Table of concordance

HML responses to the Government of Newfoundland and Labrador's comments on the

Howse Property Project Environmental Preview Report

Gov NL Concern	HML Response	Location in EPR
Department Number: NL-PPD-01 IN IR 26d CEAA 7 For the Howse mini-plant, 2 diesel burners for ore dryer are listed as 3719 L/hr operating 5110 hr/yr. The fuel usage is listed as 9 502 624 L/yr. However 3719 L/hr x 5110 hr/yr is 19 004 090 L/yr. • Clarify calculations and how much total fuel would be used per year. • Include how the revised calculation would affect the predictions of GHG emissions and potential effects analysis.	At Plant 2, one dryer has been included in the modelling with an iron ore input design of 450 tonnes per hour (operating 12 months/year). At Howse Mini Plant, two dryers have been included in the modelling, each of them designed for an iron ore input of 320 tonnes per hour (operating 7 months/year). Assumptions provided by Tata Steel to AECOM had indicated that 50% of the iron ore material going through any of the plants would end up going through the drying process, while the other half would be deemed to be within the acceptable range for moisture content. The use of the expression "assumes an average burner firing rate of 50% over the operating period" is misleading and should be replaced by "**assumes that 50% of the iron ore material requires drying**". Needless to say that whenever the dryers are operating, they are indeed operating at full capacity and not at a 50% burner firing rate. To remain conservative and to consider the uncertainty of "when" those downtimes actually occur, the modelling has not taken this 50% into account. For modelling purposes, all the dryers are operating at full capacity, 24 hours per day. The 50% assumption was only used for evaluating the annual fuel consumptions, which further impact the GHG calculations.	Section 7.3.1.1, Page 7-12 A note was added to Table 7-3: **assumes that 50% of the iron ore material requires drying**
Department Number: NL-PPD-02 IN IR-26d CEAA 8 There are a number of calculation and summation errors in Table 7-4. For example, the total L/yr should not equal 348 million litres; the mini-plant CO2 should be greater than 5601 Kt/yr.	Indeed, the proponent has changed the value of 5601 tonnes to 56,013,324 kg. The text in the EIS should read: GHG emissions from the Howse Project activities were calculated for all three phases as a whole, since the Construction and Decommissioning and Reclamation phases will be largely limited to road traffic, resulting in negligible emission (as compared to the operations phase). Emissions were estimated based on the amount of fuel burned and the emission factors of the National Inventory Report, 1990-2011 (Environment Canada, 2013a). According to this report, each litre of diesel fuel burned results in the emission of 2,663 g of CO_2, 0.13 g of CH_4 and 0.4 g of N_2O.	Section 7.3.1.1, page 7-13 Table 7-4 and text in paragraph above table, page 7-13

