Rook I Project

Environmental Impact Statement

Annex 2 Responses:
Federal Indigenous Review Team Advice to Proponent – Round 2

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ECCC-09	Section 7.4.5	**Context:** In Sections 7.4.5 and 7.4.6 the Proponent draws conclusions about the magnitude of residual effects based on a comparison of the GHG emissions from the Project with provincial and federal emissions. **Rationale:** A percentage comparison of GHG emissions to provincial (Saskatchewan) annual total emissions and national annual total emissions is not meaningful. When compared to provincial or national GHG emissions, one project's GHG emissions will be considered low, which does not help to contextualize the Project's emissions against Canada's emissions targets. This comparison can unduly influence the determination of significance of effects of a project.	Provide an assessment of residual effects by utilizing more appropriate means than a comparison of the Project's GHG emissions to provincial and federal emissions. The Proponent should consider mitigation measures for the disturbance of carbon sinks. The Proponent can refer to the Draft Technical Guide section 3.5.3 for additional guidance.	A comparison of the Project's greenhouse gas (GHG) emissions from the Construction, Operations, and Decommissioning and Reclamation (i.e., Closure) phases to Canada's 2030 targets is provided below and will be added to Table 7.4-13 of revised EIS Section 7.4.5.1.2 (Project Emissions Intensity). Canada's 2030 Emissions Reduction Plan projects GHG emissions to be 503,000 kt carbon dioxide equivalent (CO_2e) by the year 2030 (Government of Canada 2022), approximately 31% less than 2005 GHG emission levels. ▪ **Comparison of Construction Phase:** The annual GHG emissions from Construction are estimated to be 170.80 kt CO_2e as outlined in Table 7.4-12 in Draft EIS Section 7.4.5.1.2. These emissions could contribute approximately 0.03% of the 2030 GHG emission reduction target levels. ▪ **Comparison of Operations Phase:** The annual GHG emissions from Operations are estimated to be 81.60 kt CO_2e as outlined in Table 7.4-12 in Draft EIS Section 7.4.5.1.2. These emissions could contribute approximately 0.02% of the 2030 GHG emission reduction target levels. ▪ **Comparison of Closure Phase:** The annual GHG emissions from Closure are estimated to be 69.20 kt CO_2e as outlined in Table 7.4-12 in Draft EIS Section 7.4.5.1.2. These emissions could contribute approximately 0.01% of the 2030 GHG emission reduction target levels. Project GHG emissions are not expected to result in a significant adverse effect to the climate change valued component or affect Canada's ability to reach the national emission reduction targets or its alignment with transitioning to a low carbon economy. The Project is anticipated to accelerate Canada's transition to a low carbon economy by providing the country with the fuel needed from a low-carbon energy source (i.e., nuclear power). Consistent with the approved Terms of Reference (Draft EIS Appendix 1A [Concordance Tables for the Terms of Reference and Generic Guidelines for Preparation of an Environmental Impact Statement], Table 1A-2), pre-Draft EIS submission meetings with the CNSC and the Saskatchewan Ministry of Environment, and recent *Canadian Environmental Assessment Act, 2012* submissions, the GHG assessment endpoints will remain as the provincial and federal totals. Emission intensity was calculated for the Project and provided in Draft EIS Section 7.4.5.1.2; suitable emission intensity benchmarks were not available for comparison to provide an additional assessment endpoint. As outlined in Draft EIS Section 7.4.8 (Monitoring, Follow-Up, and Adaptive Management), the Project would participate in any required federal and provincial reporting programs, which will continue to be key drivers behind reaching the GHG reduction targets for Canada. A mitigation for the disturbance of carbon sinks includes removal of merchantable trees and most of the woody debris with soils that are salvaged, where required (i.e., where not planned for use in future reclamation activities), in order to maintain the carbon stocks and avoid release of carbon through decomposition. This mitigation measure is listed under Pathway ID CC-01 (GHG emissions) in Table 7.4-7 in Draft EIS Section 7.4.4 (Project Interactions and Mitigation). Other mitigation measures include limiting the Project footprint using the following practices: ▪ designing an efficient infrastructure footprint (i.e., buildings clustered together); ▪ optimizing the use of cleared areas for Project activity;	Section 7.4.5.1.2	ECCC-09		**Context:** The Proponent has provided additional information regarding emissions comparisons, and mitigation measures for disturbance of carbon sinks. ECCC accepts the proposed addition of the comparison of the Project's greenhouse gas (GHG) emissions from the Construction, Operations, and Decommissioning and Reclamation (i.e., Closure) phases to Canada's 2030 targets. It is ECCC's understanding that this information will be added to Table 7.4-13 of revised EIS Section 7.4.5.1.2 (Project Emissions Intensity). However, additional clarity is needed regarding the new information that was provided on the mitigations for the removal of carbon sinks. **Rationale:** The new information provided on the mitigation of carbon sinks removal is unclear, specifically, it is recommended that more information is provided regarding the removal of merchantable trees and if they are going to be removed from the site, which will influence the carbon sinks discussion in Section 7.4.5 of the EIS. **Advice:** Clarify what is meant by the removal of merchantable trees and update the carbon sinks discussion in Section 7.4.5 of the EIS to include the impact to carbon sinks due to the removal of merchantable trees.	As outlined in Table 7.4-7 of Draft EIS Section 7.4.4 (Project Interactions and Mitigations) and noted by the reviewer, a potential Project mitigation measure is to remove merchantable timber to maintain the carbon stocks by limiting the release of carbon through decomposition. As outlined in Draft EIS Section 7.4.5.1.1 (Project Greenhouse Gas Emissions) and Section 7C5.4 of Appendix 7C (Greenhouse Gas Emissions Estimation Methodology Report), the assessment assumed that all biomass, including trees, was lost in the maximum disturbance area. Therefore, this biomass was assumed to decompose and release CO_2, with no accounting for removed merchantable timber that would be used in products that would not decompose. As a result, the assessment of effects in Draft EIS Section 7.4.5 (Residual Effects Analysis) is conservative as there is no assumption of benefits associated with the removal of merchantable timber. NexGen also notes that a merchantable timber volume estimate has not been completed for the Project. Therefore, quantifying the benefit of this mitigation measure in the EIS would not align with a precautionary approach (Draft EIS, Section 7.4.7 [Prediction Confidence and Uncertainty]; Draft EIS Section 6.10 [Prediction Confidence and Uncertainty]). Given the conservatism applied in the assessment and the uncertainty associated with the specific volume of merchantable timber that could be harvested, no edits are required in the revised EIS.	n/a

