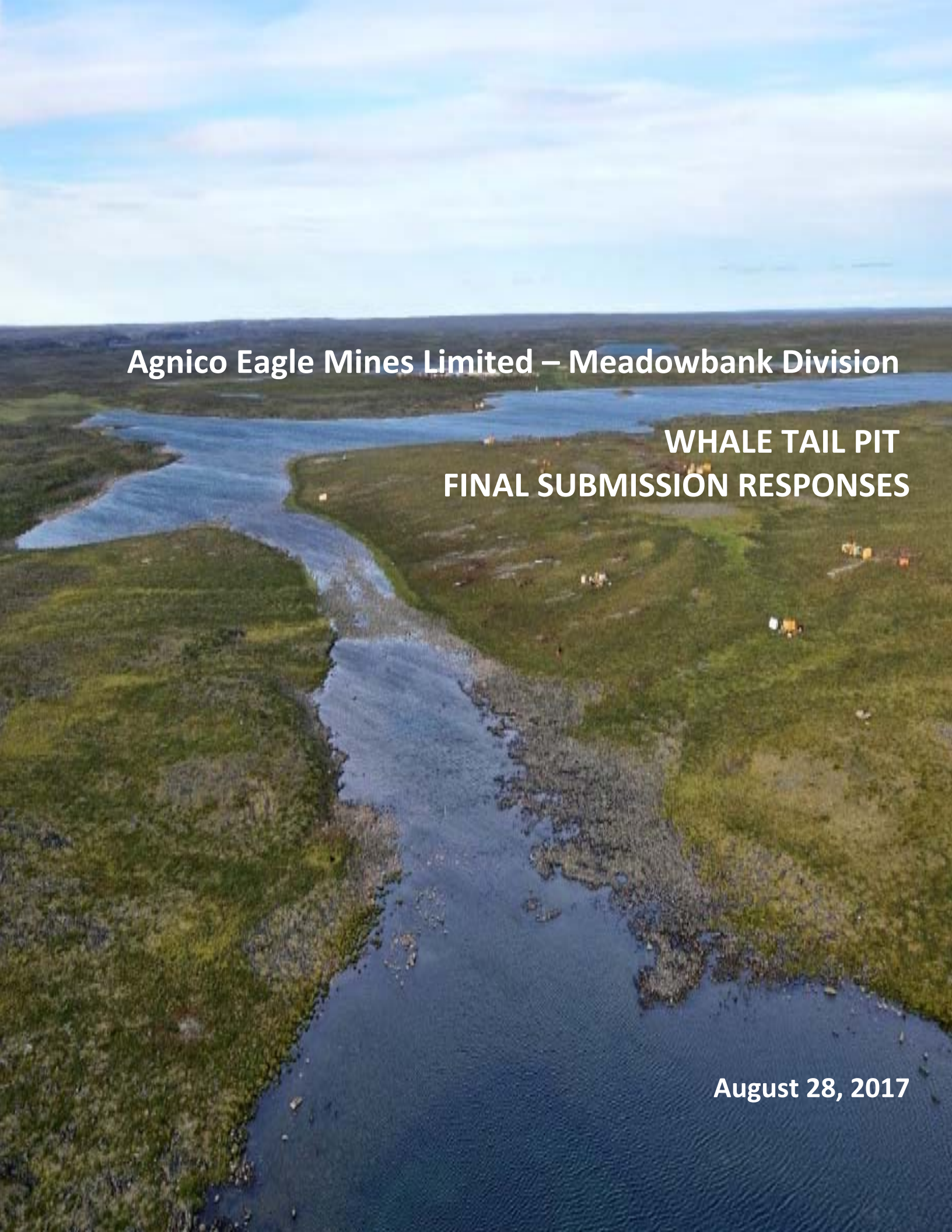

Agnico Eagle Mines Limited – Meadowbank Division

WHALE TAIL PIT
FINAL SUBMISSION RESPONSES

August 28, 2017

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Attachments:

DFO: Attachment 1: Draft Fish Habitat Offsetting Plan: Whale Tail Pit, June 2017

GN: Attachment 1: Percent Collared Caribou in Zones of Influence

BAKER LAKE HUNTERS AND TRAPPERS ORGANIZATION'S

Interested Party:	**Baker Lake Hunter Trappers and Association (HTO)**	**Ref No.:**	**BLHTO-1**
Re:	**Legacy Benefits for the Community of Baker Lake**		

Technical Review Comment / Recommendation Made By Interested Party:

The BLHTO recommends Agnico-Eagle and the Kivalliq Inuit Association work to ensure that legacy benefits in the form of infrastructure and housing are provided to the community of Baker Lake.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico has committed to providing $3,000,000 in the Whale Tail IIBA which shall be placed by the KivIA into a community initiative fund. Additionally, in the 2017 review and amendment of the Meadowbank IIBA, the Post Closure Wellness Fund was released to the KivIA and is earmarked for a Baker Lake Community Project, as indicated in KivIA's Report on IIBA Revenues and Input for Future Revenue Use. If BLHTO was not able to comment during the KivIA Community Tour in August 2017, Agnico Eagle recommends that the BLHTO provides input into the expenditure of IIBA revenues to the KivIA. Outside of the IIBA, Agnico Eagle looks forward to working with the BLHTO and Baker Lake Hamlet on providing support for environmental sustainability projects that will directly benefit the hamlet such as the Baker Lake sewage lagoon restoration or culvert replacement project.

Interested Party:	**Baker Lake Hunter Trappers and Association (HTO)**	**Ref No.:**	**BLHTO-2**
Re:	**Barriers to Employment**		

Technical Review Comment / Recommendation Made By Interested Party:

The BLHTO suggests that NIRB consider whether or not a lack of necessary government services may be causing barriers to employment for Kivalliq Inuit. Further, the BLHTO recommends NIRB, in its final hearing report, consider making recommendations to federal and territorial governments regarding barriers to employment and government services.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Impacts to government infrastructure were assessed as part of the EIS (Volume 3, Appendix 3-C) and were determined to have no linkage to the Whale Tail Project because no Project employment-driven migration or population change is anticipated.

Whether or not a lack of necessary government services may be causing barriers to employment for Kivalliq Inuit is the mandated responsibility of the Government of Nunavut and/or Federal Government. Agnico Eagle does not believe the issue should generate a term and condition on Agnico Eagle within the final hearing report generated by the Nunavut Impact Review Board for the Project. Agnico Eagle agrees that the recommendations on this issue be made directly to the federal and territorial government.

Interested Party:	Baker Lake Hunter Trappers and Association (HTO)	Ref No.:	BLHTO-3
Re:	Community participation in project monitoring and mitigation decisions		

Technical Review Comment / Recommendation Made By Interested Party:

i. *The BLHTO suggests AEM provide funding for an independent dust-fall monitoring study, which emphasises Baker Lake resident's perspectives on dust. Further, the BLHTO suggests that the results of this study be used to determine whether or not dust suppressant is required.*

ii. *The BLHTO suggests AEM provide funding to the HTO or other group to hire independent wildlife monitors, that are not directly employed by AEM.*

iii. *The BLHTO would like Agnico-Eagle, the Kivalliq Inuit Association, and the GN to form a monitoring committee that includes representatives from local councils and organizations (i.e. Hamlet Council and HTO) to oversee monitoring and make decisions about mitigation.*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Response i)

Agnico Eagle agrees with the BLHTO recommendation and will work with the BLHTO to hire an independent consultant to conduct a dust-fall monitoring study in 2018 to determine whether or not dust suppressant is required. However, it should be noted that the KivIA has completed third party and independent review of all monitoring studies and results at Meadowbank, including dustfall monitoring. The independent review by the KivIA should be assessed and shared with the relevant parties as this may meet the needs and scope that the BLHTO is recommending.

Response ii)

Agnico Eagle agrees with this recommendation and will hire an HTO representative, to assist and support wildlife surveys along the AWAR during sensitive caribou migration and movement periods.

Response iii)

Agnico Eagle interprets this recommendation to be related to a wildlife committee, which we refer to as, and is consistent with, the Terrestrial Advisory Group (TAG). Agnico Eagle agrees in the process of reviewing our terrestrial monitoring and data collection through meetings, annual report presentations and have received valuable input of the BLHTO in the past, which recently participated in caribou mitigation workshops and assisted Agnico Eagle in evaluating dust and mitigating dust along the AWAR. As a member of the TAG (outlined in the TEMP), Agnico Eagle looks forward to working with the BLHTO to ensure the review and continuous improvement of monitoring and mitigation of the terrestrial environment.

Agnico Eagle's Proposed Term and Condition:

Agnico Eagle proposes the following condition related to Response ii):

> *The Proponent will hire an HTO representative to assist and support on wildlife surveys along the AWAR during the fall and spring migration periods.*

Interested Party:	**Baker Lake Hunter Trappers and Association (HTO)**	**Ref No.:**	**BLHTO-4**
Re:	**Need to remodel Meadowbank and Amaruq roads**		

Technical Review Comment / Recommendation Made By Interested Party:

- *The BLHTO suggests AEM remodel the Meadowbank and Amaruq access roads, to allow caribou and snowmobiles to cross.*
- *The sections of the road where the slope needs to be adjusted should be identified by elders, appointed by the HTO*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Over the past several years, Agnico Eagle has worked with the BLHTO and Elders to ensure approved Meadowbank AWAR snowmobile crossings are adequately sloped, located, and maintained to ensure:

- the safety of hunters crossing the road;
- locations are visible; and
- the safety for road vehicles and machine operators.

With consideration of these safety measures, more recently, the BLHTO has also approved traditional land use crossing locations and designs on the Whale Tail Pit Haul Road (to ensure safety of hunters crossing at specified locations and operations on the haul road).

Agnico Eagle will continue to work with the BLHTO to address these recommendations and will discuss the slopes of sections of the Meadowbank AWAR and Whale Tail Pit Haul Road with the BLHTO, Elders, and TAG members to ensure the roads are sloped and if needed, recontoured in selected sections to allow caribou to safely cross the road.

ENVIRONMENT AND CLIMATE CHANGE CANADA

Interested Party:	**Environment and Climate Change Canada (ECCC)**	**Ref No.:**	**ECCC-Atmospheric**
Re:	**Atmospheric Environment**		

Technical Review Comment / Recommendation Made By Interested Party:

In NIRB Technical Comment ECCC#2 and during the Technical Session, ECCC expressed concern over the location of the active particulate monitoring station meant to monitor dust from Whale Tail pit. The Proponent and ECCC discussed two other potential locations for dustfall monitoring stations proposed by the Proponent. As per the meeting minutes, the Proponent agreed to evaluate adding a supplemental low-powered particulate monitoring station and assess relocating the proposed monitoring station once site infrastructure is in place. ECCC will review these assessments in future iterations of the Air Quality Monitoring Plan. ECCC has no outstanding air quality concerns at this point

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle acknowledges that ECCC is satisfied with proposed approach to monitoring stations. Agnico Eagle maintains the commitments made in submission of Commitment #4 as submitted to the NIRB and NWB on June 22, 2017.

Interested Party:	**Environment and Climate Change Canada (ECCC)**	**Ref No.:**	**ECCC-1**
Re:	**Migratory Birds: Flooding**		

Technical Review Comment / Recommendation Made By Interested Party:

a) *ECCC recommends that the Proponent conduct additional field studies to better characterize the migratory bird and vegetation communities within the predicted flood area and that results be reported in the annual Terrestrial Ecosystem Monitoring Report.*

b) *ECCC recommends that the Proponent conduct field tests during the 2018 season and/or conduct a thorough literature review of the effectiveness of the proposed deterrents prior to actual flooding in order to inform mitigation measures.*

c) *ECCC recommends that the Proponent monitor the effectiveness of the mitigation measures during flooding to ensure they are working as intended.*

d) *ECCC recommends that the Proponent continue to work with ECCC and other interested parties on the development and implementation of the Migratory Birds Protection Plan.*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle has agreed to these recommendations through meetings with ECCC and subsequently in our commitment #17 submission, entitled Migratory Bird Protection Plan, in Appendix I of the TEMP.

Agnico Eagle believes that the information that has been provided to ECCC and NIRB is sufficient to assess the impacts of the Whale Tail Pit Project on the environment and to make a determination on the Project.

Interested Party:	**Environment and Climate Change Canada (ECCC)**	**Ref No.:**	**ECCC-2**
Re:	**Migratory Birds Use of the Tailings Storage Facility**		

Technical Review Comment / Recommendation Made By Interested Party:

ECCC recommends that the Proponent revise sections of the TEMP and the WSLRAP to include Commitments #14-16 made at the Technical Session as follows:

a) *Monitor upland breeding birds, including shorebirds, as part of the bird monitoring program at the Tailings Storage Facility (TSF);*

b) *Add Semipalmated Sandpiper as a wildlife receptor of concern as part of the Wildlife Screening Level Risk Assessment Plan (WSLRAP);*

c) *c) To have the WSLRAP include risk assessments for potential ingestion of water and/or sediment at the TSF for all wildlife receptors of concern.*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle has agreed to these recommendations during the Technical Meetings, Pre-hearing Conference, and through meetings with ECCC. Agnico Eagle will update the TEMP and WSLRAP to reflect these commitments 60 days following issuance of the Project Certificate.

Interested Party:	**Environment and Climate Change Canada (ECCC)**	**Ref No.:**	**ECCC-3**
Re:	**Migratory Bird By-Catch and Other Mortalities**		

Technical Review Comment / Recommendation Made By Interested Party:

ECCC recommends that the Proponent ensure migratory bird interactions and mortality incidents are reported to ECCC and that details surrounding the incident are recorded and included in the relevant annual report(s) for review by parties. This should be clearly captured in the TEMP

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle has agreed to these recommendations during the Technical Meetings, Pre-hearing Conference, and through meetings with ECCC. Agnico Eagle will continue to report these annually and will update the TEMP to reflect this recommendation, 60 days following issuance of the Project Certificate.

Interested Party:	**Environment and Climate Change Canada (ECCC)**	**Ref No.:**	**ECCC-4**
Re:	**North Wall Pushback of Whale Tail Pit**		

Technical Review Comment / Recommendation Made By Interested Party:
ECCC recommends that the Proponent conduct an alternatives analysis of the pit design with and without the north wall pushback scenario, in order to assess the potential risks and benefits to the aquatic receiving environment. The alternatives analysis should consider the entire life of mine and through post-closure.

Agnico Eagle's Response to Technical Review Comment / Recommendation:
Agnico Eagle does not anticipate any other effects from proceeding with the north wall pushback and consequently, estimates that no additional evaluation of the alternatives is necessary. This response outlines the reasons for this conclusion.

The impacts from not doing the north wall push back constitute the base case of the mining scenario which has been fully evaluated and documented and the EIS (EIS Volume 6, Appendix 6-H) and revised modelling scenario (Golder 2017). Addition of the north wall push back has been evaluated for economics, effects to mining rate, changes in pit size, closure scenario, and effects to water quality through evaluation of updated predictions for the WRSF pond, the open pit, the flooded pit lake, and the attenuation pond.

The north wall push back is determined to be economically viable and to be minable within the same period as the base case without the north wall push back. The increased pit size results in a slightly longer flooding period than the base case presented in Golder (2017) but faster than the flooding time of the first version of the model (EIS Volume 6, Appendix 6-H) where dyke breach occurred in June 2029. The dike breach with and without the north wall push back occurs June 2028 and June 2026 respectively. Given the leachability of the north wall ultramafic rock, placement of this waste rock on land is estimated to be the most viable closure alternative for this material rather than placed back into the open pit for flooding. In the WRSF, the ultramafic rock will be mixed with low-leaching waste rock, and leaching will be controlled in the long term via water infiltration through encapsulation underneath a low-leaching waste rock cover and a frozen core.

The results of the north wall pushback have been documented in a report submitted to ECCC and INAC (Golder 2017). It indicated a 20% decrease in the maximum total and dissolved arsenic concentration in the WRSF pond during operation (no change once the cover is placed at closure) and a similar decrease in long term arsenic concentration in the flooded pit and North Whale Tail Lake water quality prior to breaching the Mammoth Lake dike. Consequently, the north wall push back scenario will also improve

downstream lake water quality, reflecting the lower arsenic concentration in the flooded North Whale Tail Lake water that will flow into Mammoth Lake upon dike breaching.

References:

Golder (Golder Associates Ltd.) 2017. Revision 3 – Addendum to Agnico Eagle Mines Whale tail FEIS Appendix 6-H. Sensitivity Analyses on Water Quality Modelling in Support of Responses to Technical Commitments 30, 36, 37, and 42 and Intervenor Comments ECCC #15 and INAC-TRC #3 and #5, on the Water Licence A Application to the Nunavut Water Board. August 24, 2017. Ref: 1658927_Revision 3/6100/6130 Doc 125.

Interested Party:	Environment and Climate Change Canada (ECCC)	Ref No.:	ECCC-5
Re:	**Sensitivity Analyses on Water Quality Modeling**		

Technical Review Comment / Recommendation Made By Interested Party:
ECCC recommends that the Proponent submit detailed management plans to be implemented for:

- *waste rock segregation and testing,*
- *thermal monitoring of waste rock, and*
- *seepage management and monitoring.*

Plans should include a schedule for reporting of results and periodic updating of predictions for the WRSF pond quality, along with proactive planning for optimal cover conditions. Contingency measures should be identified as appropriate. Monitoring results for receiving waters should be compared to model predictions and thresholds identified for management actions should trends indicate water quality objectives may be exceeded.

Agnico Eagle's Response to Technical Review Comment / Recommendation:
Agnico Eagle agrees with the ECCC recommendations and will adhere to the ARD/ML Monitoring Plan (EIS Volume 8, Appendix 8-E.5), Waste Rock Storage Facility Management Plan (EIS Volume 8, Appendix 8-A.1), and Water Quality and Flow Monitoring Plan (EIS Volume 8, Appendix 8-B.3) during construction, operations and closure to inform adaptive management at the Whale Tail Pit Project. Monitoring will continue into post-closure and modelled predictions will be updated using geochemistry and water quality monitoring data obtained during construction and operation. Additional site-specific data continues to be collected to validate the water quality model inputs, including the following:

- Thermistor data from existing and new instrumentation to be installed as the waste rock pile is built
- Waste rock chemical composition through sampling and analysis of mined waste rock to be placed in the WRSF for disposal and in the area to be used for cover
- Water quality monitoring information collected at the locations and frequency described in the Water Quality and Flow Monitoring Plan (EIS Volume 8, Appendix 8.B-3) and the Core Receiving Environment Program (EIS Volume 8, Appendix 8-E.2)
- Laboratory-scale leaching tests and larger field-scale rock leaching tests currently underway at Amaruq Exploration site to document waste rock geochemical behavior in time and under site specific conditions

Experience and knowledge gained through operations and closure of Meadowbank facilities and that which is to be gained during the construction and operations of Whale Tail will continue to inform final closure planning for the Project.

At this time, Agnico Eagle believes that the information that has been provided to ECCC and NIRB is adequate to assess the impacts of the Whale Tail Pit Project on the environment and to make a determination on the Project.

Agnico Eagle will follow the Monitoring Plans proposed for the project, the QA/QC, and decision matrices on action planning set out in the Water Quality and Flow Monitoring program (EIS Volume 8, Appendix 8.B-3). If deemed appropriate by NIRB and NWB, Agnico Eagle submits ECCC's recommendation could be reflected in the Type A Water Licence. Recommendations can be incorporated to support detailed and final design of Project Components and Agnico Eagle proposes to provide the information within the applicable final designs required 60 days prior to construction. In addition, ongoing data collected during operations can be provided in the Annual Report and subsequent revisions to the Management Plans.

Interested Party:	Environment and Climate Change Canada (ECCC)	Ref No.:	ECCC-6
Re:	**Effluent Quality Criteria**		

Technical Review Comment / Recommendation Made By Interested Party:

ECCC recommends the Effluent Quality Criteria (EQC) be set based on concentrations that are achievable and that minimize discharge levels to receiving waters. EQC should be applicable to all mine-related discharges to surface waters.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle agrees with ECCC that EQC values should be set based on concentrations that are achievable and that minimizes discharge loads to the receiving environment. Agnico Eagle submitted proposed EQCs on June 7, 2017 for review by ECCC. After receiving the final technical submission from ECCC, a follow-up meeting was held with ECCC to resolve any outstanding issues related to the proposed EQC. The EQCs have been updated to reflect comments from ECCC (Table 1). Changes to EQC are as follows:

- iron: changed from 3.0 and 6.0 mg/L (average and maximum, respectively) to 1.0 and 2.0 mg/L (average and maximum, respectively)
- lead: changed from 0.1 and 0.2 mg/L (average and maximum, respectively) to 0.05 and 0.1 mg/L (average and maximum, respectively)
- zinc: changed from 0.4 and 0.8 mg/L (average and maximum, respectively) to 0.1 and 0.2 mg/L (average and maximum, respectively)
- total dissolved solids, ammonia, and cadmium: average and maximum limits have been added
- mercury: average and maximum limits to be added after further discussion with ECCC

Table 1. Proposed Effluent Quality Criteria for Discharge to Mammoth Lake

Constituent	Unit	Licence A Updates Attenuation Pond (Operations, Treated)		Proposed Whale Tail Effluent Quality Criteria	
		Mean[a]	Maximum[b]	Mean[a]	Maximum[b]
Conventional Constituents					
pH		-	-	6 - 9.5	6 - 9.5
Total suspended solids		-	-	15	30
Total Dissolved Solids	mg/L	254	519	*1,400*	*1,400*
Nutrients					
Total Ammonia	mg-N/L	0.14	0.23	*16.0*	*32.0*
Total phosphorus	mg-P/L	0.16	0.27	0.3	0.6
Total Metals					
Aluminum	mg/L	0.322	0.322	0.5	1
Arsenic	mg/L	0.086	0.105	0.1	0.2
Cadmium	mg/L	0.000054	0.000093	0.002	0.004
Chromium	mg/L	0.011	0.019	0.02	0.04
Copper	mg/L	0.0042	0.014	0.1	0.2
Iron	mg/L	0.94	1.1	*1.0*	*2.0*
Lead	mg/L	0.0011	0.0037	*0.05*	*0.1*
Mercury	mg/L	0.000014	0.00007	c	c
Nickel	mg/L	0.022	0.06	0.25	0.5
Zinc	mg/L	0.0067	0.017	*0.1*	*0.2*
Other					
Total Petroleum Hydrocarbons[d]	mg/L	-	-	3.0	6.0

Note: - = no guideline or data; cells highlighted in blue represent revisions since June 7, 2017 submission to Environment and Climate Change Canada.

a) Mean = Maximum Monthly Mean Concentration;

b) Maximum = Maximum Concentration in a Grab Sample.

c) For further discussion with Environment and Climate Change Canada before the Nunavut Water Board hearing.

Discharges to surface water also include non-contact water diversions. For the non-contact water diversions, discharge criteria during operations proposed for TSS are 15 mg/L (average) and (30 mg/L as maximum in a grab sample).

As suggested by ECCC, cyanide and radium-226 are not expected to occur in effluent, but will be monitored under MMER and as such do not need to be included in the Water Licence.

Agnico Eagle believes that the information that has been provided to ECCC and NIRB adequately assesses the impacts of the Whale Tail Pit Project on the environment to make a determination on the Project. As NIRB understands, setting of discharge criteria are under the jurisdiction of the NWB and EQC's will be licensed under the Type A Water Licence.

Interested Party:	**Environment and Climate Change Canada (ECCC)**	**Ref No.:**	**ECCC-7**
Re:	**Sludge Management**		

Technical Review Comment / Recommendation Made By Interested Party:

ECCC recommends that sludge be disposed using methods that have been demonstrated to provide effective containment and isolation under Northern conditions. Therefore, ECCC recommends disposing of sludge into the Waste Rock Storage Facility or the Tailings Storage Facility at Meadowbank, rather than into the attenuation pond/Whale Tail Lake.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle agrees with the recommendations of ECCC and will dispose of the sludge in the Whale Tail Pit Waste Rock Storage Facility, rather than into the Attenuation Pond.

Interested Party:	Environment and Climate Change Canada (ECCC)	Ref No.:	ECCC-8
Re:	Mercury Study		

Technical Review Comment / Recommendation Made By Interested Party:

ECCC recommends conducting a separate study during the construction, operations, and closure of the flooded areas to address key uncertainties (Arctic environment, ice rafting, tundra soils, ice cover, interrupted discharge, cold water, slow fish growth, and shortened reservoir life) that were identified in the Azimuth report (February 2017), in order to inform mercury modeling for this Project. Adaptive management actions should be considered based on the results from this study.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle agrees with ECCC. The mercury model completed by Azimuth (2017) describes potential changes to mercury and methylmercury that may occur in the aquatic environment after flooding of Whale Tail Lake South Basin. Agnico Eagle believes that the information that has been provided to ECCC and NIRB is sufficient to assess the impacts of the Whale Tail Pit Project on the environment and to make a determination on the Project.

Agnico Eagle's Proposed Terms and Condition:

> *Conduct a separate mercury monitoring program (water, sediment, and biota of Whale Tail Lake South Basin), that will be conducted alongside the Core Receiving Environment Monitoring Program and Fisheries and Offsetting Monitoring Plan, with results compared to model predictions. Details of the monitoring program will be provided 60 days following approval of the Type A Water Licence.*

References:

Azimuth (Azimuth Consulting Group Partnership). 2017. Whale Tail Pit project: Predicted changes in Fish Mercury Concentrations in the Flooded Area of Whale Tail Lake (South Basin). Prepared for Agnico Eagle Mines Ltd., Meadowbank Division. February 2017.

Interested Party:	Environment and Climate Change Canada (ECCC)	Ref No.:	ECCC-9
Re:	Sediment Core Analyses		

Technical Review Comment / Recommendation Made By Interested Party:
ECCC recommends that a full suite of testing be conducted on sediment core samples. Recommended analyses include pH, metals, particle size, Total Organic Carbon, Total Phosphorus, and moisture content.

Agnico Eagle's Response to Technical Review Comment / Recommendation:
The sediment core sampling program is routinely done every three years for the analysis of metals, pH and total organic carbon. The intent of the core program is to capture spatial variability and to evaluate the effect of mining operations on surficial sediment metal concentrations. The analytical laboratories require a minimum amount of material to conduct a suite of analyses to the preferred detection limits. There is insufficient material obtained from the independent core samples to analyze for more than metals, pH, and total organic carbon. Agnico Eagle proposes the following protocols which have been developed for the surficial sediment program continue to be applied in the Whale Tail CREMP.

Sediment sampling is done routinely as part of the Meadowbank CREMP (Azimuth 2015) and is planned to be done regularly as part of the Whale Tail CREMP. From the Whale Tail CREMP study design (EIS Volume 8, Appendix 8.E-2) and in response to technical comments ECCC-11 and ECCC-26, surficial sediments will be collected as grab samples (conducted annually) and core samples (conducted every three years). Samples will be collected following the standard operating procedure for sediment sampling (Azimuth 2015, Appendix B) and sediment core sampling (Azimuth 2015, Appendix C). The sediment coring program is a complement to, and not a replacement of, the grab sampling program. The core program is designed to collect 10 independent samples from each sampling area as a means to capture spatial variability and to capture recent changes in sediment metal chemistry (i.e., the top 1.5 cm from a 6.67 cm diameter core are submitted for analysis). The grab sampling program is designed to analyze particle size, total organic carbon, pH, moisture, and metals, to support interpretation of the benthic invertebrate community data (the top 3 to 5 cm from a Ponar grab are submitted for analysis).

For consistency in historical CREMP sampling protocols, laboratory restrictions, and best practice, Agnico Eagle will continue to analyze for a full suite of constituents in the sediment grab samples (as this type of analysis relates to benthic assessment endpoints) and will continue to analyze for metals, pH, and total organic carbon in the core samples.

References:
Azimuth (Azimuth Consulting Group Partnership). 2015. Core Receiving Environment Monitoring Program (CREMP): 2015 Plan Update. Prepared for Agnico Eagle Mines Ltd., Meadowbank Division.

FISHERIES AND OCEANS CANADA

Interested Party:	Fisheries and Oceans Canada (DFO)	Ref No.:	DFO-3.1
Re:	Freshwater Environment – Habitat Losses		

Technical Review Comment / Recommendation Made By Interested Party:

3.1.1 Request: DFO re-iterates our request that AEM provide the requested illustrations as agreed to by AEM, which DFO would like to receive prior to the commencement of the regulatory phase.

3.1.2 Request: DFO re-iterates our request that AEM provide additional details outlining how they intend to evaluate the potential mixing or non-mixing situation in the pit portion of Whale Tail Lake as the information adopted from Meadowbank's CREMP and Water Quality Monitoring Plan would seem insufficient to do so. If AEM is unable to demonstrate sustainable water quality and habitat suitable for fish in the post-closure scenario, AEM should provide DFO with contingency offsetting options located outside the Whale Tail Lake basin."

3.1.3 Request: DFO re-iterates our requests that AEM provide additional and updated information on the evaluation of end pit lake scenarios, with references, to address the above listed concerns regarding the end pit lake scenario. AEM has noted Gammons et al 2009 which does evaluate the Colomac Gold Mine in NWT. There have been several documents written that would provide a beneficial overview with lessons learned. This information would aid DFO and the proponent in subsequent reviews of the conceptual offsetting plan and monitoring reports. In addition to the monitoring data available for the Colomac Gold Mine (e.g. Colomac Mine site surveillance network program and enhanced natural removal program annual reports), DFO is providing AEM with the following documents to aid in their evaluation: Pieters, R., Coedy, W., Ashley K.I., and Lawrence, G.A. 2015. Artificial circulation of a mine pit lake. Can. J. Civ. Eng. 42:33-43 and Pieters, R. and Lawrence, G.A. 2014. Physical processes and meromixis in pit lakes subject to ice cover. Can. J. Civ. Eng. 41: 569-578.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Response 3.1.1)

Agnico Eagle believes we have addressed this request by providing plan views of the flooding in Figure 3.10 to 3.12 in the Draft Fish Habitat Offsetting Plan: Whale Tail Pit (submitted June 2017). In addition Agnico Eagle refers DFO to the cross-section of the pits provided to the NIRB and NWB on June 23, 2017 in Agnico Eagle commitment #29 submission. If not sufficient to meet DFOs recommendations, Agnico Eagle agrees to work with the DFO to fulfill this request and will provide the requested illustrations in the Final Fish Habitat Offsetting Plan: Whale Tail Pit. This will be finalized during the DFO authorization phase of the Project.

Response 3.1.2)
Agnico Eagle refers DFO to Appendix 8-E.2 of the EIS entitled the Core Receiving Environmental Monitoring Program (CREMP), which is an addendum to Azimuth (2015 – CREMP Updated Plan) which was peer reviewed and developed in collaboration with KivIA, ECCC, DFO, and other stakeholders beginning in 2010, finalized in 2012, updated in 2015, and reviewed annually. Agnico Eagle will adopt CREMP monthly monitoring in the pit during flooding and closure, and agrees with DFO to evaluate the mixing and non-mixing portion of the pit through depth profile, limnological monitoring and depth integrated sampling. However, this monitoring will not be duplicated in the Water Quality and Monitoring Plan as it is consistent with CREMP monitoring with the goal in monitoring of the pits to achieve receiving water quality objectives.

Using lessons learned from Meadowbank Vault Pit Closure during Whale Tail Pit operations, Agnico Eagle will work with the DFO and NWB prior to closure to ensure consistency and safety when adopting the CREMP monitoring in Whale Tail Pit reflooding and closure.

Response 3.1.3)
Agnico Eagle appreciates the DFO's list of references and will provide additional and updated information on the evaluation of end pit lake scenarios in the Final Offsetting Plan. Based on DFO's original feedback on approach to end pit lakes, Agnico Eagle took a conservative approach under a post-closure scenario and assigned zero fisheries value to Habitat Type 10 in deep sections of the Whale Tail Pit. This is presented in the attached Draft Fish Habitat Offsetting Plan: Whale Tail Pit (June 2017), submitted to DFO and KivIA for review on June 28, 2017.

Agnico Eagle's Proposed Term and Condition
Based on DFO recommendations 3.1.1 and 3.1.2 related to pit reflooding, Agnico Eagle proposes the following condition:

> *If the proponent is unable to demonstrate sustainable water quality and habitat suitable for fish in the post-closure scenario, the proponent should provide DFO with contingency offsetting options located outside the Whale Tail Lake basin that would be part of the Final Closure Plan.*

Interested Party:	Fisheries and Oceans Canada (DFO)	Ref No.:	DFO-3.2
Re:	Freshwater Environment – Valued Components		

Technical Review Comment / Recommendation Made By Interested Party:

3.2.1 Request: DFO requests that AEM give equal weights to species based on presence/absence in the offsetting calculation. DFO also recommends that AEM continue to work with DFO to resolve the equal weighting discrepancy as part of the offsetting plan finalizations. DFO notes that the request to assign equal value to all fish species was part of Commitment #31 from the Technical Meeting in April 2017.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle agrees with the DFO. As indicated in Section 2.1.4 of the Draft Fish Habitat Offsetting Plan: Whale Tail Pit (June 2017), as requested by DFO, equal weights were assigned to each of the six species present.

Interested Party:	Fisheries and Oceans Canada (DFO)	Ref No.:	DFO-3.3
Re:	Freshwater Environment – Habitat Alteration		

Technical Review Comment / Recommendation Made By Interested Party:

3.3.1 Request: DFO requests AEM provide more information regarding the 24 hectares and 3390 linear metres of habitat loss associated with impacted waterbodies in the post-closure scenario that was discussed in the conceptual offsetting plan and how it is captured in the recent fisheries offsetting plan.

3.3.2 Request: DFO requests AEM clarify the calculated numbers for all phases of the project, providing rationale, and request AEM provide the calculations (including the raw data used in the calculations) to determine how these numbers are being reached. DFO continues to reiterate previous comments that AEM omit any habitat gains associated with temporary flooding activities during the operations.

3.3.3 Request: DFO requests AEM provide more information regarding their plan to permanently flood Whale Tail Lake by raising the water level by 0.5m, including the rationale, and ability to sustain this condition so as to provide measurable increases in fisheries productivity. Similar to DFO's concerns respecting the potential losses in fisheries productivity associated with the flooding of the Whale Tail Lake South Basin and surrounding waterbodies, DFO requests this proposed flooding is not included as a gain in the Conceptual Offsetting Plan.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Response 3.3.1)

Attached is the Draft Fish Habitat Offsetting Plan: Whale Tail Pit, June 2017 (Agnico Eagle, 2017), which was submitted to DFO and KivIA for review on June 28, 2017. The offsetting calculations in Agnico Eagle (2017), captures the request of the DFO and takes into account recommendations provided to Agnico Eagle from the DFO in the Information Request and Technical Comment phase of the review regarding habitat gains, losses, and modifications. Agnico Eagle refers DFO to Tables 3-4 and 3-5 that provide a summary of habitat unit losses under the post closure scenario. Detailed calculation tables are provided in the Appendix B. The methods and results of the supporting field investigations, and the methods used to incorporate those habitat features into the calculation of habitat gains and losses were presented at meetings with DFO and KivIA on November 16, 2016, March 23, 2017, and with DFO on June 9, 2017.

More specifically, the 24 hectares is an outdated calculation that reflected changes in habitat area from baseline to post-closure, including all habitat types (presented in Table 3.2 of the Conceptual Offsetting Report [June 2016]). On June 28, 2017, Agnico Eagle submitted to DFO an updated Draft Fish Habitat Offsetting Plan: Whale Tail Pit June 2017 (Agnico Eagle 2017), for review by DFO and KivIA. In Table B2 of that document there is a change in habitat area from baseline to post-closure, including all habitat types, as presented in Table B2, is an increase of 25.3 ha. If the area of Habitat Type 10 (42.8 ha), as

presented in Table B2, is excluded from the area calculation the calculated change in habitat area from baseline to post-closure is -17.5 ha. (25.3 – 42.8 = -17.5). As recommended by DFO, this is taken into account in the calculation of habitat units, by assigning no habitat value to Habitat Type 10.

Response 3.3.2)
Agnico Eagle refers DFO to the Draft Fish Habitat Offsetting Plan: Whale Tail Pit, June 2017 (Agnico Eagle, 2017), submitted for review on June 28, 2017. More specifically, the summary calculations and supporting data are presented in tabular form in Appendix B. The raw data will be provided to DFO as part of the authorization phase of the project.

Habitat creation is one of four main categories of offsetting identified in the Canadian Science Advisory Secretariat Science Advisory Report 2013/074 (Science Advice on Offsetting Techniques for Managing the Productivity of Freshwater Fisheries. DFO 2013). The original decision to flood the Whale Tail Lake (South Basin) was driven by the results of the Multiple Accounts Analysis, and in the selected option was driven in part by the increased benefits of creating additional fisheries habitat, as per DFO guidance in DFO (2013). Agnico Eagle is of the opinion that the additional habitat that is created through flooding during operations and closure, combined with the increased productivity in Whale Tail Lake (South Basin) due to the transfer of fish biomass from the North Basin to the South Basin and will offset productivity losses due to habitat that is dewatered or otherwise unavailable to fish.

At this time, Agnico Eagle believes that the information discussed with DFO related to complementary measures and Draft Final Offsetting Plan (Agnico Eagle 2017) provided to DFO is sufficient for the NIRB to make a determination on the Whale Tail Pit Project. Agnico Eagle has presented in this document and discussed in great detail a suite of offsetting options that provide sufficient net gains to offset the proposed habitat losses. Should the Project proceed, Agnico Eagle proposes that this be addressed during the DFO authorization phase and that Agnico Eagle will continue to work with DFO and KivIA to finalize offsetting that DFO are agreeable to.

Response 3.3.3)
Agnico Eagle refers DFO to the Draft Fish Habitat Offsetting Plan: Whale Tail Pit, June 2017 (Agnico Eagle 2017), submitted for review to DFO and KivIA on June 28, 2017. Agnico Eagle is of the opinion that increasing the water elevation by 0.5 m on the upstream side of the Mammoth dike is a feasible method to create offsetting habitat for the Project.

Habitat creation is one of four main categories of offsetting identified in the Canadian Science Advisory Secretariat Science Advisory Report 2013/074 (Science Advice on Offsetting Techniques for Managing the Productivity of Freshwater Fisheries. DFO 2013). According to that document, “Aquatic habitat creation is the creation or expansion of aquatic habitat into a previously dry area or terrestrial area.” As stated in the conceptual fisheries offsetting plan (June 2017), this can be achieved by either excavation

or flooding. Flooding is generally an effective and sensible way to create aquatic habitat for offsetting purposes (pers. comm. Cam Portt and Dr. Ken Minns, June 14, 2017).

At this time, Agnico Eagle believes that the information discussed with DFO related to complementary measures (i.e., research projects) and offsetting plans presented in the Draft Final Offsetting Plan (Agnico Eagle 2017) is sufficient for the NIRB to make a determination on the Whale Tail Pit Project. Agnico Eagle has presented in this document and discussed in great detail a suite of offsetting options that provide sufficient net gains to offset the proposed habitat losses. Should the Project proceed, Agnico Eagle proposes that this be addressed during the DFO authorization phase and that Agnico Eagle will continue to work with DFO and KivIA to finalize offsetting that DFO are amenable to.

Agnico Eagle's Proposed Term and Condition

Agnico Eagle will work with DFO and KivIA to finalize the Fish Habitat Offsetting Plan for approval by DFO prior to construction.

