Enclosure 1 – Natural Resources Canada Federal Authority Advice Record - Crawford Nickel Project – Technical review of the proponent's responses to IAAC's Comments

Please submit the completed form by **February 2, 2026**, to Crawford@iaac-aeic.gc.ca.

Department Contact Information

Submission Date	February 02, 2026
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1. Review the assigned proponent responses to IAAC's comments on the Impact Statement and provide views for IAAC's consideration in the analysis of the project's effects and preparation of the Impact Assessment Report (in Table 1). Also using Table 1, provide an answer to each of IAAC's targeted questions outlined in Table 2 that is assigned to your department or agency.

Table 1. Advice to Inform the Impact Assessment

Table 1 should be used to provide views for IAAC's consideration in the analysis of the project's effects[1] and preparation of the Impact Assessment Report and potential conditions. Expert advisors should consider project and regulatory context and provide risk-proportional, solution-oriented advice that allows the assessment to proceed to decision-making. Advice should include responses to, but not be constrained by, the targeted questions in Table 2.

Comment ID	Reference to IAAC's Comment	Description of View or Concern Related to an Effect	Advice to Inform the Impact Assessment
Please identify comments by organization and comment number. *e.g.: IAAC-01*	*Identify the specific Comment ID associated with IAAC's comments on the Impact Statement to which your comment applies.* *e.g.: FFH-01*	*Provide a brief description of the view or concern for IAAC's consideration in the analysis of effects, based on available information, such as:* • *a missing pathway of an adverse federal effect that may increase the overall extent of significance;* • *inaccurate characterization of an adverse residual effect; or* • *sources of uncertainty that, in your organization's view, may weaken conclusions*	*Considering project and regulatory context, provide solution-oriented advice that allows the assessment to proceed to decision-making. For example:* • *Characterize residual effects and associated uncertainty, as predicted by your organization, based on available information. Explain the uncertainty. Consider describing a range of possible effects scenarios. Consider qualitative descriptions of effects, if needed.* • *Suggest other mitigation and follow-up measures or adaptive management that may reduce predicted adverse federal effects, increase certainty in predictions, or help manage uncertainty, including operational guidance or standards, and well-understood practices.* • *Describe any other federal or provincial legislative frameworks, policies, programs, and potential complementary measures that may provide another means to address adverse federal effects, including predictable outcomes and whether other tools set conditions on the proponent.* • *Identify those mitigation measures and project design elements that are necessary to limit the extent of significance of adverse federal effects, and those follow-up program measures that address substantial uncertainty with the accuracy of predictions and the effectiveness of mitigation, in relation to key issues that are material to decision-making.* • *Provide advice on risk (likelihood and severity of effects), using applicable frameworks relevant to your mandate, to support IAAC's risk-based decisions.* *Based on current knowledge, IAAC does not intend to ask more questions of the proponent. If you are not able to respond to the specific prompts for advice outlined here and in Table 2, IAAC requests a discussion to better understand your views.*
NRCan-01	GW-01a to c	Within the Impact Statement, the performance of the groundwater model was evaluated by comparing simulated baseflow (groundwater discharge to surface water) results to baseflow values calculated from regional hydrometric monitoring stations. As the geology of these stations differ from the local study area, localized information was requested. The proponent has now provided an assessment of sub-regional baseflow measurements at 9 hydrometric stations within the local study	The ability of the groundwater model to match observed surface water discharge and the integration of the groundwater model results into the surface water model introduces uncertainty that is then carried forward to the assessment of impacts to fish and fish habitat, namely: • Seepage from mine facilities may be greater than that forecasted by the model • Forecast effects of groundwater drawdown may be greater than that carried forward into the surface water model. The proponent has proposed monitoring, mitigation, and adaptive management to address this uncertainty. It is NRCan's view that this monitoring should include ongoing assessment

[1] "Effects" means adverse effects within federal jurisdiction and direct or incidental adverse effects (as defined in section 2 of the *Impact Assessment Act*).