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				▪ using existing road infrastructure, including existing access road and bridge crossing; ▪ storing tailings underground; and ▪ maximizing water diversion away from site facilities through design and the establishment of berms and grading. Additionally, in Draft EIS Section 1 (Introduction), NexGen outlines its commitments around environmental, social, and corporate governance (ESG) and sustainability, including reducing GHG emissions. These commitments will be used to guide planning and design outside of the revised EIS to reduce the disturbance of carbon sinks. **References** *Canadian Environmental Assessment Act, 2012*. SC 2012, c 19, s 52. Repealed, 2019, c 28, s 9. Available at https://laws-lois.justice.gc.ca/eng/acts/C-15.21/20170622/P1TT3xt3.html Government of Canada. 2022. Canada's 2030 Emissions Reduction Plan – Chapter 3.					
ECCC-10 Link: IR 50	Section 5.4.7.5 Appendix 7A3.2.10.2	~	~	~	~	ECCC-10 Link: IR 50	**Context:** Additional clarification is needed for item three from the previous IR response. The Proponent has clarified that the air modelling assessment in the draft EIS considered the use of lower-tier engines as a conservative approach to analysis, demonstrating that a worst-case scenario for vehicle emissions of the Project remains in compliance with air quality standards. The Proponent indicated that they intend to utilize Tier 4 engines for the Project if available. **Rationale:** Should the Proponent choose to use different vehicles than those listed in the draft EIS, updated vehicle information should be provided so that ECCC can understand whether or not the Proponent will be using Tier 4 engines and how to assess potential impacts to air quality resulting from the fleet composition. Since Tier 4 is currently the most stringent emission standard to which engines can comply, ECCC recommends the use of Tier 4 engines as the best available technology to reduce air pollutant emissions compared to lower-tier engines. As such, if the Proponent uses any engines that are lower-tier than Tier 4, ECCC suggests that the Proponent provides justification (e.g., older model years, alternative standards, etc.) as to why the Proponent is not using the best available technology (BAT). Knowing the fleet composition and engine tiers that will be used will allow a more accurate estimate potential air quality impacts resulting from the Project, and knowing the Proponent's justification for not using BAT will help to understand why the selection was necessary.	**Advice:** ECCC recommends the use of Tier 4 engines, and the Proponent should provide an explanation for the use of any engines that are certified to a lower tier than Tier 4.	NexGen acknowledges the reviewer's comment and notes that the procurement of engines for the Project has not been completed at this time and likely would not be concluded until greater certainty is achieved regarding Project approvals and development. As noted in the initial response to IR 50, NexGen confirms the intent to purchase and use the lower emitting Tier 4 engines, if Tier 4 engine options are available. However, flexibility is required in case Tier 4 engine options are not available; otherwise, it may not be possible to construct or operate the Project. NexGen further notes that if new equipment is to be used, Tier 4 engines are the only option available for purchase in Canada.	n/a
ECCC-11 Link: IR 68	Appendix 7A3.1	~	~	~	~	ECCC-11 Link: IR 68	**Context:** NexGen acknowledged that the comparison of temperature as listed in Table 7A-88 in Section 7A3.1.3.2 of Draft EIS Appendix 7A (Air Dispersion Modelling Report) was made for 2016 only because this is the only year of overlap between the AERMET dataset and on-site monitoring data.	**Advice:** ECCC recommends that the title to Table 7A-88 be corrected to read 'AERMET Derived Temperature Summary (2016)', to accurately reflect NexGen's clarification that the temperature comparison was made for 2016 only.	NexGen acknowledges the reviewer's comment and will amend the title for Table 7A-88 in Section 7A3.1.3.2 of revised EIS Appendix 7A (Air Dispersion Modelling Report) to state "AERMET Derived Temperature Summary (2016)".	Appendix 7A, Table 7A-88

