSC during Project licensing. Please provide proposed text for the revised EIS, for SME review and acceptance.	As noted in the original response to IR-229 (Annex 1, IR-229, page 85/419), any engineering design control measures identified in Bounding Scenario 6 will be included in the detailed design and will be provided for acceptance by the CNSC during Project licensing. Per this additional FIRT request, this commitment has been included in the text of Section 14.6.6.2 of the revised Draft EIS. It is also noted that additional mitigations have been added to those described in Section 14.6.6.2 so that there is consistency between the Draft EIS and Appendix 14-A - that is, these are not new measures; rather the text has been modified for consistency. Section 14.6.6.2 of the Draft EIS is presented below in its entirety for reference, with revised text highlighted in bolded font. "Denison would make sure that the design of the plant includes control measures to reduce exposure levels to workers and members of the public to levels that are as low as achievable. The control measures would work to make sure that the processing plant is adequately ventilated. Emergency response and spill response plans would include procedures for worker protection, details about personnel protection equipment (particularly respiratory equipment), and procedures to evaluate exposures during a release of uranium powder. **In addition, the following is noted with respect to mitigation:**	Yes EIS Section 14.6.6.2

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								• implementation of regular and preventive inspection, testing, and maintenance programs; **• ventilation design considerations for upset conditions;** **implementation of personnel training and orientation;** **• development and implementation of the Occupational Health and Safety Program, including specific plans, procedures and PPE;** **• implementation of fire safety plan and firefighting systems; and** **• ambient monitoring.** **For reference, the engineering design controls identified as mitigating measures above will be included in the detailed design and will be provided for acceptance by the CNSC during Project licensing.**" It is noted that this IR response does not change the outcome of the accidents and malfunctions assessment. Information that will be added to the EIS documentation as noted above is to add clarity and consistency to the reporting.	
IR-235	-	ECCC ERAD Fish and fish habitat	Fish and fish habitat	Section 15.5.2, Expected Environmental Conditions	**Context:** In this section it is stated that: "Table 15.5-1 and Table 15.5-2 summarize the predicted mean values of the climate variables for the Tomblin Lake regional grid unit, following the RPC4.5 and RCP8.5 scenarios, respectively, as indicated by the Climate Atlas (PCC 2019)." RCP4.5 represents predicted climate conditions of a moderate carbon future. RCP8.5 represents predicted climate conditions under a high carbon future. The values shown in Tables 15.5-1 and 15.5-2 show averages of 25.9 and 26.7 mm for RCP4.5 and 25.9/27.5 mm for RCP8.5. These values do not correspond to the source indicated by the Proponent. **Rationale:** Based on the Proponent's description we would expect to find the same values for "Max 1-Day Precipitation (mm)"in the Climate Atlas for RCP4.5 and RCP8.5 scenarios. ECCC was unable to duplicate the results. ECCC queried the Climate Atlas for Tomblin Lake and returned a result of "Region Geikie River." https://climateatlas.ca/find-local-data ECCC then queried the Climate Atlas for Max 1 Day Precipitation (mm). https://climateatlas.ca/data/grid/782/maxdaypr_2030_85/line https://climateatlas.ca/data/grid/782/maxdaypr_2030_45/line	1. Provide the source of the data displayed in Max 1-Day Precipitation (mm) category in Tables 15.5.1 and 15.5-2. 2. Provide detailed calculations for the following average values: • 25.9 mm 26.7 mm in Table 15.5-1: Predicted Climate Conditions of a RCP4.5 Moderate Carbon Future • 25.9 mm 27.5 mm in Table 15.5-2: Predicted Climate Conditions of a RCP8.5 High Carbon Future 3. Explain how the data shown in Tables 15.5.1 and 15.5.2 were used in the precipitation risk assessment. 4. Denote the differences between "mean", "value/max value", and "fluctuation", in the calculation of extreme event risk. 5. Compare model derived data against:	Although responses 1 to 4 have been accepted, this response has not been accepted for the following reasons: 5. although PMP is used for design purposes as indicated in Section 8, presenting the variability of observed versus climate model predicted historical precipitation values would provide understanding on the uncertainties associated with climate model projected or historical precipitation (Max 1-day, seasonal or annual) values. Thus, the proponent is recommended to include more clarification in the revised EIS.	The PMP is similar to annual precipitation and ~6 to 10x higher than measured and predicted future maximum 24-hour precipitation and 1:100 24-hour return events. In terms of Project effects on water quantity, the conservative estimate of water withdrawal would result in a reduction of flow of about 3% at times of low flow and the water level in Whitefish Lake could change by 1 cm; this minor change is beyond the ability of monitoring techniques to practically measure and the assessment concluded that the Project would not result in a significant effect on surface water quantity (hydrology). Monitoring, including of water withdrawal rates and of potential effects (e.g., change in water flow, change in lake levels) will be implemented as the Project moves forward. The reviewer has requested information would not change the EA conclusions. However, for the purposes of demonstrating the uncertainties of climate model predicted values vs. observed data, the Max 1-day precipitation annual average historical data for Tomblin Lake, high carbon (RCP8.5) was compared to the predictive model results from the period of 1950 to 2013 (i.e., ensemble high carbon dataset). The predicted model data were hindcast for periods prior to 2006 and these value are then based on the historical data set with the ensemble values derived from 24 CMIP5 global climate models (the complete list of models can be found at https://climateatlas.ca/data-sources-and-methods) (Climate Atlas of Canada, 2023). A correlation coefficient (R2) value was calculated for these two datasets and the result was a coefficient of 0.36 which indicates the level of uncertainty that can be expected in the forward casting of precipitation data into the future. This information is further included in the EIS to indicate that current climate models are variable in nature and their uncertainty requires continued monitoring. For clarity with reference to the above, the following has been added to Section 15.5.2 of the revised Draft EIS.	Yes Revised Draft EIS, Section 15.5.2 (text added to discuss uncertainty in the climate predictions)