Gov NL Concern	HML Response	Location in EPR
Review Table 7-4 for calculation and summation errors and correct, as appropriate. Present an updated table, with revised totals. Revise the analysis and conclusions, as appropriate taking into consideration updated calculations	Table 7-4 has been revised Carbon dioxide equivalents (CO2 eq) were determined by multiplying the amount of emissions of a particular gas by the global warming potential (GWP) of that gas. GHGs differ in their ability to absorb heat in the atmosphere due to their differing chemical properties and atmospheric lifetimes. For example, over a period of 100 years, methane's (CH4) potential to trap heat in the atmosphere is 25 times greater than carbon dioxide's potential, and thus it is considered to have a GWP of 25. The IPCC publishes the GWPs and atmospheric lifetimes for each GHG which can be found in Environment Canada (2013a). The GHG emissions were calculated as CO_2 equivalent per year (CO_2eq/yr) using the following IPCC (2013) global warming potentials: 25 for CH_4 and 298 for N_2O. GHG emissions from the Howse Project are estimated to be 0.067 MtCO_2eq/yr. Newfoundland and Labrador total GHG emissions for the years 1990, 2005 and 2013 are 9.8, 10.3 and 8.6, respectively (Environment Canada, 2013a https://www.ec.gc.ca/indicateurs-indicators/default.asp?lang=en&n=18F3BB9C-1). The Howse emissions represent roughly 0.7% of Newfoundland and Labrador total emissions (based on a mean GHG emissions value of 9.56 MT CO2 eq/YR).	
Department Number: NL – PPD-04 **CEAA 9** The proponent has noted that under both the "Blasts" and No Blasts" scenarios, the 24-hour NO2 standard may be exceeded at the workers camp but that such a situation was highly unlikely to occur in reality. The proponent was asked to justify stating that exceedances were highly unlikely when the modelling clearly indicates the possibility. Simply stating that exceedances will occur 0.38% of the time doesn't answer the question of likelihood. Likelihood should address with the question of whether the various emission sources that were emitting to generate the exceedances are actually operating at the given rate over the given	NOx, CO and VOC emission data were obtained from the diesel generators manufacturers or EPA emissions factors. Emissions calculations, methodology and source of data are presented in Appendix A. As of summer 2016, the electricity at the Workers' Camp is now supplied by the Main Plant GenSet which have a higher engine to generator efficiency than the diesel generators located at the Camp (95% vs 85%). The four diesel generators located at the Workers' Camp and listed in Table 2-5 are still in place but only used for emergency situations (ex.: malfunction of the Main Plant GenSet or failure of the power line between the Main Plant and Workers' Camp). The Main Plant Generators loads and emission calculations presented in this report include the portion of electricity required at the Workers' Camp, since TSMC had already planned for this power switch; it just occurred faster than anticipated. The air modelling study was conducted assuming all generators were in operation as listed in Table 2-5 and represent a theoretical worst-case scenario. Note that for all diesel generators, except the Main Plan GenSet (5 x 2825 kW units), pollutants emissions were calculated by multiplying respective emission factors in units of g/kW by the generators power ratings in units of kWe instead of the engine power inputs in units of kW. This procedure may have underestimated emissions of these sources by	Section 3.1, Page 3-1. Section 7.3.2.2.2, page 7-36 Section 8.3.3.1, page 8-4 ADMR Appendix E-2 (EPR) NL, sub-Table 2-5

Gov NL Concern	HML Response	Location in EPR
period of time. This was not done. That being said, based on previous experiences it can be deduced that the likelihood of all emission sources operating at the rate to generate an exceedance is very low, and as such the answer will be accepted.	approximately 15%. Considering the high-level of conservativeness used in all other calculations and assumptions coupled to the fact that the Workers' Camp generators emissions are overly exaggerated since they will only be used for emergency purposes, it is evaluated that changes to the calculations procedure are not warranted. Emissions calculations, methodology and source of data are presented in Appendix A.	
Department Number: NL – PPD-06 **CEAA 10** The response provided is acceptable.	-	
Department Number: NL – PPD-08 **CEAA 11** The proponents response does not address the question. Below is a copy of the emission calculations provided in the report for one of the generators. As can be clearly seen near the bottom of this page, the emission rates are calculated based on g/hp-hr and not a g/hr as noted in the proponents response. It can also be shown that the same calculation occurs for most of the generators. The problem is the emission rates in g/hp-hr are engine based emissions and not generator based emissions, thus the 2.98 g/hp-hr emission rate for NOx is the emission rate based on the hp of the engine. The engine drives the generator, and as such the generator hp (or kw) will be less than the engine due to operational losses – typically the generator / engine efficiency is approximately 85%. In the calculations below clearly the generator hp (ekW) is being used meaning the emissions are being	Replace this: *Considering the inputs to the air modelling study were conservative (e.g. worst-case), the noted exceedance for the single parameter NO2 (24-hr) is highly unlikely to occur in reality.* With: As of summer 2016, the electricity at the Workers' Camp is now supplied by the Main Plant GenSet which have a higher engine to generator efficiency than the diesel generators located at the Camp (95% vs 85%). The four diesel generators located at the Workers' Camp and listed in Table 2-5 are still in place but only used for emergency situations (ex.: malfunction of the Main Plant GenSet or failure of the power line between the Main Plant and Workers' Camp). The Main Plant Generators loads and emission calculations presented in this report include the portion of electricity required at the Workers' Camp, since TSMC had already planned for this power switch; it just occurred faster than anticipated. The air modelling study was conducted assuming all generators were in operation as listed in Table 2-5 and represent a theoretical worst-case scenario. Note that for all diesel generators, except the Main Plan GenSet (5 x 2825 kW units), pollutants emissions were calculated by multiplying respective emission factors in units of g/kW by the generators power ratings in units of kWe instead of the engine power inputs in units of kW. This procedure may have underestimated emissions of these sources by approximately 15%. Considering the high-level of conservativeness used in all other calculations and assumptions coupled to the fact that the Workers' Camp generators emissions are overly exaggerated since they will only be used for emergency purposes, it is evaluated that changes to the calculations procedure are not warranted. Emissions calculations, methodology and source of data are presented in Appendix A.	Section 3.1, Page 3-1. Section 7.3.2.2.2, page 7-36 Section 8.3.3.1, page 8-4 ADMR Appendix E-2 (EPR) NL, Section 3.2