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							Rationale: Table 7A-88 continues to be titled 'AERMET Derived Temperature Summary (2012 to 2016) despite the assertion that the comparison was made for 2016 only. An inaccurately labelled table could result in misinterpretation of the data contained within.			
ECCC-12 Link: IR 80	Section 10.2.8.2.1 Section 10.3.1.2 Section 10.5.1.1.3, Section 10.5.1.1.1	~	~	~	~	ECCC-12 Link: IR 80	**Context:** The Project will increase expected inputs of both sulphate and mercury to receiving waters. Increased sulphate availability in the receiving aquatic environment can lead to increased methylation rates of mercury to methylmercury in sediment and surface water. **Rationale:** Methylmercury is a toxin that can bioaccumulate within the food chain and negatively impact aquatic biota. Considering the current proposed mercury effluent concentrations of 0.19 ug/L from Table 7 Appendix H TSD XVIII, a biological study on the mercury concentrations in fish tissue will be necessary as a part of follow-up monitoring.	**Advice:** To monitor for the potential for bioaccumulation of methylmercury in aquatic biota, ECCC advises that the Proponent consider additional sampling for methylmercury within the follow-up monitoring program.	In the response to FIRT IR 80, NexGen stated that aquatic monitoring of treated effluent, water quality, sediment quality, and aquatic biota (including benthic invertebrates and fish) would be undertaken in Patterson Lake and the downstream lakes during Operations as part of the Project's Environmental Monitoring Plan and the Environmental Effects Monitoring, as prescribed by Metal and Diamond Mining Effluent Regulations (MDMER). NexGen confirms that this monitoring would include sampling for mercury and generate sufficient information to evaluate spatial and temporal trends. The requirement for a follow-up study investigating fish tissue mercury would be dependent on the resulting data from the aquatic monitoring, and if applicable MDMER triggers are met for mercury concentrations. However, NexGen confirms that, in alignment with the commitment provided in the response to IR 80, NexGen has included methylmercury monitoring, in addition to mercury monitoring, in planned monitoring activity sampling in Patterson Lake in 2024, particularly in the Patterson Lake West Arm – North Basin, where the treated effluent would be discharged.	n/a
ECCC-13 Link: IR 126	Section 14.4.2 Table 14.4-1 Table 23A-1 Table 23A-5	~	~	~	~	ECCC-13 Link: IR 126	**Context:** The Proponent stated that vegetation will be cleared during the construction phase to widen the access road and prepare the mine site. They have committed to developing an Environmental Protection Program (EPP) that will describe the supporting processes with details regarding scheduling vegetation clearing to comply with activity restrictions to minimize negative effects to migratory birds and species at risk. **Rationale:** In the absence of reviewing an EPP prior to a decision on their application, Table 14.4-1 requires revision to provide more detail to ensure the project will avoid harm to migratory birds consistent with ECCC's Guidelines to avoid harm to migratory birds – Canada.ca. ECCC does not recommend the use of nest searches or pre-clearing surveys for active bird nests during the breeding season as a mitigation measure, given the difficulty associated with finding nests reliably and the high likelihood of disturbing nesting birds when searching. Instead, ECCC recommends that clearing and grubbing activities not be conducted during the breeding bird season (late April - mid-August). Pileated Woodpecker and other MBCA Schedule 1 migratory birds have year-round nest protection. The abandoned nest registry with the associated monitoring of abandoned Pileated Woodpecker nests must be utilized prior to the removal of any nest of a MBCA Schedule 1 listed species.	**Advice:** ECCC recommends that the Proponent revise Table 14.4-1 so that entries [i.e., Pathway ID's' W-01, (habitat loss), W-02 (habitat alteration), W-04 (Fibre optic line), W-07 (edge habitat)], and any other applicable pathways, include avoidance of the breeding bird window (late April – mid-August) as a mitigation measure similar to that of W-03. Table 14.4-1 should also be updated to include the mitigation measures listed in the text. Provide details that describe the supporting processes with details regarding scheduling vegetation clearing to comply with activity restrictions to minimize negative effects to migratory birds and species at risk. Table 14.4-1 should also be revised to reflect potential requirements related to Pileated Woodpeckers (and other MBCA Schedule 1 listed species) and avoidance of nest searches or preclearing surveys for active bird nests during the breeding season.	As requested by the reviewer, NexGen will edit Pathway ID W-01, Pathway ID W-02, Pathway ID-04, and Pathway ID W-07 in Table 14.4-1 of revised EIS Section 14.4 (Project Interactions and Mitigations) to include the following mitigation measure: ▪ Implement an Environmental Protection Program with restricted activity periods to limit effects on denning animals and nesting migratory birds during sensitive time periods (e.g., per Nesting Zone B6 [ECCC 2018] guidelines and the *Migratory Birds Convention Act, 1994*). If sensitive periods cannot be avoided, pre-clearing wildlife sweeps will be completed by qualified professionals and buffers applied, as required. To address the issue of environmental design features and mitigation measures that appear in the text within Draft EIS Section 14.4 but not within Table 14.4-1 of Draft EIS Section 14.4, NexGen will add the following mitigation measures within Table 14.4-1 of revised EIS Section 14.4 (Project Interactions and Mitigations): <u>Pathway ID W-05 (Injury and mortality from clearing)</u> ▪ If vegetation removal is required during the black bear denning/hibernation periods, conduct bear den presence/absence surveys and wildlife tree surveys prior to clearing activities <u>Pathway ID W-13 (Surface water quality from runoff)</u> ▪ Implement a Project-specific Environmental Monitoring Plan that includes monitoring water quality, sediment quality, and aquatic organisms, and applying adaptive management, if necessary NexGen notes that pileated woodpecker was not detected during baseline field surveys. However, surveys for active and inactive pileated woodpecker nests will be completed prior to vegetation removal in the limited areas of the Project footprint that contain habitats that have potential to support pileated woodpecker nests (i.e., deciduous and mixed-wood forests with large diameter deciduous trees; approximately 2.1 ha). Should pileated woodpecker nests be discovered, applicable regulatory requirements would be implemented (ECCC n.d.). No changes to the revised EIS are required in this regard. **<u>References</u>** ECCC (Environment and Climate Change Canada). n.d. Damage or Danger Permits for Nest Destruction - Section 70 of the Migratory Birds Regulations (specifically for Pileated Woodpecker nesting cavities). https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/dod-permits-nest-destruction-pileated-woodpecker-nesting-cavities.html. ECCC. 2018. General Nesting Periods of Migratory Birds. Available at https://www.canada.ca/en/environment-climate-change/services/avoiding-harm-migratory-birds/general-nesting-periods/nesting-periods.html.	Section 14.4, Table 14.4-1

