MEMORANDUM

TO Agnico Eagle - Ryan Vanengen **DATE** June 23, 2017

CC Sophia Granchinho – NIRB; Karen Kharatyan - NWB

FROM Valérie Bertrand **REFERENCE No.** 1658927-Commitment 29

COMMITMENT 29 – CROSS SECTION SCHEMATIC

During the Technical Meeting and Pre-hearing Conference, held in Baker Lake, Nunavut on April 28 to May 2, 2017 the Environment and Climate Change Canada (ECCC) requested Agnico Eagle to provide cross section schematic of Whale Tail Pit, and overlying north basin water, including lake bathymetry, and schematic of groundwater flow (Commitment 29).

This document provides further explanation of the groundwater regime and expected groundwater flow conditions for the fully flooded open pit lake at post-closure. To support this discussion, figures from the Hydrogeological Baseline Report (FEIS Appendix 6-A) and Hydrogeological Model Pre-Mining, During Mining and Closure Report (FEIS Appendix 6-B) are referenced for explanation (Figures 1 to 4).

Figure 1 (from FEIS Appendix 6-A and 6-B) shows the regional groundwater flow direction based on water level elevations in lakes with open taliks within the Hydrogeology Baseline Study Area. Figure 2 (from FEIS Appendix 6-A) shows the conceptual model of the groundwater flow regime for pre-mining conditions. The figure also illustrate the expected permafrost conditions based on baseline investigations (KP Permafrost and Hydrogeological Report, November 2015).

Figures 3 (from FEIS Appendix 6-B) shows the conceptual model of groundwater flow conditions during operations and as the pit lake is forming during closure. At the end of closure and during long-term post-closure, the frozen permafrost below the pit lake is expected to transition to open talik, as illustrated on Figure 4 (from FEIS Appendix 6-B).

Groundwater flow conditions are expected to be re-established similar to pre-mining conditions, as illustrated on Figures 4 and 5. The elevations of lakes with open taliks are expected to be the primary control of groundwater flow directions in the groundwater flow regime, with density gradients providing a secondary control. The closed talik below the open pit is expected to become open during the long-term post-closure. Whale Tail Lake is expected to be both an area of groundwater recharge (in the northern portion of the Lake) and an area of groundwater discharge (tin the southern portion of the like), based on the relative elevations of the lakes in the study area. The open pit side of Whale Tail Lake is expected to remain a groundwater recharge area. Localised flow of arsenic under density and diffusion gradients may occur from the pit walls, but our experience at other mine sites is that this flux is negligible and limited to the deeper portions of the flooded open pit.

