NComment Form – Draft Permitting Plan and Draft Tailored Impact Statement Guidelines – Federal Review Team

Great Bear Gold Project **Response required by: June 5, 2024**

Commented [KS1]: Template from crawford: Document Overview: 2023-02-06 - Comment form - draft TISG and Permitting Plan - Federal Authorities - Crawford Nickel Project (gcdocs.gc.ca)

All comments should be submitted via the Submit a Comment feature available on the Project's Canadian Impact Assessment Registry page (https://iaac-aeic.gc.ca/050/evaluations/proj/85832?culture=en-CA). Documents can be uploaded using this feature. If you have any difficulties submitting this way, please contact the Registry directly at registry-registre@iaac-aeic.gc.ca. All comments submitted using this form will be posted on the Registry website for the Project.

Please note that this is your opportunity to customize the draft Tailored Impact Statement Guidelines.

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Section 1 – Draft Permitting Plan:

1. Confirm that all applicable legislative and regulatory oversight that may apply to the Project, under the authority of your department or agency, is accurately listed in the draft Permitting Plan.

Insert response here: Depending on the proponent's final mine design and operational plans, Explosives Act licensing may be required.

2. Indicate whether your department or agency has identified any power that it will be unable to exercise to allow the Project to proceed, in whole or in part. For more information, please refer to subsection 17(1) of the IAA.

Insert response here: NRCan is not aware of any power that it will be unable to exercise to allow the Project to proceed

Section 2 – Draft Tailored Impact Statement Guidelines:

1. Please review the draft Tailored Impact Statement Guidelines (the Guidelines) sections that are applicable to your department's or agency's mandate.
2. Using the table below, given the context of the Project, please provide any comments and include your recommendation for how the final Tailored Impact Statement Guidelines should be adapted to address any comments.
    - Please indicate any corrections, additions or deletions that should be made to the text. Please provide a clear context and rationale for your recommendations.

- Federal expert advice should be commensurate to the situational context of the Project and informed by risk-based prudence and evidence in the proponent's Detailed Project Description[1] and Response to the Summary of Issues[2], with a strong reliance on well-understood mitigation measures, existing guidance, and regulatory instruments that will manage effects.

NRCan Draft TISG Comments

TISG Section 3.4 – Project Components and Activities

Section	Paragraph	Draft TISG Text	Comments/Notes
3.4.	Page 11	Suggest removal of the footnote on page 11: ''The Impact Statement must confirm that the Project does not include manufacturing of explosives''	On the same page, in the Project Activities list, we already have '' blasting (locations, frequency, duration, time of year, time of day and methods);''. Here, ''methods'' will provide a clarification on the type of explosives they will use (pre-package vs bulk – bulk being considered as manufacturing), which will suffice for us to confirm our regulatory role.

TISG Section 8.3 – Geochemistry of mined or excavated materials

Section	Paragraph	Draft TISG Text	Comments/Notes
8.3.	1.	Geochemistry of mined or excavated materials	
	2.	*8.3.1. Baseline conditions*	
	3.	The Impact Statement must:	
	4.	• provide a geochemical characterization of expected mined or excavated materials ~~(and historical waste, if applicable)~~, such as waste rock, ore, low grade ore, pit wall materials, underground development ramps, process waste (i.e. tailings, treatment sludge), overburden, and potential construction material (i.e. mine rock, quarries, unconsolidated material), whether sourced on-site or transported to the site from external sources. The program should be designed to meet the requirements in section 8.6.2 Effects to groundwater and surface water and in consideration of the AEX project and metallurgical testing of the bulk sample, if possible; ~~and~~	The Proponent states (DPD page 15) that there is no historic waste on site, so reference to this can be deleted. The Proponent states (DPD page 16) that the AEX project will advance two development ramps to collect a bulk sample plus surface storage of mine waste. Results of the geochemical characterization program and source term development completed to support permitting of the AEX should be considered in the design of the overall site

[1] https://iaac-aeic.gc.ca/050/evaluations/document/155992
[2] https://iaac-aeic.gc.ca/050/evaluations/document/153313