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									Migratory Birds Convention Act, 1994. SC 1994, c 22. Last amended 12 December 2017. Available at https://laws-lois.justice.gc.ca/eng/acts/m-7.01/.	
ECCC-14 Link: IR 205	Section 22.7 TSD XXII	~	~	~	~	ECCC-14 Link: IR 205	**Context:** In their response to IR 205, the Proponent indicates that, "The climate adaptation framework is a proposed approach for developing a living document focused on climate resilience, which would be updated as a part of NexGen's continual improvement process." The Proponent also indicates that, "The continual improvement processes and climate adaptation framework are anticipated to be completed as part of the Operations Phase for the Project. Sufficient information is not available to make firm commitments during the current design stage of the Project." **Rationale**: The climate adaptation framework will be receiving updates as a part of NexGen's continual improvement process. While firm commitments cannot be made during the design stage of the Project, ECCC suggests that certain sources are included as a part of the continual improvement process to increase Project resilience against the potential risks associated with natural hazards and future climate change.	**Advice:** To advance the development of the climate adaptation framework, ECCC recommends that the proponent consult the following resources: Cannon, A. J., Jeong, D. I., Zhang, X., & Zwiers, F. W. (2020). Climate-resilient buildings and core public infrastructure 2020 : aassessment of the impact of climate change on climatic design data in Canada. Gatineau: Environment and Climate Change Canada. CSA Group. (2019). Technical guide: Development, interpretation and use of rainfall intensityduration-frequency (IDF) information: Guideline for Canadian water resources practitioners. CSA PLUS 4013:19. Government of Canada. (2022). Draft technical guide related to the Strategic Assessment of Climate Change: Assessing climate change resilience. Gatineau: Environment and Climate Change Canada.	NexGen appreciates the reviewer's comment and will add the following text to Section 3.0 of revised EIS TSD XXII (Climate Adaptation Framework): "In addition to the MAC guidance, additional resources considering the climate resilience of buildings and infrastructure (Cannon et. al., 2020), the application of future rainfall intensity-duration-frequency information (CSA Group 2019), and assessing climate change resilience (Government of Canada, 2022) will be considered, where appropriate, as part of the proposed climate adaptation framework." **References** Cannon, A. J., Jeong, D. I., Zhang, X., & Zwiers, F. W. 2020. Climate-resilient buildings and core public infrastructure 2020: assessment of the impact of climate change on climatic design data in Canada. Gatineau: Environment and Climate Change Canada. CSA Group (Canadian Standards Association 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. Government of Canada. 2022. Draft technical guide related to the Strategic Assessment of Climate Change: Assessing climate change resilience. Gatineau: Environment and Climate Change Canada.	TSD XXII, Section 3.0
ECCC-15 Link: IR 84	TSD XXI ERA Section 4.2.4 Baseline Annex V.I Aquatic Baseline Section 9.2.1.3, Section 9.2.1.4, Section 9.3.2.2 Baseline Annex V.I Aquatic Baseline Appendix C Table 49 and Table 51	~	~	~	~	ECCC-15 Link: IR 84	**Context:** In Section 4.2.4 of the ERA, the Proponent indicated that they conducted an assessment of selenium concentrations in fish tissue. The United States Environmental Protection Agency (US EPA) guideline for selenium in fish muscle tissue of 11.3 mg/kg dry weight was used for large-bodied fish included in this assessment, as opposed to the ECCC Federal Environmental Quality Guidelines (FEQG) for selenium in fish tissue, as the FEQGs were only available in draft format at the time of the draft EIS submission. The US EPA fish muscle tissue guideline of 11.3 mg/kg dry weight was converted to fresh weight, and therefore the fish muscle tissue guideline of 2.83 mg/kg fresh weight was used. Predicted fish tissue concentrations of selenium in northern pike and lake whitefish over the Project phases for both the Application Case and Upper Bound sensitivity scenario were provided in Figure 4-4, along with a comparison against the US EPA selenium fish muscle tissue guideline of 2.83 mg/kg fresh weight. However, details were not provided on the bioaccumulation model used to predict