References:

DFO (Fisheries and Oceans Canada). 2013. Fisheries Productivity Investment Policy: a proponent's guide to offsetting. Published by: Ecosystem Programs Policy Fisheries and Oceans Canada. Ottawa ON, November 2013.

DFO. 2013. Canadian Science Advisory Secretariat Science Advisory Report 2013/074. Science Advice on Offsetting Techniques for Managing the Productivity of Freshwater Fisheries. Ottawa ON, November 2013.

Interested Party:	Fisheries and Oceans Canada (DFO)	Ref No.:	DFO-3.4
Re:	Freshwater Environment – Changes to Lake Ecosystem Productivity		

Technical Review Comment / Recommendation Made By Interested Party:

3.4.1 Request: DFO requests clarification on whether the newly proposed changes to the project, specifically in the form of the phosphorus treatment, will still result in a change to the trophic status of the lake.

3.4.2 Request: DFO reiterates the previous comments made in DFO's Technical Submission (Technical Comment 5) submitted in March, 2017. If the trophic status is predicted to change from an oligotrophic state and return again in a few years' time, this would harm fishery productivity and should be considered a loss. DFO requests that the losses caused by a trophic change in the lake ecosystem from nutrient overloading be considered as losses in the calculations for offsetting.

3.4.3 Request: DFO requests clarification on whether AEM is planning on conducting a study in conjunction with University of Manitoba on the change in fisheries productivity due to a change in the lake ecosystem from oligotrophic to eutrophic and back again.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Response 3.4.1)

Agnico Eagle originally took a worst case scenario approach in water quality modelling, which assumed a discharge water quality "without treatment". As a result, this worst case scenario originally predicted that the lake could transition to a eutrophic lake. As mitigation, Agnico Eagle is committed to treat sewage effluent to 1.0 mg-P/L before it is diverted to the Attenuation Pond and discharged to Mammoth Lake. Updated predictions were provided in the technical memorandum as a response to Technical Commitments 30, 36, 37, and 42, submitted July 11, 2017. As a result, updated predictions indicate that there will be a change in trophic status; it is predicted that nutrients will increase in Mammoth Lake and that it will gradually transition from oligotrophic, to worst case mesotrophic through operations, and back to oligotrophic post-closure.

Response 3.4.2)

A sudden change from oligotrophic to mesotrophic status is not anticipated; rather it is expected that there will be a gradual increase in nutrients through operations, and a gradual decrease in nutrients from the start of closure through post-closure. This increase in nutrients is expected to increase the biomass of phytoplankton, zooplankton, and benthic invertebrates which may also lead to increased growth and production of fish. As a result, Agnico Eagle believes these are not habitat losses and have not accounted for these in the Draft Fish Habitat Offsetting Plan: Whale Tail Pit, June 2017 (Agnico Eagle 2017).

Monitoring with adaptive management will be used to track changes to downstream environments. Mitigations (e.g., hypolimnetic aeration, sediment phosphorus inactivation) can be investigated.

At this time, Agnico Eagle believes that the information provided to DFO is sufficient for the NIRB to make a determination on the Whale Tail Pit Project for environmental assessment purposes. Should the Project proceed, Agnico Eagle proposes that this detail be addressed during the *Fisheries Act* authorization process.

Response 3.4.3)
Based on current predictions and treatment of phosphorus, Mammoth Lake is not expected to become eutrophic. Agnico Eagle will work with the DFO to select the best appropriate research topic and academic institution to develop regional studies related to fisheries productivity in the lake ecosystems near the Whale Tail Pit Project. However, due to the change in downstream predictions, at this point we do not believe the proposed work should be integrated into this research component, as it does not reflect the current downstream water quality predictions.

Interested Party:	Fisheries and Oceans Canada (DFO)	Ref No.:	DFO-3.5
Re:	Monitoring, Mitigation and Management Plans – Water Quality and Flow Monitoring		

Technical Review Comment / Recommendation Made By Interested Party:

3.5.1 Request: DFO requests that AEM place monitoring stations in Whale Tail South Basin, Mammoth Lake and Nemo Lake in the locations or similar to the locations described in the above table. DFO also requests that when sampling at these locations, that multiple depths be sampled at 1, 5 and 10 m, if the location permits, ensuring to always measure for Temperature, Pressure, Dissolved Oxygen, pH, Salinity and Conductivity.

3.5.2 Request: DFO requests that AEM include at least 2 control lake monitoring stations in the Water Quality and Flow Monitoring Plan and include rationale to why the reference lakes that are chosen are appropriate.

3.5.3 Request: DFO requests AEM ensure consistency in sampling frequency i.e. all stations as suggested by DFO are sampled each monitoring year rather than 1 station in year 4 and a different one in year 11 as is currently the case in AEM's Water Quality and Flow Monitoring Plan.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Response 3.5.1)

Agnico Eagle agrees with the DFO's request and refers the DFO to the Core Receiving Environmental Monitoring Program (CREMP) (EIS Volume 8, Appendix 8-E.2). For specific details refer to:

- Section 2.2.2 - Sampling Areas and Figure 2-2 to 2-5; and
- Section 2.4 describes Whale Tail Lake (South Basin), Mammoth Lake and Nemo Lake monitoring (including limnologic profiling).

Response 3.5.2)

Agnico Eagle agrees with the DFO's request and refers DFO to the Core Receiving Environmental Monitoring Program (CREMP) (EIS Volume 8, Appendix 8-E.2, Section 2.2.2) for details on the sampling areas. As described in Section 2.2.2 the CREMP has 2 reference lakes (or control lakes) referred to as Innuggugayualik Lake and Pipedream Lakes. As previously stated, the receiving water quality monitoring should not be duplicated in the Water Quality and Monitoring Plan, as the evaluation of a control lake associated with project lakes is consistent with CREMP monitoring goal to evaluate impacts in the receiving environments.

Response 3.5.3)
Agnico Eagle agrees with DFO's request and will ensure consistency in sampling locations and frequency according to the DFO request, the Type A Water Licence, and associated management, mitigation, and monitoring plans (i.e., Water Quality and Flow Plan and CREMP).

Attachment 1:

Draft Fish Habitat Offsetting Plan: Whale Tail Pit, June 2017

AGNICO-EAGLE MINES: MEADOWBANK DIVISION

FISH HABITAT OFFSETTING PLAN:
WHALE TAIL PIT

DRAFT: JUNE 2017

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EXECUTIVE SUMMARY

Agnico Eagle Mines Limited: Meadowbank Division (Agnico Eagle) is proposing to develop Whale Tail Pit, a satellite deposit on the Amaruq property, in continuation of mine operations and milling of the Meadowbank Mine. The Amaruq Exploration property is a 408 square kilometre (km^2) site located on Inuit Owned Land approximately 150 kilometres (km) north of the hamlet of Baker Lake and approximately 50 km northwest of the Meadowbank Mine in the Kivalliq region of Nunavut.

Base-line fisheries investigations were conducted in Mammoth Lake, Whale Tail Lake, and tributary streams and lakes in 2014, 2015, and 2016. Individuals of six fish species were captured in the primary study area. These were comprised of four large-bodied species (Lake Trout, *Salvelinus namaycush;* Arctic Char, *Salvelinus alpinus*; Round Whitefish, *Prosopium cylindraceum*; Burbot, *Lota lota*) and two small-bodied species (Slimy Sculpin, *Cottus cognatus*; Ninespine Stickleback, *Pungitius pungitius*).

The goal of this document is to characterize the fish habitat in areas that will be directly altered by the Whale Tail Pit mining operations under baseline conditions and predicted conditions during the operations and post-closure scenarios for the Whale Tail Pit and to describe habitat creation and enhancement measures that could be used to offset for losses to fish habitat that will result from the project. This document presents an approach to offsetting for the Whale Tail pit to form the basis for determining the final offsetting plan which will include both traditional offsetting (i.e. habitat manipulation) and complementary measures.

The habitat evaluation procedure (HEP) that was used to quantify habitat losses and offsets for Whale Tail Pit is based on the procedure used for the 2012 NNL assessment for the Meadowbank Mine and incorporates refinements that have been introduced during subsequent work between 2014 and 2016 to develop offsetting measures for Phaser Lake. Three new habitat categories were added representing connecting channels between lakes, small streams with fine substrate and small streams with coarse substrate

Changes to fish habitat will occur during the operations and post-closure phases of Whale Tail Pit. During the operations phase of the project there will be habitat losses due to enclosure of existing habitat within dikes and dewatering or isolation of portions of Whale Tail Lake and some of its tributary lakes and connecting watercourses, but there will also be habitat gains as a consequence of flooding terrestrial areas. Much smaller habitat losses will also occur in Mammoth Lake during operations as a result of diking and dewatering and in Nemo Lake due to the construction of a freshwater intake jetty. Overall, there is a 49.2 ha increase in the area of fish habitat and a 42.9 unit increase in the number of habitat units during operations. The substantial increase in habitat area and habitat units in Whale Tail Lake during the operations phase is expected to result in an increase in the productivity of the aquatic system so that it is, at a minimum, equal to the productivity under baseline conditions.

Post-closure, most of the area affected during operations will revert to baseline conditions. The dikes will be breached, dewatered areas will be reflooded and isolated areas will be reconnected. The largest change from baseline conditions to post-closure is the creation of the pit. For the purposes of the calculations presented in this report it has been assumed that the flooded pit will become meromictic and that the area over the meromictic portion will have no fish habitat value. Therefore, although the pit will increase the surface area of Whale Tail Lake the number of habitat units present will decrease. There are also smaller decreases in the number of habitat units in Mammoth and Nemo lakes.

Following closure, without offsetting, there will be a net decrease of 5.5 habitat units compared to baseline conditions. One offsetting measure considered is modifying the Mammoth Lake dike post-closure to restore flow from Whale Tail to Mammoth Lake but maintain Whale Tail lake at an elevation of 104.5 masl, which is approximately 0.5 m higher than its pre-construction elevation. This increase would convert land to aquatic habitat and modify much of the existing habitat by increasing its depth. The net result is an increase of 11.3 ha and 6.4 habitat units relative to the post-closure condition with no offsetting. This results in an offsetting to losses ratio of 1.16:1.

If, in addition to increasing the water level by 0.5 m east of Mammoth dike, the roads within the area that is flooded post-closure are scarified to convert them from mixed to coarse substrate and 4.5 ha of rock shoals are constructed in areas of fine substrate within the portion of Whale Tail Lake that is dewatered, the net result is an increase of 11.3 ha and 8.2 habitat units relative to the post-closure condition with no offsetting. This creates an offsetting to losses ratio of 1.49:1.

DFO has indicated support for complementary measures to provide at least 60% of the required offsetting. Agnico Eagle is supportive of funding research as a complementary measure to offset habitat losses resulting from the Whale Rail pit and has provided to DFO for consideration an outline of a number of research activities to benefit local stakeholders and contribute to the understanding of aquatic systems. The traditional offsetting measures presented here will provide a basis for determining what portions of those measures will be implemented and for determining the monetary value of the complementary measures that will form a portion of the offsetting for the Whale Tail pit.

SECTION 1 • INTRODUCTION

Agnico Eagle Mines Limited: Meadowbank Division (Agnico Eagle) is proposing to develop Whale Tail Pit, a satellite deposit on the Amaruq property, in continuation of mine operations and milling of the Meadowbank Mine. The Amaruq Exploration property is a 408 square kilometre (km^2) site located on Inuit Owned Land approximately 150 kilometres (km) north of the hamlet of Baker Lake and approximately 50 km northwest of the Meadowbank Mine in the Kivalliq region of Nunavut (Figure 1-1).

1.1 GOAL

The goal of this document is to characterize the fish habitat in areas that will be directly altered by the Whale Tail Pit mining operations under baseline conditions and predicted conditions during the operations and post-closure scenarios for the Whale Tail Pit.

Options being considered to offset residual serious harm to fish that would occur as a result of mining activities at Whale Tail Pit were introduced in the Conceptual Fish Habitat Offsetting Plan (Agnico Eagle, 2016). In subsequent meetings to discuss offsetting for the project, DFO staff indicated that, given the need for knowledge regarding how fish populations and communities in the north respond to habitat changes, it would be acceptable for at least 60% of the offsetting to consist of complementary measures. Those complementary measures would focus on funding scientific research that will improve the understanding of how aquatic systems in the far north respond to perturbations from human activities and/or the development of technologies to reduce impacts from human activities. The amount of research funding provided would be based on the predicted cost of achieving the desired offsets using typical offsetting methods that involve habitat alteration. This document presents an approach to offsetting for the Whale Tail pit to form the basis for determining the final offsetting plan which will include both traditional offsetting (i.e. habitat alteration) and complementary measures.

The approach to quantifying harm and offsetting (previously compensation) builds upon the methods developed for the Meadowbank mine site from 2012 through 2016. Offsetting options were introduced for the Whale Tail Lake satellite deposit in the 2012 Meadowbank no-net-loss plan (NNLP) after researching techniques and projects implemented at other northern mines, holding workshops and site visits with the local Hunter's and Trapper's Organization, Kivalliq Inuit Association and the DFO Habitat and Science & Research Departments, and reviewing the literature for information on effectiveness of compensation. The offsetting concepts specific for Whale Tail Pit were discussed with community groups during TK workshops held in Baker Lake in February 2016; follow-up workshops were held during the authorization phase of the project.

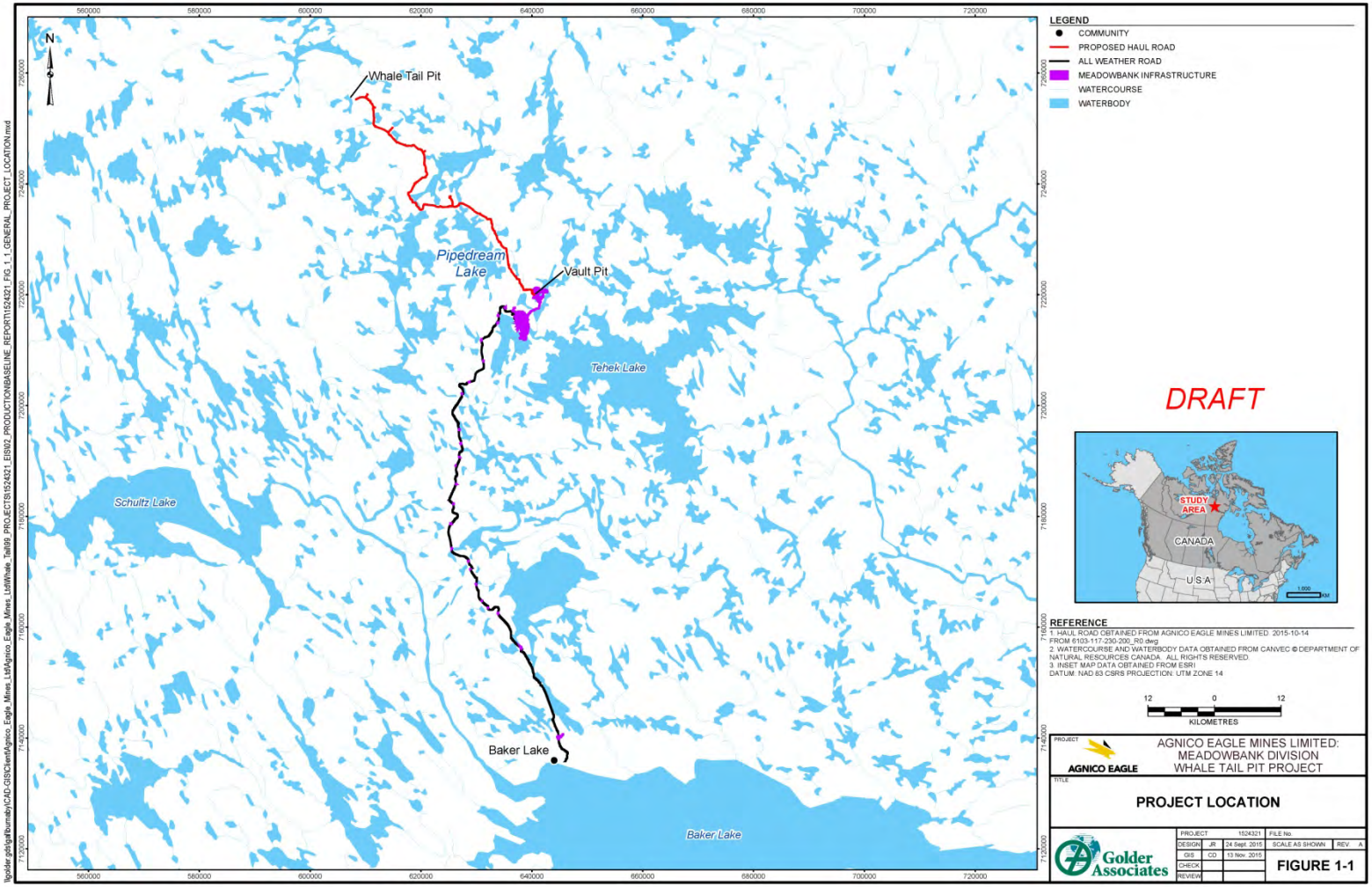


Figure 1-1. Location of the proposed Whale Tail Pit Study Area.

1.2 HYDROLOGIC SETTING

The hydrologic setting of the Whale Tail pit is shown in Figure 1-2. **Error! Reference source not found.** The lakes were assigned alpha-numeric codes to facilitate discussion, with the letter designating the subwatershed and, within each branch, the number increasing in an upstream direction. Lake A17 is referred to as Whale Tail Lake. Lake A16 is referred to as Mammoth Lake and lake C38, in the subwatershed immediately north of the Whale Tail Pit, is referred to as Nemo Lake.

The primary study area is in the headwaters of subwatershed A. All of the flow from the primary study area ultimately reaches lake DS1, but there are two pathways of flow downstream from Lake A12. The primary flow path, which conveys the majority of the flow, passes through lakes A11, A10, A9, A8 and A7, and then into Lake A32 before continuing through Lakes A6, A5, A4, A3, A2, A1 and into DS1. The secondary flow path is from Lake A12 to Lake A77 and then to Lake A76. Lake A76 has two outlets; with about half the outflow of the lake flowing to the east through Lake A41 to rejoin the primary flow path at Lake A10, while the other half flows west through Lakes A75, A74, A73, A72, A71, A70, A69 and into Lake DS1Figure 1-2. Hydrologic setting and lake identification codes. Mammoth Lake is A16. Whale Tail Lake is A17. Nemo Lake is C38.

1.3 DETERMINATION OF WATER ELEVATIONS AND LAKE SHORELINES UNDER BASELINE CONDITIONS

The shorelines used to determine habitat areas in the Conceptual Fish Habitat Offsetting Plan (Agnico Eagle, 2016) were from CanVec mapping. Comparison of these shorelines to satellite imagery from July 21, 2011, indicated that the water levels represented by the CanVec shorelines were lower than those shown in the imagery. Water elevations were estimated by overlaying the digital elevation model for the study area and the July 21, 2011, satellite imagery for three lakes where actual water level data were available for 2015 and 2016 and the estimated elevations were compared to the field data[1]. The results (Table 1-1) were shared with DFO (meeting held in Winnipeg, March 23, 2017) and it was agreed that the water elevations and shorelines used to calculate habitat areas under baseline conditions would be determined using DEM and the July 21, 2011, imagery. Those elevations are provided in Appendix A.

[1] The following determination of shoreline elevations was provided in response to DFO IR 4 and 7. Agnico Eagle (January, 2017). DFO IR 4 – Freshwater Environment – Habitat Alteration; DFO IR 7 – Monitoring, Mitigation and Management Plans – Conceptual Offsetting Plan. January 20th, 2017 submission RE: NIRB File No 16MN056 Application No: 124683/NWB File No. 2AM WTP ----: Information Requests Received from Parties Regarding Agnico Eagles Mines Ltd's "Whale Tail Pit" Project.

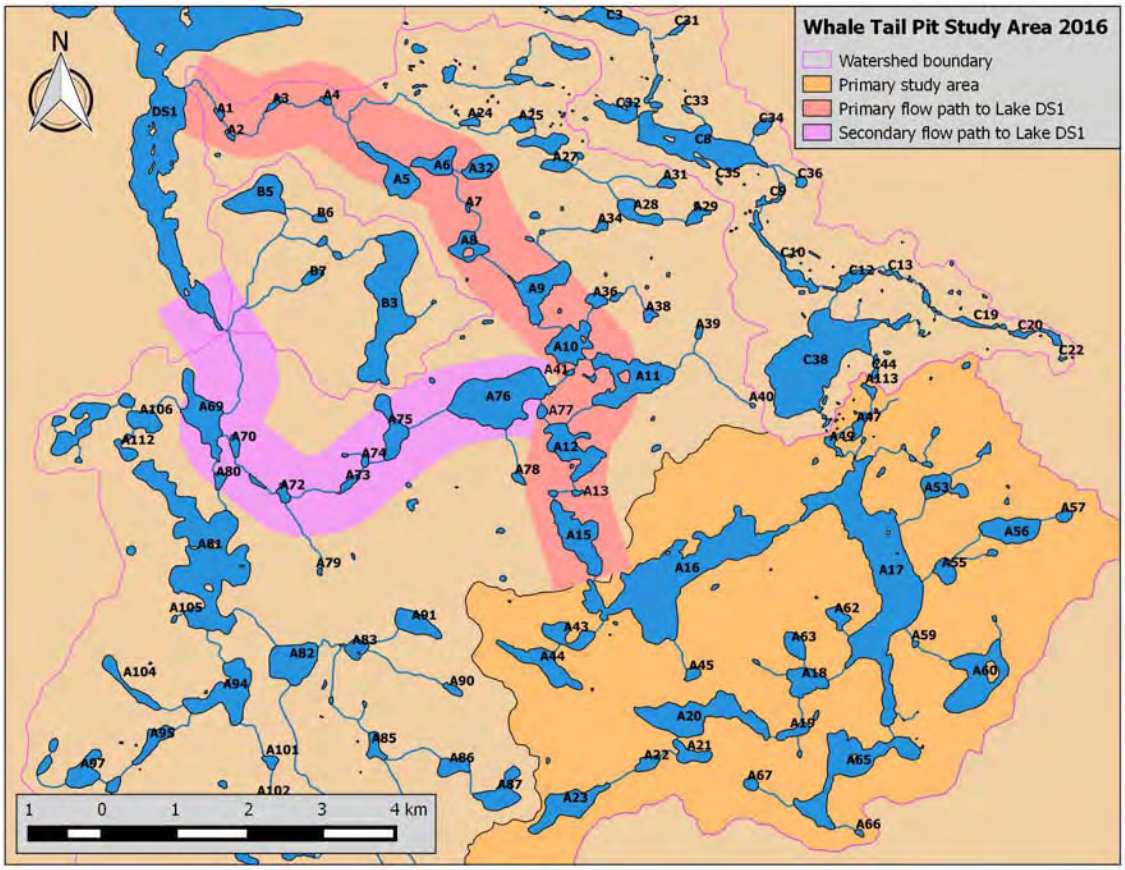


Figure 1-2. Hydrologic setting and lake identification codes. Mammoth Lake is A16. Whale Tail Lake is A17. Nemo Lake is C38.

Table 1-1. Water elevation estimated from the July 21, 2011, imagery, the minimum, maximum and range of water elevations recorded in the field in 2015 and 2016, the difference between the minimum and maximum water elevations recorded in the field and the water elevation estimated from the July 21, 2011, imagery, and the number of days each year that the recorded water elevation was higher than the water elevation estimated from the July 21, 2011, imagery, for 2015 and 2016.

	Whale Tail Lake (A17)		**Lake A18**		**Nemo Lake (C38)**	
Water elevation estimated from July 21, 2011 imagery (masl)	153.02		154.05		156.00	
Year	2015	2016	2015	2016	2015	2016
Maximum water elevation (masl)	153.31	153.11	154.20	154.10	155.98	156.04
Minimum water elevation (masl)	152.46	152.59	153.80	153.78	155.65	155.70
Range (m)	0.85	0.53	0.40	0.32	0.33	0.34
Difference between estimated water elevation and the recorded maximum (m)	0.29	0.09	0.15	0.05	-0.02	0.04
Difference between estimated water elevation and the recorded minimum (m)	-0.56	-0.43	-0.25	-0.27	-0.35	-0.30
# of days water elevation was higher than the water elevation estimated from shoreline elevation	10	5	11	5	0	11

1.4 WHALE TAIL STUDY AREA FISH COMMUNITY

Base-line fisheries investigations conducted in Mammoth Lake, Whale Tail Lake, and tributary streams and lakes in 2014 and 2015 are described in C. Portt and Associates (2015) and those conducted in 2016 are described in C. Portt and Associates (2016). The results are summarized here.

Individuals of six fish species were captured in the primary study area during the 2014, 2015, and 2016 sampling. These were comprised of four large-bodied species (Lake Trout, *Salvelinus namaycush;* Arctic Char, *Salvelinus alpinus*; Round Whitefish, *Prosopium cylindraceum*; Burbot, *Lota lota*) and two small-bodied species (Slimy Sculpin, *Cottus cognatus*; Ninespine Stickleback, *Pungitius pungitius*).

No Arctic Grayling (*Thymallus arcticus*) have been captured in the primary study area and it is believed that none are present. Movement into the primary study area from locations downstream where Arctic Grayling were captured is prevented by a steep set of rapids on the primary flow path and by a long section where there is only sub-surface, interstitial flow, even during spring freshet, on the secondary flow path. In addition to those primary barriers, there are connecting channels between a number of other lakes along these flow paths where there is only interstitial flow except during spring freshet.

Lake Trout were the most widely distributed (**Error! Reference source not found.**) and the most abundant species in gill net catches and were captured in Mammoth, Whale Tail and Nemo Lakes as well as eight of the smaller lakes. Round Whitefish were captured in Mammoth and Whale Tail Lakes and in two of the smaller lakes. Arctic Char were captured in Whale Tail Lake and in five of the smaller lakes. The Arctic Char are presumed to be land-locked, given the distance to a marine environment, and the barriers that would prevent movement during their migratory period.

No large-bodied fish were captured in Lake A45 or in Lake A113 and it is thought that none are present. Lake A45 is 2.9 ha in area and has a maximum depth of 4.5 m. There is no surface connection between Lake A45 and any other waterbody. No fish were captured in a 2 hour gill net set in Lake A45 in 2015 or in a 29.2 hour gill net set in 2016 using a standard Agnico index gill net gang comprised of 22.7 m long and 1.8 m deep panels of 126, 102, 76, 51, 38, and 25 mm stretched mesh (total gang length = 136.4 m). Lake A113 is 2.1 ha in area with a maximum depth of less than one metre and there is no defined channel connecting it to other waterbodies or watercourses downstream. No fish were captured in 3 panels of gill net (22.7 m long and 1.8 m deep panels of 38 mm, 51 mm and 76 mm mesh) set for 16.6 hours in 2015.

Table 1-2. Number of individuals of large-bodied fish species captured by gillnetting and the small-bodied fish species that were captured by electrofishing (X indicates that the species was captured) in the waterbodies that will be directly altered or have access affected during operations at the Whale Tail pit. Nemo Lake was not sampled for small-bodied fish.

Waterbody	Lake Trout	Arctic Char	Round Whitefish	Burbot	Ninespine Stickleback	Slimy Sculpin
A18	0	8	0	0	X	X
A19	0	2	0	1	X	X
A20	11	0	6	0		
A22	2	1	0	0	X	X
A45	0	0	0	0	X	
A47	0	1	0	0	X	
A49	3	0	0	0		X
A53	1	2	0	0	X	
A55	5	0	0	1		X
A62	3	0	0	0	X	
A63	1	0	0	0		X
A65	2	0	2	0	X	X
A113	0	0	0	0	X	
Mammoth Lake	49	0	20	0	X	X
Whale Tail Lake	35	2	5	0	X	X
Nemo Lake	22	0	0	0	ns	ns

Large mesh hoop nets, set between June 19 and July 13, 2015, in areas where there was thought to be potential for fish movement between lakes, caught one Lake Trout and one Arctic Char in 3000 hours of soak time. In total, electrofishing 1,978 m of lake shoreline resulted in the capture of 145 Ninespine Stickleback, 55 Slimy Sculpin, 2 juvenile Arctic Char and 3 juvenile *Salvelinus* sp., either Arctic Char or Lake Trout, which were not identified to species. There were, however, several isolated or nearly isolated small lakes and ponds in which no fish were captured. Most of these were located north of Whale Tail Lake.

Electrofishing effort and catches in small streams in the primary study area during the 2015 and 2016 field seasons are summarized in Table A??. Effort totalled 35,657 electroseconds and 6,330 m. Portions of the largest of these streams were fished on up to eight occasions. The most abundant species in the catches was Ninespine Stickleback (n=1192) followed by Slimy Sculpin (n=360). Low numbers of juvenile Arctic Char (n=24), juvenile Lake Trout (n=5), juvenile Burbot (n=3), and one juvenile Round Whitefish were captured, as well as three juvenile *Salvelinus* that could not be confidently identified to species in the field or from photographs. No adult large-bodied fish were captured.

In the latter part of June and early July of 2016, one adult Arctic Char was caught in a gill net set across stream A53-A17 near its mouth for a total 17 days, and seven adult Arctic Char, five moving upstream and two moving downstream, were captured in a gill net set across stream A55-A17 near its mouth for a total of 16 days. One Lake Trout and one Arctic Char were captured in a hoop net set near the mouth of stream A55-A17 for 12 days in late June and early July of 2015.

SECTION 2 • HABITAT EVALUATION PROCEDURE

The habitat evaluation procedure (HEP) that was used to quantify habitat losses and offsets for Whale Tail Pit in this report is based on the procedure used for the 2012 NNL assessment for the Meadowbank Mine and incorporates refinements that have been introduced during subsequent work between 2014 and 2016 to develop offsetting measures for Phaser Lake.

The HEP involves the classification of lake habitat into ten habitat types, based on depth and substrate. For the Whale Tail Pit HEP three additional habitat types have been incorporated to address connecting channels between lakes and small streams, as described in Section ??. Suitability of each habitat type is ranked between 0-1 for each of four life functions (spawning, nursery, foraging, overwintering) for each fish species that is (or is predicted to be) present. The area of each habitat type (in hectares) is multiplied by a habitat suitability index (HSI) and a series of weights (a species weight, a life-function weight and an access weight) and summed in order to derive a value in habitat units (HUs) that describes both the quality and quantity of habitat. These calculations are made for the natural, or baseline, condition and for predicted conditions during the operations and post-closure phases of the project.

The changes in HUs among phases depend on the changes (losses or gains) in the area of the habitat types (each of 13 types) that are lost and gained, and the suitability of each habitat type for each fish species. HUs for offsetting measures that involve altering habitat or access can be calculated using the same procedure. The HEP model is described in further detail below.

2.1 HEP MODEL

The HEP model used here can be described, for each fish species (spp 1-n) as:

$$\mathbf{HU}_{\text{spp 1-n}} = \sum_{\text{HT 1-10}} \left(\sum_{\text{sp,nu,fo,ow}} (\mathbf{HT}_{\text{1-10}} \text{ x } \mathbf{HSI}_{\text{sp,nu,fo,ow}} \text{ x } \mathbf{\text{life function weight}} \text{ x } \mathbf{\text{species weight}})\right) \text{ x } \mathbf{\text{access factor x habitat co-factor}}$$

Where HT_{1-10} = area (ha) of habitat types 1 through 10

$HSI_{sp,nu,fo,ow}$ = habitat suitability index for each life function:

- sp = spawning use
- nu = nursery use
- fo = foraging use
- ow = overwintering use

2.1.1 Habitat Type Area (HT_{1-13})

The foundation of the HEP is the delineation of areas that provide certain "habitat types" which are based on depth and substrate (Table 2-1). Habitat types 1 – 9 are lake habitats and were components of the original Meadowbank HEP model. These habitats are delineated by intersecting depth and substrate polygons.

Habitat Type 10 is deep flooded pit and was added to the HEP model during the development of the Phaser Lake offsetting plan at the request of DFO to address uncertainty with respect to fish utilization of those areas. According to DFO, this uncertainty arises primarily because there are "no examples of successful re-establishment of self-sustaining fish populations in refilled pits in Canada's North upon which to base end pit lake design" and there is a possibility that the deep areas of flooded pit may become meromictic (i.e. permanently stratified) and therefore be unsuitable for fish (DFO letter dated November 27, 2015) . For the purposes of the offsetting calculations, it has been assumed that any area of the pit that exceeds the maximum depth of Whale Tail Lake under baseline conditions (22 m) is Habitat Type 10. The portion of the pit that is shallower than 22 m was assigned a habitat type based on its depth and being coarse substrate.

Habitat type 11 is specific to this study. It is the connecting channels that occur between several of the lakes in the Whale Tail Pit study area. These channels are wide and have predominantly boulder and cobble substrates. They have shallow surface flow over most or all of their length during spring freshet and only interstitial flow over most or all of their length later in the open-water season. They freeze during the winter. The edge of the water in the connecting channels was observed in the field to correspond closely to the edge of the tundra vegetation. Therefore, these channels were delineated by digitizing the edge of the tundra vegetation in the July 21, 2011, satellite imagery. The upstream and downstream limits of the connecting channels are defined by the intersection of the upstream and downstream lake elevations with the DEM. When an area that is Type 11 habitat under

baseline conditions is flooded during the operations or post-closure phases it becomes the lake habitat type with coarse substrate that corresponds to its new depth.

Habitat types 12 and 13 are also specific to this study and represent small streams with fine and coarse substrate respectively. These streams were characterized from field measurements made using a point-transect methods from July 5 through July 8, 2016 (C. Portt and Associates, 2017). Many of these small streams have multiple channels and the width of each of the channels was measured at transects across the watercourses and summed to determine the total wetted width. To facilitate GIS analysis, the primary flow path of each of these streams was digitized based on the July 21, 2011, satellite imagery and a 'stream polygon' was created by assigning the total wetted width to the digitized flow path at each transect location. This allows the areas of stream habitat to be visualized and calculated during baseline and subsequent stages using standard GIS techniques. The portion of stream habitat that is fine substrate (Habitat Type 12) or coarse substrate (Habitat Type 13) was calculated by multiplying the stream polygon area by the proportion of the points where substrate was fine or coarse based on the field measurements. When Type 12 and 13 habitat was flooded due to increased water levels it was considered converted to lake habitat and the habitat type was assigned based on depth and substrate.

Table 2-1. Physical characteristics of the habitat types proposed for the Whale Tail Lake HEP. Note that habitat type 10 is applied to all non-backfilled pit areas, independent of depth and substrate characteristics.

Habitat Type	Depth Zone	Substrate
1	0-2 m	Fine
2	0-2 m	Mixed
3	0-2 m	Coarse
4	2-4 m	Fine
5	2-4 m	Mixed
6	2-4 m	Coarse
7	>4 m	Fine
8	>4 m	Mixed
9	>4 m	Coarse
10 (pit area > 22 m))	>22 m	na
11	connecting channels	Coarse
12	small streams	Fine
13	small streams	Coarse

* Substrate in pits is assumed to be coarse but has no relevance to suitability (see Section 2.1.2).

In order to calculate the extents of each habitat type, depth zones and substrate were mapped for the entire Whale Tail Pit site, for baseline, operations, and post-closure scenarios. The area (in ha) for each lake habitat type was determined by overlaying depth and substrate layers. All habitat type area calculations and mapping were completed by Dougan and

Associates using standard GIS methods consistent with AEM (2012) and Phaser Lake offsetting plan.

2.1.2 Habitat Suitability Index ($HSI_{sp,nu,fo,ow}$)

The habitat suitability term represents the relative quality of each habitat type for each life function of each fish species present in the region. In the case of this HEP, the life functions spawning, nursery, foraging and overwintering were considered. Habitat suitability for each life function is indicated through a ranking of 0, 0.25, 0.5, 0.75 or 1. HSIs for all fish species[2] and habitat types used in this HEP are shown in Table 2-2. The HSIs for the lake habitats were developed through a series of consultations and a workshops beginning in July 2011 with KivIA, HTO, and DFO in Baker Lake, and a series of workshops held with Golder Associates and DFO between November 2011 and December 2011 (by webex and in Ottawa). The process is further described in AEM (2012). For the time being, it has been conservatively assumed that habitat type 10 will provide no fish habitat (i.e. all HSIs are zero) with the understanding that HSIs and the provision of habitat units will be re-evaluated if field investigations demonstrate that there is no stratification or that fish use the pelagic zone above a chemocline.

The HSIs for habitat types 11, 12, and 13 were assigned based on their habitat characteristics and the fish sampling conducted as part of the Whale Tail pit baseline investigations, taking into consideration the HSIs previously developed for lake habitats[3]. The connecting channels have primarily boulder and cobble substrate. There is shallow water above the substrate during the spring freshet in most of these channels but later in the summer there is only interstitial flow. No adult large-bodied fish have been observed or captured by electrofishing in these connecting channels. No fish were captured in hoop nets set in the connecting channel between Whale Tail Lake and Mammoth Lake for a total of 63 net-days between June 19 and July 13, 2015. A single Arctic Char was captured in a gill net set across the connecting channel between Lake A18 and Whale Tail Lake from June 22 – 28, 2016 and July 2-8, 2016. Based on these data, these connecting channels do not provide foraging habitat for large-bodied fish (foraging HSI = 0). Juvenile Lake Trout and juvenile Lake Whitefish have been captured by electrofishing in the connecting channels and it has been assumed that juvenile Arctic Char and juvenile Burbot can also use this habitat during the open-water season. Therefore, for all large-bodied species the connecting channels have been assigned the same nursery HSIs as coarse substrate in the 0 – 2 m lake depth stratum. The connecting channels freeze during the winter and therefore have been assigned HSIs of zero

[2] Addresses, DFO 1- Freshwater Environment – Habitat Losses technical comment regarding consideration of all species, including bottom dwellers. Agnico Eagle (April, 2017). April 7th, 2017 submission NIRB File No. 16MN056 Application No: 124683/ NWB File No. 2AM WTP ---- : Receipt of Technical Review Comment Submissions for the NIRBs Review and NWB Consideration of Agnico Eagle Mines Ltd's " Whale Tail Pit" Project Proposal and associated Water License Application

[3] The stream habitat types were developed in response to DFO 4 and 8 Information Request. Agnico Eagle (January, 2017). DFO- 4 and 8 – Freshwater Environment- Habitat Alteration. January 20th, 2017 submission RE: NIRB File No 16MN056 Application No: 124683/NWB File No. 2AM WTP ----: Information Requests Received from Parties Regarding Agnico Eagles Mines Ltd's "Whale Tail Pit" Project.

for overwintering for all species and zero for spawning for fall/winter-spawning species, which includes all of the large-bodied species that are present.

Slimy Sculpin and Ninespine Stickleback, the two small-bodied species that are present in the study area, have both been captured in the connecting channels and are likely to use the shallow areas and interstitial spaces in much the same way that they do in shallow areas with coarse substrate in lake habitats. Therefore, for these two species the HSIs for coarse substrate in the 0 – 2 m deep stratum has also been used for the connecting channels.

The dimensions of the small streams in the Whale Tail pit primary study area summarized in Table A??. These streams typically have multiple channels and are shallow, with mean depths ranging from 6 cm to 17 cm. Peat is the dominant substrate in the majority of the watercourses and only watercourse A55-A17 is dominated by coarse substrates. These watercourses freeze in the winter and have been assigned HSIs of zero for overwintering for all species and zero for spawning for fall/winter-spawning species, which includes all of the large-bodied species that are present.

