

Howse Property Iron Mine Project Information Request (CEAA 106)

Context and Rationale: The Canadian Environmental Assessment Agency (the Agency), with input from NRCan, has conducted a technical review of the proponent's responses to Information Requests (IRs) CEAA 16 to 20 (Round 1, Part 1). NRCan has noted some errors and issues in SNC's Report titled *Hydrogeology Numerical Modeling for the Howse Deposit Project*, dated May 16, 2017 (SNC May 2017). The Agency's internal review has identified two further issues that must be addressed before the Agency can accept the response as adequate.

For additional context and rationale, please refer to the original IRs CEAA 16 to 20 (Round 1, Part 1).

Specific Question or Request:

1. Comments from NRCan are embedded in the SNC May 2017 report (see attachment), and include:
 - Many of the cardinal points referred to in the SNC May 2017 report appear to be incorrect, which could be attributed to the fact that figures in the model were rotated (see comments embedded in the attached document). Verify the cardinal points and make corrections as appropriate.
 - The SNC May 2017 report uses the term "permanent state" which is an incorrect translation from French. The appropriate term is "steady state" (see comments embedded in the attached document).

Address the comments embedded by NRCan in the SNC May 2017 report, as appropriate, and re-submit the document.

Proponent Response

Please find attached updated report: Howse IR 106 response SNC
640974_Report_Regional_Modeling_F01 170713.pdf

2. In the May 30, 2017 memo submitted to the Agency, the proponent describes monitoring and follow-up measures at Triangle Lake, Morley Lake, and Goodream Creek. Based on *Figure 1: Water Monitoring Plan* (submitted to the Agency on April 26, 2017 - see attachment), the SNC May 2017 report, and the EIS, the Agency understands the proponent would also monitor surface water and groundwater quality and/or quantity at various other points around the Project, including Pinette Lake, Burnetta Lake, local wetlands, and at other locations.

Update *Figure 1: Water Monitoring Plan* as appropriate, and provide an overview of the water quality and quantity parameters that would be monitored at all water monitoring stations which would be part of the Project's follow-up program.

Proponent Response

Water quality will be monitored through several means. First, GNL's RTWQ Monitoring Network already has Instant Water Monitoring Stations in Goodream Creek and Elross Creek. These stations supply live information on water levels plus a number of water quality parameters. Other stations could be installed in the LSA at the GNL's request. The Howse Project is also subject to the *Environmental Control Water and Sewage Regulations, 2003* (Newfoundland and Labrador Regulation 65/03), under the *Water Resources Act* (O.C. 2003-231). The Howse mine is subject to the *Metal Mining Effluent Regulations* (SOR/2002-222), under the *Fisheries Act* (R.S.C., 1985, c. F-14); the monitoring program already in place for TSMC's DSO projects, including monitoring for physico-chemical parameters, will be extended to include the Howse Project. The combination of these programs will ensure proper monitoring of water quality during mine operation.

Surface and ground water

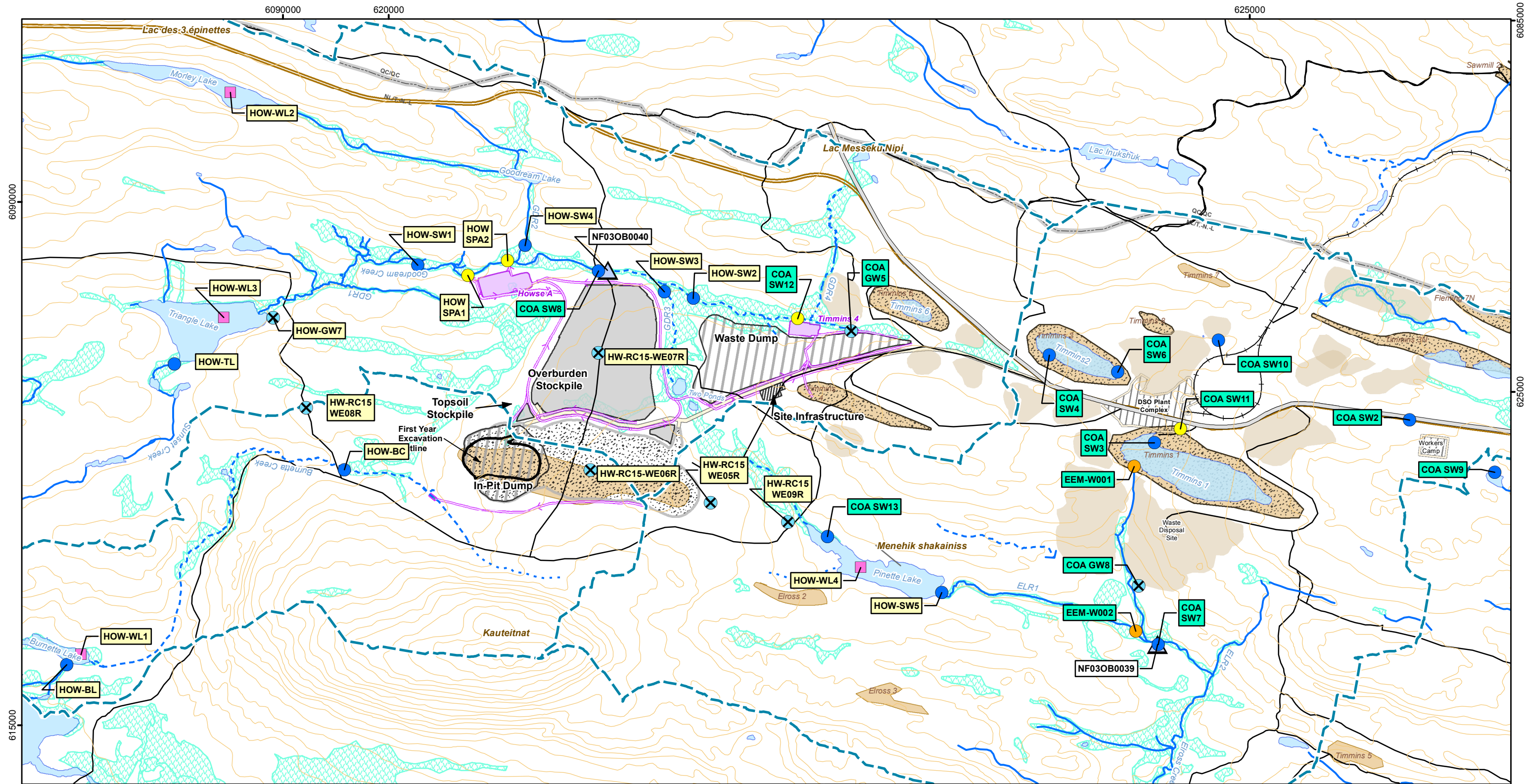
Parameters will follow MMER. Please refer to section 9.1.3 of the Howse EIS for more details. For groundwater, water level and quality (following MMER guidelines) will be recorded four times annually for the duration of the construction, operations, and decommissioning phases