the fish tissue concentrations for different Project scenarios and phases. Baseline concentrations of fish tissue selenium concentration can be found in the Baseline Annex V.I: Aquatic Baseline report, but the bioaccumulation modelling methodology for predicting selenium fish tissue concentrations was not provided for review. The ECCC FEQG selenium fish tissue concentration guidelines have now been finalized and ECCC recommends that the selenium fish tissue assessment be updated to use these guidelines as they are more stringent than the US EPA guidelines. The baseline fish tissue muscle samples that the Proponent has collected can be used in the ECCC FEQG by converting to egg/ovary concentrations using species-specific conversion factors from US	**Advice:** ECCC recommends that the Proponent consider the following actions: 1. That in the ERA, the assessment of selenium concentrations in fish tissue be updated to include the methodology used for bioaccumulation when determining predicted fish tissue concentrations of selenium in northern pike and lake whitefish. This is recommended to be done over all Project phases for both the Application Case and Upper Bound sensitivity scenario for verification of effect predictions to fish populations. 2. Confirm if fish muscle tissue samples were collected during spawning periods for both fish species. 3. That in the ERA, the assessment of selenium concentrations in fish tissue be updated to include a comparison of selenium fish tissue concentrations to ECCC FEQG guidelines for either fish whole body tissue (6.7 ug/g dry weight) or fish egg/ovary tissue (14.7 ug/g dry weight).	Responses to part 1, part 2, and part 3 of this IR are provided below. 1. NexGen notes that selenium was not identified as a constituent of potential concern in the environmental risk assessment (ERA) since upper bound concentrations of selenium did not exceed screening values (Draft EIS TSD XXI [Environmental Risk Assessment], Section 4.2.3.2, Table 4-2; Draft EIS TSD XXI, Section 4.2.3.3). However, considering that selenium toxicity in the aquatic environment is primarily from bioaccumulation in the aquatic food chain, selenium concentrations in fish tissue for northern pike and lake whitefish were modelled and compared against appropriate guidelines; the bioaccumulation factors (BAFs) used for fish were derived using regional fish data for northern Saskatchewan. The selenium BAF for northern pike was 9.49E+02 L/kg fw and the BAF for lake whitefish was 5.94E+03 L/kg fw. The fish tissue concentrations for the Application Case and Upper Bound sensitivity scenario are shown in Table 1 of Attachment ECCC-15 (see part 3 of this response) for all lakes assessed in the ERA. Specific to Patterson Lake North Arm – West Basin, the fish tissue concentrations for selenium are shown in Figure 4-4 of Section 4.2.4 of Draft EIS TSD XXI. The assessment showed that the maximum bioaccumulation in northern pike and lake whitefish in Patterson Lake would be less than 7% of the United States Environmental Protection Agency (EPA) selenium criteria (2021). Therefore, further evaluation of selenium bioaccumulation in fish is not required. NexGen acknowledges that the information regarding selenium BAFs could have been more clearly presented in the Draft EIS. Therefore, relevant context provided in this response will be added to Section 4.2.4 of revised EIS TSD XXI (Environmental Risk Assessment). 2. NexGen confirms that fish muscle tissue samples were collected during the spawning period for lake whitefish and shortly after the spawning period for northern pike (Draft EIS Annex V.1 [Aquatic Environment Baseline Report]. 3. Section 4.2.4 of Draft EIS TSD XXI assessed selenium in fish muscle tissue based on the available baseline data. NexGen confirms that this assessment of selenium in fish muscle tissue in the ERA is scientifically credible. For additional context, in response to the request from the reviewer, whole-body concentrations from the predicted selenium in muscle using EPA (2021) conversion factors have been calculated and presented in Table 1 of Attachment ECCC-15. The resulting whole-body concentrations (shown in blue in Table 1 of Attachment ECCC-15) do not exceed either EPA (2021) or ECCC (2022) guidelines for whole-body tissue, (i.e., 8.5 mg/kg dw and 6.7 mg/kg dw, respectively); therefore, the conclusions of the risk assessment remain unchanged and no edits to the ERA are required in the revised EIS.	Section 14.4, Table 14.4-1