Gov NL Concern	HML Response	Location in EPR
underestimated by approximately 15%. The proponent is therefore requested to validate the emission calculations. Should it be shown that the emissions have been underestimated, then a reassessment of the predicted impacts will be required.	Replace this : *Considering the inputs to the air modelling study were conservative (e.g. worst-case), the noted exceedance for the single parameter NO2 (24-hr) is highly unlikely to occur in reality.* With this: The principal cause of predicted NO2 (24 hours) exceedances the Workers' Camp (R40) are the four (4) diesel generators located right within the Camp area. As of summer 2016, the electricity at the Workers' Camp is now supplied by the Main Plant GenSet which have a higher engine to generator efficiency than the diesel generators located at the Camp (95% vs 85%). The four diesel generators located at the Workers' Camp are still in place but they will only be used for emergency situations (ex.: malfunction of the Main Plant GenSet or failure of the power line between the Main Plant and Workers' Camp). Considering this change and the fact that assumptions and calculations procedures used in this air modelling study were conservative (e.g. worst-case), the noted exceedance for the single parameter NO2 (24-hr) is very highly unlikely to occur in reality.	Chapter 7 Howse Effects Assessment on Physical Environment, Page 7-26.
CEAA 74 & 75 In this response, caribou are being given similar consideration as bear. Due to the conservation concern of caribou in Labrador, the Wildlife Division should be contacted to determine appropriate action should caribou not move away from project activities. Rubber bullets should not be indicated as a mitigative measure, even as a last resort. Discussions would need to take place with the Wildlife Division.	If the surveys indicate that the caribou has moved near the project area, the proponent will inform the Wildlife Division and seek their advice for the next action. No rubber bullets will be used by the Proponent on caribou.	Clarifications are provided in Section 9.2.2, page 9-40.
CEAA 76 Provide a rationale and discussion of proposed mitigation measures related to caribou including: a. Explain how many collars would be accessed through the agreement with the Ungava project and CARMA.	a. According to Dr. Steeve Côté, Director of the Ungava program, there are presently 70 live collars on the GRCH which are being monitored for HML under an agreement between TSMC and the Ungava project and CARMA. b. The decision to purchase more collars will be joint between all the partners in the UNGAVA program. c. If monitoring data from the radio collars indicate that some of the caribou have moved to within 20 km of the Howse Project, HML will institute surveys within that radius to monitor their movements in greater detail. Survey details will be evaluated during the	Additional details provided in Section 9.2.2, page 9-40.