Effluent

Parameters will follow MMER and continuous flow. Please refer to section 9.1.5 of the Howse EIS for more details.

Lake water level

The lake levels will be monitored (cm) before (2017), during and after the operations phase. An automatic gauge will allow for hourly readings of water levels to be taken during the operations phase, and four times per year during the construction and decommissioning phases.



LEGEND

Existing and Proposed Stations

- Water Quality Real-Time Station
- Monitoring Well
- Effluent
- Surface Water
- Level Logger
- EEM Monitoring Station

Howse Project

DSO3 Project

Infrastructure and Mining Components

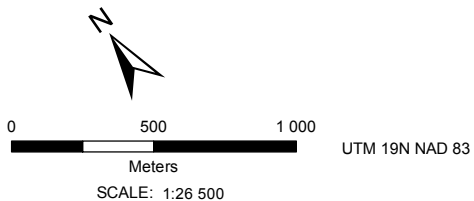
- DSO Haul Road
- Existing Railroad
- Elross Lake Area Iron Ore Mine (ELA IOM) Plant
- Infrastructure footprint
- Existing Dump
- Deposit
- Proposed Ditch
- Proposed Howse Pit
- Proposed Topsoil/Overburden Stockpile
- Proposed Site Infrastructure
- Proposed In-Pit Dump/Waste Dump
- Proposed and Existing Sedimentation Pond
- Proposed Dissipation Pool
- Proposed Mine Haul Road
- First Year Excavation Outline

Basemap

- Permanent Watercourse
- Intermittent Watercourse
- Storm Runoff
- Disappearing Stream
- Artesian Spring
- Water Body
- Wetland
- Contour Line (50 ft)
- Main Access Road
- Existing Road
- Provincial Border
- Watershed Boundary

*Hydronyms are oriented along the direction of water flow

FILE, PROJECT, DATE, AUTHOR:
GH-0817, PR185-28-16, 2017-07-24, edickoum



SOURCES:

Basemap
Government of Canada, NTDB, 1:50,000, 1979;
Government of NL and government of Quebec,
Boundary used for claims.
Groupe Hémisphères, Hydrology and Wetland update, 2013

Infrastructure and Mining Components
New Millennium Capital Corp., Mining sites and roads
Howse Minerals Limited/ MET-CHEM,
Boundary used for claims.
Howse Deposit Design for General Layout, 2015

REQUEST FOR REVIEW:
HOWSE PROPERTY PROJECT

Water Monitoring Plan
Howse Minerals Limited

GroupeHemispheres

5731, rue Saint-Louis,
Bureau 201, Lévis (QC)
Canada, G6V 4E2

1453, rue Beaubien est,
Bureau 301, Montréal (QC)
Canada, H2G 3C6

Figure 1

3. In conjunction with the request above, provide a description of the thresholds that monitoring results would be compared to or the other factors that would trigger the implementation of adaptive management actions or mitigation measures for affected waterbodies and wetlands.

Proponent Response

Effluent

Threshold based on MMER recommendations.

Surface water

Threshold based on CCME beyond 250 m of a rejection point.

Groundwater

Threshold based on CCME.