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							EPA values, or muscle tissue concentrations could be compared to the FEQG whole body tissue guideline. In general, muscle tissue selenium concentrations must be collected during spawning and are a less reliable indicator of toxicity compared to fish egg/ovary tissue samples, which are considered the most reliable indicator of toxicity. **Rationale:** The EIS and supporting documents do not contain enough information to validate the predicted fish tissue selenium bioaccumulation effects to fish and fish habitat caused by increased selenium in the aquatic environment from Project effluent. To verify predictions of fish tissue selenium concentrations and effects to fish over the Project phases for both the Application Case and Upper Bound sensitivity scenario, details on the bioaccumulation modelling methodology should be included in the ERA. The ECCC FEQG is the Canadian standard and is more stringent than the US EPA guidelines. Use of the ECCC FEQG during the ERA selenium fish tissue concentration assessment would allow for improved comparability of baseline data and ERA predictions with future follow-up monitoring. As the ECCC FEQG does not currently provide a guideline for fish muscle tissue concentrations of selenium, the ideal method is measuring egg/ovary concentrations. Alternately, converting muscle tissue concentrations to egg/ovary concentrations using species specific conversion factors or comparing muscle tissue concentrations to whole body guidelines are two less accurate methods that may also be used for comparison to the FEQG.		**<u>References</u>** ECCC (Environment and Climate Change Canada). 2022. Federal Environmental Quality Guidelines. Selenium. Environment and Climate Change Canada. EPA (Environmental Protection Agency). 2021. 2021 Revision to: Aquatic Life Ambient Water Quality Criterion for Selenium 2016. EPA 822-R-21-006. U.S. Environmental Protection Agency.	
HC-01 Link: IR-69	Draft EIS TSD XXI (ERA), Section 4.3.3.3.1	~	~	~	~	HC-01 Link: IR-69	**Inappropriate use of an outdated standard in assessing health and environmental effect(s) from short-term exposure to nitrogen dioxide (NO_2).** The Draft EIS technical supporting document (TSD XXI (ERA)) appears to misinterpret Health Canada's 2016 Human Health Risk Assessment for Ambient Nitrogen Dioxide in setting its screening criteria and evaluating the health impacts from exposure to Nitrogen Dioxide. The document states: *Health Canada published a national one-hour maximum acceptable level of 400 µg/m^3 for NO_2 in ambient air using a risk assessment approach (Health Canada, 2016b). This value considers sensitive human populations and is used here to determine if nitrogen dioxide requires further assessment in the ERA.* Health Canada does not support this inaccurate statement. As indicated in Health Canada's 2016 Human Health Risk Assessment for Ambient Nitrogen Dioxide, this value (400 µg/m^3) corresponds to the National Ambient Air Quality Objective (NAAQO) for NO_2, which was developed in the 1970s. The CAAQS were later developed to replace existing Canada-wide standards, including the NAAQOs, and should be used as the most up-to-date standards.	**Advice:** The CAAQS were developed in consideration of both human health and the environment. Modelled predictions within an air quality assessment's study area should be compared to the most stringent air quality standards, guidelines or objectives applicable to the given region that may be affected by project activities. In many cases such as this one, CAAQS will be the most stringent levels. CAAQS are national air quality standards and are not restricted to applications only within the context of the Air Quality Management System (AQMS). An evaluation using 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. As health effects can occur even at levels of exposure below the CAAQS, they should not be viewed as "pollute-up-to" levels. The Proponent should strive for continuous improvement with the objective of keeping clean areas clean and take preventive actions to reduce emissions to the extent practicable to protect against significant air quality deterioration. This advice is also relevant to IR-69 and may be of use in responding to that request for a	NexGen acknowledges the reviewer's comment regarding National Ambient Air Quality Objective for NO_2. As Health Canada has indicated that they no longer support the national one-hour maximum acceptable level of 400 µg/m^3 for NO_2 in ambient air (Health Canada 2016), text associated with this assertion will be removed from Section 4.3.3.1 of revised EIS TSD XXI. NexGen appreciates the reviewer's advice regarding the comparison of Project emissions to the Canadian Ambient Air Quality Standards (CAAQS) but respectfully disagrees that modelled predictions within the air quality assessment should be compared to the CAAQS where these standards represent the most stringent guidelines. As noted in Attachment IR 69-R1 of the response to IR 69-R1, the CAAQS were not developed as facility-level regulatory standards (CCME 2019) and should not be compared to modelled predictions at or beyond a facility boundary (CCME 2012, CCME 2020a,b). However, in alignment with the advice provided by the reviewer, NexGen has provided a comparison of predicted Project NO_2 emissions to the CAAQS in Attachment IR 69-R1. In addition, context regarding the comparison of predicted Project NO_2 emissions to the CAAQS will be added to Section 4.3.3 of revised EIS TSD XXI (Environmental Risk Assessment) for information purposes; however, no other changes to the ERA in this regard (e.g., quantitative assessment of effects associated with 1-hour NO_2) are required. **<u>References</u>** CCME (Canadian Council of Ministers of the Environment). 2012. Guidance Document on Achievement Determination Canadian Ambient Air Quality Standards for Fine Particulate Matter and Ozone. PN 1483. Available at https://ccme.ca/en/res/pn1483_gdad_eng-secured.pdf. CCME. 2019. Guidance Document on Air Zone Management. PN 1593. Available at https://ccme.ca/en/res/guidancedocumentonairzonemanagement_secured.pdf.	TSD XXI, Section 4.3.3, Section 4.3.3.1