		area. This data was then applied to 26 sub-watersheds within the local study area for comparison to the groundwater model. The groundwater model results remain well below observed baseflow values (i.e. less groundwater discharging to surface water compared to observations). The exception to this bias is for the small watersheds ND16 and ND17, which both contain a hydrometric station. Model parameter adjustment did not improve model results. The challenge in matching groundwater model results to observed low flow measurements is recognized; however, this consistent bias introduces uncertainty when carried forward to subsequent surface water and fish habitat modelling. As the baseline groundwater model does not generate sufficient groundwater discharge, the surface water model does not apply the model results for baseline conditions. Groundwater discharge to surface water is fixed at a value that matches observations. Groundwater model results are then integrated into the surface water model for operations and closure/post-closure as follows: • If the groundwater model forecasted an increase to groundwater discharge because of project development, that increase was added to the surface water model by applying the simulated *percentage* increase to the *observed* baseline condition • If the groundwater model forecasted a decrease in groundwater discharge because of project development, *or a reversal so that the surface water feature loses water to* groundwater, then groundwater seepage in the surface water model was set to zero. This approach assumes any reduction in flow can be mitigated by pumping of site water. This approach introduces uncertainty to subsequent surface water modelling as: 1. The changes in the groundwater model are carried forward to the surface water model as proportional changes, as the absolute values are biased low. 2. The groundwater model underestimates the quantity of groundwater discharging to surface water. This may translate to lower simulated seepage quantities from mine infrastructure. 3. The simulated drawdown from pit operations results in flow reversal, so that certain surface water features are forecasted to	of surface water low flows to constrain groundwater modelling uncertainty. NRCan recommends that monitoring be initiated early, and account for the delayed response of the groundwater flow system, as mitigation options may be limited once impacts are realized. The proposed mitigation options are standard and should be effective if adequately implemented. NRCan recommends that a plan to assess the ability of site water management plans to meet the mitigation options included in the modeling assumptions be provided and implemented, and further that the plans include the assessment of water availability for drawdown mitigation under dry conditions.

		lose water to the groundwater system during operations (e.g. West Buskegau gains ~1000 m^3/day from groundwater under baseline conditions and is forecasted to lose 2000 m^3/day to groundwater at the end of operations). These results are not carried forward to the surface water models, with mitigation assumed to prevent these conditions.	
NRCan-02	GCH-01(a-e) – 02 (a-d)	NRCan's level of confidence in the geochemical program is high at this stage, even though gaps in the mine material characterization have been identified; however, such gaps are typical during the impact assessment phase.	It is important to note that mine material characterization is an on-going process starting at mine planning/impact assessment stage, where geochemical testing is completed on exploration drill core and pilot tailings, and continues during construction and operation where further testing is done on disturbed (i.e. pit walls), excavated (overburden, ore, low-grade ore and waste rock) and processed mine material (i.e. tailings). This on-going characterization provides information to update metal leaching and acid rock drainage (ML/ARD) release rates and water quality predictions on and off site. In parallel, water quality predictions are verified through seepage, groundwater, and surface water runoff during operations. If monitoring indicates concentrations are above water quality predictions made at the impact statement stage, it should trigger adaptive mitigation measures to keep ML/ARD releases as low as practicable. In NRCan's view, this process should be adequately described in the ML/ARD management plan, which enables mining operators to make informed and science-based decisions on adequate mitigation measures and adaptive management if necessary, during operations, to limit release of ML/ARD to the environment. The permitting process in Ontario is robust. The Ontario Regulation 35/24 of the Mining Act prescribes that effective prevention, mitigation, and monitoring strategies are developed and implemented. Furthermore, the Ontario Regulation 35/24 of the Mining Act prescribes that the sampling and testing program and data interpretation is required to be developed and conducted by a qualified professional in accordance with the Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials (MEND guidelines). Finally, condition 4.2 of Schedule 1 of Ontario Regulation 35/24 requires that materials, and conditions created as a result of mining, that produce or may produce ML/ARD be managed in accordance with the management plan required under the Code. As such, NRCan is confident that the MECP has the regulatory foundation required to ensure that the proponent adequately fills the gaps in ML/ARD characterization through their ML/ARD management plan. NRCan remains available to support the proponent, the province, and IAAC, and remains available to support the MECP if and when required.

Please insert additional rows as necessary.

Table 2. Targeted Questions to the Guide the Technical Review

Table 2 is a reference to help guide advice provided in Table 1. It outlines: the federal and provincial authorities assigned to review each of the proponent's responses to IAAC's comments on the Impact Statement; context on how IAAC will use the information to develop the Impact Assessment Report; and targeted questions to guide the technical review. Answers to the targeted questions should be provided as distinct row entries to Table 1 and consider the relevant prompts provided.