Electrofishing catches in these streams were dominated by Ninespine Stickleback and Slimy Sculpin and for these two species the HSIs for fine and for coarse substrates in the 0 – 2 m lake depth habitat (Habitat Types 1 and 3 respectively) have been applied to Habitat Types 12 and 13 for spawning, nursery and foraging.

One or more juveniles of all of the large-bodied species were captured in the small streams and the nursery HSIs for fine and for coarse substrates in the 0 – 2 m lake depth habitat (Habitat Types 1 and 3 respectively) have been applied to Habitat Types 12 and 13 for the four large-bodied species.

The absence of adult large-bodied fish from the electrofishing catches is consistent with their shallow nature and indicates that there is little if any foraging in theses streams by adults of the large-bodied species. It is thought that the few individuals that were captured in gill nets or hoop nets set in these streams were probably moving between lake habitats. The small streams have been assigned a HSI of zero (0) for foraging by the four large-bodied species.

Table 2-2. HSI values for the Whale Tail fish species (sp=spawning, nu=nursery, fo=foraging, ow=overwintering). *Habitat type 10 is applied to all non-backfilled pit areas with depth greater than 22 m.

Habitat Type	Depth	Substrate	Arctic Char				Lake Trout				Round Whitefish			
			SP	NU	FO	OW	SP	NU	FO	OW	SP	NU	FO	OW
1	<2 m	Fines	0	0.25	0.25	0	0	0.25	0.25	0	0	0.25	0.75	0
2	<2 m	Mixed	0	0.25	0.25	0	0	0.5	0.5	0	0	0.75	0.5	0
3	<2 m	Coarse	0	0.5	0.5	0	0	1	0.75	0	0	0.75	0.5	0
4	2-4 m	Fines	0	0.5	0.5	0.75	0	0.5	0.5	0.75	0	0.25	1	0.75
5	2-4 m	Mixed	0.5	0.75	0.75	0.75	0.5	0.75	0.75	0.75	0.5	0.75	0.75	0.75
6	2-4 m	Coarse	1	1	1	0.75	1	1	1	0.75	1	1	0.75	0.75
7	>4 m	Fines	0	0.25	0.5	1	0	0.25	0.5	1	0	0.25	1	1
8	>4 m	Mixed	0.5	0.5	0.75	1	0.5	0.5	0.75	1	0.25	0.25	0.5	1
9	>4 m	Coarse	1	0.5	1	1	1	0.5	1	1	0.75	0.5	0.5	1
10*	mixolimnion	Coarse	0	0	0	0	0	0	0	0	0	0	0	0
11	connecting channel	Coarse	0	0.5	0	0	0	1	0	0	0	0.75	0	0
12	stream	Fines	0	0.25	0	0	0	0.25	0	0	0	0.25	0	0
13	stream	Coarse	0	0.5	0	0	0	1	0	0	0	0.75	0	0
Habitat Type	**Depth**	**Substrate**	**Burbot**				**Slimy Sculpin**				**Ninespine Stickleback**			
			SP	NU	FO	OW	SP	NU	FO	OW	SP	NU	FO	OW
1	<2 m	Fines	0	0.25	0.25	0	0	0	0.25	0	1	1	1	0
2	<2 m	Mixed	0	0.75	0.5	0	0.25	0.25	0.5	0	0.5	0.5	0.75	0
3	<2 m	Coarse	0	1	0.5	0	1	1	1	0	0	0.25	0.75	0
4	2-4 m	Fines	0	0.25	0.25	0.75	0	0	0.25	0.75	0	0	0.5	0.75
5	2-4 m	Mixed	1	0.5	0.75	0.75	0.25	0.25	0.5	0.75	0	0	0.25	0.75
6	2-4 m	Coarse	0.75	0.5	1	0.75	0.75	0.75	1	0.75	0	0	0.25	0.75
7	>4 m	Fines	0	0	0.25	1	0	0	0	1	0	0	0	1
8	>4 m	Mixed	1	0	0.75	1	0	0	0.25	1	0	0	0	1
9	>4 m	Coarse	0.75	0.25	1	1	0.5	0.5	0.5	1	0	0	0	1
10	mixolimnion	Coarse	0	0	0	0	0	0	0	1	0	0	0	0
11	11	connecting channel	0	1	0	0	1	1	1	0	0	0.25	0.75	0
12	12	stream	0	0.25	0	0	0	0	0.25	0	1	1	1	0
13	13	stream	0	1	0	0	1	1	1	0	0	0.25	0.75	0

2.1.3 Life Function Weight

This HEP values all life functions equally, with a weight of 0.25 each assigned for spawning, nursery, foraging and overwintering.

2.1.4 Species Weight

The overall species weights used in the HEP method sum to 1 across species. The species weights for various Meadowbank offsetting plans are comprised of a biomass weighting and a fishery value weighting:

Species weight = (biomass weight/2) x (fishery weight/2)

In the conceptual Whale Tail pit offsetting plan (Agnico, 2016) the biomass weight was based on the relative biomass of the species determined during fish-outs of Meadowbank site lakes that have been drained, with one percent allocated to each of slimy sculpin and ninespine stickleback, as they are not susceptible to the gill nets used in the fish-outs. Also, in the conceptual Whale Tail pit offsetting plan (Agnico, 2016) a modification of this approach was proposed that included an aboriginal fishery value which would be determined through community consultations. In subsequent discussions, DFO has indicated a preference for all species to be weighted equally[4]. Therefore, each of the six species that are present in the study area has a weight of 0.165 in the calculations presented in this document.

2.1.5 Access Factor

In a workshop conducted in February, 2012 (The Basic Concepts of No Net Loss Accounting - February, 2012) Dr. Charles K. Minns suggested the use of an access factor when fish assemblages are expected to change in the offsetting scenario. According to this concept, the access factor is 1 for any species present in the habitat area, and 0 for any species not present (Table 2-3). Each species receives an access factor in both the loss and gain calculations. Therefore, the opening of access to a habitat area for a species (that did not have access previously), results in an increase of habitat units. Similarly, the loss of access results in a loss of habitat units. These gains or losses may be complete (i.e. affect all species), or partial (only some species are affected). The presence or absence of a species in loss calculations is typically based on on the observed presence/absence of each species during baseline monitoring studies (AEM, 2012, 2013, 2016). If a change in access is predicted for an offset

[4] Agnico Eagle (January, 2017). KivIA – IR – Aquatic- Final fish habitat offsetting plan. January 20th, 2017 submission RE: NIRB File No 16MN056 Application No: 124683/NWB File No. 2AM WTP ----: Information Requests Received from Parties Regarding Agnico Eagles Mines Ltd's "Whale Tail Pit" Project. &

Agnico Eagle (April, 2017). DFO 5- Freshwater Environment – Changes to Lake Ecosystem Productivity. April 7th, 2017 submission NIRB File No. 16MN056 Application No: 124683/ NWB File No. 2AM WTP ---- : Receipt of Technical Review Comment Submissions for the NIRBs Review and NWB Consideration of Agnico Eagle Mines Ltd's " Whale Tail Pit" Project Proposal and associated Water License Application

scenario (i.e. due to the removal of a barrier to fish movement) the change would need to be confirmed as part of compensation monitoring.

Table 2-3. Access factor theoretically applied to each species for habitat loss and gain calculations, based on presence/absence (or anticipated presence/absence, for offsetting projects).

Scenario	Access Factor	
	Losses	Gains
Species Present	1	1
Species Not Present	0	0

Typically, the access factors applied are based on the observed presence/absence of each species during baseline monitoring studies (AEM, 2012, 2013, 2016). For the calculations in this report, an access factor of 1 has been applied for all six fish species that have been captured in the study area. The effect of isolating the north-east pond during operations has been addressed by conservatively estimating that habitat is temporarily 'lost'.

2.1.6 Habitat Co-factor

The habitat co-factor represents any changes to non-mapped habitat quality (thermal, hydrological, biological or chemical regimes) that will occur in the fish habitat in question as a result of impacts or offsetting. The use of this factor is suggested by Dr. Ken Minns, and his suggested values as presented in a workshop for DFO in February, 2012 are shown in Table 2-4. No habitat co-factor has been applied to the HEP calculations presented in this report

Table 2-4. Habitat co-factor for various pre- and post-compensation scenarios, according to Minns, 2012.

Change in regime	Description	Baseline conditions factor	Post-closure factor
Degradation (expected)	Thermal, hydrologic, chemical and/or biological regime shifts away from preferred state for fish habitat	1	> 0 and < 1
No change	-	1	1
Enhancement (anticipated or proposed)	Thermal, hydrologic, chemical and/or biological regime expected to shift towards preferred state for fish habitat	> 0 and < 1	1

SECTION 3 • CHANGES IN HABITAT

The proposed approach to mining the Whale Tail Pit is to build three dikes in order to isolate the pit area. The area within those dikes would be dewatered to allow mining to occur. The When mining is completed, the dikes would be breached, allowing the pit to flood and water elevations to return to baseline conditions. The proposed operations phase and post-closure phases are shown in Figure 3-1 and Figure 3-2.

3.1 CHANGES FROM EXISTING CONDITIONS DURING THE OPERATIONS PHASE

The area to be enclosed by dikes and dewatered during mine operations includes the northern basin of Whale Tail Lake and a small portion at the east end of Mammoth Lake as well as the connecting channel between those two lakes. The exterior surface of the dikes will be coarse substrate.

An area to the north of Whale Tail Lake, that includes a number of small lakes and ponds which currently drain to Whale Tail Lake, would be isolated by the north dike. In this area, referred to as the north-east pond, the water level would rise to 156.47 masl, resulting in the flooding of some terrestrial areas. This area would drain to Nemo Lake. It has been assumed that fish from Nemo Lake would not have access to the north-east pond and therefore it will be completely isolated. It has also been assumed, at this time, that due to the limited amount of deep habitat in the north-east pond, fish might not survive the winter there. Therefore the habitat present in the area occupied by north-east pond under base line conditions is assumed to be 'lost' during the operations phase. If monitoring determines that fish survive there, an operations phase offsetting credit could be calculated.

South of the Whale Tail Dike that bisects Whale Tail Lake the water level will rise to 156 masl. This will result in the flooding of terrestrial areas so that a number of lakes that are now connected to each other or to Whale Tail Lake (South Basin) by connecting channels (lakes A18, A19, A20, A21 and A22) or small streams (lakes A55, A62, A63), or have no surface connection to Whale Tail Lake (lake A65), would become contiguous. This larger contiguous waterbody is referred to in this document as *the expanded Whale Tail Lake*; fish salvaged during the fishout of Whale Tail Lake (North Basin) will be transferred to the expanded Whale Tail Lake (Agnico Eagle, 2017a) The expanded Whale Tail Lake will drain to Lake A45 via a constructed channel and Lake A45 will drain to Mammoth Lake via an existing boulder feature. The boulder feature between Lake A45 and Mammoth Lake does not exhibit surface flow under existing conditions, even during spring freshet. It has not yet been determined if it will be necessary to modify that connection, but for the purposes of the habitat calculations it has not been assigned any fish habitat value during any phase of the project.

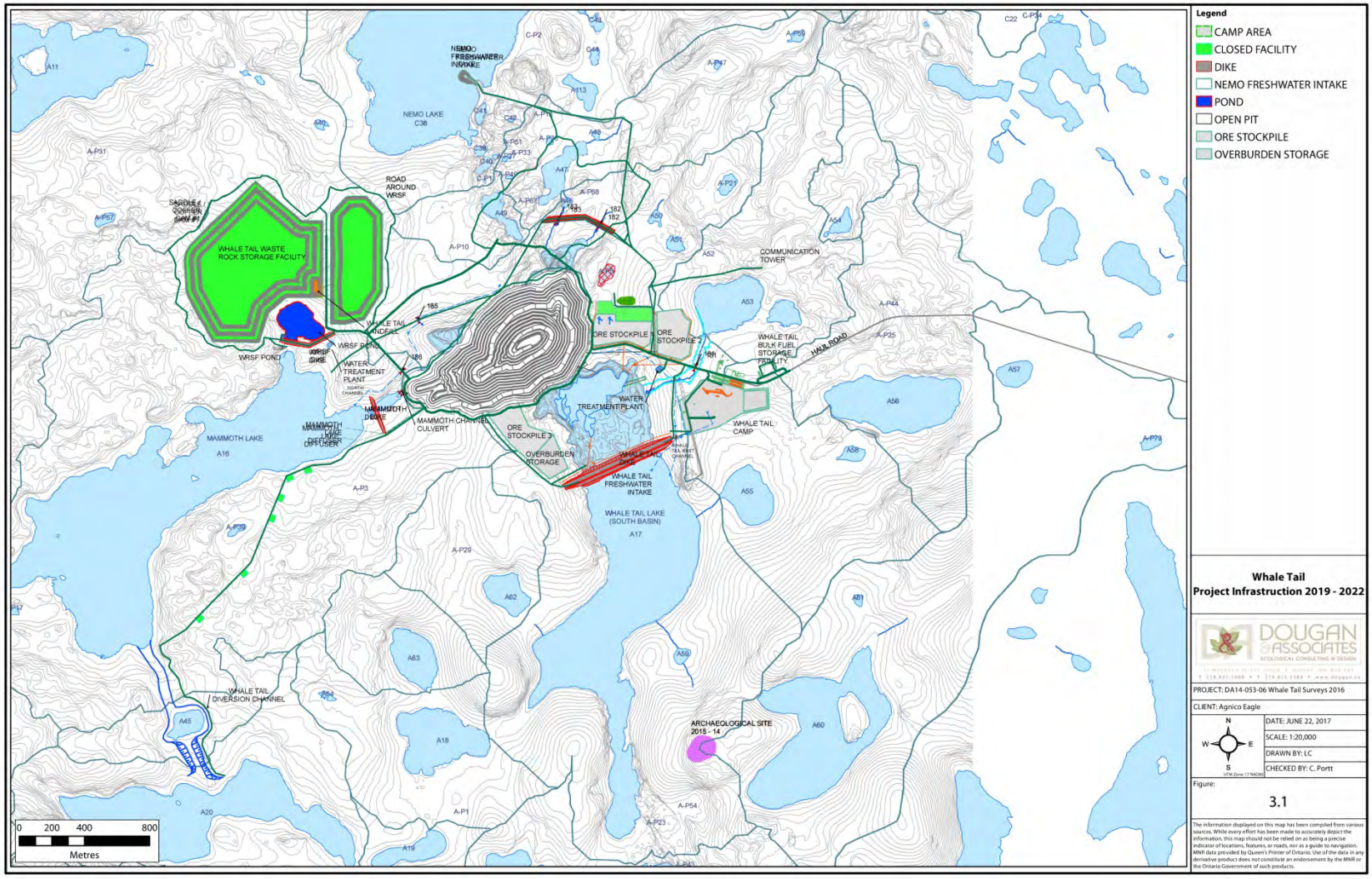


Figure 3-1. Whale Tail Project Infrastructure 2019 to 2022.

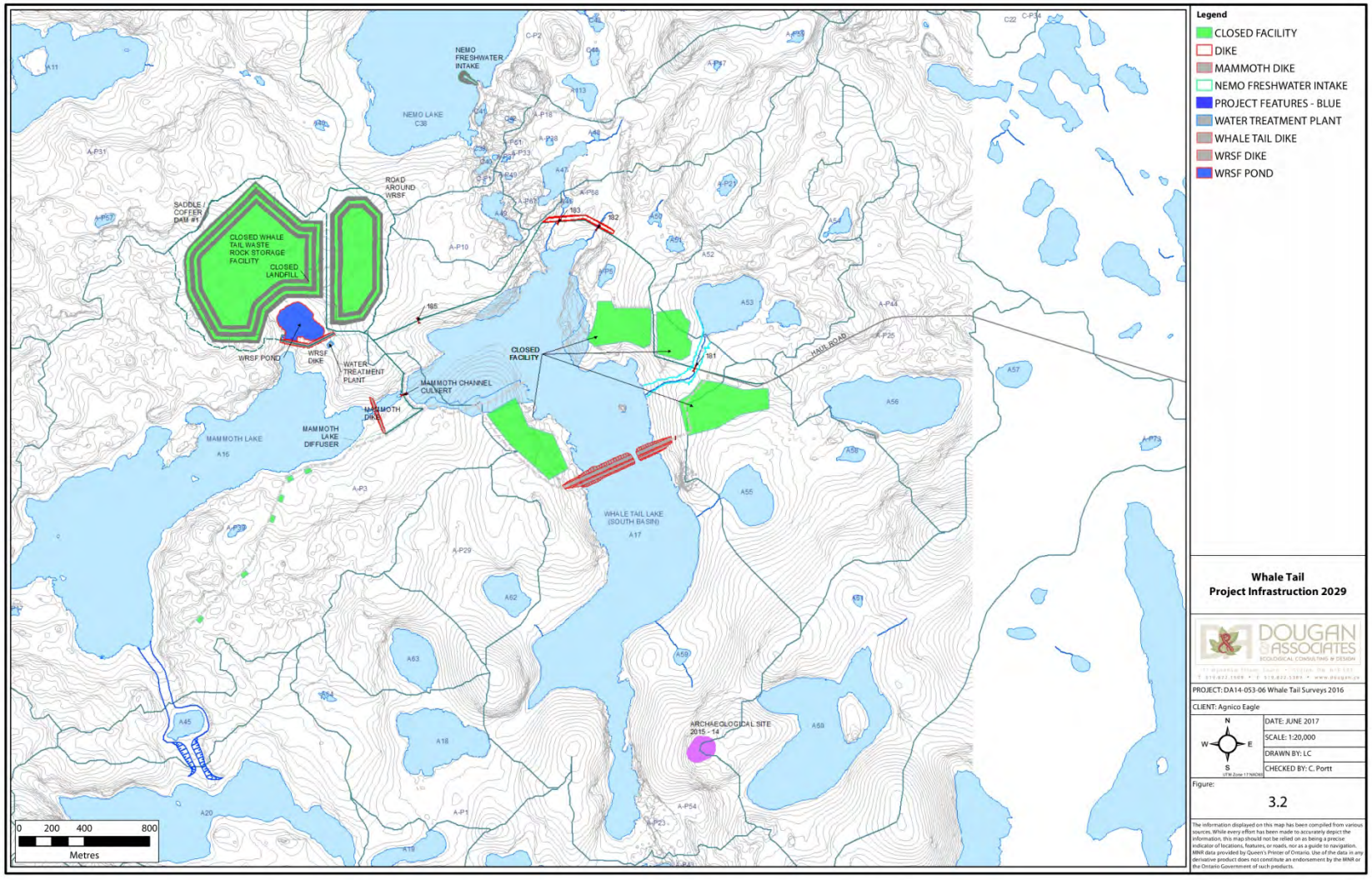


Figure 3-2. Whale Tail Project Infrastructure 2029.

Lake A53, east of Whale Tail Lake, currently drains to the portion of Whale Tail Lake that would be dewatered. The lower reach of the existing watercourse will be eliminated and a new watercourse would be constructed to convey this flow to Whale Tail Lake south of the Whale Tail Dike. The proposed route of this realignment is shown in Figure 3-1. It has been assumed that the width and the proportions of fine and coarse substrates of the realigned portion will be the same as those of the existing watercourse.

There will be a reduction in the flow to Mammoth Lake and downstream during the period when the expanded Whale Tail Lake is filling, before flow via Lake A45 occurs. Flow into Mammoth Lake approaches zero during the latter part of the ice-free season under base line conditions. During the period when the expanded Whale Tail Lake is filling, the water level in Mammoth Lake is expected to be at or near what is its minimum elevation under baseline conditions. This will occur again during closure when the pit is refilling. This temporary condition has not been incorporated into the HEP calculations.

In addition to the alterations within the Whale Tail Lake and Mammoth Lake drainages, a water intake jetty would be constructed in Nemo Lake that will result in a change in depth and substrate, including an area that will be raised so that it is above the water surface and no longer fish habitat. The jetty will have coarse substrate.

3.2 CHANGES FROM EXISTING CONDITIONS FOLLOWING MINE CLOSURE

3.2.1 Post-closure conditions without offsetting measures

Based on current Whale Tail Pit mining plans it is assumed that, in the absence of offsetting measures, the dikes would be breached and water levels would return to pre-mine elevations following mine closure by 2029. Therefore, the aquatic habitats would revert to their pre-mine condition with the following exceptions:

1. The area of Whale Tail Lake will be increased by 27.94 ha as a consequence of terrestrial areas being excavated and becoming part of the flooded pit, post-closure.
2. A portion of what was Whale Tail Lake under baseline conditions will be excavated as part of the pit and will be deeper post-closure. All of the pit that is more than 22 m deep is classed as Habitat Type 10. The areas that are less than 22 m deep are assigned a habitat type based on their depth and assuming they have coarse substrate.
3. A pit cap will be constructed around the pit. This area will have coarse substrate.
4. The Whale Tail Dike that bisects Whale Tail Lake will be breached but not removed following mine closure. Therefore it will continue to occupy a portion of what was previously Whale Tail Lake and a portion of it will be above the water. For the purposes of habitat calculations, it has been assumed that a 100 m wide breach will be created in the Whale Tail Dike.

5. The Mammoth Dike that isolates the eastern end of Mammoth Lake will be reduced in height, so that it becomes shallow lake habitat with coarse substrate (Type 3 habitat).
6. The North-east Dike will be breached at the locations where two small watercourses existed pre-construction, so that the watercourses are re-established and the lakes and ponds are reconnected to Whale Tail Lake through the approved access road culverts.
7. The portion of the watercourse connecting Lake A53 to Whale Tail Lake that was re-aligned will be returned to its former channel.
8. Roads that are flooded post-operations will remain in their operations phase condition and have mixed substrate.
9. A jetty to the attenuation pond that is in the dewatered area during operations will remain in its operations phase condition and have coarse substrate.
10. The jetty for the freshwater intake in Nemo Lake will remain in its operations phase condition.

3.2.2 Proposed offsetting measures

In order to offset for the losses that result from baseline to post-closure habitat changes the following offsetting measures are proposed:

1. A portion of the top of the Mammoth Dike will be reconfigured to create a surface connection between Whale Tail and Mammoth Lake but raises the elevation of Whale Tail Lake by 0.5 m.
2. The roads within the area that is flooded post-closure will be scarified to convert them from mixed to coarse substrates.
3. Rock shoals will be constructed within the dewatered area prior to reflooding, to convert areas of fine substrate to coarse substrate. For the purposes of the habitat calculations, it was assumed that these rock shoals would decrease depth by 0.5 m.

Increasing the water level by 0.5 m in the area upstream from the Mammoth Dike has the following effects on habitat:

- the portion of Mammoth Lake that is upstream from the Mammoth dike becomes part of Whale Tail Lake and increases in depth, as does the portion of the connecting channel between Mammoth and Whale Tail Lakes that remains post-closure,
- the depth of habitats in Whale Tail Lake are increased by 0.5 m relative to base line conditions,
- an area of terrestrial habitat around Whale Tail Lake is flooded and becomes part of the lake.
- A portion of the small streams that drain into Whale Tail Lake are flooded and become part of the lake.

- A portion of the connecting channel between Lake A18 and Whale Tail Lake is flooded and becomes part of Whale Tail Lake.

3.2.1 Habitat Area and Habitat Units Calculation

The depth zones, substrate types (fines, mixed, coarse), and habitat types under baseline conditions are shown in Figure 3.3, 3.4 and 3.5, respectively.

As indicated previously, for the operations phase, the extent of flooding and the depths were calculated based on a 156 masl elevation for the expanded Whale Tail Lake and no change from baseline conditions to the elevation of Mammoth Lake. The substrate for the flooded terrestrial areas was assigned based on the ecological land classification community types, as shown in Table 3-1. The dike side slopes and the freshwater jetty in Nemo Lake will have coarse substrate. The constructed channel connecting the expanded Whale Tail Lake to Lake A45 will be less than 2 m deep and have coarse substrate. It has been assumed that the connection between Lake A45 and Mammoth Lake will continue to be subsurface/interstitial during operations and that it will not provide fish habitat. The depth zones, substrate types (fines, mixed, coarse) and habitat types for the operations phase are shown in Figure 3.6, 3.7 and 3.8 respectively.

Table 3-1. Substrate category assigned to flooded terrestrial areas based on the terrestrial ecological land classification community types that are present under baseline conditions.

Substrate category	ELC Community Type
Coarse	Boulder/gravel
	Lichen/rock
Fine	Graminoid tundra
	Wet graminoid
	Sand
Mixed	Graminoid/Shrub tundra
	Heath tundra
	Heath upland
	Heath upland/rock complex
	Lichen tundra
	Shrub tundra
	Shrub/heath tundra

The depth zones, substrate types (fines, mixed, coarse), and habitat types following closure and reflooding of the pit, in the absence of any measures to offset for harm to fish habitat, are shown in Figures 3.9, Figure 3.10 and 3.11 respectively. For these calculations it was assumed that the elevations of all lakes would revert to their pre-construction levels. It was also assumed that substrate within the area that was dewatered did not change from pre-construction conditions unless it was excavated as part of the pit or the pit cap, or covered by infrastructure (dikes, roads, jetties).

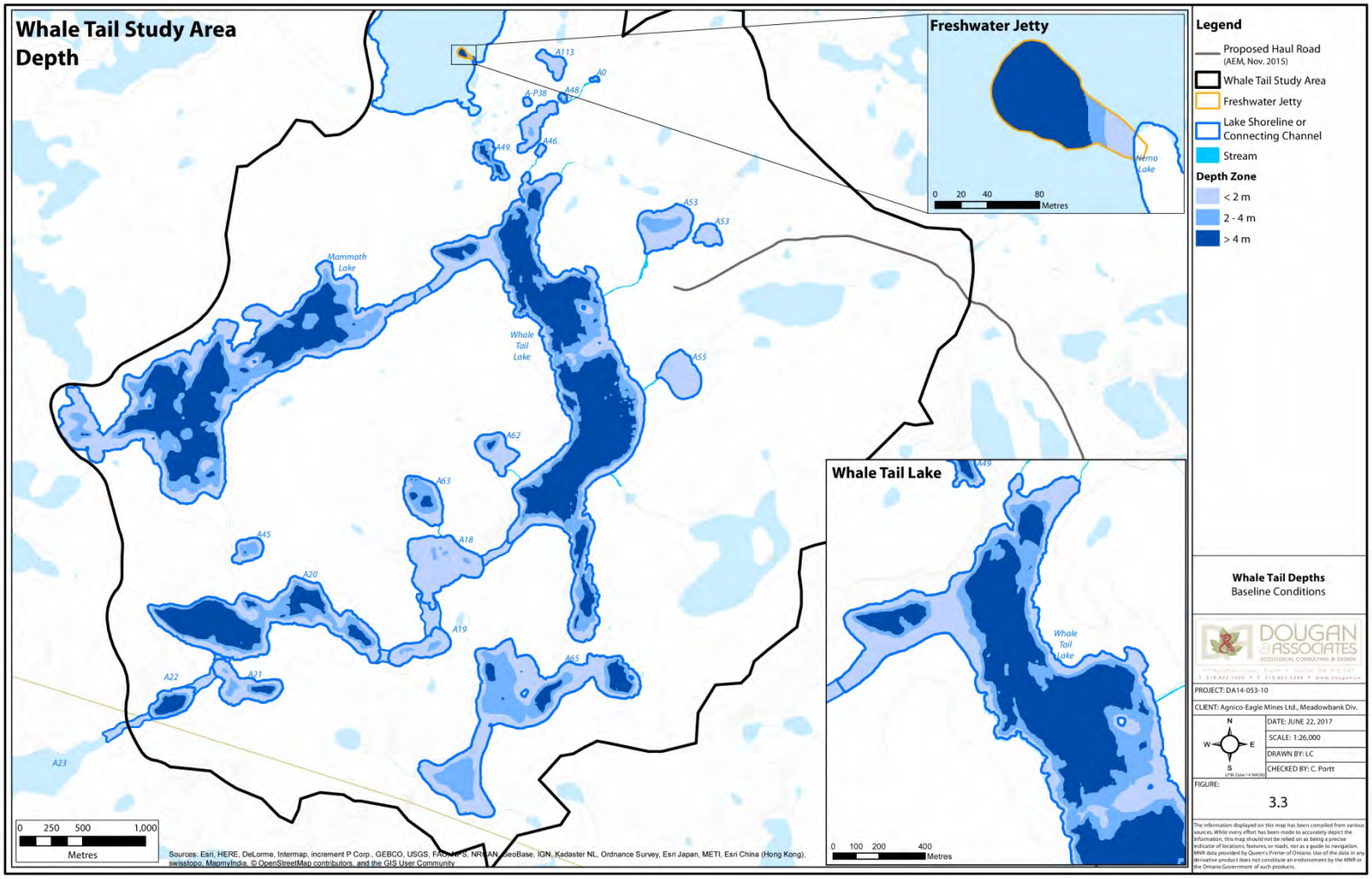


Figure 3-3. Whale Tail pit lake study area depths under baseline conditions.

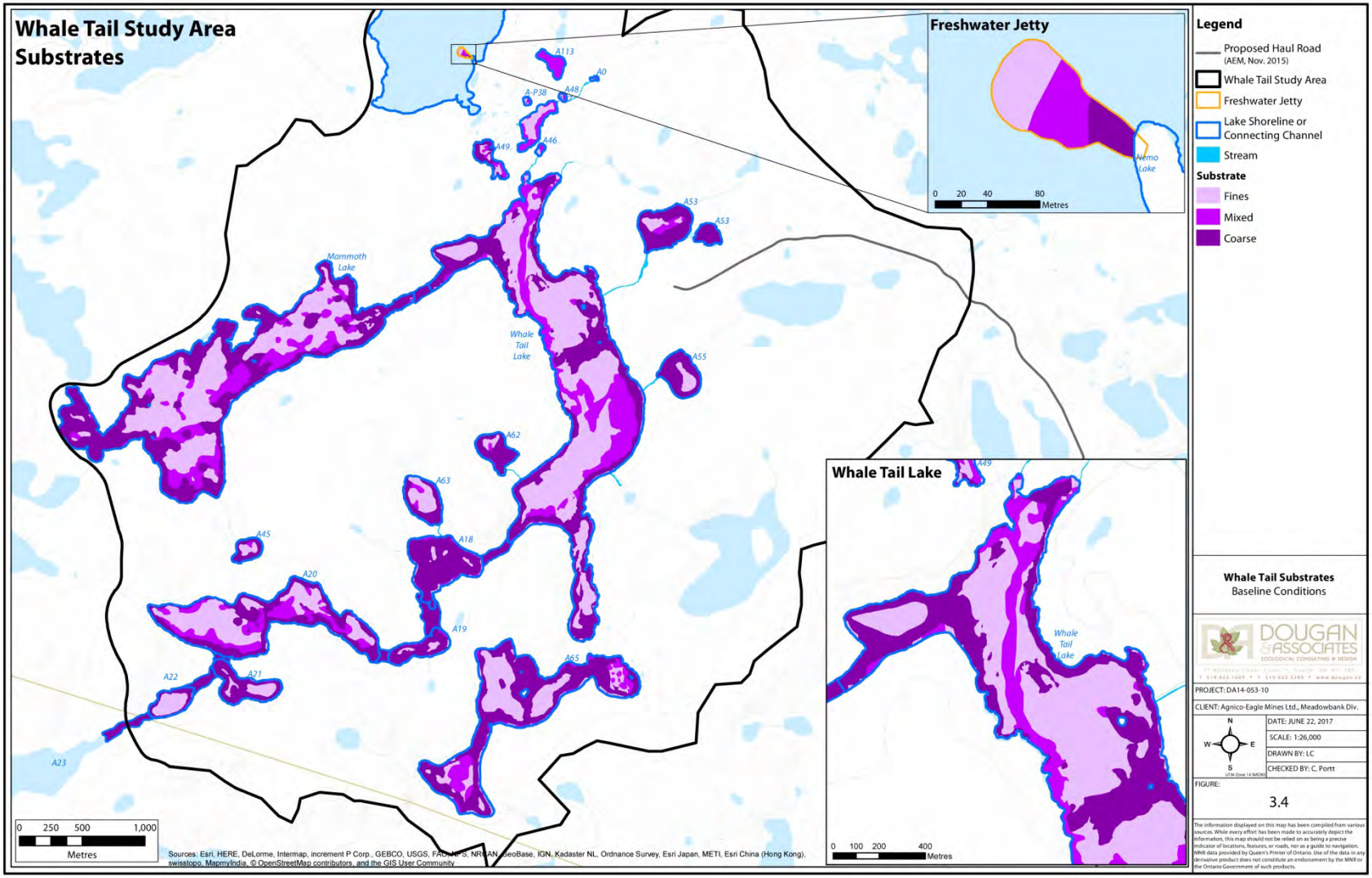


Figure 3-4. Whale Tail pit study area substrates under baseline conditions.

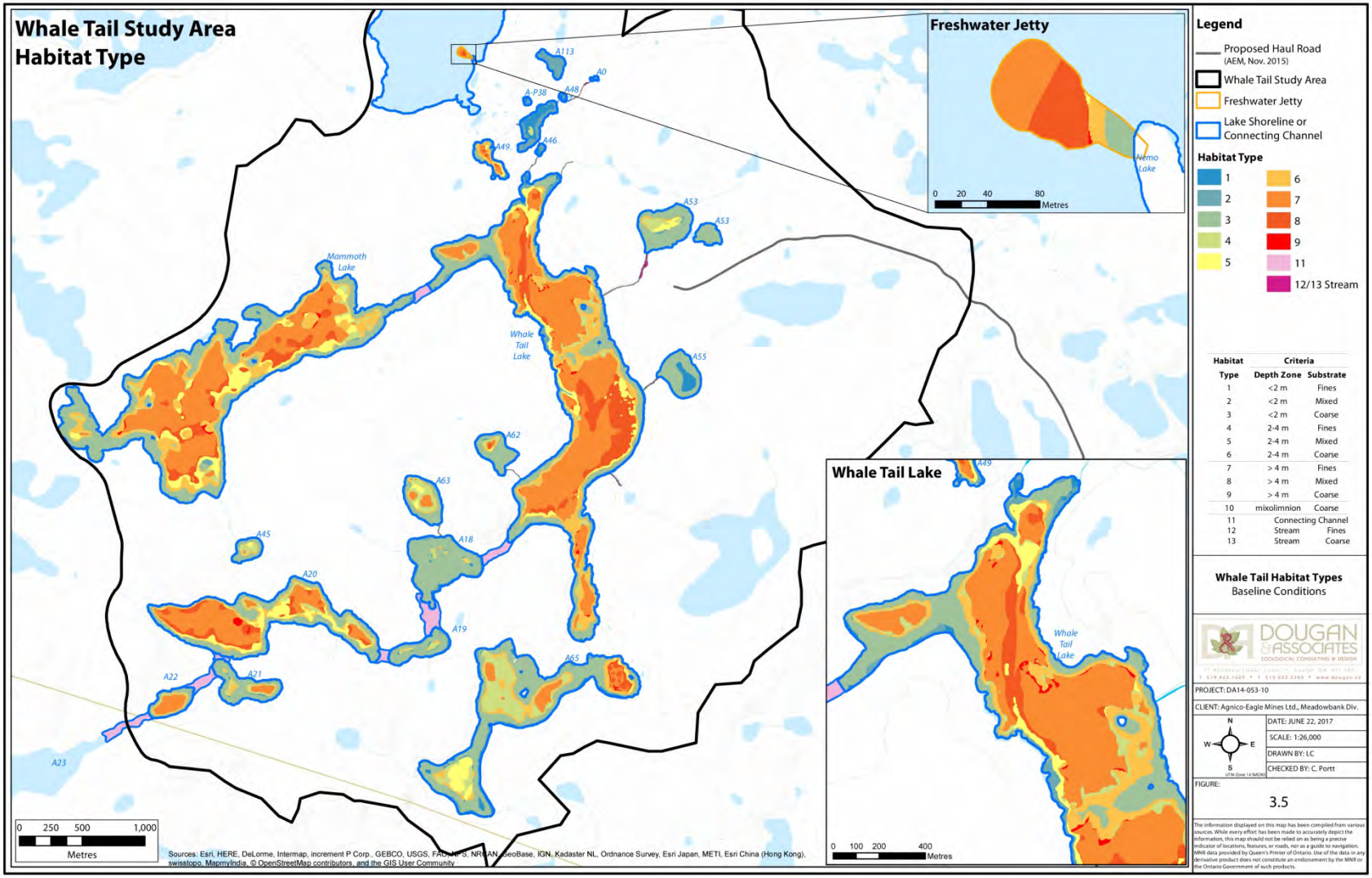


Figure 3-5. Whale Tail pit study area habitat types under baseline conditions.

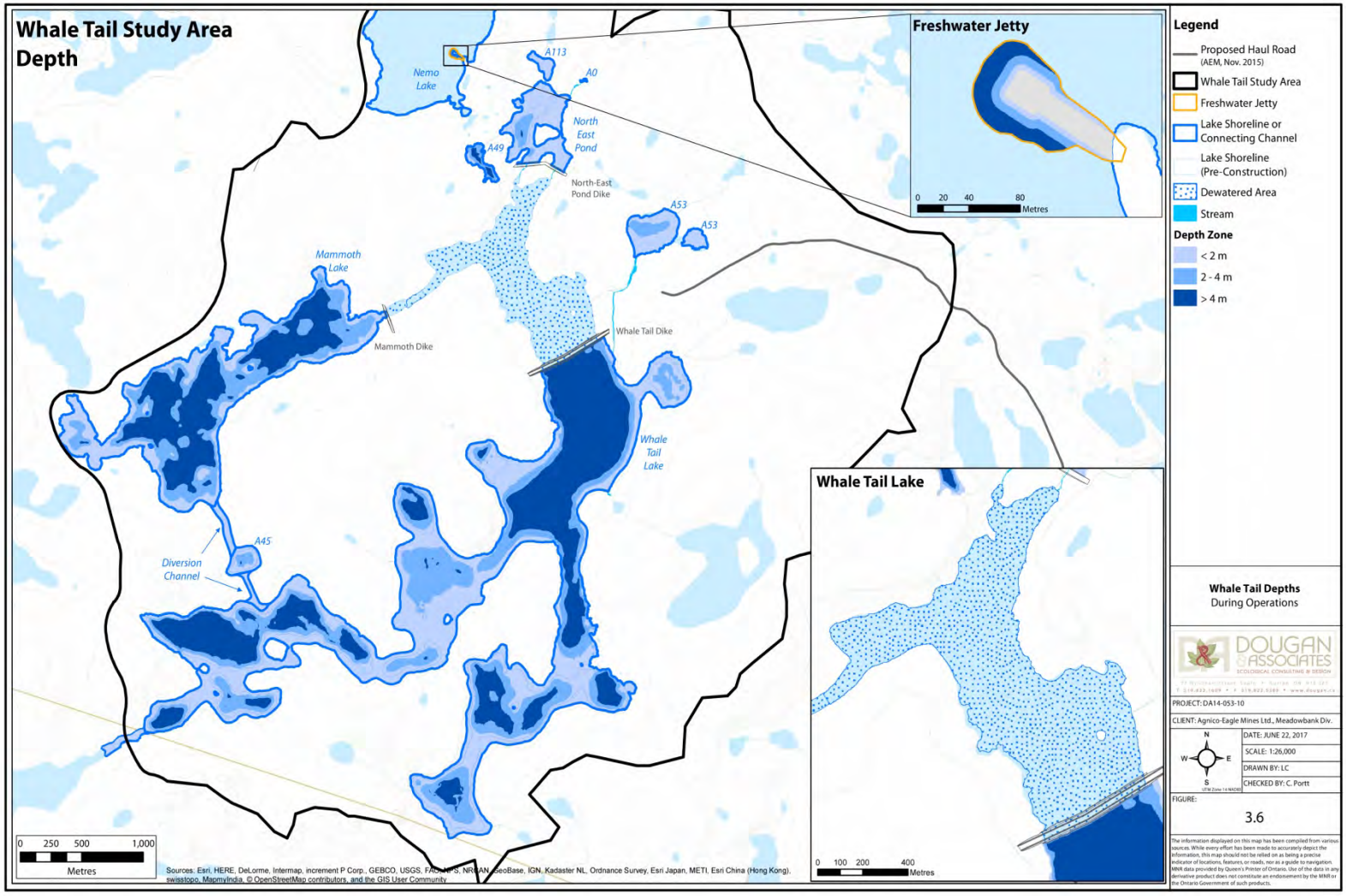


Figure 3-6. Whale Tail pit study area depths during operations.