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					The results displayed an array of values ranging from 83.6 mm (2050) to 87.3mm (2092) for a Regional Concentration Pathway RCP8.5 scenario and values ranging from 48.9mm (2050) to 89.5 mm (2083) for an RCP4.5 scenario. These values do not match the averages shown in Tables 15.5-1 and 15.5-2.	1. Natural variability of the observed data. 2. Variability in the statistics generated via observation based time series. **Technical Discussion Required**: Yes		"For the purposes of demonstrating the uncertainties of climate model predicted values versus. observed data, the Max 1-day precipitation annual average historical data for Tomblin Lake, high carbon (RCP8.5) was compared to the predictive model results from the period of 1950 to 2013 (i.e., ensemble high carbon dataset). The predicted model data was hindcast for periods prior to 2006 and these values are then based on the historical data set with the ensemble values derived from 24 CMIP5 global climate models (the complete list of models can be found at https:/climateatlas.ca/data-sources-and-methods) (Climate Atlas of Canada, 2023). A correlation coefficient (R2) value was calculated for these two datasets and the result was a coefficient of 0.36 which indicates the level of uncertainty that can be expected in the forward casting of precipitation data into the future.	
IR 236	-	ECCC ERAD	Fish and fish habitat Fish and fish habitat	Section 15.5.2, Expected Environmental Conditions	**Context:** It is stated that, "Table 15.5-1 and Table 15.5-2 summarize the predicted mean values of the climate variables for the Tomblin Lake regional grid unit…" As per the Proponent's description, Tomblin Lake was chosen as representative location for Wheeler when Climate Atlas was used as data source. **Rationale:** In those two tables, for the "Max 1-Day Precipitation (mm)" the historical average is given as 24.1mm. Local time series analysis for the climatic region in which Wheeler Project is located provide averages (for 1-day max precipitation) of approximately 30+ mm. It is the Proponent's responsibility to keep the required database current and up to date, because the length of the time series influences all derived statistics. Statistical analysis of extreme events is highly dependent of the mean with extreme values reaching values 3 to 4 times higher than the mean.	1. Provide a clear explanation on how the historical mean for 1-Day Max Precipitation was calculated. 2. Compare the values obtained via various means (ex: copied from the internet, modeled via some online algorithm, derived from specialty literature), against time series analysis based on observations. **Technical Discussion Required**: Yes	This response has not been accepted. The Proponent made a correlation between precipitation and the Probable Maximum Precipitation (PMP). However, annual maximum and PMP cannot be correlated as they are two separate concepts that require different statistical methods to verify. The Proponent provided two tables which displayed precipitation data under current, existing, and future climate scenarios for two nearby lakes. These were provided to support the Proponent's response, however, the calculations used to achieve the table figures within the response or Attachment: IR-236 were not provided. As one value cannot be used to infer the other, reviewing the calculations is required to support the Proponent's conclusions. Please see the following requests: 1. In Table 3 of Attachment: IR-236, the historical mean value (1976 to 2005) for the Maximum 1-Day Precipitation is 24.1 mm and is indicated as measured. However, this estimate appears to be derived from ensembles of climate modeled historical precipitation. Thus, proponent to insert a footnote at Table 3 that indicate the total annual as well as maximum 1-day are estimates based on ensembles of climate modeled historical precipitation. The Proponent needs to provide the calculations that were used to reach the conclusions found within Tables 2 and 3 of Attachment: IR-236. Reviewing the calculation will allow for verification of the Proponent's conclusions. If the currently used data sources do	Please see Attachment IR-236.	Yes IR-236 added as Appendix D of Appendix 6-C