Comment ID	Relevant Authorities	IAAC's Focus for the Impact Assessment Report	Targeted Questions
1) Fish and Fish Habitat			
FFH-01-FFH03	DFO, ECCC, NRCan	In the Impact Assessment Report, IAAC will describe the likely adverse residual effects to fish and fish habitat (using magnitude, geographic extent, duration, uncertainty etc.), taking into account both direct loss from overprinting and loss through alteration of flows. Primarily, IAAC's focus is whether the anticipated harmful alteration, disruption, or destruction of fish habitat can be reasonably offset, accounting for any uncertainty in conceptual offset options (e.g., North Driftwood Diversion Channel). IAAC will rely on authorizations needed under the *Fisheries Act* to further refine the effects predictions, mitigation measures, and follow-up programs.	• Describe your level of confidence in the proponent's analysis of effects to fish and fish habitat from changes to groundwater and surface water flows, including the overall predicted magnitude and geographic extent of fish habitat loss in water courses. • Describe your level of confidence that, with ongoing refinement through permitting, there are likely to be sufficient offsetting measures available for the harmful alteration, disruption, or destruction of fish habitat. If needed, suggest feasible offsetting concepts. • Describe any outstanding uncertainty in the geotechnical feasibility of the Natural Driftwood Diversion Channel including its ability to function as an offset for fish habitat and a location for effluent discharge. Outline any next steps for the proponent to increase certainty. If there is insufficient confidence in the information provided by the proponent, provide advice to IAAC informed by the prompts in the "Advice to Inform the Impact Assessment" column of Table 1.
2) Groundwater-Surface Water Interactions, where Changes May Affect Fish Habitat and Indigenous Peoples			
GW-01(a-e)	ECCC, MECP, NRCan	In the Impact Assessment Report, IAAC will describe the likely adverse residual effects to fish and fish habitat (using magnitude, geographic extent, duration, uncertainty etc.), as well as the likely adverse impacts on the current use of lands and resources for traditional purposes by Indigenous peoples, resulting from changes to water quantity. Understanding how reasonably the groundwater model performs is necessary to interpret how well the surface water model reflects project-related changes in groundwater-surface water interactions. This information will inform IAAC's conclusions on potential adverse effects to fish habitat and impacts to Indigenous use. IAAC will rely on authorizations under the *Fisheries Act* and on provincial regulatory frameworks (e.g., *Ontario Water Resources Act, Lakes and Rivers Improvement Act*, etc.) to further refine the effects predictions, mitigation measures, and follow-up programs.	• Describe your level of confidence in the proponent's analysis of changes to groundwater-surface water interactions. • Would surface water model predictions (changes to surface water levels, flow and quantity) reasonably reflect project-related groundwater drawdown and mounding? • Describe implications of uncertainty in the groundwater-surface water interactions (see questions 3 and 4, which may overlap). Use geographic scenarios for changes to springs and surface water levels, if needed. • Consider any follow-up program and adaptive management measures proposed by the proponent, or your authoritative ability to require adaptive management, to manage uncertainty in your response. If there is insufficient confidence in the information provided by the proponent, provide advice to IAAC informed by the prompts in the "Advice to Inform the Impact Assessment" column of Table 1.
3) Surface Water Quantity, where Changes May Affect Fish Habitat and Indigenous Peoples			
SW Quan-01(a-d) and 02(a-b)	ECCC, MECP	In the Impact Assessment Report, IAAC will describe the likely adverse residual effects to fish and fish habitat (using magnitude, geographic extent, duration, uncertainty etc.), as well as the likely adverse impacts	• Describe your level of confidence in the proponent's analysis of changes to surface water levels, flows, and quantity to inform effects on fish and fish habitat, use of waterways by Indigenous peoples.