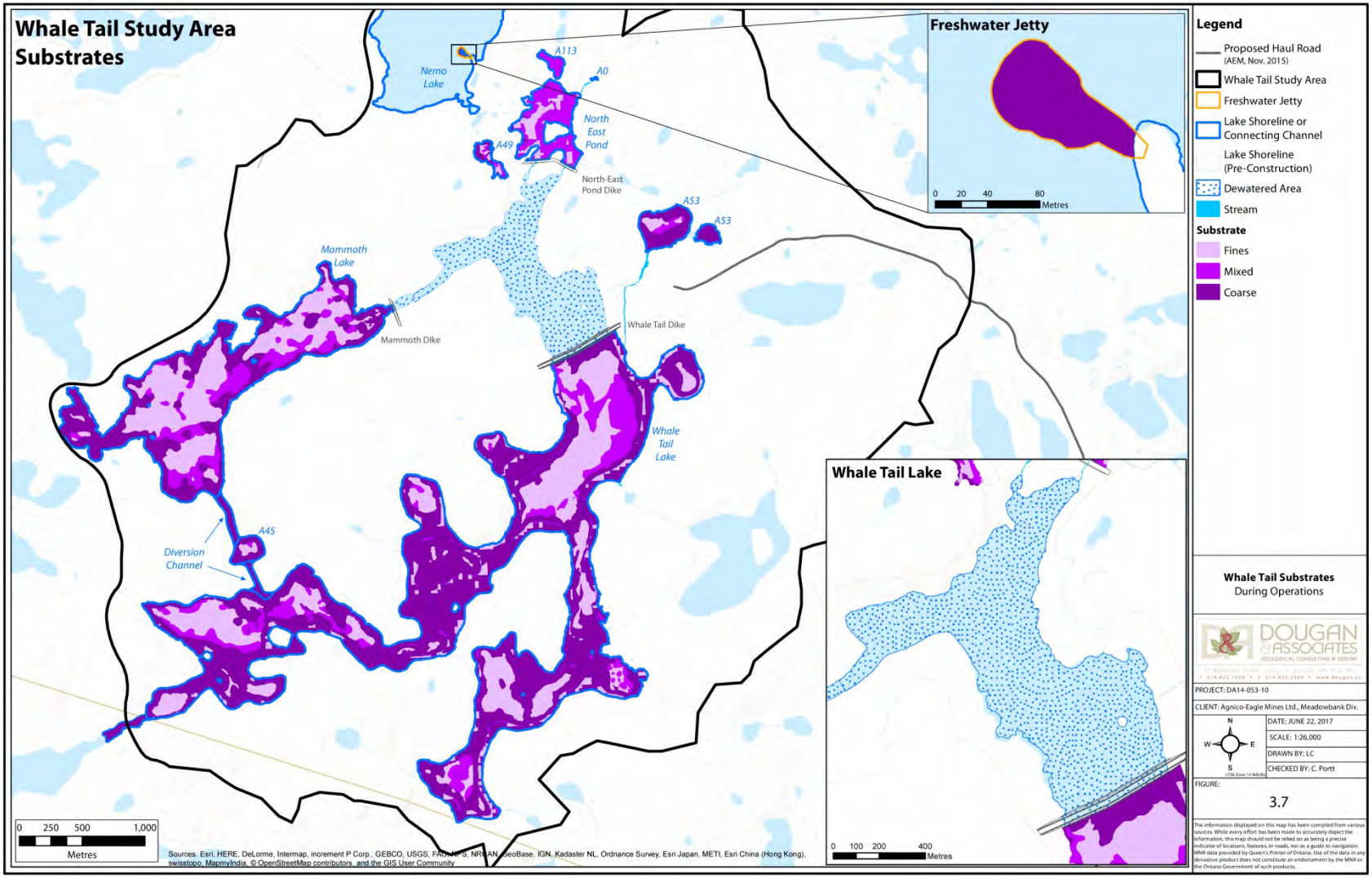


Figure 3-7. Whale Tail pit study area substrates during operations.

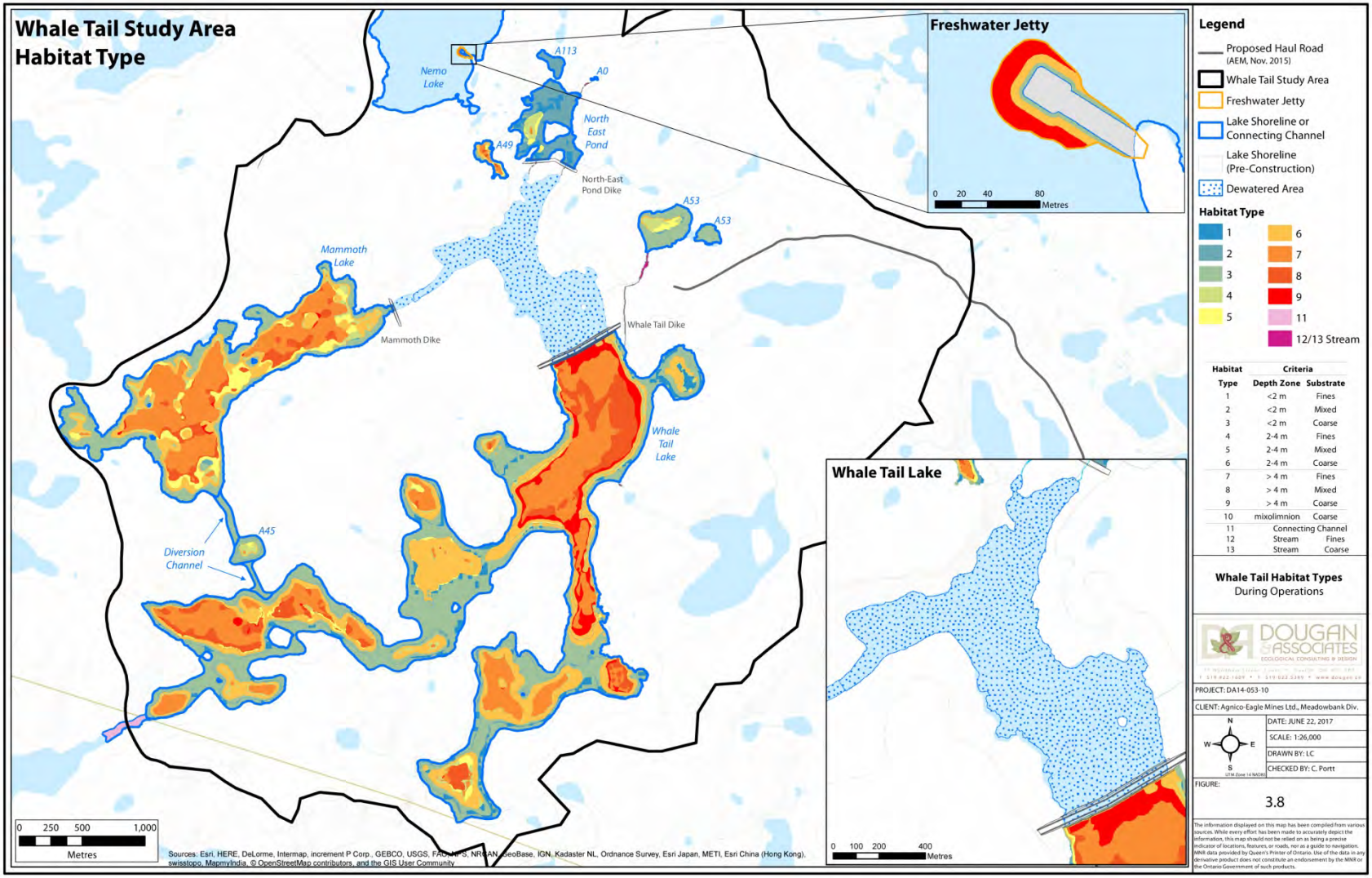


Figure 3-8. Whale Tail pit habitat types during operations.

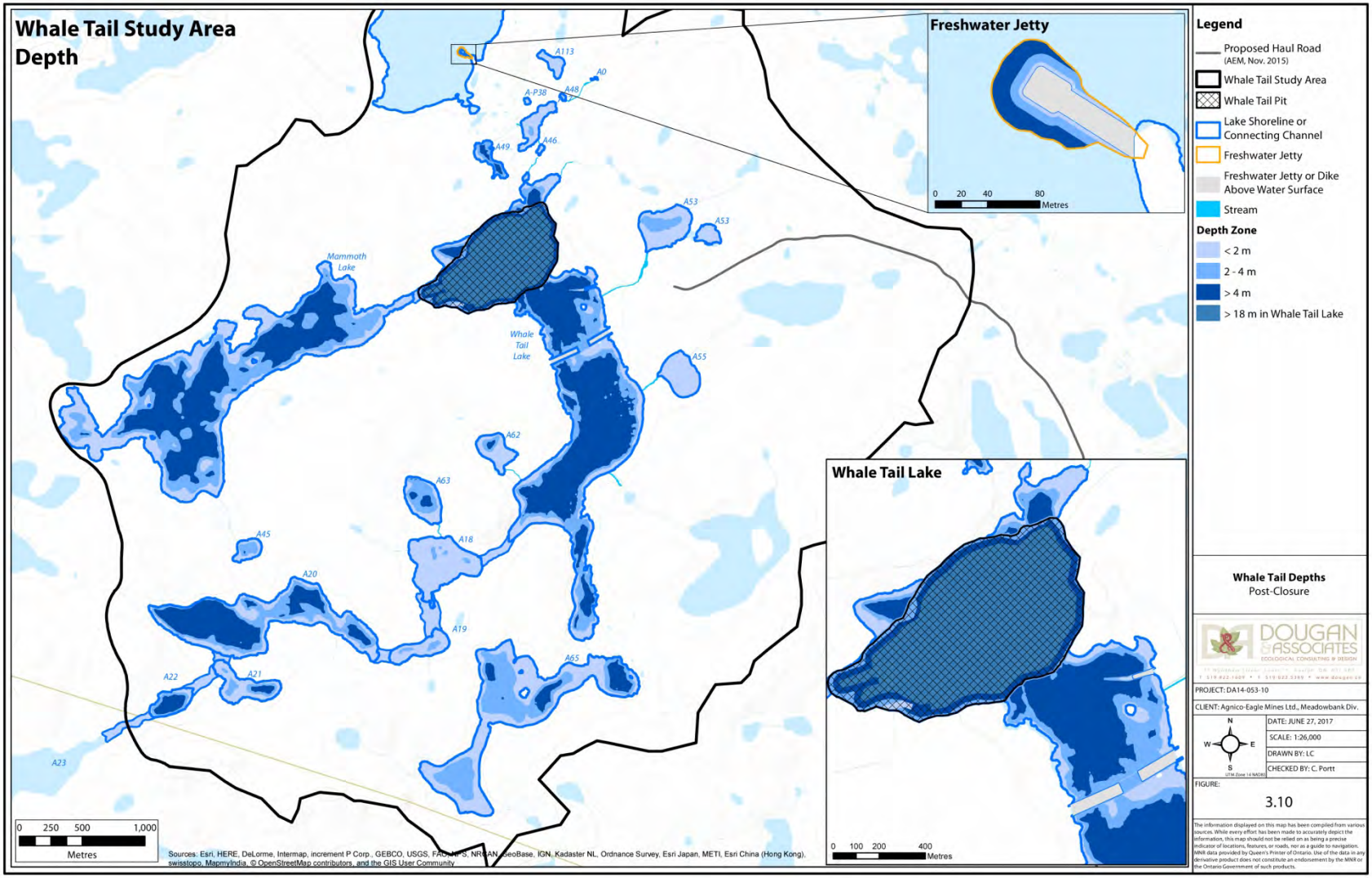


Figure 3-9. Whale Tail pit depths post-closure with no offsetting.

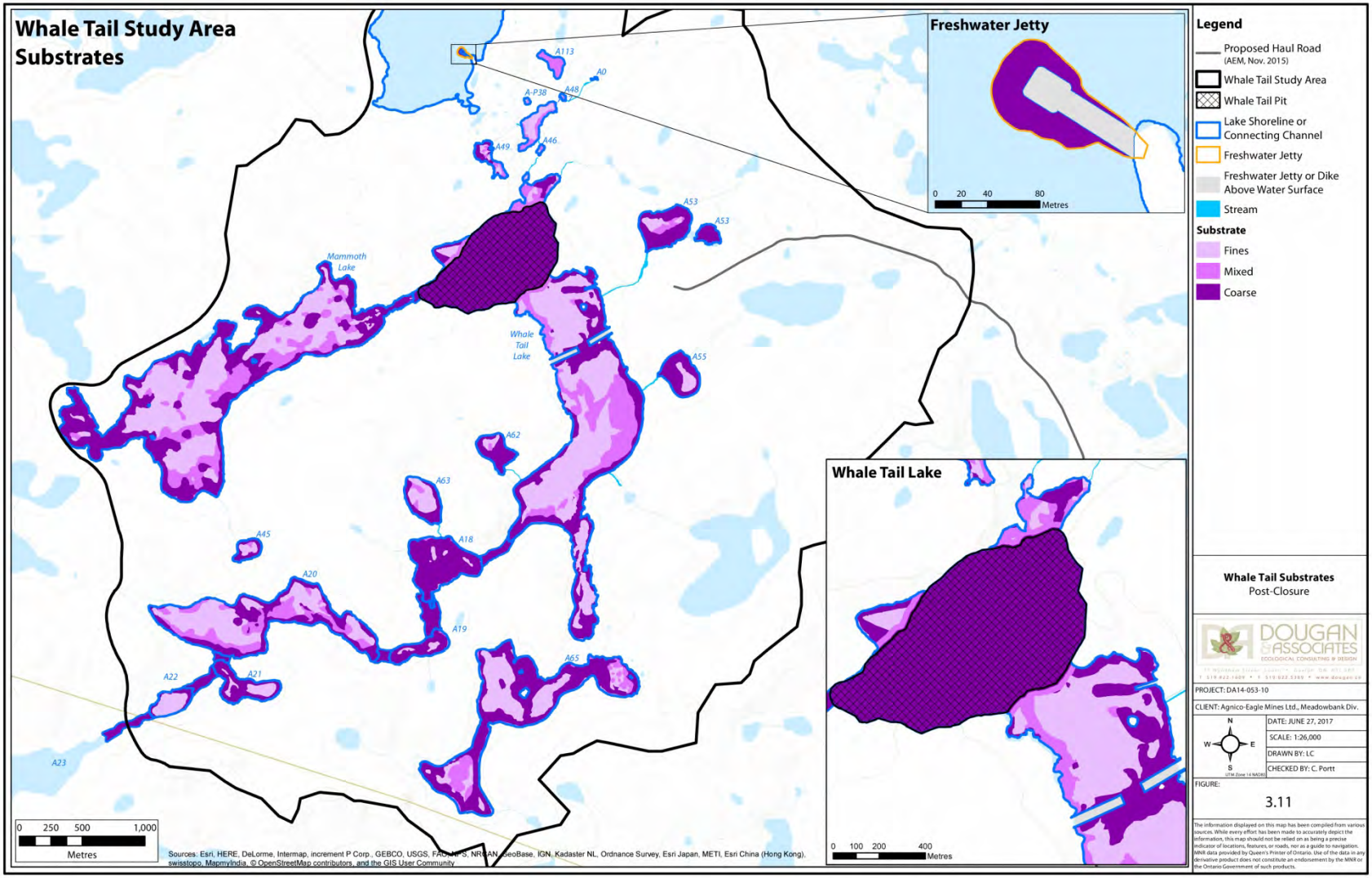


Figure 3-10. Whale Tail pit substrates post-closure with no offsetting.

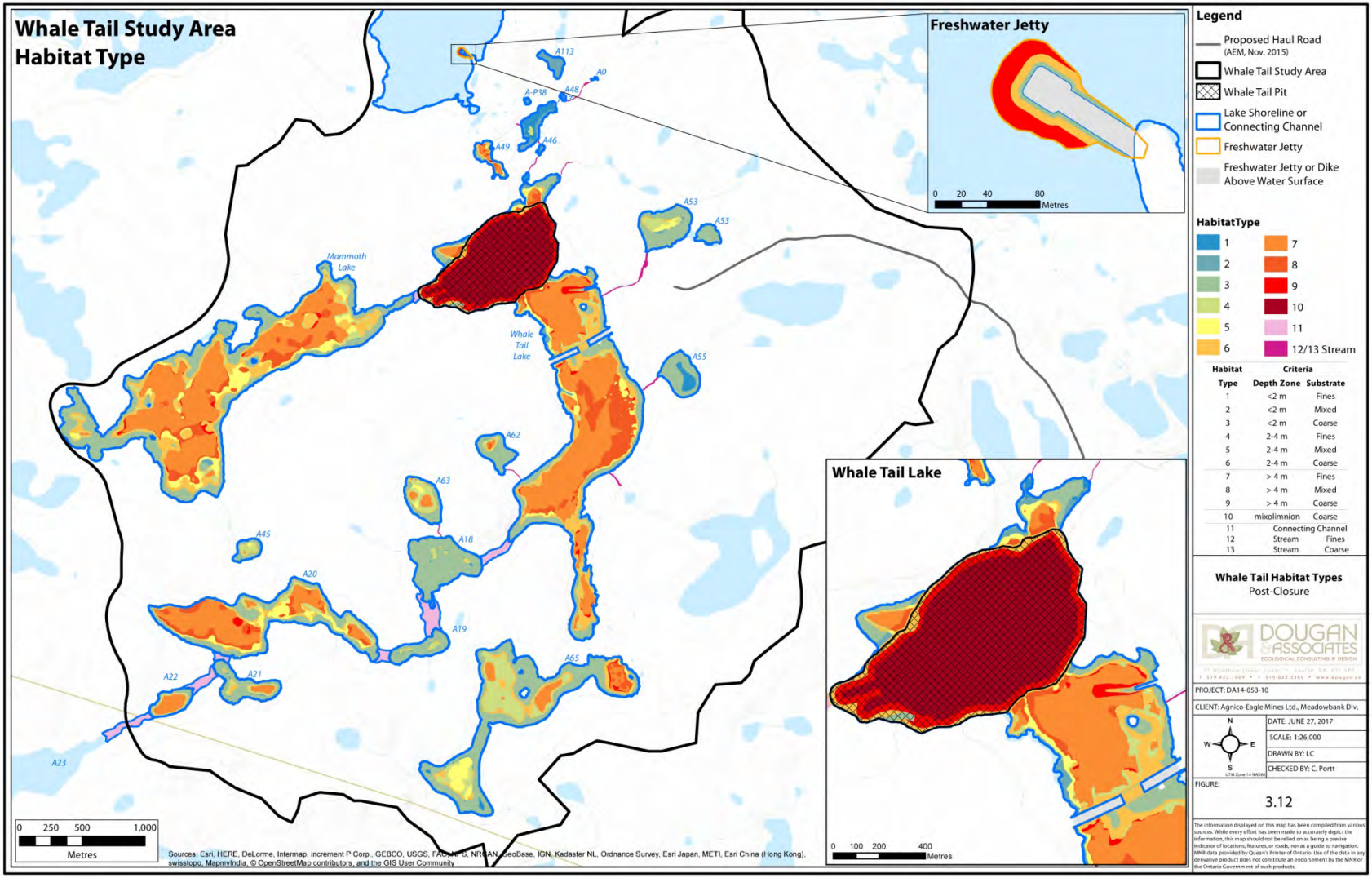


Figure 3-11. Whale Tail pit habitat types post-closure with no offsetting.

3.3 COMPARISON OF PRECONSTRUCTION PHASE TO OPERATIONS PHASE

The changes in habitat area and habitat units between the pre-construction and operations phases are summarized in Table 3-2. The locations and areas of habitat losses and gains and habitat modified are presented in Table 3-3. The habitat unit calculations are provided in Appendix B. Overall, there is a 49.24 ha increase in the area of fish habitat and a 42.93 increase in the number of habitat units during operations. There are relatively small decreases in the habitat area and habitat units in Nemo Lake as a result of the construction of the freshwater intake jetty. The area of Mammoth Lake is decreased due to the construction of the Mammoth dike and the dewatering of the portion of Mammoth Lake that is east of that dike, resulting in a concomitant number of habitat units.

Table 3-2. Changes in habitat area and habitat units between preconstruction phase and operations phase, by feature/habitat type.

	Change from pre-construction phase to operations phase	
Feature/habitat type	**Hectares**	**Habitat Units**
Nemo Lake	-0.2	0.0
Mammoth Lake	-1.2	-0.5
Whale Tail Lake (expanded during operations)	240.6	122.3
Other Lakes and Ponds	-183.6	-77.0
Connecting channels	-8.0	-2.4
Streams	-0.3	-0.1
Diversion Channel A17-A45	1.8	0.5
Net change	49.2	42.9

The expanded Whale Tail Lake during operations (407.8 ha) includes the portion of Whale Tail Lake that is not dewatered plus the other existing lakes, connecting channels and streams that are within the flooded area (280.0 ha), land that is flooded (127.4 ha), and the portion of the south side of the Whale Tail dike that is below the water (0.4 ha). The total area of habitat lost, including the habitat that is isolated in the north-east pond, is 73.7 ha. In addition to the increase in habitat area, during the operations phase the habitat value increases in some of the existing habitats where depth increases, contributing to the overall increase in habitat units.

Table 3-3. Area of habitat that is lost, isolated in the north-east pond, unaltered, modified and created during the operations phase.

Changes to habitat	Area in hectares
Habitat lost during operations	
Nemo Lake filled	0.2
Whale Tail Lake dewatered	69.5
Mammoth Lake dewatered	1.1
Streams dewatered	0.4
Whale Tail Lake covered by dike and dry during operations	2.5
Mammoth Lake covered by dike and dry during operations	0.1
Total habitat lost during operations	73.7
Habitat isolated in north-east pond during operations	
Existing lake and pond habitat	7.4
Existing stream habitat	0.1
Total isolated in north-east pond (assumed not to be fish habitat)	7.6
Habitat not altered during operations	
Mammoth Lake	150.5
Portion of connecting channel A23-A22	1.4
Portion of watercourse A53-A17	0.4
Total habitat not altered during operations	152.3
Existing Habitat modified during operations	
Existing Nemo Lake covered by freshwater jetty	0.4
Existing Mammoth Lake covered by Mammoth dike	0.0
Existing Whale Tail Lake (water level increased)	94.8
Existing Whale Tail Lake covered by dike (wetted portion)	0.4
Other existing lakes in expanded Whale Tail Lake (water levels increased)	177.8
Lake A45 water levels increased	2.9
Existing connecting channels converted to lake habitat	7.1
Existing streams converted to lake habitat	0.3
Total existing habitat modified during operations	283.8
Habitat created during operations	
Land flooded around expanded Whale Tail Lake	127.4
New channel alignment for stream A53-A17	0.2
Connecting channel constructed between A17 and A45	1.8
Land flooded around Lake A45	1.6
Total habitat created during operations	130.9

3.4 COMPARISON OF PRECONSTRUCTION PHASE TO POST-CLOSURE PHASE

The changes in habitat area and habitat units between the pre-construction phase and the post-closure phase, without offsetting, are summarized in Table 3-4. The locations and areas of habitat losses and gains and habitat modified are presented in Table 3-5. The habitat unit calculations are provided in Appendix B.

There is the same small reduction in both habitat area and habitat units in Nemo Lake as there is during operations due to the construction of the freshwater jetty, which will remain in place post-closure. There is no reduction in either the habitat area or the habitat units in Mammoth Lake because the Mammoth dike is lowered and is coarse substrate, thus becoming Type 3 habitat.

The area of Whale Tail Lake increases by 26.1 ha, which includes 27.9 has of new habitat created by the pit excavation and 0.589 ha that was previously part of the Whale Tail Lake – Mammoth Lake connecting channel, but also takes into account the loss of 1.7 ha because part of the Whale Tail dike remains above the water. The total pit area is 57.1 ha; 27.9 ha is new habitat created by the pit excavation (i.e. terrestrial habitat converted to aquatic habitat) and 29.2 ha was part of Whale Tail Lake and the A17-A16 connecting channels under baseline conditions. The number of habitat units in Whale Tail Lake decreases by 5.3. This reduction is largely because the deep area of the pit, which include areas that were fish habitat under baseline conditions, is converted to habitat type 10 and habitat type 10 has been assigned zero fish habitat value. The net result of the changes between baseline and post-closure in the absence of offsetting is a reduction of 5.5 habitat units.

Table 3-4. Changes in habitat area and habitat units between preconstruction phase and post-closure phase with no offsetting, by feature/habitat type.

	Change from preconstruction phase to post-closure phase with no offsetting	
Feature/habitat type	**Hectares**	**Habitat Units**
Nemo Lake	-0.2	0.0
Mammoth Lake	0.0	0.0
Whale Tail Lake	26.1	-5.3
Connecting channel A17-A16 (becomes part of Whale Tail Lake)	-0.6	-0.2
Other connecting channels	0.0	0.0
Streams	0.0	0.0
Total	25.3	-5.5

Table 3-5. Areas of habitat that are lost, unaltered, modified and created during the post-closure phase with no offsetting.

Changes to habitat	Area in hectares
Habitat lost during post-closure phase	
Nemo Lake filled	0.2
Streams dewatered	
Whale Tail Lake covered by dike and dry post-closure	1.7
Mammoth Lake covered by dike and dry post-closure	0.0
Total habitat lost during post-closure phase	1.9
Habitat not altered during post-closure phase	
Mammoth Lake not modified post-closure no offsetting	151.6
Whale Tail Lake habitat not modified during post-closure - no offsetting	130.6
Connecting channel A17-A16 habitat not modified - no offsetting	0.3
Connecting channel A18-A17 (portion is altered in offsetting scenario so required for comparison)	1.3
Streams not altered (but altered in offsetting scenario so required for comparison)	0.7
Total habitat not altered post-closure	284.5
Existing Habitat modified during post-closure phase	
Existing Nemo Lake covered by freshwater jetty	0.4
Whale Tail Lake and connecting channel A16-A17 converted to pit	29.2
Whale Tail Lake and connecting channel A16-A17 converted to pit cap	1.1
Whale Tail Lake and connecting channel A16-A17 converted to roads	2.2
Whale Tail Lake converted to attenuation pond jetty	1.1
Whale Tail Lake converted to dike (wetted portion)	1.2
Connecting channel A17-A16 converted to part of Whale Tail Lake habitat (included in Whale Tail Lake numbers above)	0.6
Mammoth Lake - dike lowered to become lake habitat	0.1
Total habitat altered during post-closure phase	35.7
Habitat created during post-closure phase	
Whale Tail Lake habitat created post-closure (due to pit excavation)	27.9

SECTION 4 • OFFSETTING MEASURES

The substantial increase in habitat area and habitat units in the expanded Whale Tail Lake during the operations phase is expected to result in an increase productivity of the aquatic system during that phase that, at a minimum, is equal to the productivity under baseline conditions (Minns and Portt, 2017 pers. comm. June 14). Following closure, however, without offsetting there will be a net decrease of 5.5 habitat units compared to baseline conditions. Offsetting is required to address this loss.

Offsetting measures may be grouped into the following general categories (Fisheries and Oceans Canada, 2013):

- Habitat restoration and enhancement, which includes physical manipulation of existing habitat to improve habitat function and productivity;
- Habitat creation which is the development or expansion of aquatic habitat into a terrestrial area;
- Chemical or biological manipulation, which includes chemical manipulation of water bodies, and stocking of fish or shellfish, management or control of aquatic invasive species;
- Complementary measures, which are investments in data collection and scientific research related to maintaining or enhancing the productivity of commercial, recreational or Aboriginal fisheries.

A combination of habitat creation and habitat enhancement offsets to address the loss of habitat units are presented in the sections below. These provide a basis for calculating offsetting costs for traditional offsetting measure, which in turn will provide the basis for the calculation of the funding to be provided for complementary measures.

4.1 INCREASE WATER LEVELS BY 0.5 m EAST OF THE MAMMOTH DIKE

It is proposed that, as an offsetting measure, the Mammoth Lake dike is altered post-closure to restore flow from Whale Tail to Mammoth Lake but maintain Whale Tail lake at an elevation of 153.52 masl, which is 0.5 m higher than its pre-construction elevation. This increase would create new habitat around the periphery of Whale Tail Lake, the connecting channel between Whale Tail Lake and Mammoth Lake, and the portion of Mammoth Lake that is east of the dike (Figure 4.1). It will also create a small amount of additional habitat along the Whale Tail dike.

The 0.5 m increase in water elevation will also result in some habitat modifications. Small sections of the streams that are tributary to Whale Tail Lake will be converted to lake habitat, as will the remaining section of the connecting channel between Whale Tail Lake and Mammoth Lake and a portion of connecting channel A18-A17. Depth will increase in the portion of Mammoth Lake that is east of the Mammoth Lake dike and throughout Whale Tail Lake. The changes in habitat area and habitat units that will result from a 0.5 m increase in

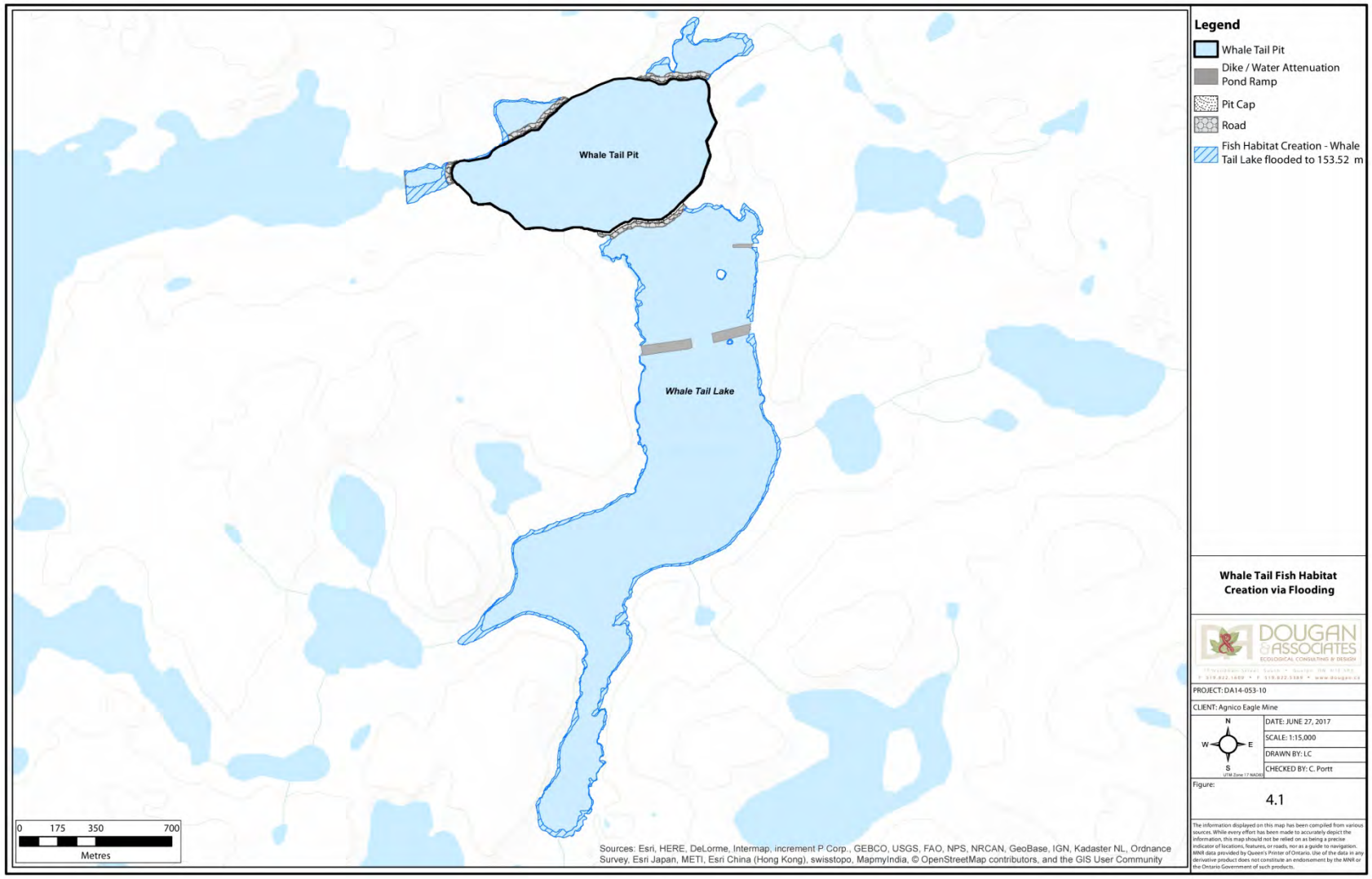


Figure 4-1. Habitat created by increasing the water elevation by 0.5 m east of the Mammoth Dike.

the water level east of Mammoth Dike are summarized in Table 4-1. The net result is an increase of 11.3 ha and 6.4 habitat units relative to the post-closure condition with no offsetting and an offsetting to losses ratio of 1.16:1

Table 4-1. Change in post-closure habitat areas and habitat units that will result from a 0.5 m increase in the water elevation upstream from the Mammoth Dike.

	Changes resulting from a 0.5 m increase in the water level upstream from the Mammoth Dike	
Feature/habitat type	**Hectares**	**Habitat Units**
Nemo Lake	0.0	0.0
Mammoth Lake	-1.2	-0.5
Whale Tail Lake	13.3	7.1
Connecting channel A17-A16	-0.3	-0.1
Connecting channel A18-A17	-0.5	-0.1
Streams	0.0	0.0
Total	11.3	6.4

4.2 CONVERSION OF ROADS TO COARSE SUBSTRATE AND CONSTRUCTION OF ROCK SHOALS

Coarse substrate has the highest habitat value and conversion of mixed or fine substrate to coarse substrate is a common habitat enhancement practice. A scenario was considered in which, in addition to increasing the water level by 0.5 m east of Mammoth dike, the roads within the area that is flooded are scarified to convert them from mixed to coarse substrate and 4.5 ha of rock shoals are constructed in areas of fine substrate within the portion of Whale Tail Lake that is dewatered (Figure 4.2). The shoal construction converts those areas to coarse substrate and was assumed to increase their elevation by 1 m. The elevation of the roads was assumed not to change due to scarification.

The depth zones, substrate types (fines, mixed, coarse) and habitat types for the post-closure phase with a 0.5 increase in the water level elevation east of the Mammoth dike, scarification of the roads and construction of 4.5 m of grid shoals are shown in Figures 4.3, 4.4, and 4.5, respectively. The changes in habitat area and habitat units that will result from the 0.5 m increase in the water level east of Mammoth Dike, scarification of roads, and construction of 4.5 ha of rock shoals are summarized in Table 4-2. The net result is an increase of 11.3 ha and 8.2 habitat units relative to the post-closure condition with no offsetting. The offsetting features in combination with the 0.5 increase in water elevation result in an offsetting to losses ratio of 1.49:1.

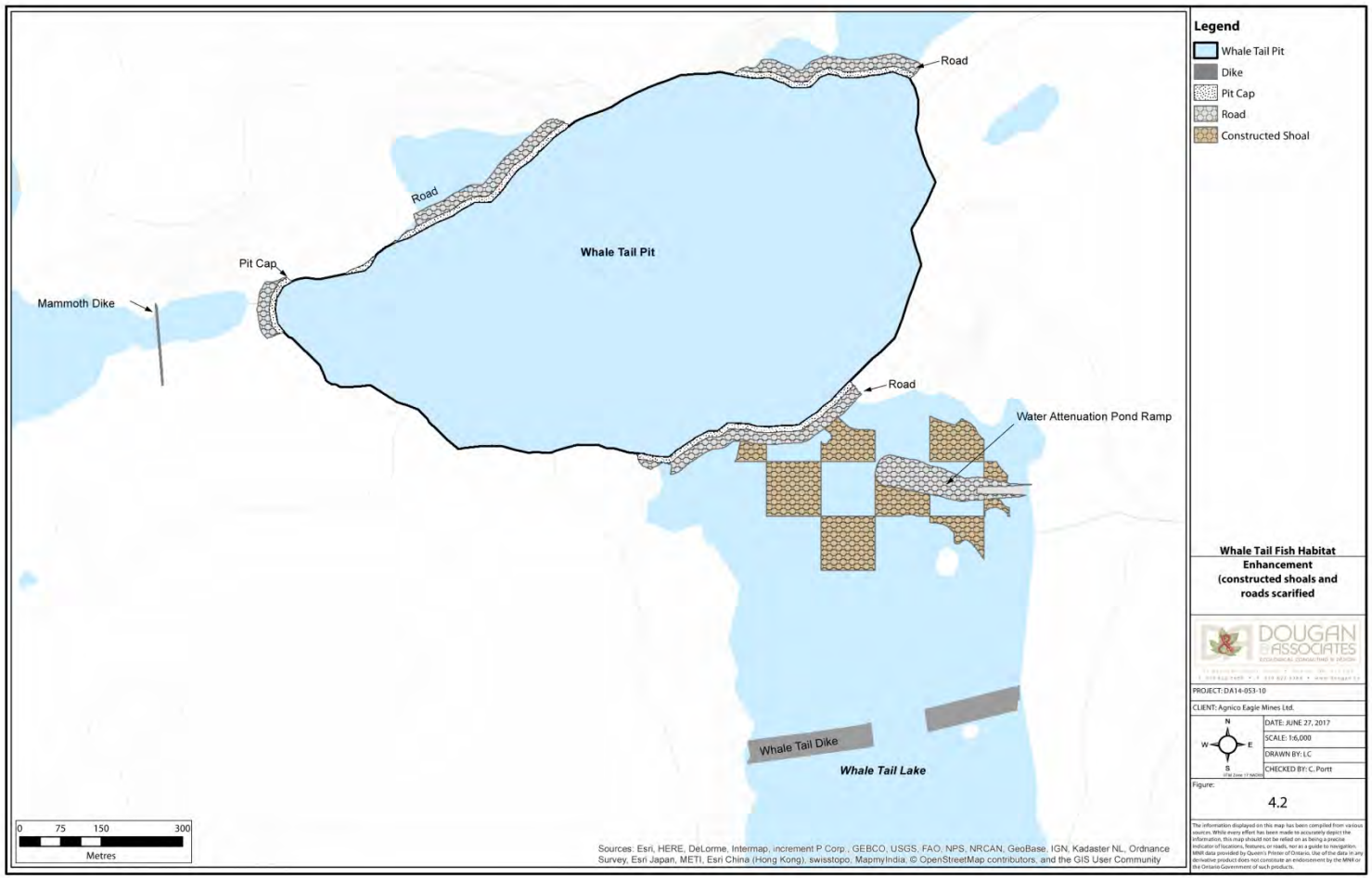


Figure 4-2. Proposed roads scarified and constructed rock shoals proposed as offsetting measures.