Gov NL Concern	HML Response	Location in EPR
b. State whether- and under what circumstances existing telemetry information would be augmented (e.g. by purchasing, deploying and/or maintaining additional collars). c. Describe plans for reporting on locational caribou data including: what would be reported on, who the information would be provided to, and how often reporting would occur. d. Propose a reporting scheme, in the case that caribou move into the area. e. Provide a description of surveys that would be conducted, if caribou move within 20 km of the Project. Clarify whether surveys would be conducted by TSMC or the proponent. f. Describe the circumstances under which additional mitigation measures (adaptive management) would be implemented. g. Describe specific adaptive management actions (i.e. mitigation measures) that could be taken to minimize disturbance to caribou and current use.	early years of operation. Initially, preference will be given to fixed-point observations along high ground areas adjacent to the Howse Project activity sites and to snowmobile- and ATV-based searches by members of the local First Nations hired by HML, with instructions to avoid disturbing the animals. It is expected that the inclusion of Aboriginal people's help will benefit from the knowledge about the movements of caribou in the area. If ground-based surveys do not prove to be useful or feasible, HML will initiate aerial surveys. Special care will be taken at all times not to interfere with the activities of First Nation hunters. The data collected during the surveys (number, age and sex; location of sightings; topography of sighting location) will be communicated frequently to the authorities concerned, who will be asked for advice with respect to the course of action to be followed, the overall goal being to reduce nuisance. d. See answer c) above e. See answer c) above f. See section 7.4.3.3 of EIS document	
CEAA 77 Provide information on the caribou monitoring program, including whether aerial surveys would be conducted in winter months and how frequently these surveys would occur	Caribou are being monitored for HML under an agreement between TSMC and the Ungava project and CARMA. This monitoring consists of telemetric data currently available from the CARMA program. Under this program, HML's Environmental Specialist / Permit Manager will be notified when migratory tundra caribou venture within 100 km of the Howse Project. Upon receipt of such a notice, operations will continue with caution. If monitoring data from the radio collars indicate that some of the caribou have moved to within 20 km of the Howse Project, TSMC will institute surveys within that radius to monitor their movements in greater detail. The Proponent is amenable to conducting aerial surveys of caribou, as requested. The data collected during the surveys (number, age and sex; location of sightings; topography of sighting location) will be communicated frequently to the authorities concerned, who	Additional details provided in Section 9.2.2, page 9-40.

Gov NL Concern	HML Response	Location in EPR
	will be asked for advice with respect to the course of action to be followed, the overall goal being to reduce nuisance.	
CEAA 78 Provide an analysis of potential change in predator-prey interactions as a result of the Project, and how this would affect the effects analysis of current use of lands and resources by Indigenous Peoples. Clarify the conclusions related to the *magnitude* and significance determination based on the information provided.	The statement about predator-prey interactions was included in the EIS because it is a possible eventual effect of the project on the GRCH. However, much like climate change effects can be inferred but not predicted, alterations in predator-prey interactions are a long-term and indirect effect that cannot be predicted. Rather, changes to predator-prey interactions, if they occur, will be identified via close monitoring, and the Proponent suggest that the Labrador Caribou Initiative is in the best position to identify this effect, if it occurs, in the future. The second phase of the Caribou Ungava program (2015-2020) will focus on the ecology of the caribou's main predators (grey wolf and black bear). The conclusion of the magnitude of the effect of the Project on caribou remains the same, as the effects, nor their likelihood, cannot be predicted.	No Change
CEAA 90 Review proposed mitigation measures associated with wetlands and provide revised measures that are specific, measurable, attainable, relevant, and time-bound along with associated analysis on its effectiveness at reducing environmental effects.	• stripping the entire area all at once rather than progressively, whenever possible; • the top layer of the stripped organic matter (the 40-50 cm layer that includes the roots) should be preserved. To the extent possible, the organic matter will be excavated in blocks, without disturbing the various horizons. It will then be deposited in, for example, a disturbed area. The area selected will be an isolated depression (far from any watercourse, so as to avoid increasing suspended matter), which will promote revegetation and, eventually, the regeneration of a wetland; • The first two mitigation methods will reduce overall surface area of wetland destruction as a result of the Howse Project by promoting their development elsewhere. This measure can be assessed by measuring the surface area of the wetland that is successfully transplanted. • if an access road has to be built, it is recommended to do it during the winter season. In the event that no road is built and only a temporary access is necessary, a temporary protection mat will be used where machinery will operate. • The last mitigation measure will protect those portions of wetlands that are not directly affect (destroyed) by the Project footprint, but rather that may be	Table 7-79, page 7-208