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Comment ID	Reference to EIS	Context and Rationale	Advice to Proponent / Comment	NexGen Response	Section in EIS	Comment ID	Context and Rationale	Justification / Rational / Additional Advice to Proponent / Comment	NexGen Response	Section in EIS
							Health Canada's 2016 Human Health Risk Assessment for Ambient Nitrogen Dioxide examined the full range of scientific literature including controlled human exposure, epidemiological and animal toxicology studies, and indicated that *"In short-term controlled studies of asthmatic adults, exposure to near-ambient levels of NO_2 elicited a range of adverse respiratory effects, including decreased lung function, increased AHR, and airway inflammation."* Furthermore, *"In most of the studies that examined the shape of the concentration-response relationship for shortterm NO_2-related mortality or medical visits, there was an approximately linear relationship, with no clear evidence of a threshold. Overall, the current evidence indicates that if a general population threshold exists for the health effects of NO_2, it is likely to be near the lower limit of ambient NO_2 concentrations. Consequently, the available evidence indicates that any increment in concentrations of ambient NO_2 presents an increased risk for serious health effects, up to and including mortality."*	comparison of predicted concentrations to the most protective applicable air quality standards available (i.e., CAAQS).	CCME. 2020a. Guidance Document on Achievement Determination for Canadian Ambient Air Quality Standards for Nitrogen Dioxide. PN 1608. Available at https://ccme.ca/en/res/gdadforcaaqsfornitrogendioxide_en1.0.pdf. CCME. 2020b. Guidance Document on Achievement Determination for Canadian Ambient Air Quality Standards for Sulphur Dioxide. PN 1610. Available at https://ccme.ca/en/res/gdadforcaaqsforsulphurdioxide_en1.0.pdf.	