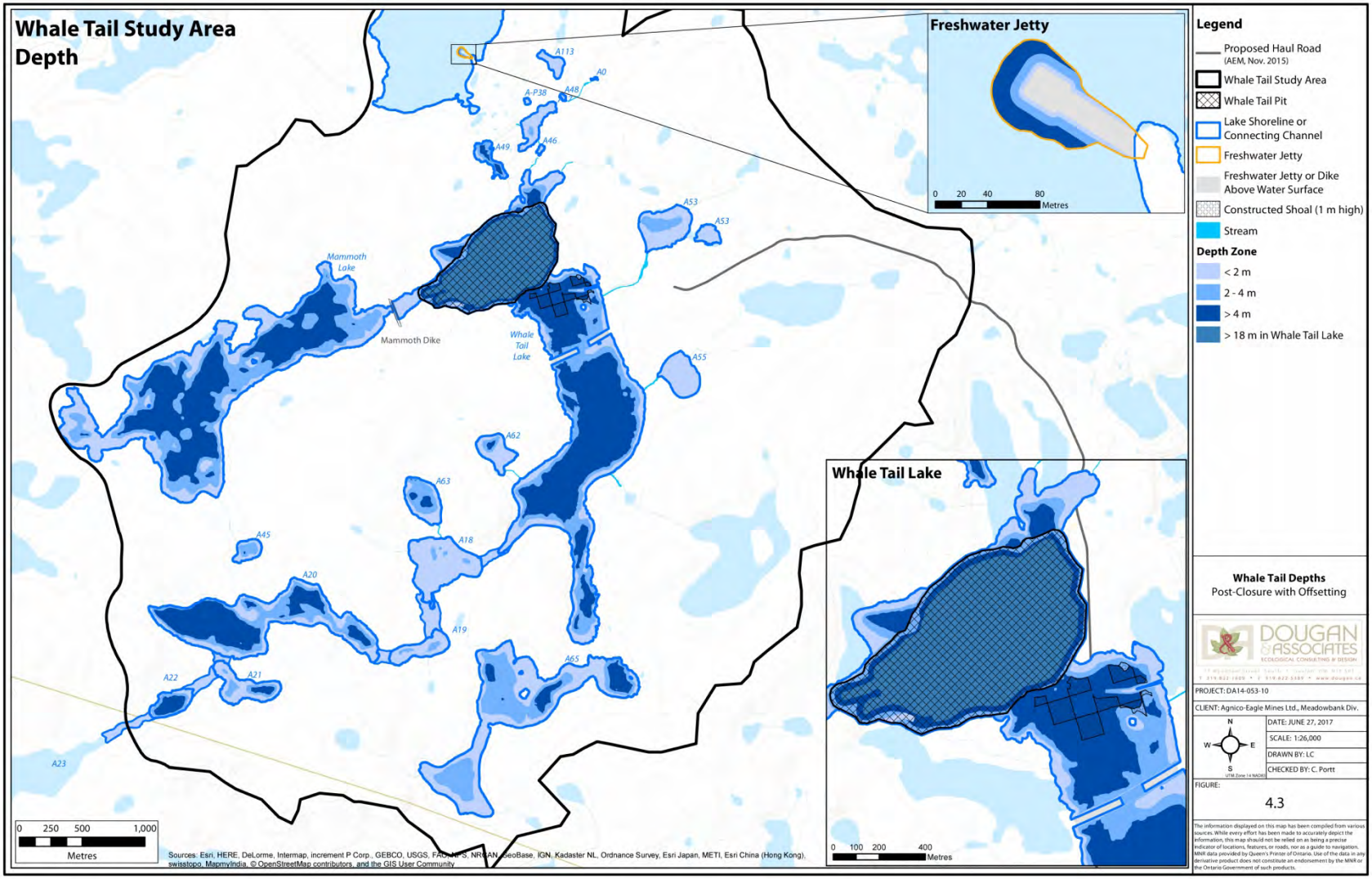


Figure 4-3. Whale Tail pit depths post-closure with a 0.5 m increase in water elevation east of Mammoth dike, roads scarified and rock shoals constructed for offsetting.

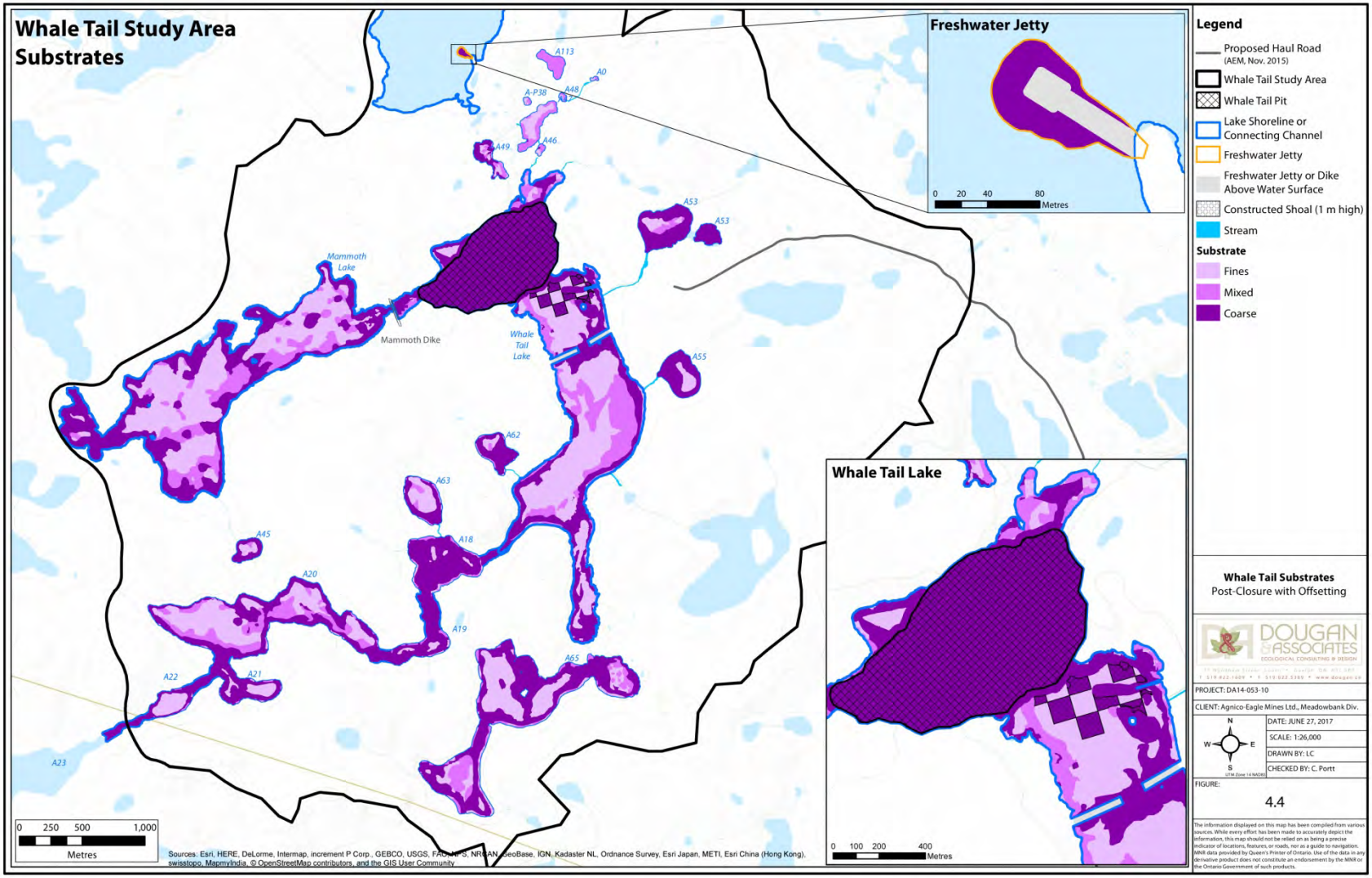


Figure 4-4. Whale Tail pit substrates post-closure with a 0.5 m increase in water elevation east of Mammoth dike, roads scarified and rock shoals constructed for offsetting.

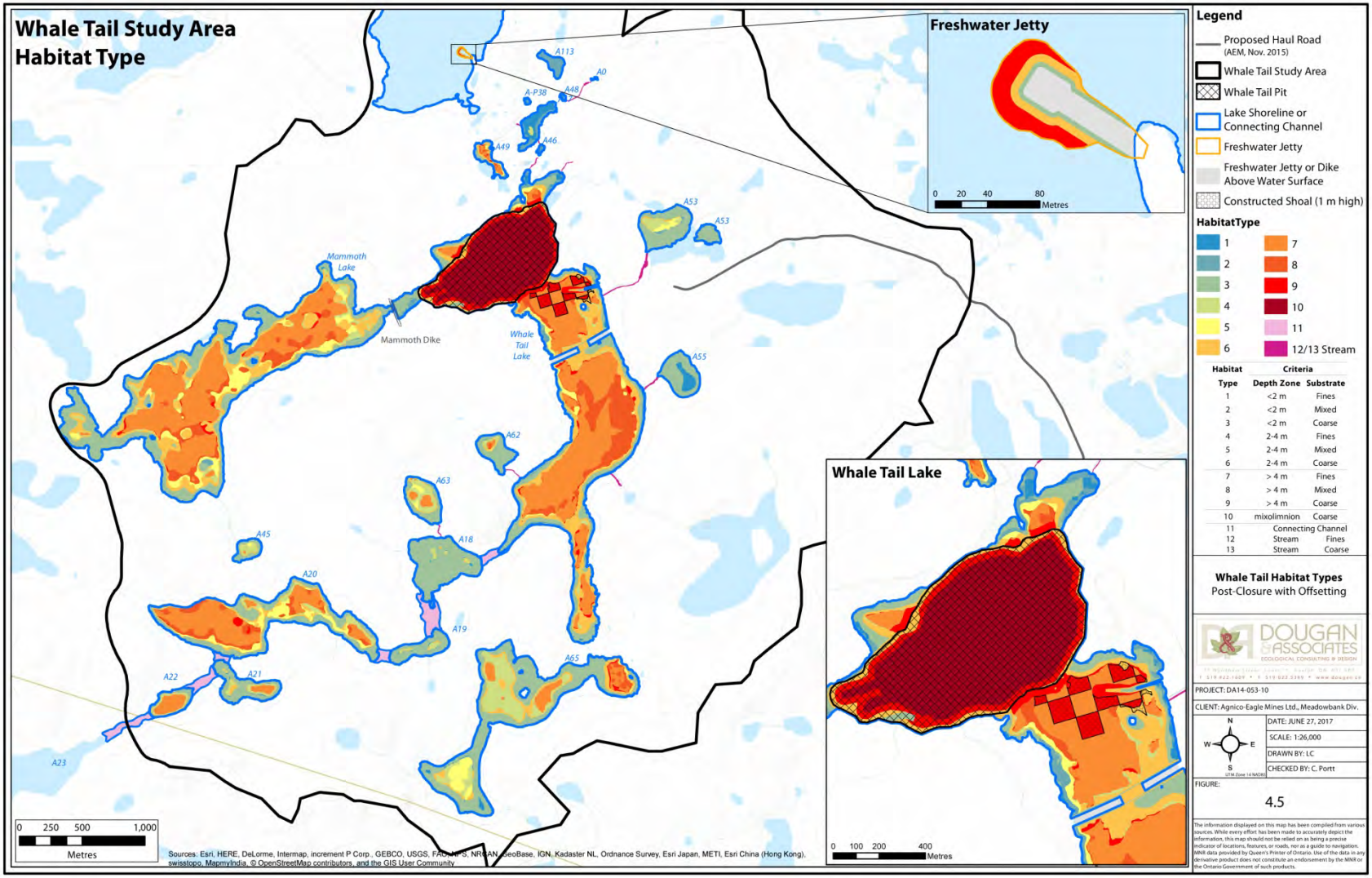


Figure 4-5. Whale Tail pit habitat types post-closure with a 0.5 m increase in water elevation east of Mammoth dike, roads scarified and rock shoals constructed for offsetting.

Table 4-2. Change in post-closure habitat areas and habitat units that will result from a 0.5 m increase in the water elevation upstream from the Mammoth Dike, scarification of roads within the area that is flooded post-closure, and construction of 4.5 ha of rock shoals.

Feature/habitat type	Changes resulting from a 0.5 m increase in the water level upstream from the Mammoth Dike, scarification of roads and construction of rock shoals	
	Habitat Units	Habitat Units
Nemo Lake	0.0	0.0
Mammoth Lake	-1.2	-0.5
Whale Tail Lake	13.3	8.9
Connecting channel A17-A16	-0.3	-0.1
Connecting channel A18-A17	-0.5	-0.1
Streams	0.0	0.0
Total	11.3	8.2

4.3 COMPLEMENTARY MEASURES

As defined by Fisheries and Oceans Canada (2013), "complementary measures are investments in data collection and scientific research related to maintaining or enhancing the productivity of commercial, recreational or Aboriginal fisheries." As discussed in Section 1.1, for the Whale Tail pit, DFO has indicated support for complementary measures to provide at least 60% of the required offsetting. Agnico Eagle is supportive of funding research as a complementary measure to offset habitat losses resulting from the Whale Rail pit and has provided to DFO for consideration an outline of a number of research activities to benefit local stakeholders and contribute to the understanding of aquatic systems (Agnico Eagle 2017b). The traditional offsetting measures presented here will provide a basis for determining what portions of those measures will be implemented and for determining the monetary value of the complementary measures that will form a portion of the offsetting for the Whale Tail pit.

SECTION 5 • CONCLUSION

There will be serious harm to fish habitat as a result of the Whale Tail Pit during both the operations and post-closure phases. Table 5-1 presents a summary of the proposed habitat losses and gains at each phase of the project. Accepted methods of habitat enhancement and habitat creation will be utilized, possibly with complementary measures, to offset the serious harm that will occur.

Offsets proposed for the Whale Tail Pit Project include:

- Mammoth Lake dike alteration to increase water levels by 0.5 m east of Mammoth Dike;
- Conversion of roads to coarse substrate and construction of rock shoals; and

- At least 60% complementary measures including research to benefit local stakeholders and contribute to the understanding of aquatic systems.

Table 5-1. Summary of change in area and habitat units relative to the pre-construction phase for the operations phase and three post-closure scenarios.

Feature/habitat type	Change from pre-construction phase to operations phase		Change from pre-construction phase to post-closure phase – no offsetting		Change from pre-construction phase to post-closure phase – 0.5 m increase in water elevation east of Whale Tail dike		Change from pre-construction phase to post-closure phase – 0.5 m increase in water elevation east of Whale Tail dike, scarification of roads and construction of 4.5 ha of rock shoals.	
	Hectares	Habitat Units	Hectares	Habitat Units	Hectares	Habitat Units	Hectares	Habitat Units
Nemo Lake	-0.2	0.0	-0.2	0.0	-0.2	0.0	-0.2	0.0
Mammoth Lake	-1.2	-0.5	0.0	0.0	-1.2	-0.5	-1.2	-0.5
Whale Tail Lake	240.6	122.3	26.1	-5.3	39.4	1.8	39.4	3.6
Other Lakes and Ponds	-183.6	-77.0	-0.6	-0.2	-0.9	-0.3	-0.9	-0.3
Connecting channels	-8.0	-2.4	0.0	0.0	-0.5	-0.1	-0.5	-0.1
Streams	-0.3	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
Diversion Channel A17-A45	1.8	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Net change	**49.2**	**42.9**	**25.3**	**-5.5**	**36.6**	**0.9**	**36.6**	**2.7**

SECTION 6 • REFERENCES

AEM, 2012. AEM Meadowbank Division – No Net Loss Plan. October 15, 2012.

AEM, 2013. Meadowbank Mine – Draft No Net Loss Plan Implementation Cost Estimate and Construction Schedule. Version 2. May 2013.

AEM, 2016. Meadowbank Gold Project – Habitat Compensation Monitoring Plan. AEM Meadowbank Division. Version 3. February, 2016.

Agnico Eagle. 2017a. Conceptual Whale Tail Lake (North Basin) Fishout Work Plan. Version 1. February 2017.

Agnico Eagle. 2017b. Fisheries and Offsetting Monitoring Plan Whale Tail Pit. Version 1. June 2017.

C. Portt and Associates. 2016. Whale Tail Pit 2015 Fish And Fish Habitat Field Investigations: Agnico Eagle Mines Ltd. - Meadowbank Division. viii +148 pp.

C. Portt and Associates. 2017. Draft Whale Tail Pit 2016 Fish and Fish Habitat Field Investigations: Agnico Eagle Mines Ltd. - Meadowbank Division. viii + 70 pp

C. Portt and K. Minns. 2017. Personal Communication on June 14th, 2017. Toronto, Ontario. Discussion with Portt, Minns and DFO (by webex) regarding HEP model and conceptual offsetting plans including the flooding of Whale Tail Lake (South Basin).

DFO, 2013. Fisheries Productivity Investment Policy: A Proponent's Guide to Offsetting. Ecosystem Programs Policy, Fisheries and Oceans Canada. Ottawa, Ontario. November, 2013. ISBN: 978-1-100-22930-0

Appendix A –

Lake Elevations Determined and Summary of Fish Catches during Baseline Field Investigations

Table A 1. Elevations used for represent baseline conditions for the determination of depths and shorelines.

Lake	Water elevation (masl) determined from the July 21, 2011 imagery
A113	156.47
A18	154.05
A19	154.85
A20	154.77
A21	154.83
A22	155.01
A45	156.47
A47	154.94
A49	159.28
A62	155.59
A63	154.62
A65	154.84
Mammoth Lake (A16)	152.57
Nemo Lake (C38)	156.00
Whale Tail Lake (A17)	153.02

Table A 2. Electrofishing effort and catches in connecting channels between lakes.

Connecting channel	Date	Distance (m)	Juvenile Lake Trout	Juvenile Round Whitefish	Ninespine Stickleback	Slimy Sculpin
A16-A15	8/25/2015	43	1		2	5
	6/21/2016	59				
	6/24/2016	23				
A16-A15 Total		**125**	**1**		**2**	**5**
A17-A16	7/9/2016	189	2	1	1	1
A18-A17	6/26/2015	100				1
	7/5/2015	112				5
	8/30/2015	30	1		6	
	6/22/2016	104				1
	6/25/2016	141				
	7/8/2016	113		16		
	8/20/2016	27			2	
A18-A17 Total		**627**	**1**	**16**	**8**	**7**
A19-A18	7/9/2015	32				
A19-A18 Total		**32**				
Grand Total		**1213**	**5**	**17**	**11**	**17**

Table A 3. Electrofishing effort and catches in small streams in the primary study area. All Arctic Char, Lake Trout, Salvelinus sp. (which are either Arctic Char or Lake Trout), Round Whitefish and Burbot are juveniles. Large catches of Ninespine Stickleback in A46-A17 occurred immediately downstream of a ledge that appeared to impede upstream migration.

Watercourse	Date	Electro-seconds	Distance (m)	Arctic Char	Lake Trout	*Salvelinus* sp.	Round Whitefish	Burbot	Ninespine Stickleback	Slimy Sculpin
A0-A48	8/1/2015	196	10						2	
A113-A47	8/1/2015	68	10						1	
	6/19/2016	160	191							
A113-A47 Total		**228**	**201**						**1**	
A46-A17	6/28/2015	579	201	1					11	8
	7/9/2015	925	148	1					153	8
	7/12/2015	85	na						100	
	8/30/2015	470	36							
	6/22/2016	110	36						0	
	6/24/2016	608	162	1					27	8
	7/7/2016	498	142	1					600	7
	8/19/2016	993	194					1	7	5
A46-A17 Total		**4268**	**919**	**4**				**1**	**898**	**36**
A47-A17	6/19/2016	500	348						1	
A47-A46	7/9/2015	136	17							1
	6/24/2016	77	13							
A47-A46 Total		**213**	**30**							**1**
A47-A49	7/7/2016	290	59							
	8/20/2016	58	7							
A47-A49 Total		**348**	**66**							
A48-A47	7/6/2016	1403	147						6	
A50-A17	6/28/2015	265	51						5	

Watercourse	Date	Electro-seconds	Distance (m)	Arctic Char	Lake Trout	*Salvelinus* sp.	Round Whitefish	Burbot	Ninespine Stickleback	Slimy Sculpin
	7/9/2015	1204	163	2	1				56	9
	8/30/2015	180	52	1				1	2	
	6/22/2016	208	37	1					0	
	6/24/2016	180	38						3	
	7/7/2016	1050	195	1					10	4
	8/19/2016	275	66							2
A50-A17 Total		**3362**	**602**	**5**	**1**			**1**	**76**	**15**
A53-A17	6/20/2015	1664	571						7	
	7/8/2015	2142	182	5					78	77
	8/30/2015	518	359		4					26
	6/18/2016	2565	563						4	4
	8/26/2016	433	248	3					5	23
A53-A17 Total		**7322**	**1923**	**8**	**4**				**94**	**130**
A55-A17	6/21/2015	996	166						6	
	7/6/2015	3330	167	1		1			20	50
	8/30/2015	483	46				1		17	1
	6/19/2016	917	182	1					1	1
	6/26/2016	1482	159							8
	7/8/2016	676	141	1				1		31
	8/19/2016	758	22						59	7
A55-A17 Total		**8642**	**883**	**3**		**1**	**1**	**1**	**103**	**98**
A59-A17	6/27/2015	730	126	1						6
	7/9/2015	1444	97						2	21
	8/30/2015	535	181	1						7
	6/22/2016	766	126						4	6
	7/7/2016	1115	122			2				24
	8/20/2016	630	56	2					4	8

Watercourse	Date	Electro-seconds	Distance (m)	Arctic Char	Lake Trout	*Salvelinus* sp.	Round Whitefish	Burbot	Ninespine Stickleback	Slimy Sculpin
A59-A17 Total		**5220**	**708**	**4**		**2**			**10**	**72**
A62-A17	7/7/2015	1025	107						1	
	7/7/2016	707	129							
A62-A17 Total		**1732**	**236**						**1**	
A63-A18	7/5/2015	848	81							3
	7/7/2015	793	81							3
A63-A18 Total		**1641**	**162**							**6**
A-P23-A17	6/26/2015	582	95							2
Grand Total		**35657**	**6330**	**24**	**5**	**3**	**1**	**3**	**1192**	**360**

Table A 4. Electrofishing effort and catches in connecting channels between lakes in the primary study area. All Lake Trout and Round Whitefish are juveniles.

Connecting channel	Date	Electro-seconds	Distance (m)	Lake Trout	Round Whitefish	Ninespine Stickleback	Slimy Sculpin
A17-A16	8/25/2015	950	240	1			4
	7/9/2016	1689	189	2	1	1	1
A17-A16 Total		**2639**	**429**	**3**	**1**	**1**	**5**
A18-A17	6/26/2015	878	100				1
	7/5/2015	1648	112				5
	8/30/2015	210	30	1		6	
	6/22/2016	988	104				1
	6/25/2016	740	141				
	7/8/2016	2228	113		16		
	8/20/2016	194	27			2	
A18-A17 Total		**6886**	**627**	**1**	**16**	**8**	**7**
A19-A18	7/9/2015	423	32				
A20-A19	6/20/2016	237	35				
A22-A21	6/20/2016	423	62				
A23-A22	6/20/2016	256	69				
Grand Total		**10864**	**1254**	**4**	**17**	**9**	**12**

Table A 5. Maximum number of channels, mean total wetted width (sum of the width of all channels at a transect), and mean and maximum depth of small streams in the Whale Tail Study area.

Stream	Maximum number of channels	Mean total wetted width (m)	Mean depth (cm)	Maximum depth (cm)
A0-AP48	2	2.5	8	30
A47-A46	1	2.0	9	21
to A47	1	3.4	6	12
A50-A17	2	0.7	9	26
A53-A17	8	7.6	7	27
A55-A17	2	7.2	17	36
A59-A17	8	6.7	9	20
A62-A17	2	1.2	6	42
A63-A18	2	2.8	7	22
A46-A17	2	1.9	11	36

Appendix B

Habitat Areas and Habitat Units, by Habitat Type, for Preconstruction,

Operations, and Post-closure Phases

Table B 1. Habitat areas and habitat units for all habitats under preconstruction (baseline) conditions and during operations phase

All Habitats				
Habitat Type	Hectares		HU	
	Pre-construction	Operations	Pre-construction	Operations
1	8.4	14.1	2.0	3.4
2	11.3	2.8	3.2	0.8
3	175.4	201.2	69.4	79.7
4	33.1	14.1	12.4	5.3
5	25.1	13.5	14.6	7.9
6	53.6	101.3	40.8	77.1
7	157.9	145.7	59.2	54.6
8	38.0	43.7	19.8	22.8
9	4.9	26.8	3.3	18.1
10	0.0	0.0	0.0	0.0
11	9.4	3.2	2.8	1.0
12	0.7	0.4	0.1	0.1
13	0.2	0.2	0.1	0.1
Total	**517.9**	**567.0**	**227.8**	**270.7**
Change		49.1		42.9

Table B 2. Habitat areas and habitat units for all habitats under preconstruction (baseline) conditions and during the post-closure phase, without offsetting.

All Habitats				
Habitat Type	Hectares		HU	
	Pre-construction	Post-closure - no offsetting	Pre-construction	Post-closure - no offsetting
1	1.6	1.3	0.4	0.3
2	4.6	4.6	1.3	1.3
3	81.4	77.3	32.2	30.6
4	11.3	10.1	4.2	3.8
5	15.9	14.9	9.3	8.7
6	41.7	39.0	31.7	29.7
7	128.4	114.5	48.1	42.9
8	30.9	28.8	16.1	15.0
9	3.8	12.3	2.5	8.3
10	0.0	42.8	0.0	0.0
11	2.1	1.6	0.6	0.5
12	0.6	0.6	0.1	0.1
13	0.2	0.2	0.1	0.1
Total	**322.4**	**347.7**	**146.7**	**141.2**
Change		25.3		-5.5

Table B 3. Habitat areas and habitat units for all habitats under preconstruction (baseline) conditions and during the post-closure phase with a 0.5 m increase in water elevation created by modifying the Mammoth dike.

All Habitats				
Habitat Type	Hectares		HU	
	Pre-construction	Post-closure +0.5 m no additional offsetting	Pre-construction	Post-closure +0.5 m no additional offsetting
1.000	1.6	3.2	0.4	0.8
2.000	4.6	6.4	1.3	1.8
3.000	81.4	77.7	32.2	30.8
4.000	11.3	7.9	4.2	3.0
5.000	15.9	13.7	9.3	8.0
6.000	41.7	44.2	31.7	33.6
7.000	128.4	116.7	48.1	43.8
8.000	30.9	30.7	16.1	16.0
9.000	3.8	14.0	2.5	9.5
10.000	0.0	42.8	0.0	0.0
11.000	2.1	0.8	0.6	0.2
12.000	0.6	0.6	0.1	0.1
13.000	0.2	0.2	0.1	0.1
Total	**322.4**	**359.0**	**146.7**	**147.6**
Change		36.6		0.9

Table B 4. Habitat areas and habitat units for all habitats under preconstruction (baseline) conditions and during the post-closure phase with a 0.5 m increase in water elevation created by modifying the Mammoth dike, roads scarified, and 4.5 ha of rock shoals constructed.

All Habitats				
Habitat Type	Hectares		HU	
	Pre-construction	Post-closure - 0.5 m water elevation increase + roads scarified + rock shoals constructed	Pre-construction	Post-closure - 0.5 m water elevation increase + roads scarified + rock shoals constructed
1	1.6	3.2	0.4	0.8
2	4.6	5.7	1.3	1.6
3	81.4	78.5	32.2	31.1
4	11.3	7.8	4.2	2.9
5	15.9	13.3	9.3	7.8
6	41.7	45.0	31.7	34.2
7	128.4	112.3	48.1	42.1
8	30.9	29.3	16.1	15.3
9	3.8	19.6	2.5	13.2
10	0.0	42.8	0.0	0.0
11	2.1	0.8	0.6	0.2
12	0.6	0.6	0.1	0.1
13	0.2	0.2	0.1	0.1
Total	**322.4**	**359.0**	**146.7**	**149.4**
Change		36.6		2.7

GOVERNMENT OF NUNAVUT

Interested Party:	Government of Nunavut (GN)	Ref No.:	GN-01
Re:	Fiscal Impacts to Government		

Technical Review Comment / Recommendation Made By Interested Party:

The GN recommends the Proponent adjust Tables 1 and 2 included in the memo distributed on July 10, 2017 in fulfillment of Commitment 78. The projected fuel-tax revenue during the operations phase in Table 2 should be reevaluated and, if found, to be reasonable, justified in greater detail.

Additionally for proper fiscal planning, the GN recommends that the Proponent commit to sharing non-confidential data related to the Whale Tail Project which may be available; in the memo the Proponent indicates "these modelled values are preliminary, and will evolve as Project planning and development advances." The GN understands that the fiscal impacts of the projects will evolve overtime and can be influenced by many factors.

Proposed Term and Condition:

The GN proposes the following Term and Condition:

- *The Proponent shall engage with the GN in order to develop a protocol for the Proponent and the GN to convene on a planned and periodic basis to exchange such relevant financial information as can be disclosed, and with such meetings to occur at the technical level and to coincide with the Proponent's budgeting cycle, including for annual budget setting (Q4 of each year) and the five-year Life of Mine (LOM) planning (Q2 of each year). The protocol shall establish which representatives are to be involved in the meetings, when meetings are to take place, and what topics are to be discussed. The planned meetings will not preclude the Parties from contacting the other as needed and necessary.*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

It is Agnico Eagle's position that the information provided to the GN following the Technical Meetings, meets the requirements of the commitment and provides sufficient information to form a conclusion on the impacts of the Project.

Agnico Eagle's Proposed Terms and Conditions:

Agnico Eagle will continue to engage with the GN and will respond to requests for financial information as appropriate. At this time Agnico Eagle recommends that a Project Certificate conditions is not appropriate.

Interested Party:	Government of Nunavut (GN)	Ref No.:	GN-02
Re:	Socio-Economic Monitoring		

Technical Review Comment / Recommendation Made By Interested Party:

In order to effectively monitor the socio-economic impacts of the Whale Tail Pit Project, the GN recommends that the Proponent create a working group dedicated to monitoring Project-specific socio-economic indicators in order to assess the Project's impacts and benefits. This would be the working group that oversees the Project SEMP outlined in Appendix 8-E.6 of the Whale Tale EIS. The working group should include members from the territorial and federal governments, and the Kivalliq Inuit Association to ensure that the work and process are collaborative

Proposed Term and Condition:

The GN proposes the following Term and Condition:

- *The Proponent shall create a Whale Tail Socio-Economic Monitoring Working Group, the members of which shall include, at minimum, the Proponent, the Government of Nunavut, Indigenous and Northern Affairs Canada, and the Kivalliq Inuit Association. The central focus of the Whale Tail Socio-Economic Monitoring Working Group shall be to collaborate to ensure that the Whale Tail Socio-Economic Management and Monitoring Plan provides for appropriate Project-specific socio-economic effects monitoring as required throughout the life of the Project. The Proponent shall produce an annual Whale Tail Socio-Economic Monitoring Plan report that reflects the input of the Whale Tail Socio-Economic Monitoring Working Group*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle agrees with the spirit of the GN recommendations and suggests the following Terms and Conditions consistent with Agnico Eagle's response to INAC-9.

Agnico Eagle's Proposed Terms and Conditions:

The Proponent is encouraged to work in collaboration with other socio-economic stakeholders including, the Government of Nunavut, Indigenous and Northern Affairs Canada, the Kivalliq Inuit Association, and communities of the Kivalliq region, to establish a socio-economic working group for the Project to develop and oversee a Kivalliq Projects AEM Socio-Economic Monitoring Program. The working group should develop a Terms of Reference which outlines each member's roles and responsibilities with regards to, where applicable, project specific socio-economic monitoring throughout the life of the Projects. The Terms of Reference for this multi-party, multi-project Working Group are to be provided to the Nunavut Impact Review Board upon completion, and within one year of issuance of the Project Certificate.

The Proponent shall work with the other parties to use the updated Kivalliq Projects Socio-Economic Monitoring Program to monitor the predicted impacts outlined in the Projects' respective EIS' as well as regional concerns identified by the Kivalliq Socio-Economic Monitoring Committee. The Proponent is encouraged to work in collaboration with all other socio-economic stakeholders such as the Government of Nunavut, Indigenous and Northern Affairs Canada, Kivalliq Inuit Association, and the communities of the Kivalliq region in developing this program, which should include a process for adaptive management and mitigation in the event unanticipated impacts are identified. The Proponent shall produce annual joint "AEM Kivalliq Projects" Socio-Economic Monitoring reports throughout the life of the Projects that are submitted to the Nunavut Impact Review Board and discussed with the wider Kivalliq Socio-Economic Monitoring Committee. Details of the Kivalliq Projects Socio-Economic Monitoring Program are to be provided to the Nunavut Impact Review Board upon finalization, and within one year of issuance of the Project Certificate.

Interested Party:	Government of Nunavut (GN)	Ref No.:	GN-03
Re:	Sensory Disturbance of Caribou: Disruption of Migratory Movements and Habitat Use		

Technical Review Comment / Recommendation Made By Interested Party:

After reviewing the results of supplementary analyses conducted by the Proponent, and the preliminary findings from the GN's 'road study', the GN remains concerned that the Project could have significant effects on surrounding caribou herds. Contrary to the Proponent's claim that "the weight of evidence, and the experience from the Meadowbank Mine, indicates that incremental and cumulative effects from the Project will not have a significant adverse effect" (EIS, Vol. 5, S.5.5.4.3), there is now a growing body of evidence to suggest that the existing mine operation has had effects on caribou range use and migration. These effects have been detected despite the limited amount of data available, suggesting that the effects themselves may be strong and of a greater extent than is presently apparent. Understanding the full extent of these effects will require additional data; data that are not available for the current Project review. Until fully quantified, the ultimate consequences of these impacts on the viability of surrounding herds (i.e. their significance) cannot be reliably determined and remains an area of great uncertainty in the Project effects assessment—one that necessitates precaution at the present time. GN is of the view that there are insufficient data to provide a confident assessment of impacts on caribou that fulfills the burden of proof regarding potential adverse effects. There is, however, sufficient evidence of effects to warrant concern.

The GN does not share the Proponent's confidence that the Project will have no significant adverse effects on caribou migratory movements and range use. With growing evidence that the existing Meadowbank mine and AWAR are having effects on caribou, the continued use of this infrastructure will prolong and potentially worsen the impacts unless the highest possible standards of mitigation and monitoring are applied. These standards must exceed those currently applied to the mine where effects have seemingly gone undetected, unreported and unmitigated over the last decade since operations began. With the addition of the Whale Tail Project, concerns about impacts on caribou are heightened. The combined Meadowbank and Whale Tail Project will consist of two mine sites and more than 180 km of all-weather-road. Traffic on the Whale Tail haul road is of particular concern given its greater intensity relative to the existing Meadowbank AWAR and, thus, greater likelihood of affecting caribou.

The Proponent maintains that the Meadowbank Project's Terrestrial Ecosystem Management Plan (TEMP) has been "effective in identifying, monitoring, and managing residual effects of the Project on wildlife and wildlife habitat" (TEMP, page i). However, the growing weight of evidence suggests that this is likely not the case with respect to caribou. Moving forward, in order to mitigate impacts on caribou due to sensory disturbance from the Whale Tail Project, the Proponent plans to rely on a system of protection measures similar in design (but not intensity) to the mobile protection measures proposed by

Poole and Gunn (2015). These protection measures are triggered when groups of caribou are detected in proximity to Project and deactivated when caribou are not detected (see for example figures 6 to 9, TEMP, v4.). As an alternative to the application of fixed measures, such as planned seasonal reductions in activities, site shutdowns or road closures, these mobile measures afford the Proponent greater flexibility in continuing mine operations when caribou are absent. However, these mobile measures are untested. The ability to implement them effectively is unproven and thus represents a significant risk. As outlined in the GN's written submissions during this review, the proposed mobile measures are likely not adequate to offset the risks of continued mine operations and the associated high traffic levels on haul roads during key periods such migrations. Although the caribou protection measures contained within the Project's Terrestrial Ecosystem Management Plan (TEMP) have been significantly revised since the technical meeting and prehearing conference, further improvements are required, as discussed and recommended in this written submission

Proposed Terms and Conditions:
GN does not propose any terms and conditions in GN-03.

Agnico Eagle's Response to Technical Review Comment / Recommendation:
In GN-03, the GN have commented on the supplementary analysis for the Meadowbank Mine and All-Weather Access Road (AWAR) Zone of Influence Assessment (2017a) and Cumulative Encounter Rate and Residency Assessment for Caribou (Golder 2017b). What follows is Agnico Eagle's response to those comments.

Zone of Influence
At the technical session, the GN and KivIA requested that Agnico Eagle complete an analysis of caribou collar data to explore the existence and extent of a zone of influence (ZOI) around the existing Meadowbank and AWAR operations (Commitment 8). The spatial extent of change in habitat use (i.e., animal distribution) is regarded as a ZOI. The request from the GN and KivIA was specific to the Ahiak, Beverly, Lorillard, and Wager Bay herd for the spring and fall migration periods. However, given the caribou observations during the winter, the analysis also included the winter period. In order to run the analysis, AEM required access to all GN caribou collar data for all of the herds with the potential to interact with the Project. The results of the Golder (2017a) ZOI analysis revealed no observed ZOI during the spring and fall migration periods and a 30-35 km ZOI during the winter period, which Golder cautioned as an uncertain result due to low sample size.

Similar to comments by the KivIA (KivIA-Terrestrial-04), the GN seems to be focusing their conclusions on a winter migration result which has the greatest degree of uncertainty relative to the results for the spring and fall seasons. As noted in Golder (2017a), the higher uncertainty associated with the winter results is related to the low sample size of collared caribou in the development phase (and unbalanced with baseline phase) for winter, which inflates Type I and II error rates (see response to KivIA-Terrestrial-04). The spring and fall results have greater certainty (given larger numbers of collared caribou and

greater interaction) and show no avoidance of Meadowbank Mine and the All Weather Access Road (AWAR) (Golder 2017a). In contrast to the conclusions made in Golder 2017a, the GN has argued that because an effect was detected in the winter development phase with six collared caribou-years that it should be assumed that more collar data in the future will follow the same trend and strengthen this result. The GN's suggestion that more future data will further reflect the result for the winter migration is not necessarily true. Larger numbers of collared caribou may alternatively show patterns as seen in the spring and fall seasons where caribou behaviour during the development phase shows similar or higher use with proximity to the Meadowbank Mine and AWAR. It should be noted that the development phase patterns for the spring and fall migrations were based on 37 and 36 collared caribou-years during spring and winter, respectively, versus six collared caribou-years for winter and so those conclusions (i.e., spring and fall migrations) should be treated with higher confidence.