Gov NL Concern	HML Response	Location in EPR
	disturbed by activities. This measure can be assessed by comparing the surface area of wetlands that will be destroyed VS the measuring the surface area of the wetland that is actually destroyed.	
From the Executive Summary p.12 Treatment Strategy – Will the sedimentation ponds be lined?	The sedimentation ponds will not be lined (please see Section 3.3 of the WMP (Appendix IV of the Howse EIS)).	NO CHANGE Executive Summary, Treatment Strategy, p. 12, line 2.
From the Executive Summary p.13, *"An allowance of 0.5m is provided at the bottom of the sediment pond for sediment storage."* Will the pond would have to be cleaned out periodically as preventive maintenance?	No estimation of sediment quantities has been made for the present engineering phase as little information is available on sediment sedimentation curves. Such estimations will be done during the project next engineering phase. Table 5-1 of SNC report (Volume 1 Appendix VI): "*Frequency at which sediments will need to be removed from the pond during the life of mine will be evaluated in the next phase of the project. If sediment removal is required, it will be managed according to all applicable regulations*"	Sentence *Frequency at which sediments will need to be removed from the pond during the life of mine will be evaluated in the next phase of the project. If sediment removal is required, it will be managed according to all applicable regulations* was added to page 13.
From the Executive Summary p.13 – *"At closure, the sedimentation pond will be covered to avoid any leaching of iron."* Is leaching of iron the concern or is this general site rehabilitation to minimize erosion and dust lift off?	With respect to pond covering, HML will study the different options, including pond covering or not, of reducing the environmental effects of iron. The Proponent will use available data from discharge quality and will base its methods on approved methodologies.	Details added to page 13 of the Executive Summary.
From Chapter 7 of the EPR Chapter 7, Section 7.3.2.2.1, Tables 7-5, 7-6, 7-7 Document Page 7-20 thru 7-25, PDF Pages 13 thru 18: Modelling results for sensitive receptors are presented however it is unclear whether these results are with or	• It is anticipated that during normal operation, blasting at the Howse Property will occur approximately once per week during summer and infrequently during winter. Blasting will also occur at the Fleming 7N pit, and since this pit is part of the DSO3 area and may have parallel operations with Howse, blasting events at both pits are included in the dispersion modelling study. Blasting events are short in duration and infrequent. The air dispersion software input requirements limits the representativeness of these blasting events, which leads to an	No Change.

Gov NL Concern	HML Response	Location in EPR
without blasting. Additionally the table only addresses sensitive receptors and not all receptors outside the boundary. Please clarify whether blasting is included in the modelling.	overestimation of the resulting short-term effects on air quality. The methodology used to capture a wide variety of meteorological conditions in the air model, was to assume one blast per day at each pit would be conducted. At the Fleming 7N pit, the blast was assumed to occur between 11AM-12PM. At the Howse pit, the blast was assumed to occur between 1PM-2PM. Using this methodology, the number of blasting events entered in the model is 730 (365 blasts/yr/2 pits), while in reality approximately 60 blasting events are expected for the two pits (Fleming 7N and Howse). An additional data gap related to blasting events is the limited knowledge on actual emissions from blasts. Conservative emission factors from USEPA AP-42 were used in the calculations. These factors have a rating of "D" on a scale of A to E. One way to minimize to minimize the emission factors lack of representativeness would be to obtain more precise factors to depict emissions from explosive detonation during the blasts. Such factors were not available at the time of preparing this air quality assessment. • Due to the limitations in modelling blasting events, air modelling results are presented for two scenarios: "With Blasts" and "No Blasts". • Please note: The results from the air dispersion modelling for all air pollutants assessed in this study are presented in this report in tabular format at the sensitive receptor locations, and also at grid receptors having the highest impacts.	