Section	Paragraph	Draft TISG Text	Comments/Notes
			geochemical characterization program. If possible, geochemical testing should be completed on tailings material produced from metallurgical testing of the bulk sample. The characterization program must be designed to support the requirements that are outlined in section 8.6.2 (bullets 15 (sub bullet 3) and 16 of the draft TISG.
	5.	• ~~provide a geochemical characterization of expected exposed rock faces of the open pit and underground mining infrastructure.~~	To streamline the guidance, this bullet has been integrated into the previous one and can be deleted here (this change is consistent with the generic TISG template).
	6.	In particular:	
	7.	• provide a detailed summary of analytical methods used to evaluate mineralogy, acid rock drainage, neutral mine drainage, metal(loid) leaching, and the potential release of other substances to meet the requirements in section 8.6.2 Effects to groundwater and surface water. The Mine Environment Neutral Drainage (MEND) report 1.20.1 is recommended as guidance to support study design plus the Government of Canada Screening Assessment – Cyanide (2023);	The Proponent states (DPD page 22) that ore will be processed using cyanide leach methods and cyanide destruction will occur prior to the final storage of tailings (DPD page 79). As such, tailings and associated process water will contain cyanide species and degradation products (nitrogen and carbon species) even after cyanide destruction, and should be included in the testing program. Note: IAD sent email to ECCC on June 7 to address following: IAD – please ask ECCC to provide feedback on the cyanide 2023 reference that was added. Do we need to reference "Risk management approach for cyanides" as well or instead?
	8.	• describe the representativeness of samples collected for acid rock drainage and metal(loid) leaching assessment. Present cross-sections or block model images at an appropriate scale that include mine rock samples, geology, mineralized zones, the approximate location of all open pit and underground mine development, borehole traces and identification numbers, and a scale and legend;	

Section	Paragraph	Draft TISG Text	Comments/Notes
	9.	• describe the representativeness of tailings solids and process water. Provide a schematic process flow chart including the location that each tested sample represents if various processing streams are tested, including with respect to cyanide destruction and desulfurization, if applicable;	The proponent has indicated that tailings will undergo cyanide destruction prior to storage and may undergo desulfurization (DPD page 30). The IS must clearly indicate whether samples tested as part of the geochemical characterization study have undergone these processes. Per the first bullet, it is recommended that geochemical testing be conducted on tailings material produced from metallurgical testing of the bulk sample, if possible.
	10.	• describe the approach and methods for the prediction of acid drainage, neutral mine drainage, and metal(loid) leaching, including identification of potential parameters of concern based on the testing program above. Provide initial leaching potential results based on short-term leach tests and an analysis of the representativeness of laboratory and field kinetic tests based on static test results;	
	11.	• describe the quality assurance/quality control procedures. Provide laboratory certificates of analysis that include information related to analytical methodology and quality assurance/quality control; and	
	12.	• provide estimates of the potential for all materials to be sources of acid drainage, neutral mine drainage, ~~and/or~~ metal(loid) leaching, and the potential release of other substances to meet the requirements in section 8.6.2 Effects to groundwater and surface water, timing to its onset, and short- and long-term loading rates calculated from kinetic testing for both neutral and acidic conditions, with consideration for the use of a proxy (i.e. ~~historical mine waste,~~ geochemically suitable analogue site,~~-~~analytical tests replicating acidic conditions) if kinetic tests have not produced acidic leachate, if applicable.	No historical waste exists on the Project site, but a geochemically suitable analogue site can be considered as a suitable proxy, if required.
	13.	*8.3.2 Effects to chemical release rates*	
	14.	The Impact Statement must describe the effects of the Project on the rate at which chemicals may be released from materials mined or excavated on site, and geological materials transported onto the site, to inform assessment of effects on groundwater and surface water quality (section 8.6.2 Effects to groundwater and surface water), which are then used to inform on necessary mitigation measures, including:	
	15.	• present chemical release rates from all major sources of mine or excavated materials and mine wastes for all materials described in *section 8.3.1 Baseline conditions*; to be used as source terms in an integrated chemical mass balance model	Addition of "of mine life" clarifies the expectation that this information is provided for all phases of mine life.

Section	Paragraph	Draft TISG Text	Comments/Notes
		described in section 8.6.2 Effects to groundwater and surface water, for all phases of mine life considering:	
	16.	○ the results of the geochemical characterization study that evaluated the potential for acid rock drainage, neutral mine drainage, metal(loid) leaching and the potential release of other substances to meet the requirements in section 8.6.2 Effects to groundwater and surface water.	The addition of cyanide and its degradation products maintains consistency with other bullets.
	17.	~~○ potential release of cyanide;~~	To streamline the guidance, this bullet is captured in the previous one and can be deleted.
	18.	○ exposure of potentially acid generating, and/or metal(loid) leaching (including radionuclides), and/or radioactive rock in pit walls;	
	19.	○ baseline groundwater and surface water quality as described in *section 8.6.1 Baseline conditions*;	
	20.	○ potentially acid-generating rock volumes and tonnage for the lifecycle of the Project; and	
	21.	○ mine waste disposal, management and mitigation methods and their affects on acid rock drainage, neutral mine drainage, ~~and/or~~ metal(loid) leaching ~~potential~~ and the potential release of other substances to meet the requirements in section 8.6.2 Effects to groundwater and surface water.	Edits in the bullet are for completeness and consistency with other bullets.
	22.	• provide a clear description and rationale for all input parameters and assumptions;	
	23.	• provide base case (i.e. most likely, mean, median) and worst case (e.g. 75th to 90th percentile) scenarios, plus applicable sensitivity scenarios; and	
	24.	• describe potential effects to groundwater and surface water and sediment quality from acid rock drainage, neutral mine drainage, and/or metal(loid) leaching, as described in section 8.6.2 Effects to groundwater and surface water.	
	25.	*8.3.3 Mitigation and enhancement measures*	
	26.	The Impact Statement must:	
	27.	• describe the conceptual approach to operational testing to identify and manage potentially acid generating and/or metal(loid) leaching mine waste during mine construction and operation, and to identify non-potentially acid generating and/or metal(loid) leaching mine rock to be used for construction purposes ~~if applicable~~;	The proponent states that a large majority of waste rock is potentially acid generating (DPD page 49) and that they will use non-potentially acid generating mine rock for construction use if geochemically suitable (DPD