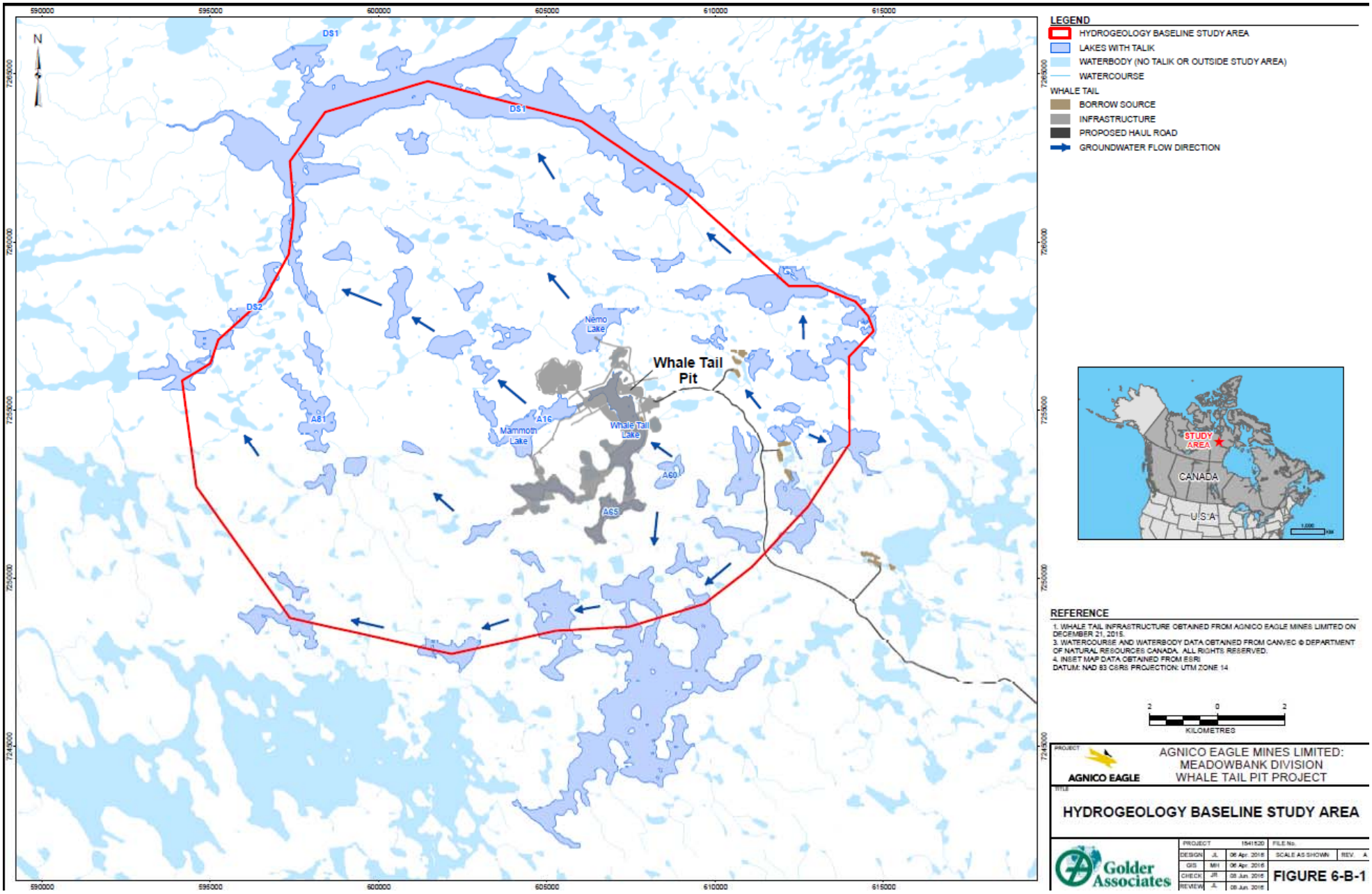
Figure 5 illustrates the domains of the Mine Site Water Quality Model in a post-closure phase, showing the flooded open pit and the overlying Whale Tail Lake North Basin. As explained during the meeting between ECCC and Agncio Eagle on June 7, 2017, the flooded open pit consists of the mined excavation below the original bottom of the lake, up to elevation 138.2 m, while the modelled Whale Tail Lake North Basin is the layer of water above the flooded open pit from elevation 138.2 m to the original surface water level of 152.5 m. As explained in the mine site water quality model report (FEIS Appendix 6=H), both the fully flooded open pit and the overlying Whale Tail

Lake North Basin are each assumed to be fully mixed but with minimal exchange between the two layers. Meromixis is expected to occur in the flooded open pit given its size and depth. This would improve water quality of the flooded open pit in the shallower portion below the Whale Tail Lake layer and minimize risk to Lake water quality; however, the risk to the overall Whale Tail water quality is considered to be low given the expected good water quality of the flooded open pit lake in the likely scenario of negligible and localised diffusive flow of arsenic from the pit walls into the deeper portions of the flooded open pit.