		on the current use of lands and resources for traditional purposes by Indigenous peoples, resulting from changes in flows. IAAC will take into account the level of confidence in the surface water hydrological model's ability to reasonably predict potential changes to surface water levels and flows to inform predicted effects to fish habitat and use of waterways by Indigenous peoples. IAAC will rely on authorizations under the *Fisheries Act* and on provincial regulatory frameworks (e.g., *Ontario Water Resources Act, Lakes and Rivers Improvement Act*, etc.) to further refine the effects predictions, mitigation measures, and follow-up programs.	• Describe implications of uncertainty in the surface water model. Use geographic scenarios for changes to surface water levels, if needed. • Consider any follow-up program and adaptive management measures proposed by the proponent, or your authoritative ability to require adaptive management, to manage uncertainty in your response. If there is insufficient confidence in the information provided by the proponent, provide advice to IAAC informed by the prompts in the "Advice to Inform the Impact Assessment" column of Table 1.
Species of Importance to Indigenous peoples, where Habitat is Lost due to Changes in Groundwater and Surface Water			
IP-01	ECCC, MECP, NRCan	In the Impact Assessment Report, IAAC will consider the predicted changes to the availability of species of importance for Indigenous peoples (e.g., waterfowl, moose, etc.) and describe the likely adverse residual effects to current use of lands and resources and cultural heritage (using magnitude, geographic extent, duration, uncertainty etc.). This will take into account habitat loss from changes in groundwater and surface water levels, including drawdowns, mounding and flooding. Understanding this habitat loss is necessary to describes residual changes to resources available to Indigenous peoples for traditional purposes. IAAC will rely on provincial regulatory frameworks (e.g., *Ontario Water Resources Act, Lakes and Rivers Improvement Act*) to refine the predicted quantity of effects, mitigation measures, and follow-up programs.	• Describe your level of confidence in the proponent's analysis of changes to the habitat of species of importance to Indigenous peoples (e.g., waterfowl, moose) from changes in groundwater and surface water levels (including drawdowns, mounding and flooding). • Describe implications of uncertainty in the groundwater and surface water model. Use geographic scenarios, if needed. For example, where might wetlands be drained or flooded? If there is insufficient confidence in the information provided by the proponent, provide advice to IAAC informed by the prompts in the "Advice to Inform the Impact Assessment" column of Table 1.
Surface Water Quality, where Changes May Affect Fish or Indigenous peoples			
SW Qual-01 - 06	ECCC, MECP, NRCan	In the Impact Assessment Report, IAAC will describe the likely adverse residual effects to fish and to the health conditions of Indigenous peoples or their current use of resources (using magnitude, geographic extent, duration, uncertainty etc.), resulting from changes in surface water quality. Changes in surface water quality may arise from controlled effluent, uncontrolled effluent (seepage), methylmercury production, and sediment-bound contaminants from the project. Understanding the geographic extent of surface water quality changes is necessary to determine potential chronic effects to fish health and	• Describe your level of confidence in the proponent's analysis of changes to surface water quality from planned effluent, unplanned effluent (seepage), methylmercury production, and sediment contamination. • Consider any follow-up program and adaptive management measures proposed by the proponent to manage uncertainty in your response. Where applicable, outline any next steps that may be necessary through provincial regulatory requirements to improve confidence. • Describe your level of confidence that, with ongoing refinement, the current project design will result in an effluent mixing scenario that can feasibly align with provincial policies that support issuance of an Environmental Compliance Approval for Industrial Sewage Works. Outline any next steps that may be necessary through provincial regulatory requirements to improve confidence or make a future determination.

		measures needed to mitigate health risks to Indigenous peoples from their use of water or fish. Further, IAAC seeks to understand the potential for future project redesigns and to build confidence in the management of mine effluent in considering federal (i.e., *Fisheries Act*, *Metal and Diamond Mining Effluent Regulations* Schedule 4) and provincial (*e.g.,* Environmental Compliance Approval for Industrial Sewage Works) regulatory frameworks. IAAC will rely on these federal and provincial regulatory frameworks to further refine the effects predictions, mitigation measures, and follow-up programs.	• Describe your level of confidence in the proponent's analysis of changes to surface water quality from a potential rail accident resulting in the release of nickel concentrate, including the geographic extent of potential effects. If there is insufficient confidence in the information provided by the proponent, provide advice to IAAC informed by the prompts in the "Advice to Inform the Impact Assessment" column of Table 1.
Geochemistry, where Conditions Influence Water Quality and Effects to Fish and Fish Habitat and Indigenous peoples			
GCH-01(a-e) – 02 (a-d)	NRCan, MECP	In the Impact Assessment Report, IAAC will describe the potential adverse residual effects to fish and fish habitat and impacts to Indigenous peoples (using magnitude, geographic extent, duration, uncertainty etc.), considering changes in surface water quality which are modelled based on the geochemical properties of mine materials. Understanding any uncertainties in the geochemical characterization program is necessary to understand effects to fish and fish habitat and to Indigenous peoples. IAAC will rely on provincial regulatory frameworks (e.g., *Ontario Water Resources Act, Mining Act*) to refine the effects predictions, mitigation measures, and follow-up programs.	• Describe your level of confidence in the proponent's geochemical characterization program to understand potential changes to surface water quality. Consider any future sampling, follow-up program, specific mine waste management strategies, water management plans, or other plans, and requirements of provincial regulatory frameworks to manage uncertainty in your response. If there is insufficient confidence in the information provided by the proponent, provide advice to IAAC informed by the prompts in the "Advice to Inform the Impact Assessment" column of Table 1.