The GN should approach making inferences from the proportions of collared caribou with caution as the number of collared caribou has varied through time and may not be correlated with herd distribution, particularly when the number of collared caribou was extremely low. For example, 48 of 162 (29.6%) caribou-years had only one or two collared caribou in active service. As the KivIA notes in KivIA-Terrestrial-04, whether these data are representative of the herd distribution is questionable. Also described in Agnico Eagle's summary of percent collared caribou report (see Attachment 1) many of the incremental increases in the percent of collared caribou interacting with ZOIs in the cumulative effects cases are associated with one additional collared caribou.

In GN-03 there is reference to a technical memo on analytical matters related to the ZOI assessment currently in preparation by the GN; however, the final submission deadline for GN was August 14, 2017.

The conclusion in the ZOI assessment done by Golder remains valid:

> "Considering the seasonal patterns and sample size and observed changes in response variables in this study, there does not appear to be strong evidence for indirect effects to caribou due to sensory disturbance from the Meadowbank Mine and AWAR." (Golder, ZOI assessment, page 13)

Encounter and Residency Analysis

The GN indicated in GN-03 that the ZOIs assumed in the encounter and residency analysis were too small based on the ZOI analysis for the winter period (Golder 2017a). As noted above, Golder believes there is a high degree of uncertainty in the patterns observed for the winter. In contrast, Agnico Eagle believes the ZOI analysis demonstrates that the encounter and residency time analysis results are conservative. This is because the ZOI analysis results (Golder 2017a) for spring and fall indicate no avoidance of the Meadowbank Mine and AWAR by any collared caribou during the seasons when caribou have the greatest degree of interaction with these developments. Thus, assuming ZOI for these developments in these seasons would overestimate assumed disturbance to caribou.

The GN is suggesting that increases in encounter rates (i.e., 3-4 fold) and one caribou with as many as 11 encounters as reported in the ZOI encounter and residency analysis (Golder 2017b) are high numbers and of significant consequence to caribou. Agnico Eagle has responded to these concerns and statements below. Golder strongly believes that the GN has taken these results out of context and is making unreliable arguments about those conclusions.

The GN is suggesting that encounters of 4, 6, and 11 are high encounter rates for caribou and should be considered as worst case scenarios and assessed as an effect to caribou. Results of the ZOI encounter and residency analysis (Golder 2017b) indicate that there are also many years where Lorillard and Wager Bay collared caribou do not encounter hypothetical development ZOIs. In other words, disturbance associated with development does not affect all caribou in all years. Similar ZOI encounter analyses have been completed for Dominion Diamond's Jay project (Dominion Diamond 2014) and the Kiggavik project (AREVA 2014), which indicate that 11 encounters is unlikely to result in a significant adverse effect to caribou energetics and population growth. For example, AREVA (2014) simulated 13 ZOI encounters by collared Qamanirjuaq caribou in their cumulative effects case and did not detect a significant reduction to caribou energetics or population growth. Similarly, Dominion Diamond (2014) demonstrated that 34 simulated ZOI encounters by Bathurst collared caribou in their future development case and in a severe insect year would not significantly influence caribou calving rates or influence the population trajectory of this herd in either a declining or increase phase using energetics models with conservative assumptions. Use of the 11 ZOI encounters value would not change the conclusions of Agnico Eagle's cumulative effects summary report (see Attachment 1) that the Project would result in no measurable changes to the energetic state of Ahiak, Beverly, Lorillard, and Wager Bay caribou, and no demographic consequences to the populations. Consequently, caribou encountering 11 hypothetical ZOIs, in a worst case year, would have no measurable effects to caribou energetics.

The following conclusion from the encounter and residency assessment done by Golder remains valid:

> "Overall, analysis of encounter rates and residency time predict that the Meadowbank Mine and AWAR and the Project would result in no measurable changes to the energetic state of Ahiak, Beverly, Lorillard and Wager Bay caribou, and no demographic consequences to the populations." (Golder, Cumulative Encounter and Residency Assessment for Caribou, page 86)

***Ongoing GN* Deflection Analysis (Road study)**

In its Final Submission, the GN has indicated that they are in the process of completing an analysis, which is not yet available for review; however, the final submission deadline for GN was August 14, 2017. As discussed with NIRB staff, GN, KivIA, and Agnico Eagle have had several caribou workshops throughout the course of the Whale Tail NIRB review, most recently in June 2017. GN indicated at those meetings that the draft study would be shared for comment with Agnico Eagle and KivIA in early August

and in advance of filing on the public registry, however neither these data nor any draft study has been provided to date (August 28, 2017).

It should be noted that Agnico Eagle has not seen this study nor any of the preliminary findings to date (other than those reflected in GN-03) and cannot comment on the report. However, we note that in GN-03, the GN has suggested that their study design will include "Analyses of collar data comparing the movements of individuals that were and were not subject to the implementation of mitigation measures." For clarity, Agnico Eagle's policy is that mitigation should be applied for the protection of all caribou and does not plan to suspend mitigation to support this analysis. As noted above, the Meadowbank Mine and AWAR ZOI analysis (Golder 2017a) incorporated deflection analysis and the report showed no avoidance by caribou in the fall season. In addition, the ZOI work completed had the specific objective of understanding a ZOI for all herds and at a larger scale than our understanding of the road deflection analysis (road study). It should be noted that deflections by caribou in response to a road would likely be shown in a ZOI analysis for the same time frame. However, as already stated no ZOI was observed for the fall migration period (Golder 2017a).

Given that the Meadowbank Mine and AWAR ZOI analysis (Golder 2017a) would already incorporate deflections from the AWAR as the raw data would be the same, Agnico Eagle suggests that once it is available, the GN deflection analysis would be appropriately considered within the TAG. Agnico Eagle believes this deflection study is a good example or demonstration of how the TAG will operate for discussing study objectives, developing study designs to address concerns, presenting preliminary findings, will include a peer review of findings and a discussion of results with all TAG participants input. In the future, such evaluations would be anticipated as ongoing work through the TAG with learnings built into the TEMP to ensure the protection of caribou and to improve mitigation measures where needed. This work would be reported to NIRB throughout the life of the project.

References:

AREVA (AREVA Resources Canada Inc.). 2014. Kiggavik Project Effects: Energy-Protein and Population Modeling of the Qamanirjuaq Caribou Herd. September, 2014.

Dominion Diamond (Dominion Diamond Ekati Corporation). 2014. Developer's Assessment Report for the Jay Project. December, 2014.

Golder (Golder Associates Ltd.). 2017a. Meadowbank Mine and All-weather Access Road Caribou Zone of Influence Assessment; Whale Tail Commitments 8. July, 2017.

Golder. 2017b. Cumulative Encounter and Residency Assessment for Caribou; Whale Tail Commitments 9 and 10. July, 2017.

Interested Party:	Government of Nunavut (GN)	Ref No.:	GN-04
Re:	Evaluating the efficacy of caribou protection measures		

Technical Review Comment / Recommendation Made By Interested Party:

If the Project proceeds, a strong and clear commitment to evaluate the proposed caribou protection measures is required. Accordingly, it is recommended that an evaluation, as described above, be incorporated as a Project-certificate requirement.

Completing this evaluation may require partnerships with other organizations, including the GN. The GN welcomes future partnership with the Proponent and commits to make data available through existing or future data sharing agreements. However, the GN wishes to note that the Proponent is solely responsible for completing this evaluation and as such should ensure that resources sufficient to undertake the necessary studies are made available.

Proposed Term and Condition:

The GN proposes the following Term and Condition:

- *The Proponent shall conduct an evaluation of caribou protection measures employed by the Project. The scope and components of this evaluation shall include the following: (see text above in the comments and supporting rationale section).*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle values the GNs input and appreciates the recognition of the new and additional caribou protection measures by the GN. Agnico Eagle agrees with the GN and also recognizes that the evolution of the TEMP will require the continued evaluation of monitoring data and effectiveness of mitigation measures which will be a significant objective of the Terrestrial Advisory Group (TAG). We recognize that this will require working with other agencies and third parties including the GN, and this type of evaluation is directly related to our signed Memorandum of Understanding (MOU) with the GN. In addition, Agnico Eagle has been providing annual TEMP reports for the Meadowbank operations to the GN and NIRB and have had limited feedback or constructive criticism to date that has required a revision to the TEMP. Feedback received to date on the TEMP has primarily focused on periodic exceedances of annual thresholds (including but not limited to harvesting activity along the road). Agnico Eagle looks forward to working with the GN to enhance and improve the monitoring techniques proposed in the TEMP (v.4.0), however, Agnico Eagle believes the proposed GN Terms and Conditions are monitoring specifications that should be addressed through the TAG, which is a mechanism to review monitoring data and accordingly revise the TEMP.

Agnico Eagle's Proposed Terms and Conditions:

Agnico Eagle will commit to working with the members of the Terrestrial Advisory Group (TAG), as per the TAG Terms of Reference, to review and refine monitoring and mitigation measures on an ongoing basis as outlined in the TEMP.

Interested Party:	Government of Nunavut (GN)	Ref No.:	GN-05
Re:	Seasonal windows for implementation of caribou protection measures		

Technical Review Comment / Recommendation Made By Interested Party:

The TEMP should be revised to define the fall caribou migration as the period from September 22 to December 15. Table 5 and figures 6 through 9 should be revised to indicate that heightened caribou protection measures will be implemented during this sensitive season.

Proposed Term and Condition:

The GN proposes the following Term and Condition:

- *The Proponent shall define the fall caribou migration season as the period from September 22 to December 15 for the purposes of applying caribou protection measures, as detailed in the Project's Terrestrial Ecosystem Management Plan. All caribou protection measures that are applied to the period from September 22 to November 7 in the current version of the TEMP (figures 6 to 9 of version 4) shall be applied to this revised period.*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

The duration of the fall seasonal range defined by the GN was extended in Golder (2017) to maximize the number of encounters with, and residency time in hypothetical ZOIs by collared caribou in the Ahiak, Beverly, Lorillard, and Wager Bay caribou herds. The results of this analysis showed that the fall season as defined in the analysis was the period when interaction with the Project may be the greatest. For operational mitigation; however, Agnico Eagle agrees with the GN and will revise the fall migration season as September 22 to December 15. However, Agnico Eagle will apply caribou enhanced protection measures when triggers are met regardless of season to maximize the protection of caribou.

Agnico Eagle's Proposed Terms and Conditions:

Agnico Eagle agrees to revise the TEMP to define the fall caribou migration season as the period from September 22 to December 15 for the purposes of applying caribou protection measures.

Interested Party:	Government of Nunavut (GN)	Ref No.:	GN-06
Re:	Caribou Group Size Thresholds		

Technical Review Comment / Recommendation Made By Interested Party:

- *To achieve the Proponent's stated objective of providing protection for 70% of caribou interacting with the Project, group size thresholds for implementing caribou protection measures should be reduced by taking into account the proposed intensity of monitoring and limitations on the ability to detect approaching caribou.*
- *The GN believes that the group size thresholds should be designed to provide enhanced protection for at least 75% of caribou interacting with the Project. This level represents a moderate level of risk management given concerns about impacts on caribou, uncertainty in the impact assessment and the untested nature of the mobile protection measures. Using the data presented in the TEMP, thresholds of approximately 110 (fall), 25 (winter and summer) and 12 (spring) assuming 100% detection of caribou are recommended. These thresholds should be further reduced, in consultation with the Project's Terrestrial Advisory Group, to take into account the proposed intensity of caribou monitoring.*
- *Additional caribou group size data are needed in order to assess the relevance of the proposed group size thresholds. These should be collected using the specific definition of caribou 'group' that the Proponent proposes to use in triggering caribou protection measures; which may differ from that used to collect the existing data. The Terrestrial Advisory Group should be directly involved in this assessment. This should occur within five years of the Project's start.*

Proposed Term and Condition:

The GN proposes the following Term and Condition:

- *The Proponent shall use caribou group-size thresholds for triggering adaptive management set initially at 110 (fall), 25 (winter and summer) and 12 (spring). These thresholds shall be further modified within two years of the Project's commencement, in consultation with the Project's Terrestrial Advisory Group, taking into account the proposed intensity of caribou monitoring, the likelihood of detecting caribou that are in proximity to the Project and any newly available data of group sizes.*
- *The Proponent shall collect additional data on caribou group-sizes in proximity to the Project (including the haul road) to assess the relevance of the proposed group size thresholds. These data shall be collected using the same definition of caribou 'group' used to trigger caribou protection measures in the TEMP. The Terrestrial Advisory Group shall be directly involved in this assessment. This shall occur within five years of the Project's start.*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle values the GNs input and recognize that the TEMP will continue to evolve as monitoring data informs decision making through the Terrestrial Advisory Group (TAG). Agnico Eagle wants to clarify the GN's point that all caribou will be protected through ongoing standard mitigation of operations, and that enhanced caribou protection measures are implemented when group size thresholds are realized. The determination of Group Size Thresholds was developed through consultation during the TEMP workshops and with members of the TAG. Originally, caribou mitigations within the TEMP for Meadowbank and the AWAR operations were triggered when 50 caribou were observed which has been ongoing since initial operations. A trigger of 50 animals represents 64% of all caribou observed on annual basis (i.e., enhanced protection measures for 64% of the caribou). Through working with the KivIA, the GN, the Baker Lake HTO and NTI, significant improvements to the TEMP have been made including an additional 10% increase in the enhanced protection measures for caribou. However, it should also be noted that Agnico Eagle intends to protect all caribou from operations through standard mitigation and operations. Agnico Eagle looks forward to working with the GN to enhance and improve the monitoring techniques proposed in the TEMP (v.4.0); however, believes the proposed GN Terms and Conditions are monitoring specifications that should be addressed through the TAG, which is a mechanism to review monitoring data and accordingly revise the TEMP. Continuing to examine appropriate group size thresholds would be one such endeavor of the TAG.

Agnico Eagle's Proposed Terms and Conditions:

Agnico Eagle has committed to using group size thresholds as follows:

- Sept 16 – Nov 7: **GST = 140** (to be extended to December 15th as per GN-05)
- Nov 8 – March 31: **GST = 35**
- April 1 – May 25: **GST = 14**
- May 26 – Sept 15: **GST = 35**

These group sizes are based on data showing that 70% of caribou are found in groups of these sizes, and this level of protection was recognized as protective as discussed during the TEMP workshops. We agree with the GN recommendation that the thresholds should be reviewed within 2 years of the project's commencement in consultation with the TAG. Agnico Eagle will commit to working with the members of the Terrestrial Advisory Group (TAG), as per the TAG Terms of Reference, to review and refine monitoring and mitigation measures on an ongoing basis as outlined in the TEMP.

Interested Party:	Government of Nunavut (GN)	Ref No.:	GN-07
Re:	Monitoring to support the implementation of caribou protection measures		

Technical Review Comment / Recommendation Made By Interested Party:

- *Height-of-land, road and ground survey frequencies should be increased from the current levels in the TEMP (v.4.0). A 4- and 2- fold increase is recommended during migratory and non-migratory seasons, respectively.*
- *The number of height-of-land and road-side survey points should be revised to provide greater than 50% line-of-sight coverage within 4 km of the Project (including haul road and pit) with coverage greater than 75% at known road crossing points (as determined from IQ, collar data and other observations, and reviewed by the Terrestrial Advisory Group).*
- *The use of observation platforms at the Whale Tail pit should be considered to achieve the objectives of >50% and >75% line-of-sight coverage.*
- *Caribou group-size thresholds should be reduced, taking into account the frequency of monitoring effort and likelihood of detecting groups, in order to ensure a majority of caribou are subject to enhanced mitigation (see GN-06: Caribou Group Size Thresholds).*
- *The efficacy of caribou monitoring methods should be evaluated quantitatively (see GN-07: Monitoring to support implementation of caribou protection measures).*
- *The Proponent should actively engage in research to develop alternative monitoring methods that may extend monitoring range, spatial coverage, frequency and detection probabilities.*

Proposed Term and Condition

i. *The Proponent shall use increased height-of-land, road and ground survey frequencies compared to the current levels in the TEMP (v.4.0). Frequency during migratory and non-migratory seasons shall be increased 4- and 2- fold, respectively.*

ii. *The Proponent shall revise the number of proposed height-of-land and road-side survey points to provide greater than 50% line-of-sight coverage within 4 km of the Project (including haul road and pit) with coverage greater than 75% at known road crossing points (as determined from IQ, collar data and other observations, and reviewed by the Terrestrial Advisory Group).*

iii. *The Proponent shall reduce caribou group-size thresholds for adaptive management, taking into account the frequency of monitoring effort and likelihood of detecting groups, in order to ensure a majority (70%) of caribou are subject to enhanced mitigation.*

iv. *The Proponent shall evaluate the efficacy of monitoring methods used to detect caribou quantitatively in accordance with other terms and conditions.*

v. *The Proponent shall actively engage in research to develop alternative monitoring methods that may extend monitoring range, spatial coverage, frequency and detection probabilities.*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle values the GNs input and recognize that the TEMP will continue to evolve as monitoring data informs decision making through the Terrestrial Advisory Group (TAG). Agnico Eagle appreciates the suggestions of the GN, and these suggestions seem reasonable; however, these should be reviewed through the TAG prior to implementation in the TEMP. The viewshed analysis is currently being improved to understand the monitoring coverage of the landscape including the location of survey points and frequency of surveys; group size thresholds will continually be reviewed and refined if necessary; understanding the efficacy of monitoring activities will also be examined, where possible; and Agnico Eagle is interested in evaluating alternative monitoring methods that are acceptable by all parties of the TAG. Agnico Eagle looks forward to working with the GN to enhance and improve the monitoring techniques proposed in the TEMP (v.4.0) however believes the proposed GN Terms and Conditions are monitoring specifications that should be addressed through the TAG, which is a mechanism to review monitoring data and accordingly revise the TEMP.

Agnico Eagle's Proposed Terms and Conditions:

1. *Agnico Eagle will adhere to the Terrestrial Ecosystem Management Plan (TEMP) and provide a wildlife summary report annually.*

2. *Agnico Eagle will update the TEMP within three months of the issuance of the Project Certificate.*

3. *Agnico Eagle will commit to working with the members of the Terrestrial Advisory Group (TAG), as per the TAG Terms of Reference, to review and refine monitoring and mitigation measures on an ongoing basis as outlined in the TEMP.*

Interested Party:	Government of Nunavut (GN)	Ref No.:	GN-08
Re:	Caribou Monitoring and Mitigation Measures for Mine Operations and Roads: Decision Trees		

Technical Review Comment / Recommendation Made By Interested Party:

For monitoring and mitigation of caribou in proximity to mine operations (TEMP, v.4.0, Fig. 6):

- *The TEMP should be revised to clarify that the definition of "non-essential vehicles and heavy equipment", as used to describe caribou mitigation procedures, means all vehicles or heavy equipment except those operated for the purpose of maintaining the safety of personnel. For clarity, non-essential vehicles shall include vehicles and equipment used to continue mining operations or hauling of ore;*
- *The TEMP should be revised to increase the intensity of caribou monitoring when moving from level 1 to level 2 in the monitoring and mitigation trees;*
- *At level 2 of caribou adaptive management, reliance on the use of discretionary mitigation measures should be reduced and specific automatic measures added to prepare for an operational shutdown if caribou move closer to the Project. One such measure, for example, is to not initiate new work activities that cannot be suspended or that take a long time to suspend once started at the mine site; and*
- *Provisions for suspension of non-essential vehicles and heavy equipment operation when caribou are within 500 m should be applied year-round and increased to 1 km during the calving and post-calving periods. This is consistent with mine operational procedures for the Back River project that were recently reviewed by NIRB but less than the buffer employed at the Proponent's Meliadine mine (3-5km; AEM 2014).*
- *For monitoring and mitigation of caribou in proximity to the Whale Tail Haul Road (TEMP, v.4.0, Fig. 7) and all-weather access road (AWAR) (TEMP, v.4.0, Fig. 8):*
- *The TEMP should be revised to clarify that the definition of "non-essential vehicles", as used to describe caribou mitigation procedures, means all vehicles except those operated for the purpose of maintaining the safety of personnel. For clarity, non-essential vehicles include vehicles and equipment used to continue mining operations or hauling of ore;*
- *The TEMP should be revised to increase the intensity of caribou monitoring when moving from level 1 to level 2 in the monitoring and mitigation trees;*
- *At level 2 of caribou adaptive management, reliance on the use of discretionary mitigation measures should be reduced and specific automatic measures added to prepare for road closure if caribou move closer to the road. One such measure is, for example, to suspend circulation of light vehicles (e.g. cars, pick-ups) and trucks (e.g. supply delivery vehicles) with the exception of emergency vehicles; and*
- *At level 3, outside migratory seasons, the limitation of non-essential vehicles should be further specified in consultation with the Terrestrial Advisory and should include suspension of light*

vehicles and a reduction in the number of haul trucks in-order to decrease traffic to a rate of approximately 4 vehicles per hour and increase the permeability of the road to caribou. (Note: In Wilson et al. (2016) a haul road traffic rate of four vehicles per hour was associated with reduced crossing rates by migratory caribou).

The GN believes that without these revisions, in particular those relating to the haul road, the risk of adverse impacts on caribou from the Project cannot be mitigated.

Proposed Term and Condition

The following revisions to the Project's Terrestrial Ecosystem Management Plan (TEMP) version 4.0 shall be made:

- *To clarify that the definition of "non-essential vehicles and heavy equipment", as used to describe caribou mitigation procedures, means all vehicles or heavy equipment except those operated for the purpose of maintaining the safety of personnel. For clarity, non-essential vehicles include vehicles and equipment used to continue mining operations or hauling of ore;*
- *To increase the intensity of caribou monitoring when moving from level 1 to level 2 in the monitoring and mitigation trees;*
- *At level 2 of caribou adaptive management, reliance on the use of discretionary mitigation measures shall be reduced and specific automatic measures added to prepare for an operational shutdown if caribou move closer to mine operations or roads;*
- *Level 3 provisions for suspension of non-essential vehicles and heavy equipment operation when caribou are within 500m of mining operations shall be applied year-round and increased to 1 km during the calving and post-calving periods; and*
- *At level 3 outside migratory seasons, the limitation of non-essential vehicles should be further specified in consultation with the Terrestrial Advisory Group and shall include suspension of light vehicles and a reduction in the number of haul trucks in-order to decrease traffic to a rate of approximately four vehicles per hour.*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle agrees with the GN-08 definitions and for additional clarity proposes the following:

- *"non-essential vehicles" include vehicles and equipment used to continue mining operations or hauling of ore.*
- *"essential vehicles" include vehicles operated for the purpose of maintaining the safety of personnel, Emergency Response Team (ERT), security and wildlife monitoring.*

Agnico Eagle values the GNs input and these additional thoughts are appreciated. It is recognized that the TEMP will continue to evolve as monitoring data informs decision making through the Terrestrial Advisory Group (TAG). Originally, caribou mitigations within the TEMP for Meadowbank and the AWAR operations were triggered when 50 caribou were observed, which represents 64% of all caribou observed on annual basis (i.e., enhanced protection measures for 64% of the caribou). Through working with the KivIA, the GN, the Baker Lake HTO and NTI, significant improvements to the TEMP have been

made including an additional 10% increase in the enhanced protection measures for caribou. However, it should also be noted that Agnico Eagle intends to protect all caribou from operations through standard mitigation and operations. As per response to GN-07, Agnico Eagle believes the proposed GN Terms and Conditions are monitoring specifications that should be addressed through the TAG, which is a mechanism to review monitoring data and accordingly revise the TEMP. Agnico Eagle looks forward to working with the GN to enhance and improve the monitoring techniques proposed in the TEMP (v.4.0).

Agnico Eagle's Proposed Terms and Conditions:

> *Agnico Eagle will commit to working with the members of the Terrestrial Advisory Group (TAG), as per the TAG Terms of Reference, to review and refine monitoring and mitigation measures on an ongoing basis as outlined in the TEMP.*

Interested Party:	Government of Nunavut (GN)	Ref No.:	GN-09
Re:	Blasting: Monitoring and mitigation for caribou		

Technical Review Comment / Recommendation Made By Interested Party:

Inadequate justification is provided for the use of a 1.5 km no-blasting buffer for caribou. The proposed buffer is too small and not precautionary. In the absence of specific empirical evidence related to blasting effects on barren-ground caribou, the GN recommends the following:

- *A year-round buffer of 4 km, increased to 5 km during calving season;*
- *Revision of the TEMP to include a noise, vibration and visual cues study that: (1) will validate blasting noise and vibration predictions in the EIS; (2) will document the scale and range of visual cues generated by blasting activities (i.e. the distance and duration over which dust plumes can be observed by the naked eye); and (3) may be used to revise the no-blasting buffer. This study and subsequent review of the no-blasting buffer are to be conducted with guidance from the Terrestrial Advisory Group; and*
- *Revision of the TEMP to include surveys prior to each blast in order to detect caribou and other wildlife within the no-blasting buffer.*

Proposed Term and Condition

The following revisions to the Project's Terrestrial Ecosystem Management Plan (TEMP) version 4.0 shall be made:

- *Blasting activities at the Whale Tail site shall be suspended when caribou above the specified group size thresholds are present within 4 km of the blast site. This shall apply year-round except during calving season when the buffer shall be increased to 5 km;*
- *A noise, vibration and visual cues study shall be conducted that: (1) will validate blasting noise and vibration predictions in the Project's EIS; (2) will document the scale and range of visual cues generated by blasting activities (i.e. the distance and duration over which dust plumes can be observed by the naked eye); and (3) may be used to revise the no-blasting buffer. This study and subsequent review of the no-blasting buffer shall be conducted with guidance from the Terrestrial Advisory Group; and*
- *Prior to each blast, surveys shall be conducted to detect caribou and other wildlife within the no-blasting buffer.*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Blasting results in high intensity noise but at low duration and frequency. It is recognized by both Agnico Eagle and the GN that it is largely unknown how caribou respond to noise and blasting. Whether or not a 1.5 km buffer is adequate can be evaluated by monitoring and adaptively managed as necessary through the TEMP. Agnico Eagle has initiated monitoring programs on noise and vibration at their operations, whereby, data will be collected on these two parameters at various distances from the blasting size and source based on construction and mining activities. This information can also be tied into caribou

behavior observations to understand the environmental response to blasting and caribou response to noise and blasting at varying distances from the source as suggested by the GN in their comments. Agnico Eagle is willing to commit to the 4 km and 5 km (during calving) blasting suspension radius when caribou group size thresholds are met within that radius in the first full year of operations. Consistent with GN-07 and GN-08, Agnico Eagle values the GNs input and believes the proposed GN Terms and Conditions are monitoring specifications that should be addressed through the TAG, which is a mechanism to review monitoring data and accordingly revise the TEMP.

Agnico Eagle's Proposed Terms and Conditions:

Agnico Eagle will commit to working with the members of the Terrestrial Advisory Group (TAG), as per the TAG Terms of Reference, to review and refine monitoring and mitigation measures on an ongoing basis as outlined in the TEMP.

Interested Party:	Government of Nunavut (GN)	Ref No.:	GN-10
Re:	Helicopter disturbance buffers		

Technical Review Comment / Recommendation Made By Interested Party:

- *Revise the Project's TEMP to make distance buffers for the operation of helicopters and fixed winged aircraft in proximity to caribou a mandatory requirement, subject to safety considerations only.*
- *Revise the Project's TEMP to clarify that the distance buffers apply to landing and take-offs of helicopters, such that engine starts and takeoffs are suspended when caribou are observed within the buffer distance.*
- *Revise the Project's TEMP to include a program to monitor and report helicopter traffic associated with the Whale Tail project, Meadowbank mine and all associated exploration activities so that the spatial scale and intensity of this activity can be documented. This should include the collection and analysis of GPS track logs for all helicopter flights contracted by the Proponent. These data will facilitate effects monitoring programs such as caribou ZOI analyses and movement studies.*

Proposed Term and Condition:

The GN proposes the following Term and Condition:

- *The Proponent shall apply mandatory, minimum distance buffers of 300m vertically and 1000m horizontally for the operation of all helicopters and fixed winged aircraft in proximity to caribou, subject to exception for safety considerations or the fulfill of regulatory compliance activities only.*
- *The Proponent shall apply the mandatory, minimum distance buffers to landings and take-offs of helicopters, such that engine starts and takeoffs are suspended when caribou are observed within the buffer distance.*
- *The Proponent shall revise the Project's TEMP to include a program to monitor and report helicopter traffic associated with the Whale Tail project, Meadowbank mine and all associated exploration activities so that the spatial scale and intensity of this activity can be documented. This should include the collection and analysis of GPS track logs for all helicopter flights contracted by the Proponent. These data will facilitate effects monitoring programs such as caribou zone-of-influence analyses and movement studies.*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle values the GNs input and recognizes that the TEMP will continue to evolve as monitoring data informs decision making through the Terrestrial Advisory Group (TAG). Agnico Eagle looks forward to working with the GN to enhance and improve the monitoring techniques proposed in the TEMP (v.4.0) however believes the proposed GN Terms and Conditions are monitoring specifications that

should be addressed through the TAG, which is a mechanism to review monitoring data and accordingly revise the TEMP.

Agnico Eagle's Proposed Terms and Conditions:

Agnico Eagle will commit to working with the members of the Terrestrial Advisory Group (TAG), as per the TAG Terms of Reference, to review and refine monitoring and mitigation measures on an ongoing basis as outlined in the TEMP.

Interested Party:	Government of Nunavut (GN)	Ref No.:	GN-11
Re:	Traffic Monitoring		

Technical Review Comment / Recommendation Made By Interested Party:

- *A traffic monitoring program should be developed based on recommendations from the Project's Terrestrial Advisory Group (TAG). This program should be designed to collect data on vehicle type, time, date, location (i.e. specific road segment utilized), point of origin and destination for all vehicles (Proponent owned or contracted) using roads.*
- *Annually, traffic data should be verified to ensure its accuracy, summarized and reported for each road segment (i.e. AWAR and Whale Tail haul road). In addition to daily rates, any seasonal or monthly variation in traffic should be reported. The observed rates and composition of traffic should be compared to predictions in the EIS to identify exceedances.*
- *Traffic rates on Project roads should not exceed those used in the impact assessment (see Proponent response to GN-Information Request #6). Where traffic rates or composition exceed predictions in the EIS, based on a 3-year average, the Proponent should produce a revised assessment to examine the potential impacts of this excess traffic on wildlife. This revised assessment should be submitted to NIRB for screening to determine the need for a Project amendment.*
- *Monitoring efforts to record public use of roads should be expanded to include collection of data by staff conducting wildlife road surveys.*

Proposed Term and Condition:

The GN proposes the following Term and Condition:

- *The Proponent shall develop a traffic-monitoring program based on recommendations from the Project's Terrestrial Advisory Group (TAG). This program shall be designed to collect data on vehicle type, time, date, location (i.e. specific road segment utilized), point of origin and destination for all vehicles (Proponent-owned or contracted) using roads.*
- *The Proponent shall verify annually traffic data to ensure its accuracy and shall summarize and report traffic data for each road segment (i.e. AWAR and Whale Tail haul road). In addition to daily rates, any seasonal or monthly variation in traffic shall be reported. The observed rates and composition of traffic shall be compared to predictions in the EIS to identify exceedances.*
- *The Proponent shall endeavor for traffic rates on Project roads to not exceed those used in the impact assessment (see Proponent response to GN Information Request #6). Where traffic rates or composition exceed predictions in the EIS, based on a 3-year average, the Proponent shall produce a revised assessment to examine the potential impacts of this excess traffic on wildlife. This revised assessment shall be submitted to NIRB for screening to determine the need for a Project amendment.*

- *The Proponent shall expand monitoring efforts to record public use of roads to include collection of data by staff conducting wildlife road surveys.*

Agnico Eagle's Response to Technical Review Comment / Recommendation:
Agnico Eagle values the GNs input and recognizes that the TEMP will continue to evolve as monitoring data informs decision making through the Terrestrial Advisory Group (TAG). The Project has proposed using enhanced mitigation measures including managing traffic to minimize or avoid effects to caribou. These are implemented when caribou group size thresholds are exceeded and are not based on traffic volume.

For point of clarification, the AWAR is a private road with a condition that allows access by Inuit for traditional activities via ATV only. Agnico Eagle looks forward to working with the GN to enhance and improve the monitoring techniques proposed in the TEMP (v.4.0) however believes the proposed GN Terms and Conditions are monitoring specifications that should be addressed through the TAG, which is a mechanism to review monitoring data and accordingly revise the TEMP. These commitments should not be in the Project Certificate Terms and Conditions.

Agnico Eagle's Proposed Terms and Conditions:

Agnico Eagle will commit to working with the members of the Terrestrial Advisory Group (TAG), as per the TAG Terms of Reference, to review and refine monitoring and mitigation measures on an ongoing basis as outlined in the TEMP.

Interested Party:	Government of Nunavut (GN)	Ref No.:	GN-12
Re:	Project Tolerant Animals		

Technical Review Comment / Recommendation Made By Interested Party:

- *'Project tolerant' should be defined as: an animal or group of animals (i) observed within a mitigation distance buffer for greater than 72 hours during the winter or 48 hours during other seasons, and; (ii) not visibly disturbed by the Project.*
- *Where mitigation measures are to be relaxed for project tolerant animals, the Proponent should consult with the GN, KivIA and Baker Lake HTO prior to reducing/removing mitigation.*
- *All cases where mitigation measures are relaxed for project tolerant animals should be documented and reported in the annual project monitoring report.*

Proposed Term and Condition:

The GN proposes the following Term and Condition:

- *The Proponent shall revise the Terrestrial Ecosystem Management Plan to define 'Project tolerant' as: an animal or group of animals (i) observed within a mitigation distance buffer for greater than 72 hours during the winter or 48 hours during other seasons; and (ii) not visibly disturbed by the Project.*
- *Where mitigation measures are to be relaxed for project tolerant animals, the Proponent shall consult with the Government of Nunavut, the Kivalliq Inuit Association and the Baker Lake Hunter Trapper Organization prior to reducing/removing mitigation.*
- *The Proponent shall document all cases where mitigation measures are relaxed for project tolerant animals and shall report these cases in the annual project monitoring report.*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle appreciates the definitions provided on project tolerant animals and they appear reasonable and will include these in the next version of the TEMP; however, these definitions should be discussed and vetted through the TAG before incorporation into the TEMP. The TEMP outlines mitigation and the conditions where the frequency or intensity of mitigation can be adaptively managed. Agnico Eagle will engage with the GN, KivIA, and Baker Lake HTO on the results of the TEMP annually via the TAG and any proposed changes to mitigation or monitoring. These suggestions can be addressed in the next TAG meeting. Agnico Eagle looks forward to working with the GN to enhance and improve the monitoring techniques proposed in the TEMP (v.4.0) however believes the proposed GN Terms and Conditions are monitoring specifications that should be addressed through the TAG, which is a mechanism to review monitoring data and accordingly revise the TEMP.

Agnico Eagle's Proposed Terms and Conditions:

Agnico Eagle will commit to working with the members of the Terrestrial Advisory Group (TAG), as per the TAG Terms of Reference, to review and refine monitoring and mitigation measures on an ongoing basis as outlined in the TEMP.

Interested Party:	Government of Nunavut (GN)	Ref No.:	GN-13
Re:	Muskox Mitigation		

Technical Review Comment / Recommendation Made By Interested Party:

Given the gaps in knowledge and potentially higher vulnerability of muskox to impacts from exposure to year-round mining activities, a precautionary approach to protecting the species is warranted at the present time, until further evidence is available through monitoring and research. Accordingly, the following is recommended:

- *The group size threshold for triggering adaptive management for muskox should be justified based on the available data and amended as necessary such that a threshold providing enhanced mitigation to 75% of muskox encountering the Project is applied.*
- *Discretionary measures for muskox mitigation should be replaced by automatic measures triggered by group size and distance thresholds.*
- *When groups of muskox above the group size threshold are observed within 1 km, blasting activities should be suspended until the animals have moved away. This is provision matches the no-blasting threshold established for the Back River project recently reviewed by NIRB.*
- *When groups of muskox above the group size threshold are observed within 500 m of Project roads, vehicles should slow to 30 km/hr when passing. This matches muskox protection measures established for the Back River project recently reviewed by NIRB.*
- *Mandatory aircraft flight buffers applied to caribou (300m vertically, 1000m horizontally) should also be applied to muskox.*

Proposed Term and Condition:

The GN proposes the following Term and Condition:

- *The Proponent shall justify the group-size threshold for triggering adaptive management for muskox based on the available data. The Proponent shall amended as necessary the group-size threshold such that a threshold providing enhanced mitigation to 75% of muskox encountering the Project is applied.*
- *The TEMP shall be revised to include the following provisions:*
    - *When groups of muskox above the group size threshold are observed within 1 km, blasting activities shall be suspended until the animals have moved away.*
    - *When groups of muskox above the group size threshold are observed within 500 m of Project roads, vehicles shall slow to 30 km/hr when passing.*
    - *Mandatory aircraft flight buffers applied to caribou (300m vertically, 1000m horizontally) shall also be applied to muskox.*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle appreciates the comments from the GN and these seem reasonable, however, these suggestions should be discussed and vetted through the TAG before incorporation into the TEMP. Agnico Eagle looks forward to working with the GN to enhance and improve the monitoring techniques proposed in the TEMP (v.4.0) however believes the proposed GN Terms and Conditions are monitoring specifications that should be addressed through the TAG, which is a mechanism to review monitoring data and accordingly revise the TEMP.

Agnico Eagle's Proposed Terms and Conditions:

> *Agnico Eagle will commit to working with the members of the Terrestrial Advisory Group (TAG), as per the TAG Terms of Reference, to review and refine monitoring and mitigation measures on an ongoing basis as outlined in the TEMP.*

Interested Party:	Government of Nunavut (GN)	Ref No.:	GN-14
Re:	Raptor mitigation		

Technical Review Comment / Recommendation Made By Interested Party:

As an acceptable standard to reduce uncertainty, to ensure compliance with provisions of the Nunavut Wildlife Act, and to attain consistency with existing guidelines for raptor nest mitigation, the GN recommends that an automatic, minimum no-disturbance buffer should be applied to every active raptor nest located in proximity to the Project. Within this buffer, activities such as operation of vehicles, heavy equipment, aircraft and blasting should be prohibited. Exceptions to this automatic prohibition, and adjustments to buffers, should be based on an agreed nest-specific management plan that has been reviewed and approved by the GN, subject matter experts and other relevant parties.

In the absence of Nunavut-specific guidelines, the GN recommends the use of buffers such as those in the BC Guidelines for Raptor Conservation (http://www.env.gov.bc.ca/wld/documents/bmp/raptor_conservation_guidelines_2013.pdf) which provide guidance on buffers by species and season. Based on these guidelines, the minimum recommended buffer is 200 to 500m dependent on species, with minimum buffers for species such as peregrines and golden eagles at 500m. These guidelines also recommend an additional buffer of at least 100m during breeding seasons.