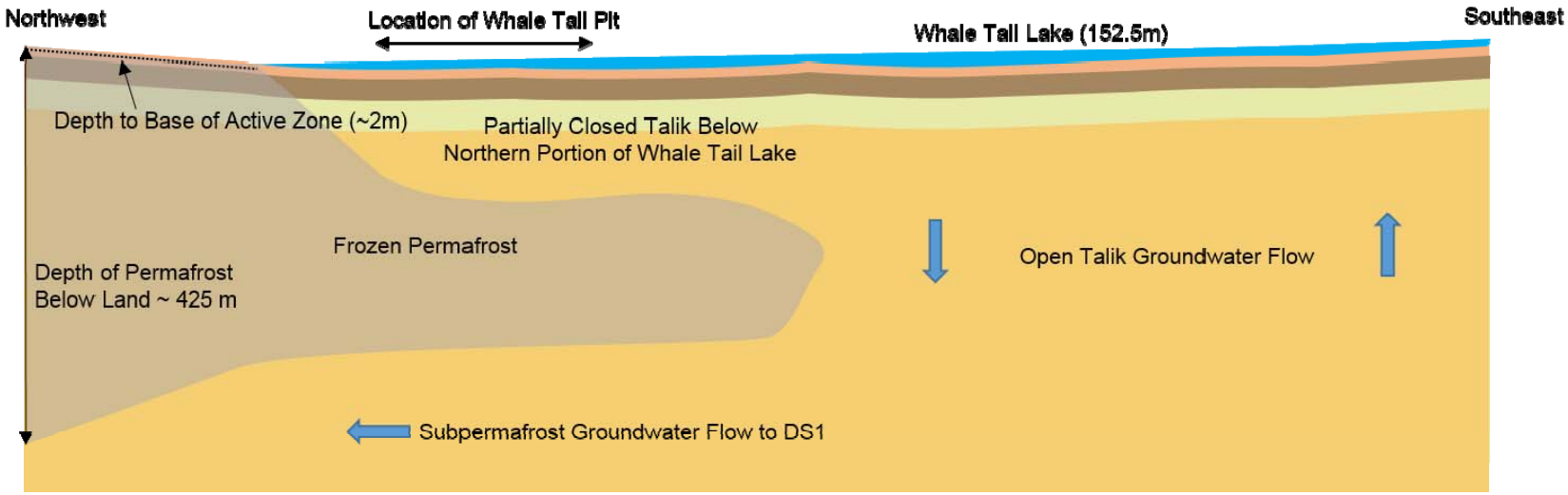
https://capws.golder.com/sites/1658927RegulatoryAffairs/p6100TM_PHC/03_TechMtg_Follow-up/Commitment 29_Schematic WT Pit/Commitment 29_CrossSectionSchematic.docx

CONCEPTUAL GROUNDWATER FLOW SYSTEM
FIGURE 1 - EXPECTED REGIONAL GROUNDWATER FLOW DIRECTIONS

AGNICO EAGLE



CONCEPTUAL GROUNDWATER FLOW SYSTEM
FIGURE 2 - PRE-MINING

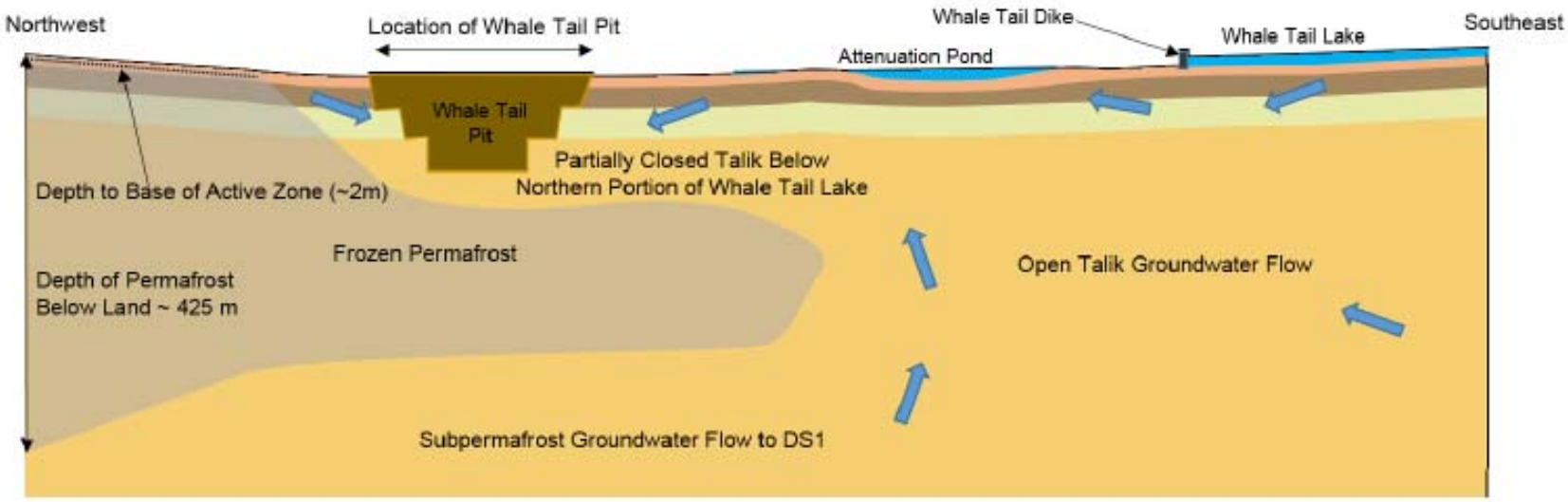


Legend

- Inferred Groundwater Flow Direction
- Waterbody
- Permafrost
- Overburden (6 to 34 m below ground surface)
- Weathered Bedrock (6 to 34 m below ground surface)
- Competent Bedrock (34 to 60 m below ground surface)
- Competent Bedrock (>60 m below ground surface)

NOTES:
Conceptual Only. Not to Scale.