Section	Paragraph	Draft TISG Text	Comments/Notes
			page 28). Geochemical suitability must consider both non-potentially acid generating and metal(loid) leaching mine rock.
	28.	• describe methods for the prevention, monitoring, management, and control of acid rock drainage, neutral mine drainage, ~~and/or and~~ metal(loid) leaching and the potential release of other substances to meet the requirements in section 8.6.2 Effects to groundwater and surface water during all project phases (considering the mine waste characterization program in Section 8.3.1); and	Edits in the bullet are for completeness and consistency with other bullets. The mine waste characterization program is not a mitigation or enhancement measure but must be used as guidance for the design of prevention, monitoring, management, and control methods.
	29.	• describe tailings management strategies including:	Bullets 29 to 35 are not appropriate in this section and should be moved, potentially to Section 3.4 facilities.
	30.	~~characterization of tailings to be backfilled and tailings to be stored on surface;~~	Can be deleted or provide reference to 8.3.1

TISG Section 8.6 – Groundwater and Surface Water

Section	Recommendation	Comments
8.6.1	Remove the opening generic paragraph, and begin this section with: "The impact Statement must:"	The guidelines are to be tailored to the project. General template language should be removed.
8.6.1	On Page 52, the following edits should be made: "describe the hydrostratigraphic units (aquifers, aquitards, aquicludes) of the hydrogeological environment in both bedrock and ~~overburden~~ *surficial sediments* and provide a piezometric map showing ~~heads~~ *groundwater elevations* and the direction of groundwater flow for the various hydrostratigraphic units; "	A minor language update to reflect technical terminology in preceding sections.
8.6.2	On Page 53, the following edit should be made: "quantify the extent of hydrological changes that will result from disturbances to ~~aquifers~~ *groundwater* and surface water features for each phase of the Project taking into account climate change (see also sections 8.12 Climate change and 14 Effects of the Environment on the Project). This includes changes to the quantity or timing of surface flow, *groundwater flow,* water levels, ice thickness or extent, sediment input, and channel regime in watercourses, and water levels in affected waterbodies; " 8.6.	Suggest a language change to remove reference to aquifer, as groundwater effects are likely to extend beyond traditionally defined aquifers, in particular when related to fish and fish habitat.

8.6.2	On page 54 the following edits: "present a 3-dimensional numerical groundwater flow model of the hydrogeological system that incorporates all major project features such as open pits, underground workings, *mine rock stockpiles*, tailings management facilities, *dewatering plans*, and water diversion ditches "	A wording update to reflect naming convention in proponent materials
8.6.2	On page 54, the following edits: "estimate key project fluxes, including open pit ~~or~~ *and underground* mine inflow rates, *open* pit ~~or~~ *and underground* mine dewatering rates, *open* pit ~~or~~ *and underground* mine-flooding rates, and tailings and waste storage (including in-pit *and underground* storage) seepage rates during operation, decommissioning, ~~and~~ the abandonment, *and long-term post closure* phases;	A wording update to reflect mine plan.
8.6.3	On Page 57 the following edit: "The proposed monitoring points to assess changes to groundwater quality and quantity, which should include well locations and depths; and"	A wording change to reflect the complete purpose of monitoring plans
14.0	Pg. 117 - Last bullet (pg. 118) mentions that it will follow NBCC 2015. For the proponent's information NBCC 2020 is now available for use.	Effects of the environment on the project

TISG Section 11.1.1 Effects to Economic Conditions - Employment

Section	Paragraph	Draft TISG Text	Comments/Notes
	1.	*11.1.1. Employment*	
	2.	The Impact Statement must:	
	8	○ a description of the plans and the justification for hiring of temporary workers, including any temporary foreign workers, to make up for any local shortage of labour and skills;	Or interprovincial workers In addition, provide details on planned living arrangements for these migratory workers.