Proposed Term and Condition

- *The proponent shall establish automatic minimum no-disturbance buffers around all raptor nests located in proximity to the Project. Project activities, including the operation of vehicles, heavy equipment, aircraft and blasting, shall be prohibited within these buffers unless an exception is specified within a nest-specific management plan that has been reviewed and approved by the GN, subject matter experts and other relevant parties. The size of minimum, no-disturbance buffers shall be based on the BC Guidelines for Raptor Conservation or similar guidelines as recommended by the Project's Terrestrial Advisory Group.*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle agrees with the GN-14 recommendations, which is consistent with our existing protocols for the protection of raptors.

Interested Party:	Government of Nunavut (GN)	Ref No.:	GN-15
Re:	Labour Market Forecasts		

Technical Review Comment / Recommendation Made By Interested Party:

In the interest of producing accurate labour market information and reliable economic and employment forecasting for the current and future labour force, the GN requires the most up-to-date determination of the numbers of position and types of employment needed for the Project as well as the skills required for these jobs. The GN recommends that the Proponent provide a detailed staff schedule for each of the Project phases. Forecasted employment positions should be categorized by department and division, and each position should be listed with its associated National Occupational Classification (NOC) code.

Proposed Term and Condition

The GN proposes the following Terms and Conditions:

- *The Proponent is strongly encouraged to submit staff schedule forecasts to the Nunavut Impact Review Board and to the Government of Nunavut six (6) months prior to each phase of the project (construction, operations, closure). The schedule forecasts should, at a minimum, provide a description of:*
  - *Title of positions required by department and division; and*
  - *Quantity of such positions available by Project phase.*
- *The Proponent is strongly encouraged to submit additional staff schedule information to the Nunavut Impact Review Board and to the Government of Nunavut for each phase of the project (construction, operations, closure), as soon as it becomes available. This information should include:*
  - *Transferable skills, both certified and uncertified which may be required for, or gained during, employment within each position; and*
  - *The National Occupational Classification code for each individual position.*
- *The Proponent is encouraged to consult the Government of Nunavut's Career Development division during development of the schedule. A new schedule shall be submitted following any significant deviation from original predictions.*
- *The Proponent's Human Resources shall make best efforts to collaborate with the Government of Nunavut's Career Development Officer and Regional Manager of Career Development. Quarterly contact, at minimum, should be initiated by the Proponent with these Government of Nunavut representatives regarding:*
  - *Hiring procedures and policies;*
  - *Issues regarding employee recruitment and retention;*
  - *AEM policies regarding career pathways and opportunities for advancement;*
  - *Internal and / or partnered training and development of employees;*
  - *Trades and apprenticeships; and*

- *Long-term labour market plans to facilitate training in communities.*

Agnico Eagle's Response to Technical Review Comment / Recommendation:
Agnico Eagle appreciates the GN's recommendations and believes mechanisms are in place to support implementation. Agnico Eagle will continue to adhere to Whale Tail and Meadowbank IIBA conditions. The Whale Tail and Meadowbank IIBA outline directives related to Inuit recruitment, employment, labour pool, work and rotation schedule and advancement of women, youth and challenged workers. Agnico Eagle believes both Meadowbank and Whale Tail IIBA are the appropriate mechanisms for managing and monitoring the labour force and project certificate conditions are not necessary. In accordance with the said IIBAs Agnico Eagle is required to meet with the Employment and Culture Committee comprised of 3 Kivalliq Inuit Association and 3 Agnico Eagle representatives on a quarterly basis (4 times per year) to report on Agnico Inuit Employment by hours worked and by job classification. Moreover, Agnico Eagle is required to report, on a monthly basis, Contractors' Inuit hours worked and job classification to the said Employment and Culture Committee.

The said IIBAs have clear obligations for Agnico Eagle to develop collaboratively with the KIA, an Inuit recruitment strategy, recruitment methods, advertisements, application procedures, interview protocols, labour pool process, selection procedures and training and promotion decision making to reduce barriers to employment. Agnico Eagle acknowledges that the said IIBAs encompasses the "Inuit" employment and recruitment and may not capture the non-Inuit labour within the territory and therefore proposed that the SEMP is an appropriate forum to implement GN recommendations and provide the requested information.

Agnico Eagle will continue the implementation of the SEMP. The SEMP is a proven mechanism for providing information to the stakeholders. Agnico Eagle continues to encourage the GN to participate in the SEMP and to propose such recommendations in the SEMP Working Group and develop solutions within the SEMP process. Agnico Eagle would suggest the issues raised by GN are not Project specific but rather speak to Agnico Eagle Kivalliq regional operations. The IIBA and SEMP are established mechanisms in place that would support implementation of GNs recommendations.

Interested Party:	Government of Nunavut (GN)	Ref No.:	GN-16
Re:	Employee Sexual Health and Sexual Health Education		

Technical Review Comment / Recommendation Made By Interested Party:

The GN recommends that the Proponent commit to including further sexual and well-being information in its employee orientation programming.

Proposed Term and Condition

The GN proposes the following Term and Condition:

- *The Proponent shall update their Occupational Health and Safety Plan to include sexual and well-being information in its employee orientation programming.*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle agrees with the GN-16 recommendations and the proposed Term and Condition.

Interested Party:	Government of Nunavut (GN)	Ref No.:	GN-17
Re:	Use of Community Health Centres		

Technical Review Comment / Recommendation Made By Interested Party:

It is the GN's recommendation that the Proponent commit to undertake an education program to inform workers of the range of health services available onsite, to increase provision of health services on-site to meet the needs of the mining camp, and to work with the GN to develop a process to ensure that any conditions first treated at the mine site and requiring ongoing care is appropriately accommodated in a timely manner at the community health centre as required.

Proposed Term and Condition

The GN proposes the following commitment:

- *The Proponent undertake an education program to inform workers of the range of health services available onsite.*
- *The Proponent increase provision of health services on-site to meet the needs of the mining camp.*
- *The Proponent engage with the GN to develop a process to ensure that any conditions first treated at the mine site and requiring ongoing care is appropriately accommodated in a timely manner at the community health centre as required.*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle commits to undertake an education program to inform workers of the range of health services onsite, as well as to engage with the GN to develop a process to ensure that any conditions first treated at the mine site and requiring ongoing care are appropriately accommodated in a timely manner at the community health center as required. Agnico Eagle believes that the provision of health services on-site meets the needs of the mining camp; however, Agnico Eagle encourages the GN to bring recommendations to increase specific health services on-site to the Kivalliq Socio-Economic Monitoring Committee, and develop solutions as appropriate within the SEMP process. The Whale Tail IIBA has conferred onto the Proponent strict conditions and commitments to reduce barriers to employment, which may be inferred by medical scrutiny. Accordingly, the Kivalliq Socio-Economic Monitoring Committee, which the KivIA is expected to contribute, is the proper mechanism to discuss any increased provision of on-site health services.

Interested Party:	Government of Nunavut (GN)	Ref No.:	GN-18
Re:	Absenteeism in the Mining Sector		

Technical Review Comment / Recommendation Made By Interested Party:

The NHC believes that the Project will increase demand on the region's social housing stock as a result of direct-project employment, project-induced in-migration, and population increase within the Project Local Study Area (LSA). It is therefore in the interest of the Proponent to establish a monitoring and reporting mechanism to identify migration trends and effects as a result of the Project, and to work with the NHC where these effects can be mitigated. This would allow the Proponent to collaborate with the GN, NHC, and other agencies and interested groups to identify measures for managing and mitigating adverse impacts on employee well-being and communities included in the LSA.

Proposed Term and Condition

The GN proposes the following Term and Condition:

- *The Proponent, working with the Government of Nunavut, the Kivalliq Socio-Economic Monitoring Committee, and the Nunavut Housing Corporation, shall deliver a voluntary recurring survey to its Nunavut-based employees. The survey will be developed by NHC in consultation with the Proponent and designed to track housing status of employees and identify links between housing and absenteeism. The results of the survey are to be reported to the Government of Nunavut and the Nunavut Impact Review Board, and will inform discussion and consultation on potential mitigation measures.*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

As discussed with the GN, Agnico Eagle is supportive of this initiative. As per Agnico Eagle response to April 2017 Technical Comment GN-23, while respecting the privacy of our employees, Agnico Eagle will work with the GN to ensure appropriate data is made available; however, Agnico Eagle will not collect information that steps into the private lives of our employees. Agnico Eagle encourages the NIRB to consider applying the same Project Certificate to the Whale Tail Project as is applied to the Meadowbank Mine as the labour force will be managed holistically.

Agnico Eagle Proposed Term and Condition:

The Proponent is encouraged to work with the Kivalliq Socio-Economic Monitoring Committee to design and implement a voluntary survey to be offered to its Nunavummiut employees on an annual basis in order to identify changes of address, housing status (i.e., public/social, privately owned/rented, government, etc.), and migration intentions, while respecting confidentiality of all persons involved. The survey should be designed in collaboration with the Government of Nunavut, the Nunavut Housing Corporation and other relevant stakeholders. Non-confidential results of the survey are to be reported to the Government of Nunavut and the NIRB.

Interested Party:	Government of Nunavut (GN)	Ref No.:	GN-19
Re:	Migration and Demographic Shifts in the LSA		

Technical Review Comment / Recommendation Made By Interested Party:

The Proponent should pursue collaboration with the GN, NHC, and other agencies and interested groups to identify measures to enhance employee access to a range of housing options, such as homeownership programs, in order to mitigate adverse impacts to the region's housing situation.

The GN recommends that the Proponent work with interested groups to improve employee access to a range of housing options, including private homeownership.

Proposed Term and Condition

The GN proposes the following Term and Condition:

- *The Proponent shall provide financial literacy, financial planning, and personal budgeting training with a view to enhancing employee access to a range of housing options, including homeownership, in collaboration with the Government of Nunavut, the Nunavut Housing Corporation as part of the regular Life Skills Training and/or Career Path Program.*
- *The Proponent shall work with the Government of Nunavut and the Nunavut Housing Corporation to explore options for a proponent-driven employee support program to encourage homeownership.*
- *The Proponent shall work with the Government of Nunavut to explore options regarding the development homeownership support programs, including the development of a savings matching program for employees looking to save towards home ownership.*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle agrees with the GN recommendation and the proposed Project Term and Conditions. Agnico Eagle is already developing and delivering financial literacy and financial planning initiatives through a Financial Literacy program in partnership with CPA Canada and in the Coping with Fly-in/Fly-out (Making it Work) program delivered by the Kivalliq Mine Training Society. Agnico Eagle will continue to work with the Department of Family Services, the Nunavut House Corporation and other relevant stakeholders to promote skills, training (including but not limited to financial literacy, financial planning and personal budgeting), and career advancement of current and future Inuit employees.

Attachment 1:

Percent Collared Caribou in Zones of Influence

TECHNICAL MEMORANDUM

DATE August 28, 2017 **PROJECT No.** 1658927_137_TM_3140_Rev0

TO Ryan Vanengen
Agnico Eagle Mines Limited

CC Jamie Quesnel, Jen Range

FROM Dan Coulton, Corey De La Mare **EMAIL** cdelamare@golder.com

PERCENT COLLARED CARIBOU IN ZONES OF INFLUENCE

1.0 BACKGROUND

At the request of the Government of Nunavut (GN), the following describes the percent of collared caribou encountering at least one development zone of influence (ZOI) by year for the Meadowbank Mine and All-weather Access Road (AWAR), the Whale Tail Project (Project), and reasonably foreseeable future developments (RFD). The results are based on the cumulative effects analysis results of development ZOI encounters and residency time presented in Golder (2017) for the Project to satisfy Agnico Eagle Mines Limited commitments 9 and 10.

2.0 METHODS

The percent of collared caribou encountering at least one ZOI was estimated by transforming the total number of ZOI encounters by each collared caribou in each herd and season into a binomial encounter rate where greater than zero encounters was fixed at a value of one and no encounters at zero. The percent collared caribou was estimated by dividing the total number of collared caribou with encounters by the total number of collared caribou and multiplying this value by 100 for each year of collar data. The standard error of a proportion is also presented. The same development scenarios of the Base Case, Meadowbank Case, Project Case, and RFD Case were used as in Golder (2017) to satisfy the GN's request. It is important to note that the Project Case and RFD Case are simulated estimates because these developments were not present on the landscape at the time the collared caribou were monitored.

Of note is that the ZOI encounter and residency time results presented in Golder (2017) show that collared Beverly caribou do not interact with the Meadowbank Mine and AWAR or the Project because these developments are located outside of this herd's core spring, fall, and winter seasonal ranges. Therefore, the percent collared caribou in at least one ZOI in these seasonal ranges for Beverly is zero. Similarly, these developments are also outside of the core spring and fall ranges of Ahiak caribou derived from collared caribou data. While the Meadowbank Mine and AWAR and Project are outside the core fall range of Ahiak, one collared caribou did encounter at least one ZOI, so this range was included. Table 1 provides the number of collars in service by season for each of the herds considered and indicate the number of collars in service for Ahiak, Beverly, Lorillard, and Wager Bay caribou herds have ranged from 0 to 45 from 1996 to 2017.

Golder Associates Ltd.
16820 107 Avenue, Edmonton, Alberta, Canada T5P 4C3

Tel: +1 (780) 483 3499 Fax: +1 (780) 483 1574 www.golder.com

Golder Associates: Operations in Africa, Asia, Australasia, Europe, North America and South America

Table 1: Available Number of Collared Caribou per Year, Season, and Herd

	Spring				Fall				Winter			
Year	Ahiak	Beverly	Lorillard	Wager Bay	Ahiak	Beverly	Lorillard	Wager Bay	Ahiak	Beverly	Lorillard	Wager Bay
1996	-	-	-	-	5	-	-	-	-	-	-	-
1997	4	-	-	-	5	-	-	-	4	-	-	-
1998	4	-	1	-	4	-	2	-	4	-	1	-
1999	-	-	2	-	-	-	8	1	-	-	2	-
2000	-	-	7	1	-	-	9	6	-	-	7	1
2001	5	1	9	6	5	1	7	4	5	1	9	6
2002	8	1	7	4	8	1	10	3	8	1	7	4
2003	4	1	10	3	3	1	12	12	4	1	10	3
2004	2	1	12	11	2	1	9	10	2	1	12	11
2005	8	1	8	8	8	-	3	3	8	1	8	8
2006	20	7	3	3	19	5	-	1	20	7	3	3
2007	19	5	-	1	18	11	-	-	19	5	-	1
2008	19	40	-	-	42	8	-	-	19	40	-	-
2009	42	7	-	-	34	2	-	1	42	7	-	-
2010	27	4	-	1	24	-	-	1	27	4	-	1
2011	19	-	-	1	15	-	8	2	19	-	-	1
2012	34	-	8	2	25	-	5	1	34	-	8	2
2013	18	-	5	1	13	-	5	-	18	-	5	1
2014	8	22	5	-	10	23	2	-	8	22	5	-
2015	5	45	2	-	3	39	5	2	5	45	2	-
2016	2	34	5	2	2	26	12	6	2	34	5	2
2017	-	36	12	5	-	-	-	-	-	36	12	5

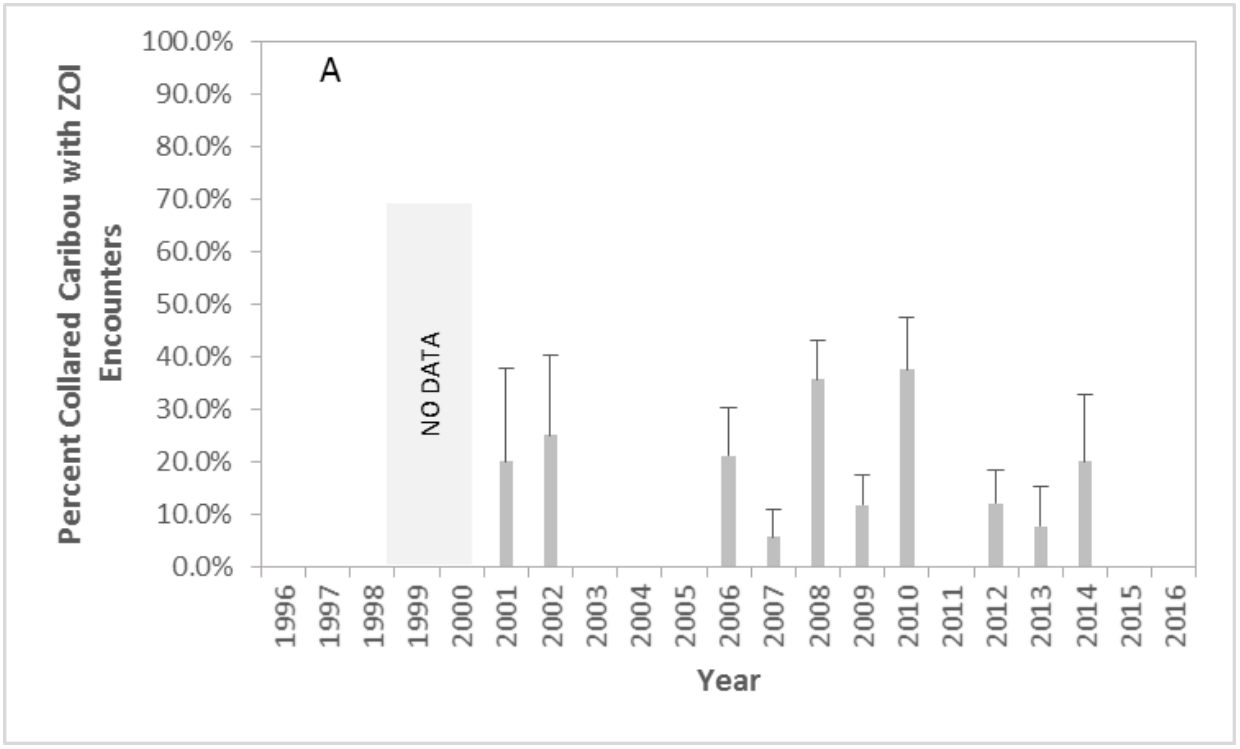
3.0 RESULTS

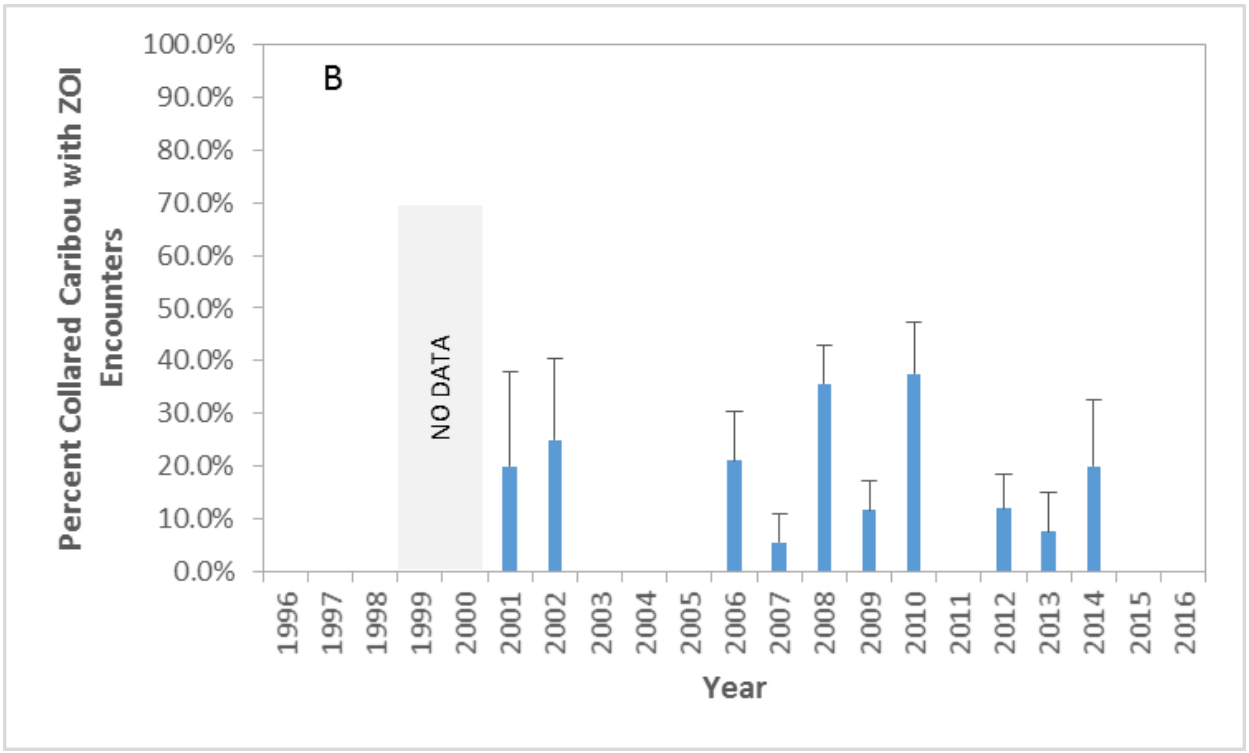
3.1 Ahiak

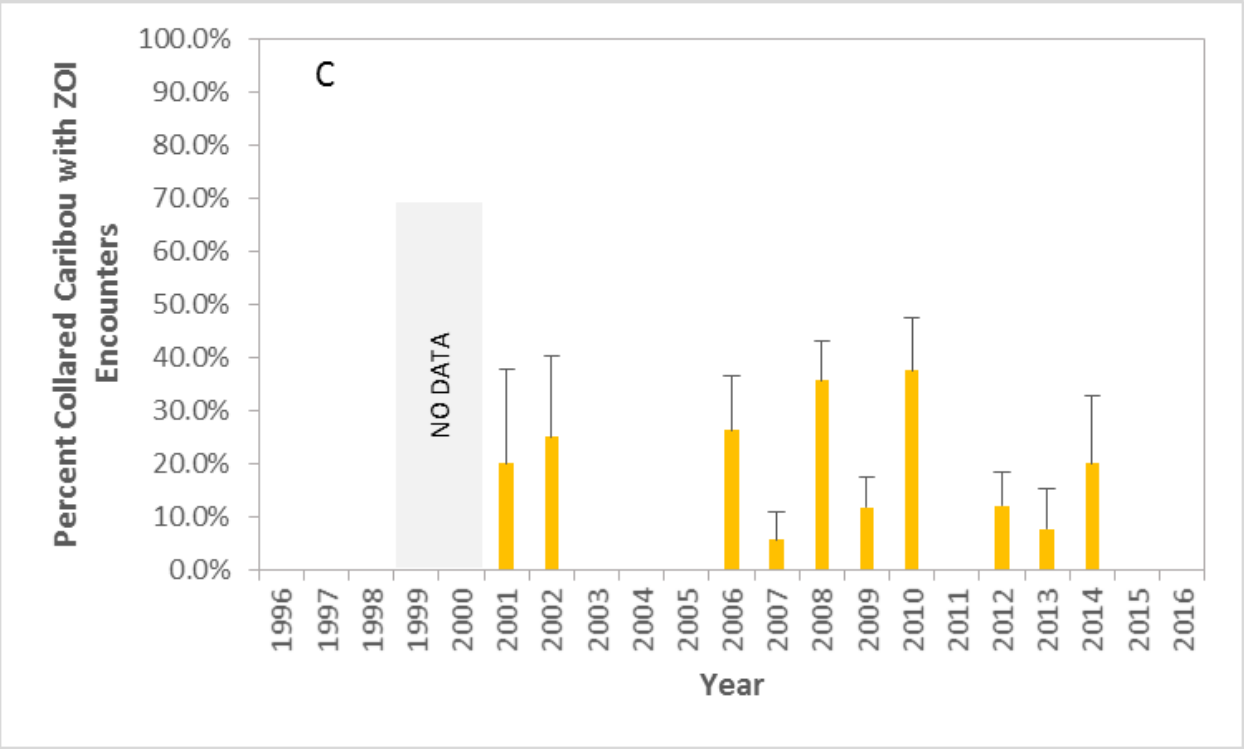
3.1.1 Fall Migration

The annual percentages of collared caribou interacting with at least one development ZOI in the Base Case ranged from 0.0% in 1996, 1997, 1998, 2003, 2004, 2005, 2011, 2015, and 2016 to 37.5% in 2010 and has been variable across time (Figure 1A). For the Meadowbank Case, the annual percentages of collared caribou interacting with at least one development ZOI are the same as the Base Case (Figure 1B). Thus, from 1996 to 2016, the presence of the Meadowbank Mine and AWAR has not increased the number of collared caribou interacting with development ZOIs. For the Project Case, simulated annual percentages of collared caribou interacting with at least one development ZOI are the same as the Meadowbank Case except for 2006, when one more collared caribou (5.3% increase) was simulated to have interacted with the Project's ZOI. Simulated annual percentages of collared caribou encountering at least one development ZOI ranged from 0.0% in 1996, 1997, 1998, 2004, 2011, 2015, and 2016 to 38.1% in 2008.

Figure 1: Percent (± Standard Error) Collared Ahiak Caribou Encountering at least Once Development Zone of Influence from 1996 to 2016 in the Base Case (A), Meadowbank Case (B), Project Case (C) and Reasonably Foreseeable Future Development Case (D) during the Fall Migration



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Percent Collared Caribou with ZOI Encounters
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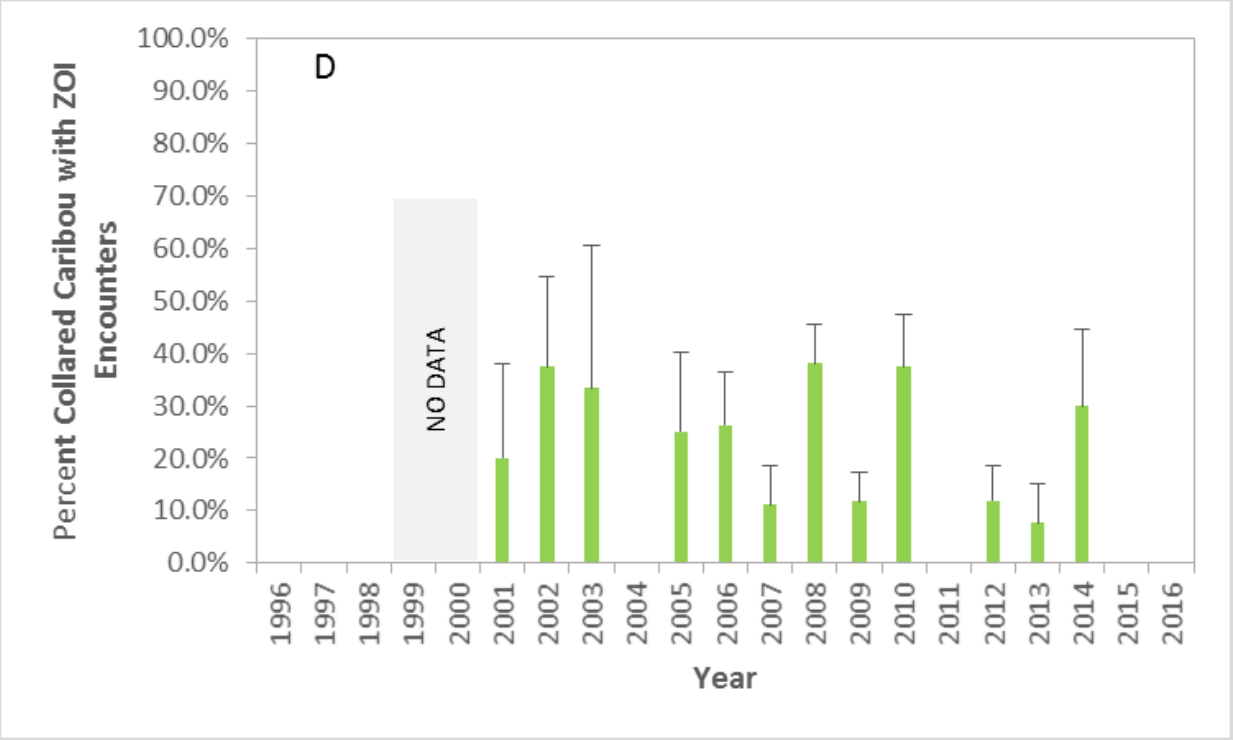
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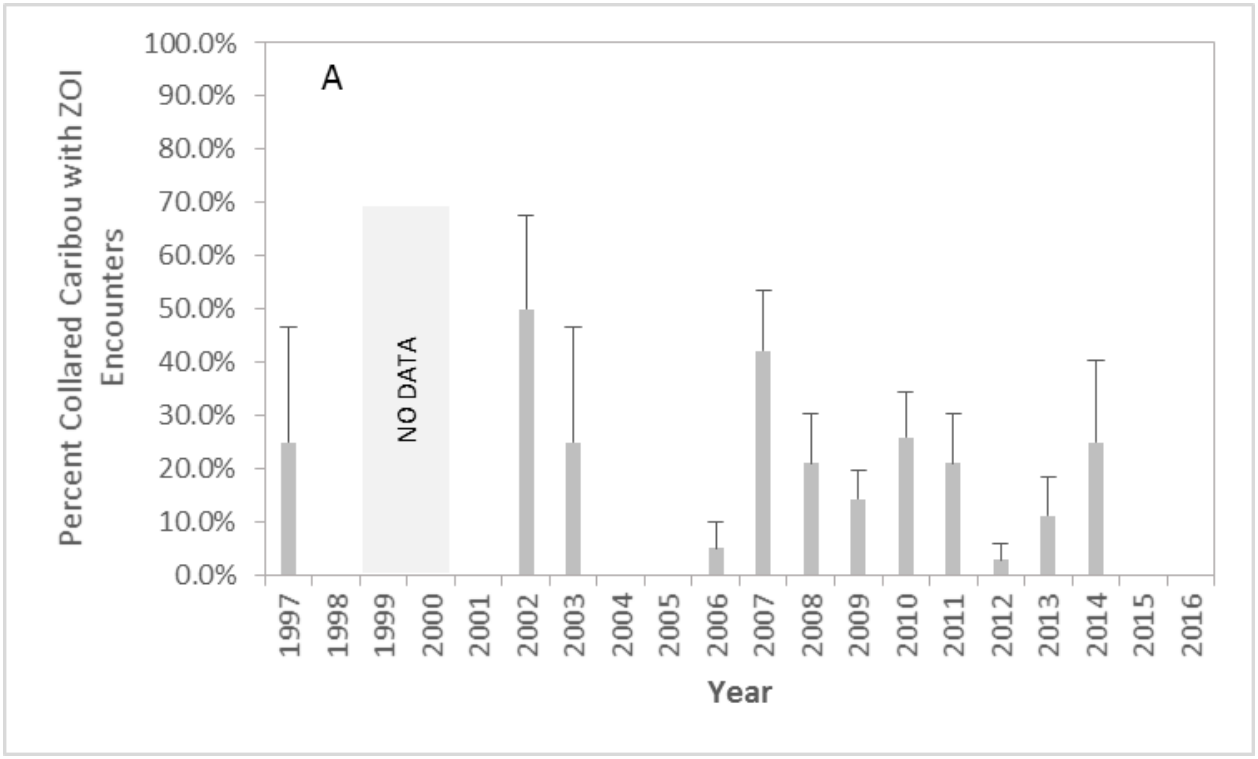
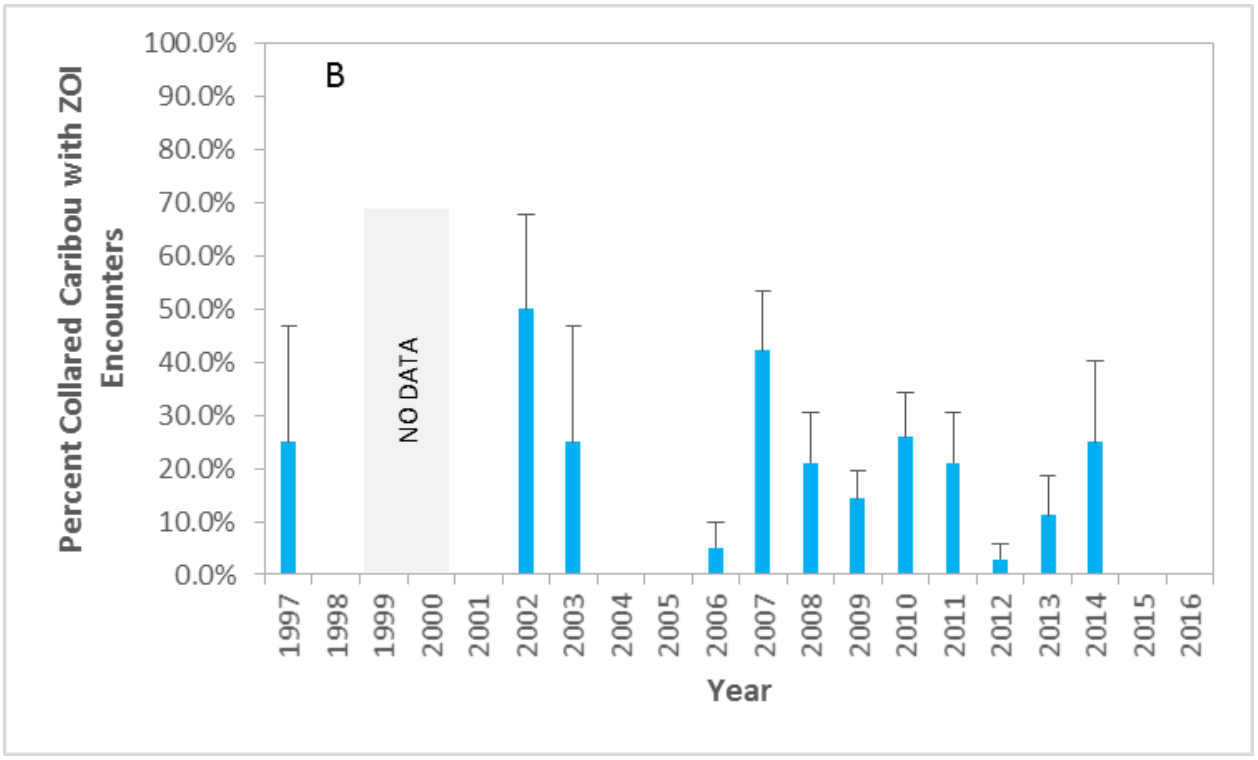
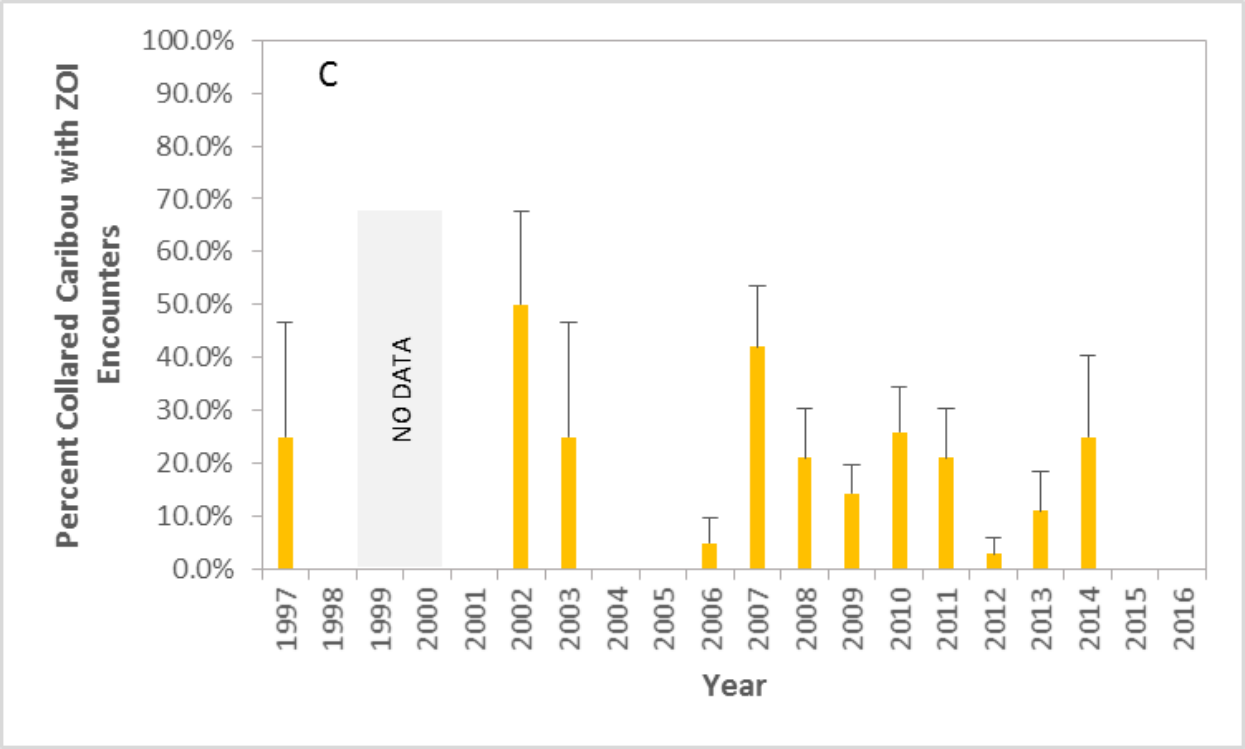
3.1.2 Winter Migration

The annual percentages of collared caribou interacting with at least one development ZOI in the Base Case ranged from 0.0% in 1998, 2001, 2004, 2005, 2015, and 2016 to 50.0% in 2002 and has been variable across time (Figure 2A). For the Meadowbank Case, the annual percentages of collared caribou interacting with at least one development ZOI are the same as the Base Case (Figure 2B). Thus, from 1997 to 2016, the presence of the Meadowbank Mine and AWAR has not increased the number of collared caribou interacting with development ZOIs. For the Project Case, simulated annual percentages of collared caribou interacting with at least one development ZOI are the same as the Meadowbank Case (Figure 2C). Simulated annual percentages of collared caribou encountering at least one development ZOI in the RFD Case ranged from 0.0% in 1998, 2001, 2004, 2005, 2015, and 2016 to 50.0% in 1997, 2002, and 2003 (Figure 2D). Simulations in the RFD Case indicate that one additional collared caribou encountered at least one ZOI in 1997 and 2003, otherwise there was no change from the Base Case.