n/a = not applicable (i.e., no changes required in the revised EIS).

Rook I Project

Environmental Impact Statement

Annex 2 Responses:
Supplemental Information

Attachment ECCC-15

Table 1: Selenium Concentrations in Fish Tissue for Lake Whitefish and Northern Pike

Fish Species	Lake Location	Application Case			Upper Bound		
		Muscle mg/kg(fw)	Muscle mg/kg(dw)	Whole Body mg/kg(dw)	Muscle mg/kg(fw)	Muscle mg/kg(dw)	Whole Body mg/kg(dw)
Lake whitefish	Reference (Broach Lake)	1.01E-01	4.06E-01	3.20E-01	1.01E-01	4.06E-01	3.20E-01
	Patterson Lake North Arm – West Basin	1.86E-01	7.43E-01	5.85E-01	1.89E-01	7.57E-01	5.96E-01
	Patterson Lake South Arm	1.24E-01	4.95E-01	3.90E-01	1.25E-01	4.99E-01	3.93E-01
	Beet Lake	1.10E-01	4.38E-01	3.45E-01	1.10E-01	4.40E-01	3.46E-01
	Clearwater River upstream of Mirror River	7.94E-02	3.17E-01	2.50E-01	7.95E-02	3.18E-01	2.50E-01
	Lloyd Lake	1.02E-01	4.09E-01	3.22E-01	1.02E-01	4.09E-01	3.22E-01
Northern pike	Reference (Broach Lake)	1.09E-01	4.36E-01	3.44E-01	1.09E-01	4.36E-01	3.44E-01
	Patterson Lake North Arm – West Basin	1.84E-01	7.34E-01	5.78E-01	1.87E-01	7.47E-01	5.88E-01
	Patterson Lake South Arm	1.30E-01	5.19E-01	4.09E-01	1.31E-01	5.23E-01	4.12E-01
	Beet Lake	1.17E-01	4.67E-01	3.68E-01	1.17E-01	4.69E-01	3.69E-01
	Clearwater River upstream of Mirror River	1.12E-01	4.48E-01	3.53E-01	1.12E-01	4.49E-01	3.53E-01
	Lloyd Lake	1.10E-01	4.39E-01	3.46E-01	1.10E-01	4.39E-01	3.46E-01

Notes:
dry weight = fresh weight/(1-0.75) [EPA, 2021]; whole body = muscle/1.27 [EPA, 2021].