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							not allow for accurate representation of their conclusions, the Proponent should use complete regional observational data sources to support the conclusions in Tables 2 and 3. 2. The analysis of mean maximum one day and mean annual total precipitation [1976-2005] based on weather station (Climate ID 4063755) at Key Lake is roughly 32mm and 470mm respectively. Thus, include both modeled and observed historical precipitation statistics in the EIS for context. Measured data should take precedence over modeled data. The Proponent is taking an ensemble of modeled data to "predict" historical data when measured data is available and can validate the models. Without strong justification, it is not appropriate to replace measured data with "predicted" modeled data.		

IR-237		CNSC	EA follow-up and monitoring program	Appendix 16-C throughout, including Table 1.5-1: Wheeler River Monitoring and Follow-up Program Summary (p. 8-15)	**Context:** CNSC's Generic Guidelines for the Preparation of an EIS state: "The EIS should provide discussion on the follow-up program's requirements, and include:
					• objectives and structure of the follow-up program and the VCs targeted by the program
					• tabular summary and explanatory text of the main components of the program including:
					  ○ a description of each monitoring activity under that component
					  ○ which of the two generic program objectives the activity is relevant to (e.g., verify EA predictions, determine effectiveness of mitigation measures)
					  ○ the specific statement from the EA that goes along with that generic objective and will be the focus for that activity (e.g., program objective: verify predicted effects; environmental assessment effect: no potential adverse effects)
					  ○ the specific monitoring objective for that activity
					  ○ planned schedule
					• roles and responsibilities to be played by the Proponent, regulatory agencies, Indigenous people, local and regional organizations and others in the design, implementation and evaluation of the program results
					• possible involvement of independent researchers
					• program funding sources
					• information management and reporting (reporting frequency, methods and format)
						It is recognized that this document will evolve over the planning process and be finalized prior to the EA Decision; however, as plans are developed and revised, CNSC staff expect that updates will be made to this document and provided with any future versions of the EIS.
						
						Appendix 16-C Summary of Monitoring and Follow-up Programs must include sufficient details to allow CNSC staff to determine the likelihood that it will deliver the type, quantity and quality of information required to reliably verify predicted effects (or absence of them) and confirm the effectiveness of mitigation measures. This includes concrete monitoring plans (sampling locations, frequency, etc.).
						
						Additionally, please incorporate any relevant information included in the EIS into this Summary.
							This response has not been accepted.
							
							Denison has indicated they will update the follow-up program in Appendix 16-C, but this information has not been provided. CNSC reminds Denison that there should be no new information in the final EIS, and that we must review this information before accepting the response to this IR.
							
							Please provide an updated version of Table 1-5.1 with detailed information proposed by Denison in the IR response for the next iteration of the FIRT technical review, for SME review and acceptance.
								See Attachment IR-237. Also see an updated version of Appendix 16-C that has been included in an updated version of Appendix 16-C that is provided with this IR response submission package.	Yes
									
									Appendix 16-C (updated)