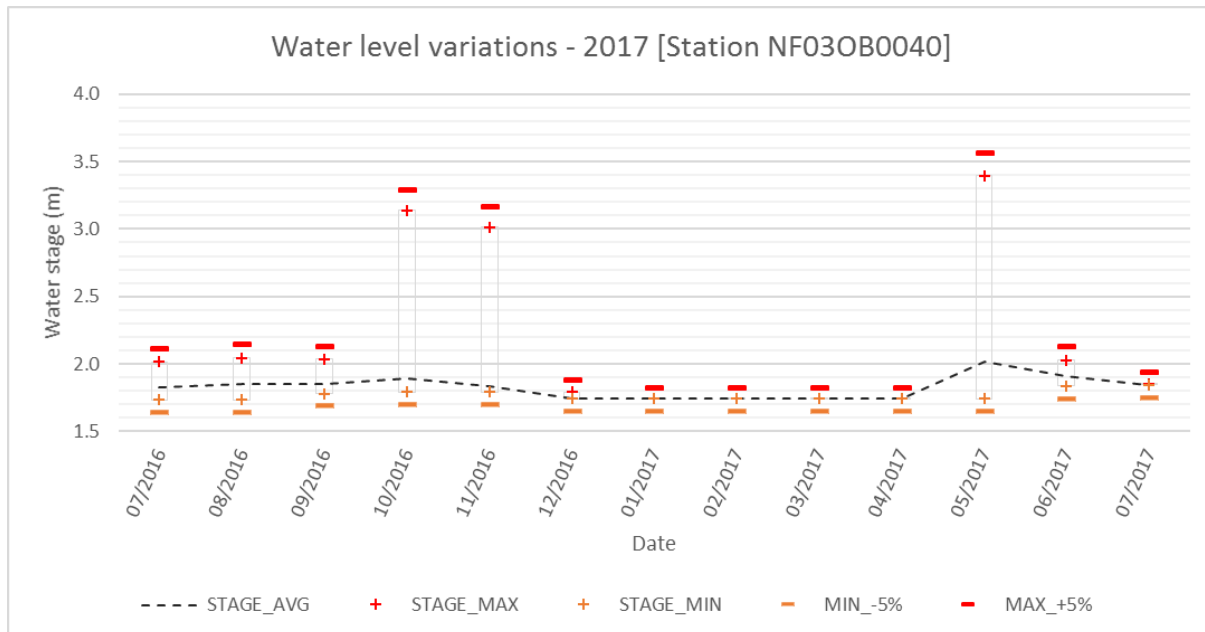
Water level

The Proponent is committed to monitoring water levels on wetlands as such: Water table monitoring wells, consisting of perforated pipe should be installed before the beginning of the construction phase in order to obtain some measures before pit dewatering begins. Measurement should be taken once a month, but once every two weeks from the beginning of operation phase until dewatering ends. Construction of water table monitoring wells is described in USACE (2005).

The Proponent does not believe that changes in water levels in wetlands will have any adverse environmental effects. As such, the Proponent does not suggest any actions or measures on wetlands based on any high or low-water level thresholds. Wetlands can be regularly flooded without any adverse environmental impacts. In addition, a low water level on a wetland is very unlikely (since it is believed that the wetlands are impervious and therefore will be replenished naturally with precipitation), and will likewise not have any adverse environmental effects on these northern wetlands. Rather, as discussed in the Howse EIS, the Howse Project may have adverse environmental effects on wetlands via the addition of TSS into them or via mechanical destructions, resulting from mining activities. Please refer to sections 7.4.2.3 and 9.2.1 of the Howse EIS for further discussion on the latter two effects.

Thresholds for water level should be considered both for groundwater and for surface water. As part of the hydrogeological numerical modeling, the consultant assumes that dewatering will induce aquifer drawdowns. Even though those drawdowns have been theoretically assessed, it is recommended to follow the recommendation of the consultant (implement an adequate groundwater monitoring). Whether the predicted groundwater levels should vary from more than $\pm 5\%$ (conservative variation), the theoretical drawdowns should be reviewed and corrective actions should be implemented.

Surface water naturally varies over the year. The average variations from the average stages in 2007 are -3.17% [min] and +18.30% [max]. Following the recent surveys conducted on site, it appears that there is no link between surface water and groundwater. Therefore, dewatering should not have adverse impacts on surface water stage. However, it is recommended to closely monitor water levels on the four lakes equipped with water gauges. The eventual observed variations should then be compared with water levels in station NF03OB0040. If the monitored variations exceeded $\pm 5\%$ of the minimum and maximum average stage, corrective actions should be implemented. As an example, the thresholds are represented as MIN_-5% and MAX_+5% in the following graph.



A conservative variation value of 5% is recommended at least for the 3 first years of operation (time to have enough data). This value could be reviewed to a normal value of 10% after 3 years.

Attachments:

- 1) Howse IRs Groundwater – Part 1 (June 3 2016) Proponent response 16-20 NRCanReview.pdf
- 2) GH-0817 WaterMonitoringPlan 170414.pdf