CONCEPTUAL GROUNDWATER FLOW SYSTEM
FIGURE 3 - OPERATIONS AND CLOSURE (PIT LAKE FORMATION)

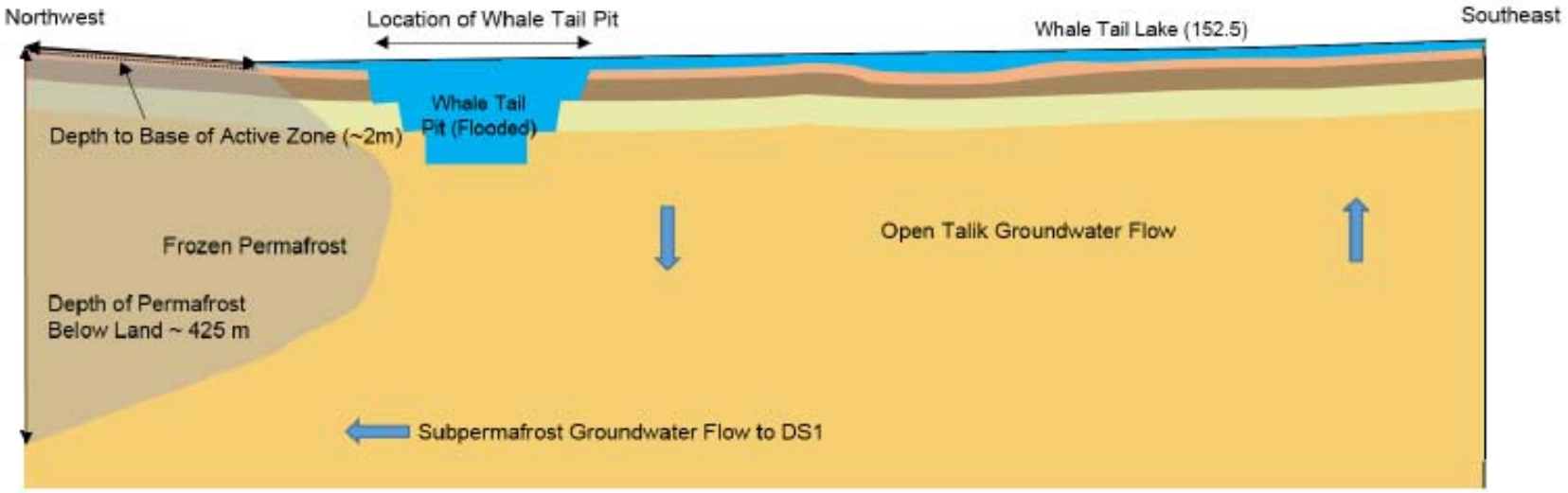


Legend

- Inferred Groundwater Flow Direction
- Waterbody
- Permafrost
- Overburden (6 to 34 m below ground surface)
- Weathered Bedrock (6 to 34 m below ground surface)
- Competent Bedrock (34 to 60 m below ground surface)
- Competent Bedrock (>60 m below ground surface)

NOTES:
Conceptual Only. Not to Scale.

CONCEPTUAL GROUNDWATER FLOW SYSTEM
FIGURE 4 –LONG TERM POST-CLOSURE



Legend

- Inferred Groundwater Flow Direction
- Waterbody
- Permafrost
- Overburden (6 to 34 m below ground surface)
- Weathered Bedrock (6 to 34 m below ground surface)
- Competent Bedrock (34 to 60 m below ground surface)
- Competent Bedrock (>60 m below ground surface)

NOTES:

Conceptual Only. Not to Scale. Following closure, open talik below Whale Tail Pit expected to form.

CONCEPTUAL CROSS-SECTION OF WHALE TAIL NORTH BASIN POST-CLOSURE

FIGURE 5 – WATER QUALITY MODEL DOMAINS