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					• possible opportunities for the Proponent to include the participation of the public and Indigenous groups, during the development and implementation of the program The follow-up program plan should be sufficiently described in the EIS to allow independent judgment as to the likelihood that it will deliver the type, quantity and quality of information required to reliably verify predicted effects (or absence of them) and confirm the effectiveness of mitigation measures." (Section 11) **Rationale:** The Summary of Monitoring and Follow-up Programs provided in Appendix 16-C contains very high-level information, and while some of the aspects detailed in the Generic EIS Guidelines are included, the aspects underlined are missing or appear incomplete. Further, all information from throughout the EIS should be incorporated into this Summary. For example, the EIS notes that: "Groundwater samples will be collected at least monthly and semi-annually in the wells within the freeze wall and on the freeze wall perimeter, respectively" (p. 7-109) and that "At least five to seven multi-well clusters are proposed across the mined area (Figure 7.8-2). Sampling will include KI parameters or the full suite of COPC at different times in the remediation process" (p. 7-111). These details (only examples) are not included in Appendix 16-C.				
IR-238	-	CNSC	Current use of lands and resources for traditional purposes Current use of lands and resources for traditional purposes	Various sections of the EIS, including: Section 8 Section 9 Section 10 Section 11 Section 12 Section 15 Section 16 Appendix 16-C (p. 3)	**Context:** The EIS indicates that "further detailed [follow-up and monitoring programs] will be developed as Project designs are finalized that may influence the nature, frequency, and locations of monitoring. In addition, input from regulatory agencies, the public and Indigenous Peoples will be considered." (Appendix 16-C, p.3) It is not clear in several section(s) of the EIS and the Indigenous Engagement Report, whether Denison has provided the interested Indigenous Nations and communities with the opportunity to participate in the development, implementation, and review of monitoring and mitigation measures, as per the guidance of REGDOC-3.2.2 and CNSC's Generic EIS Guidelines. **Rational:** As outlined in Section 11 of CNSC's Generic Guidelines for the Preparation of an EIS, please include roles and responsibilities to be played by the Proponent, regulatory agencies, Indigenous people, local and regional organizations and others in the design, implementation and evaluation of the monitoring program results as well as possible opportunities for	Please provide additional information to demonstrate whether Indigenous Nations and communities were engaged directly on the potential mitigation and monitoring measures to address the concerns raised regarding potential impacts of the Project on the potential or established Indigenous and/or treaty rights. Provide a rationale if this engagement has not been completed. As the Project develops, please provide concrete actions Denison will take in the follow-up and monitoring programs to engage Indigenous Peoples to alleviate concerns and	This response has not been accepted. Please provide additional information and updates on engagement activities to the EIS and IER (to date) that demonstrate whether Indigenous Nations and communities have been engaged directly on the potential mitigation and monitoring measures to address the concerns raised regarding potential impacts of the Project on the potential or established Indigenous and/or treaty rights. See also AD-62 in the Advice to Proponent table.	Denison has continued to engage with Indigenous Communities of Interest (COIs) along with other Indigenous communities who have expressed interest in the Project since filing its Draft EIS. This has included engagement specific to the conclusions of the draft EIS in May of 2022 and October of 2023. Through the provincial technical review process, the Federal Indigenous Review Team, and the public comments process, Denison has considered and responded to the issues and interests raised. This has included gaining a better understanding of the core issues and concerns of Indigenous communities and their desired involvement in the EIS review process going forward. A list of commitments and/ or mitigation measures arising from these processes, with specific details to each Indigenous Nation (or representative thereof), will be included in the final EIS. For clarity, this will not include any private, confidential accommodations made under contractual agreements. Where not contained in confidential contractual agreements, any new mitigation or enhancement measures will be updated in the final EIS. Further to this, Chapter 4 of the revised Draft EIS has been updated to include a summary of engagement and associated outcomes, with additional details offered in the Indigenous Engagement Report. Denison has engaged with various Nations (or representatives thereof) in response to the public comment review process and will continue to do so throughout the assessment process.	Yes Revised Draft EIS, Section 4 (including appendices)

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					the Proponent to include the participation of the public and Indigenous Nations and communities, during the development and implementation of the program.	incorporate their interests, and when this engagement is planned to take place.		More specifically to the Indigenous COIs, Denison has worked with ERFN and KML to determine their desired involvement in mitigation and monitoring processes. This has included identifying and agreeing to measures that need to be in place as part of the EIS, which topics needs to be carried through the licensing process, and each community's desired role in the process as the Project progresses. Denison and ERFN, and similarly Denison and KML, are in agreement that all items identified in the FIRT and public comment process are considered as resolved. For details, please see the Issues and Concerns table in Appendix 4B in the revised draft EIS Denison is committed to keeping the Indigenous communities who have expressed interest in the Project informed of monitoring and mitigation plans. Any commitments stemming from these processes, so long as they are not contained in confidential contractual arrangements, have been included in the revised Draft EIS.	