Figure 2: Percent (± Standard Error) Collared Ahiak Caribou Encountering at least Once Development Zone of Influence from 1996 to 2016 in the Base Case (A), Meadowbank Case (B), Project Case (C) and Reasonably Foreseeable Future Development Case (D) during the Winter Migration



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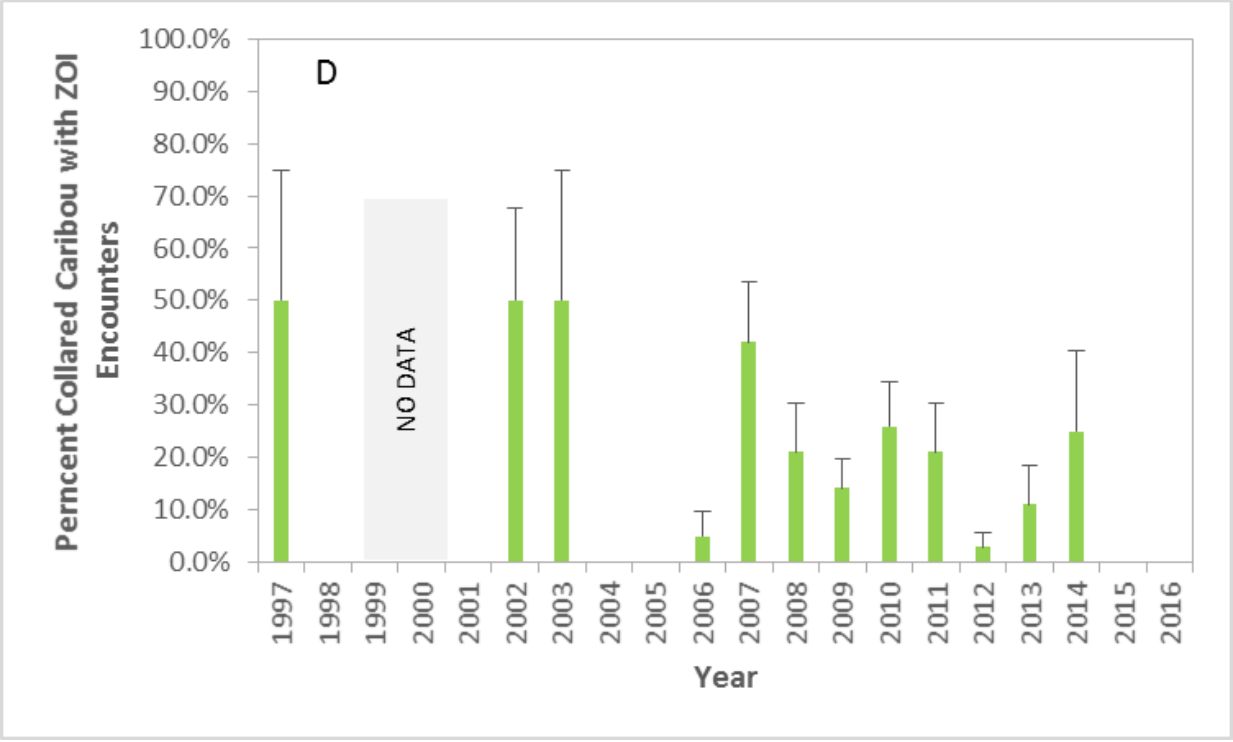
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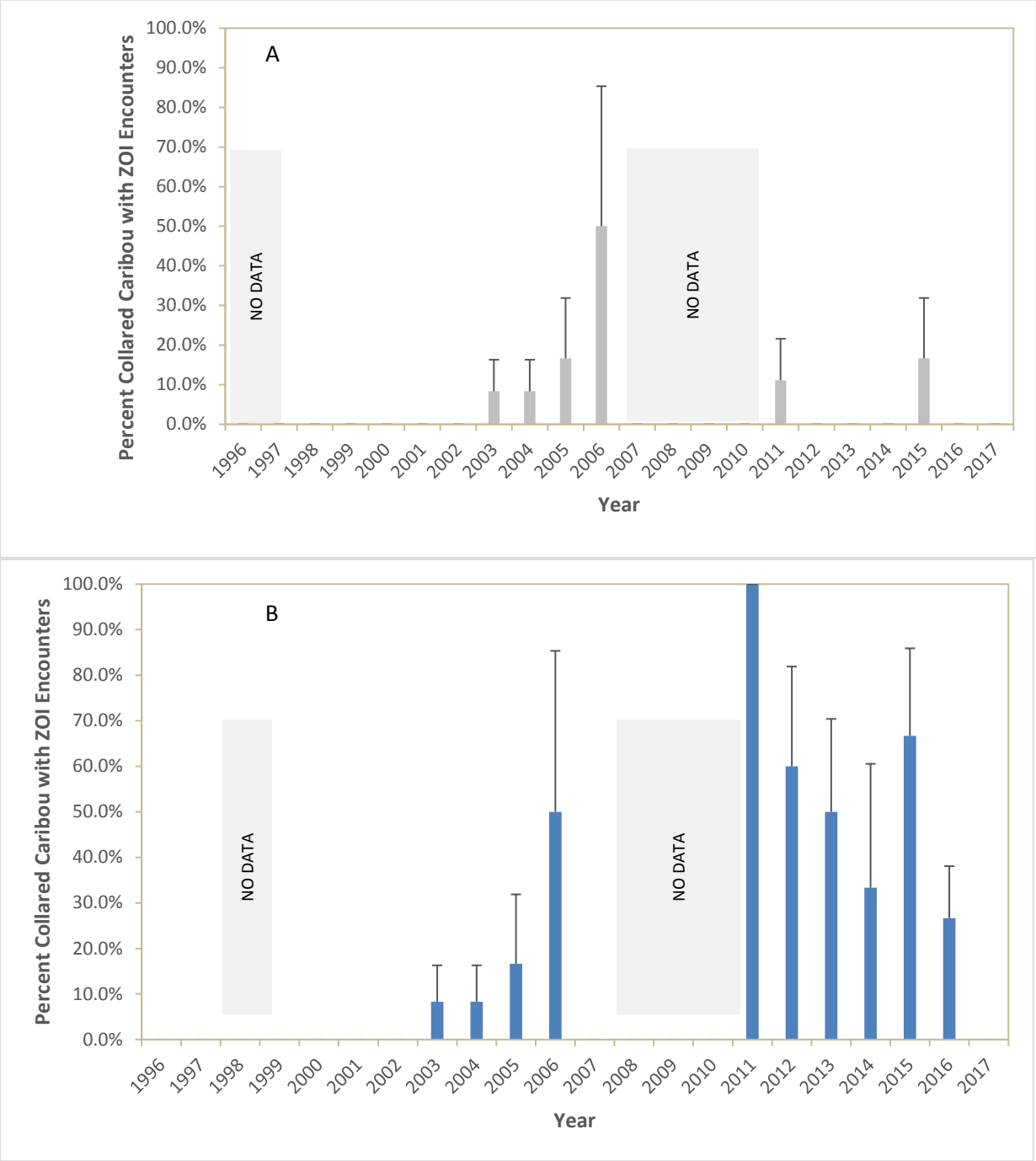
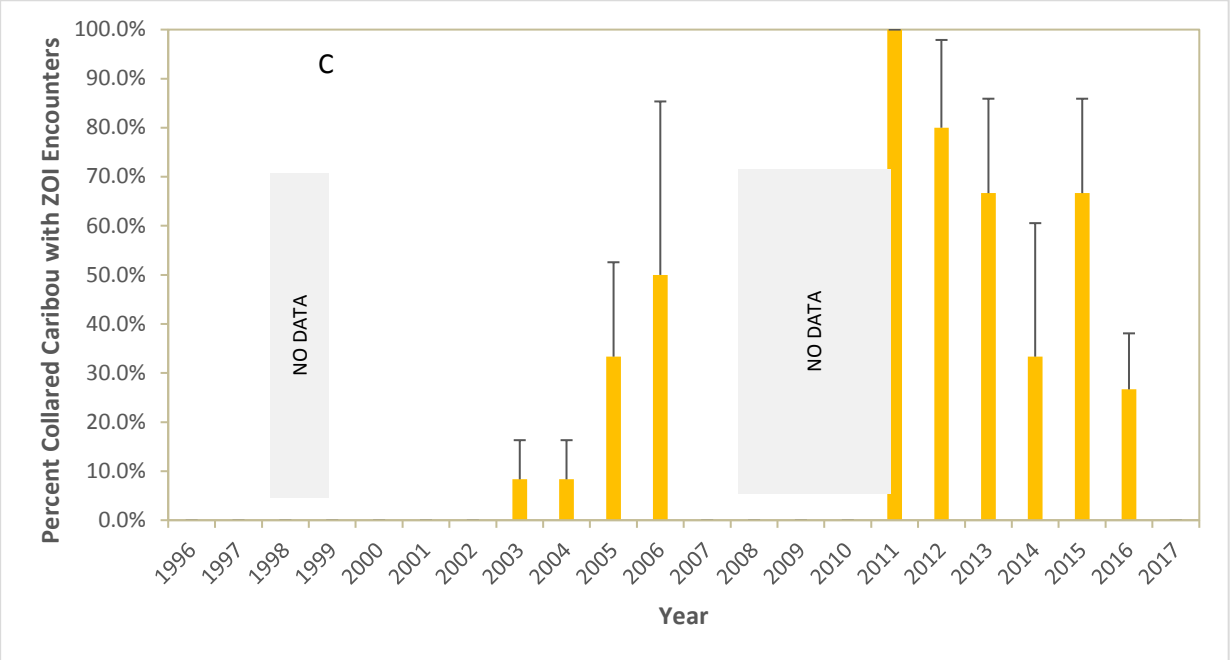
3.2 Lorillard

3.2.1 Spring Migration

The annual percentages of collared caribou interacting with at least one development ZOI in the Base Case ranged from 0.0% in 1998, 1999, 2000, 2001, 2002, 2012, 2013, 2014, 2016, and 2017 to 50.0% in 2006 and has been variable across time (Figure 3A). For the Meadowbank Case, the annual percentages of collared caribou interacting with at least one development ZOI increased from the Base Case in 2011 (88.9% increase), 2012 (60.0% increase), 2013 (50.0% increase), 2014 (33.3% increase), 2015 (50.0% increase), and 2016 (26.7% increase) (Figure 3B). These annual increases resulted from an additional eight, three, one, three and four collared caribou encountering the Meadowbank Mine and AWAR ZOI, in 2011, 2012, 2013, 2014, 2015, and 2016, respectively. For the Project Case, simulated annual percentages of collared caribou interacting with at least one development ZOI are the same as the Meadowbank Case except for 2005, 2012, and 2013, where one more collared caribou (16.7%, 20.0%, and 16.7% increase, respectively) was simulated to have interacted with the Project's ZOI in each of these years (Figure 3C). Simulations in the RFD Case were same as the Project Case (Figure 3D).

Figure 3: Percent (± Standard Error) Collared Lorillard Caribou Encountering at least Once Development Zone of Influence from 1998 to 2017 in the Base Case (A), Meadowbank Case (B), Project Case (C) and Reasonably Foreseeable Future Development Case (D) during the Spring Migration

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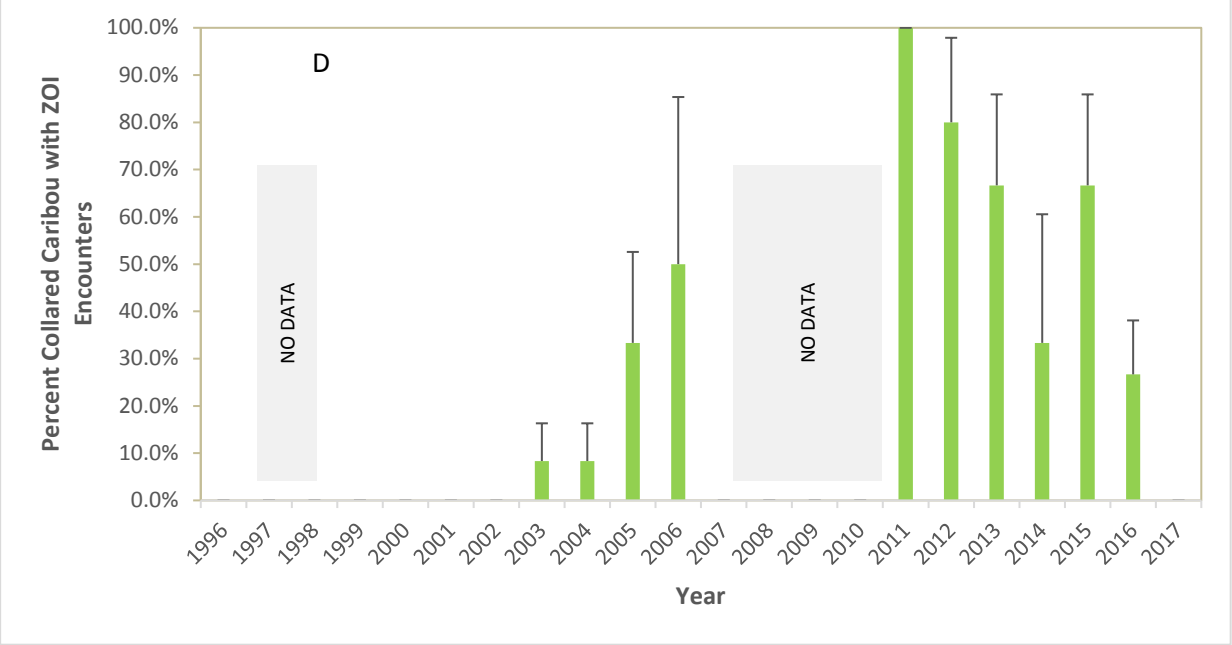
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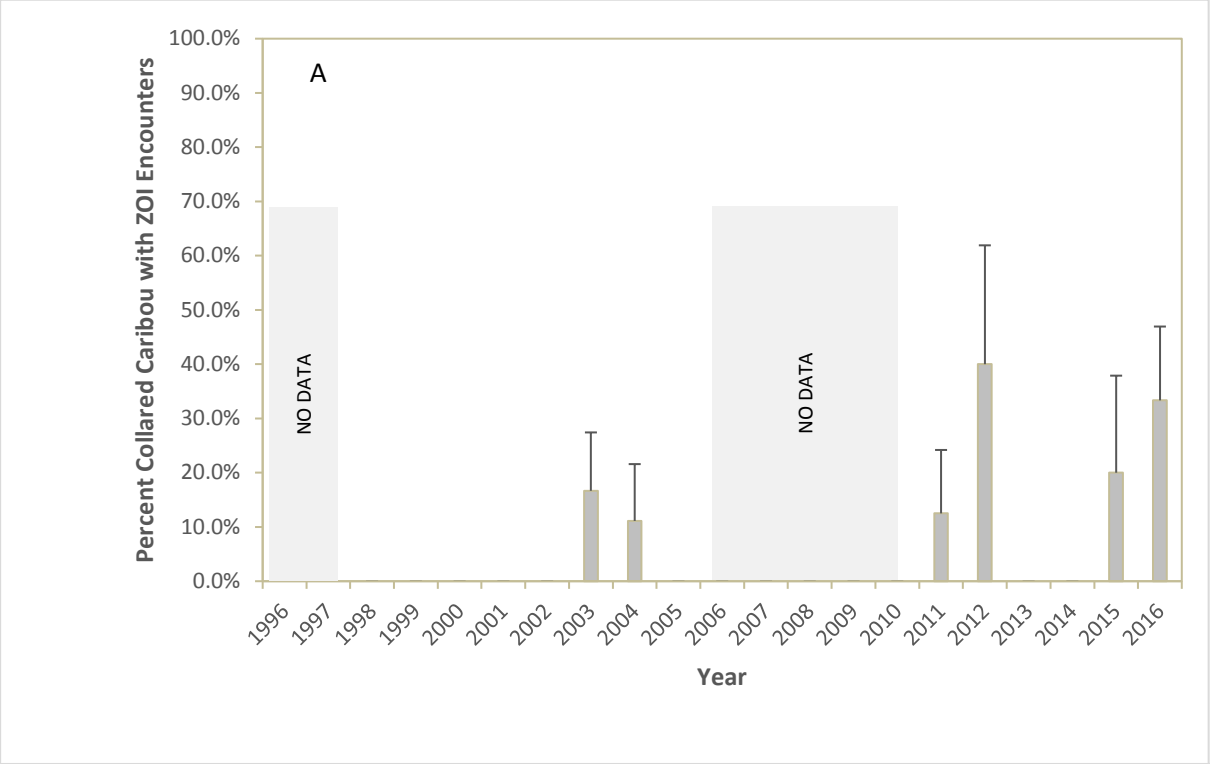
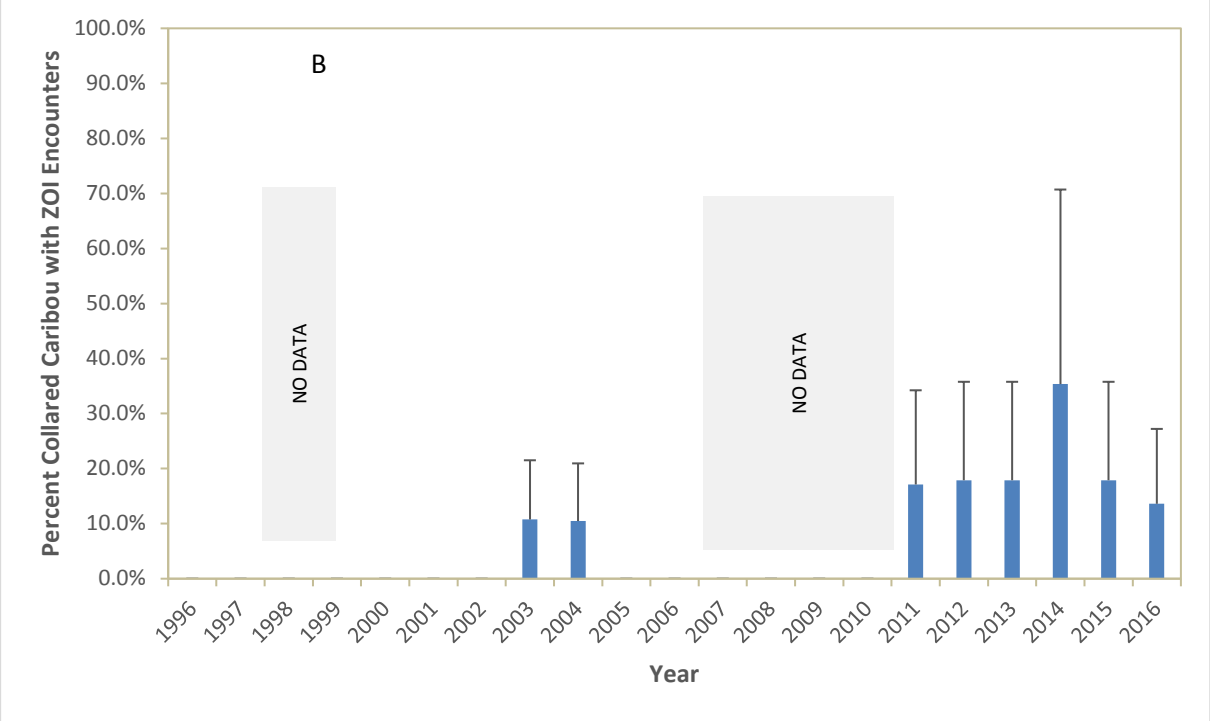
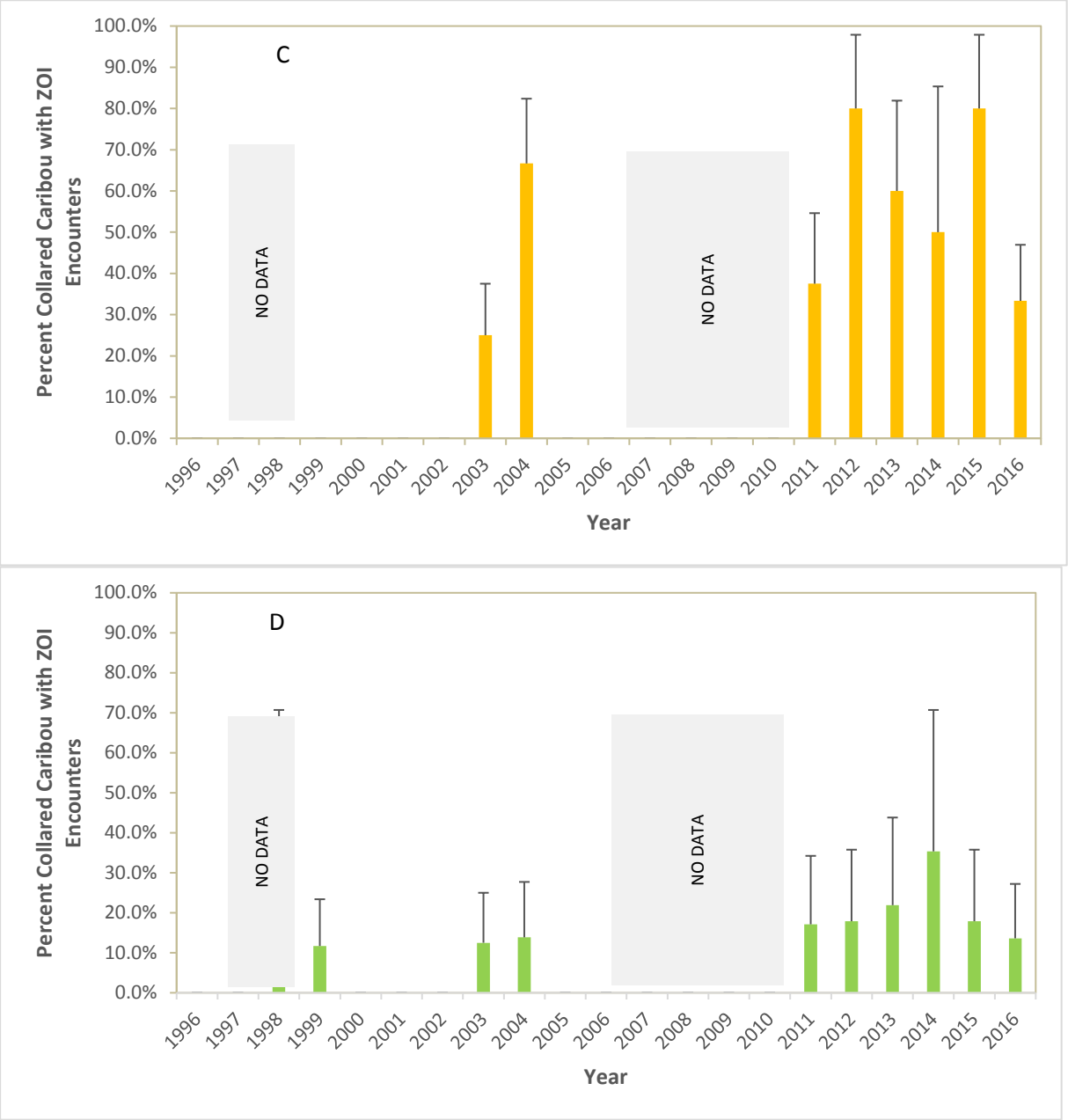
3.2.2 Fall Migration

The annual percentages of collared caribou interacting with at least one development ZOI in the Base Case ranged from 0.0% in 1998, 1999, 2000, 2001, 2002, 2005, 2013, and 2014 to 40.0% in 2012 and has been variable across time (Figure 4A). For the Meadowbank Case, the annual percentages of collared caribou interacting with at least one development ZOI increased from the Base Case in 2011 (25.0% increase), 2012 (40.0% increase), 2013 (20.0% increase), 2014 (50.0% increase), and 2015 (60.0% increase) (Figure 4B). These annual increases resulted from an additional two, two, one, one and three collared caribou encountering the Meadowbank Mine and AWAR ZOI, in 2011, 2012, 2013, 2014, and 2015, respectively. For the Project Case, simulated annual percentages of collared caribou interacting with at least one development ZOI are the same as the Meadowbank Case except for 2003, 2004, and 2013, when one more collared caribou (8.3% increase) was simulated to have interacted with the Project's ZOI in 2003, five more collared caribou (55.5% increase) was simulated to have interacted with the Project's ZOI in 2004, and two more collared caribou (40.0% increase) was simulated to have interacted with the Project's ZOI in 2013 (Figure 4C). Simulated annual percentages of collared caribou encountering at least one development ZOI ranged from 0.0% in 2000, 2001, and 2002 to 80.0% in 2012 and 2015 in the RFD Case (Figure 4D). Simulation results for the RFD Case are the same as the Project Case except that one additional collared caribou (11.1% increase) encountered at least one development ZOI in 2004.

Figure 4: Percent (± Standard Error) Collared Lorillard Caribou Encountering at least Once Development Zone of Influence from 1998 to 2017 in the Base Case (A), Meadowbank Case (B), Project Case (C) and Reasonably Foreseeable Future Development Case (D) during the Fall Migration



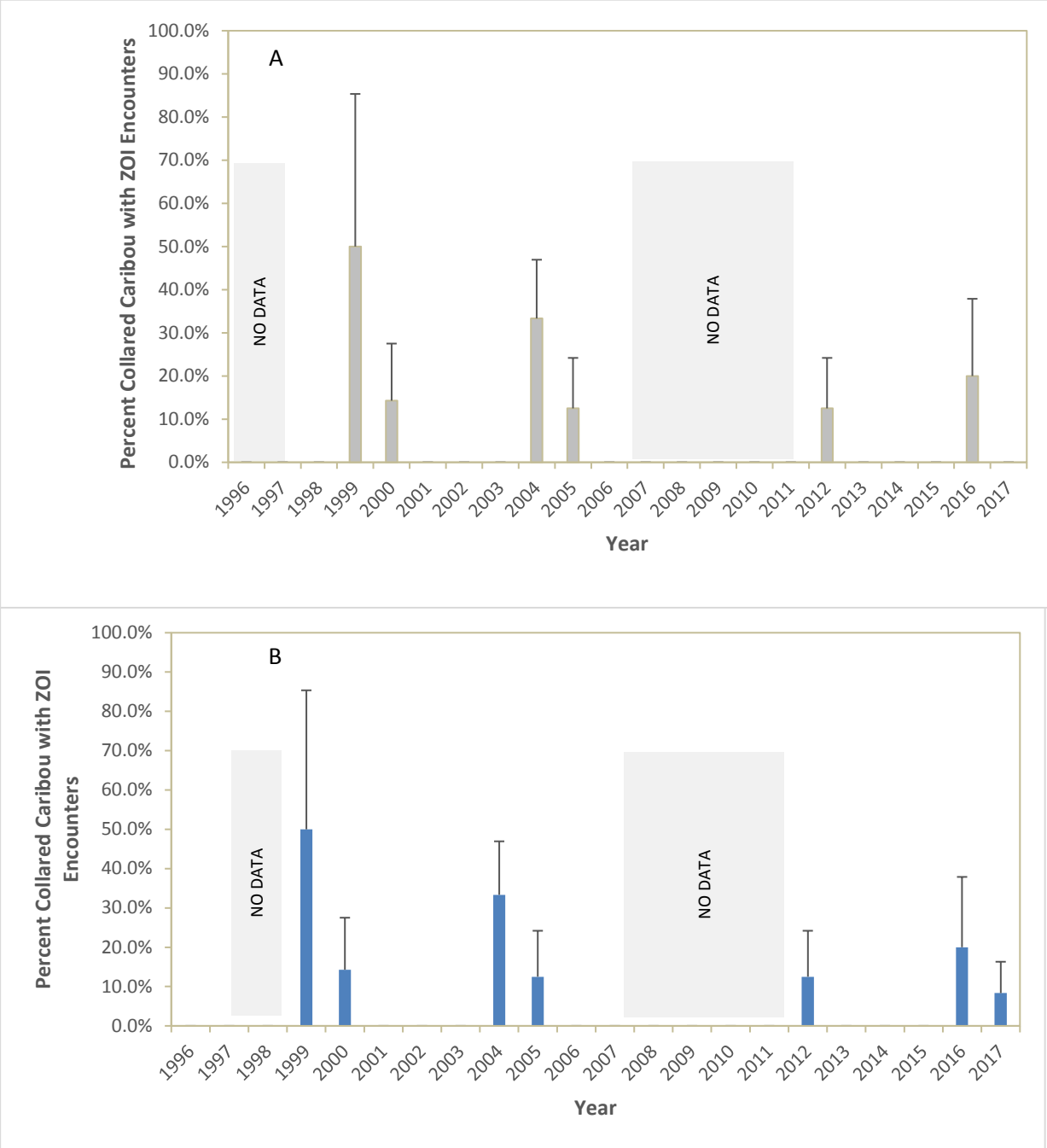


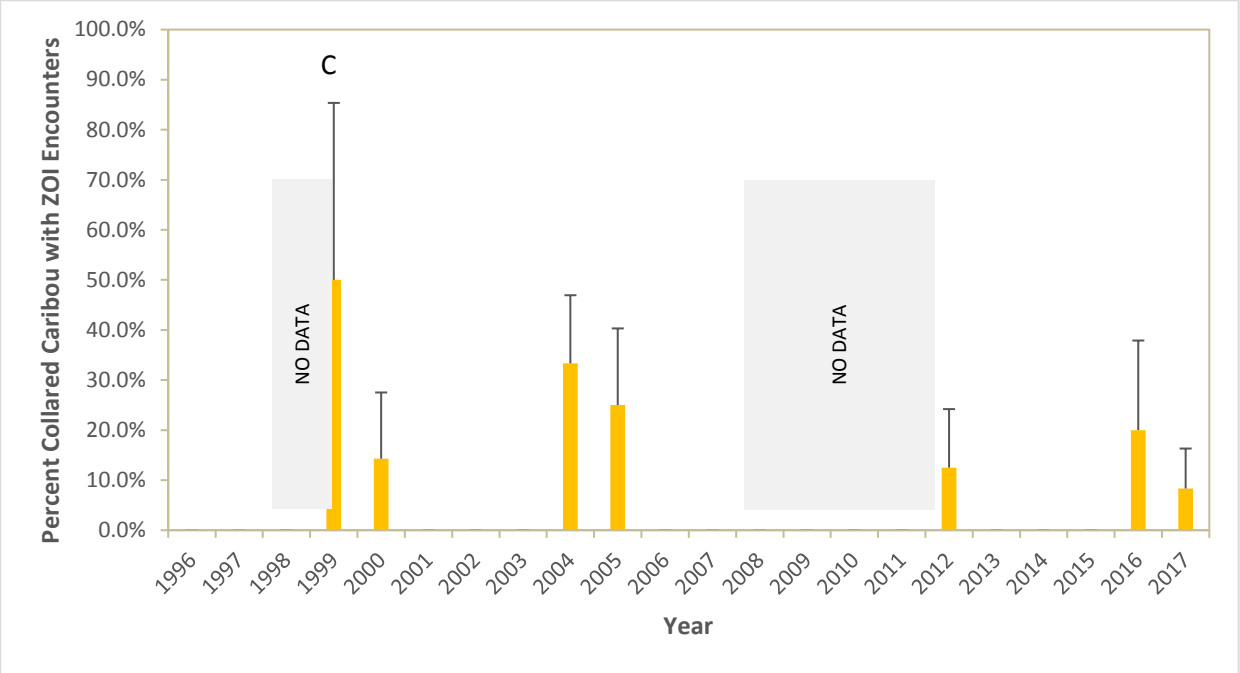


3.2.3 Winter Migration

The annual percentages of collared caribou interacting with at least one development ZOI in the Base Case ranged from 0.0% in 1998, 2001, 2002, 2003, 2006, 2013, 2014, 2015, and 2017 to 50.0% in 1999 and has been variable across time (Figure 5A). For the Meadowbank Case, the annual percentages of collared caribou interacting with at least one development ZOI were similar to the Base Case, except in 2017, when there was an increase of 8.3% (one more collared caribou)(Figure 5B). For the Project Case, simulated annual percentages of collared caribou interacting with at least one development ZOI are the same as the Meadowbank Case except for 2005, where one more collared caribou (12.5% increase) was simulated to have interacted with the Project's ZOI in 2005 (12.5% increase) (Figure 5C). Simulations in the RFD Case were same as the Project Case (Figure 5D).

Figure 5: Percent (± Standard Error) Collared Lorillard Caribou Encountering at least Once Development Zone of Influence from 1998 to 2017 in the Base Case (A), Meadowbank Case (B), Project Case (C) and Reasonably Foreseeable Future Development Case (D) during the Winter Migration

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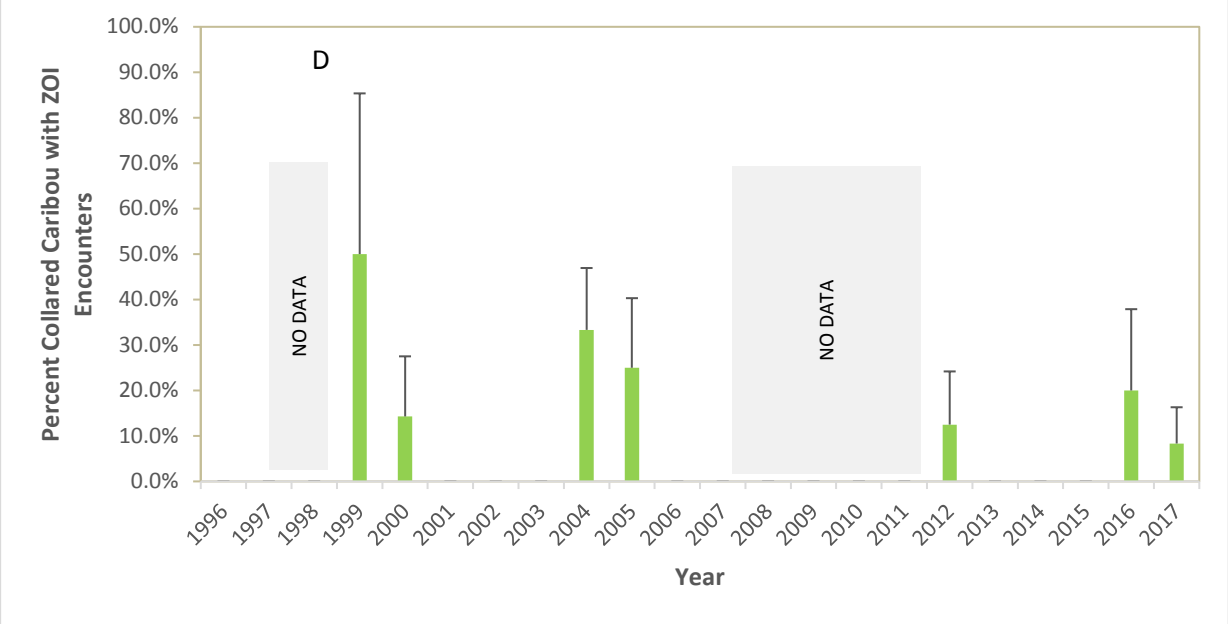
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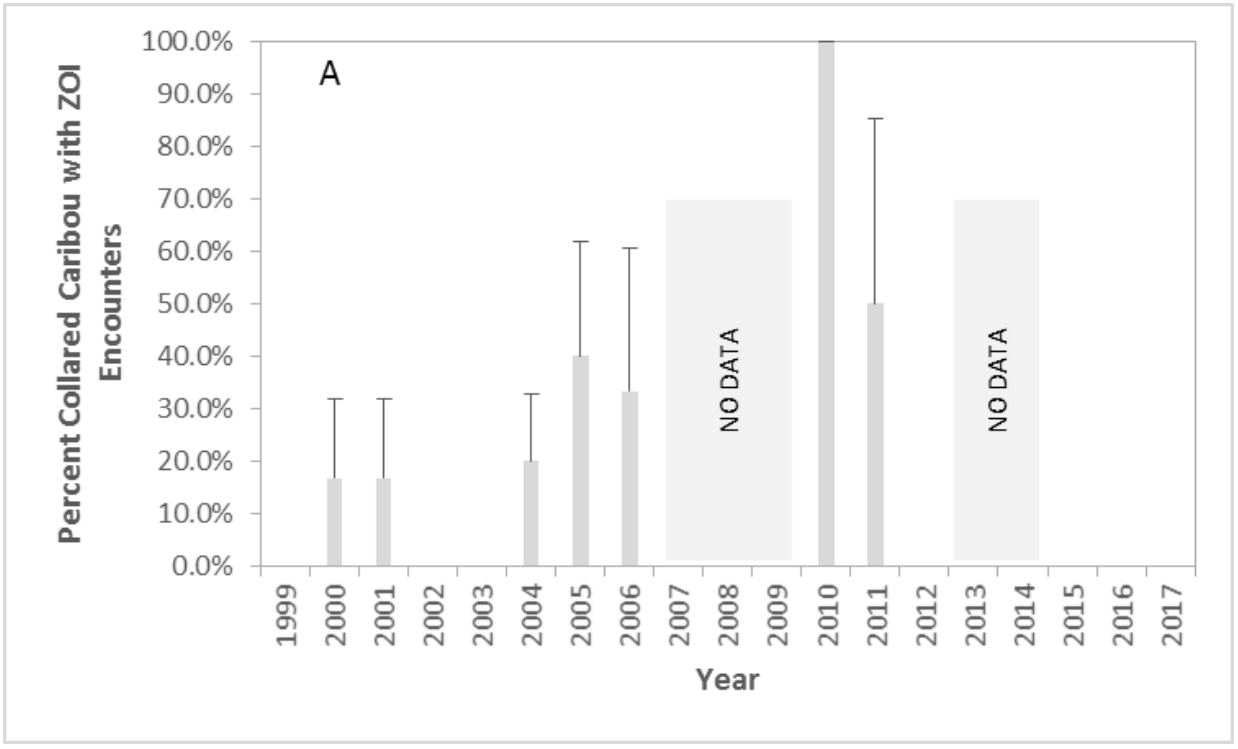
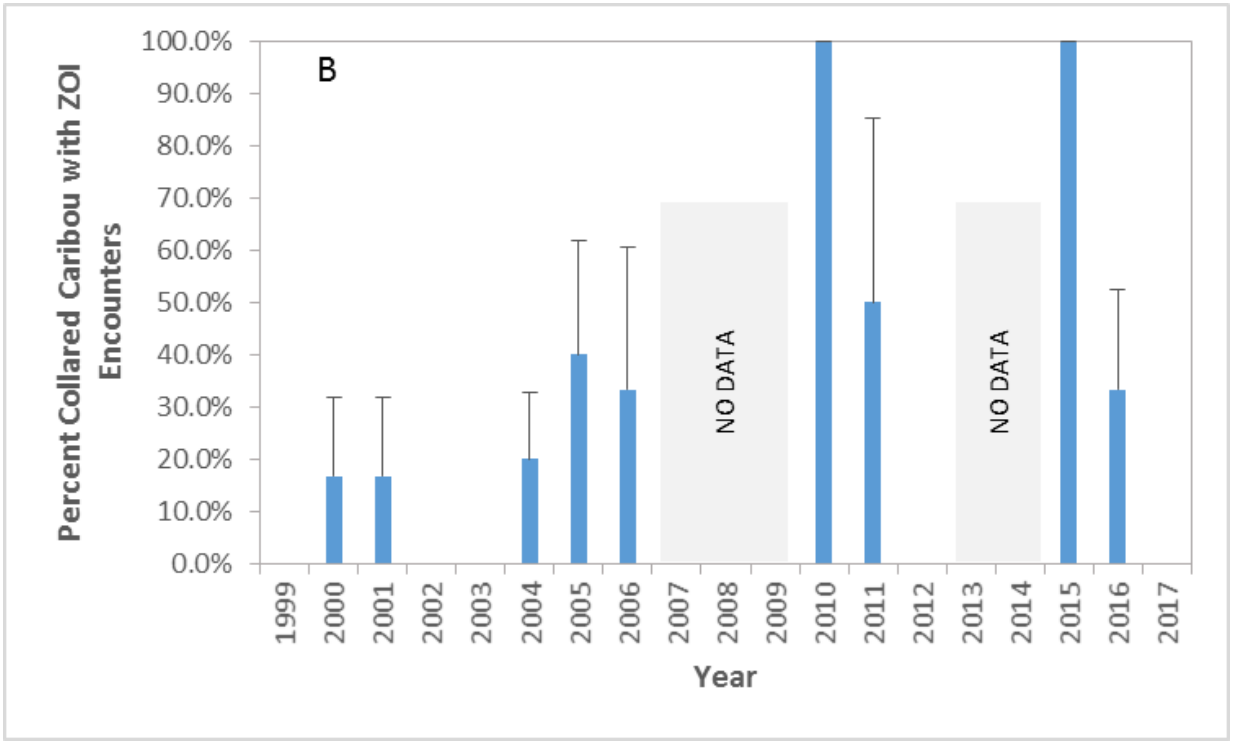
3.3 Wager Bay

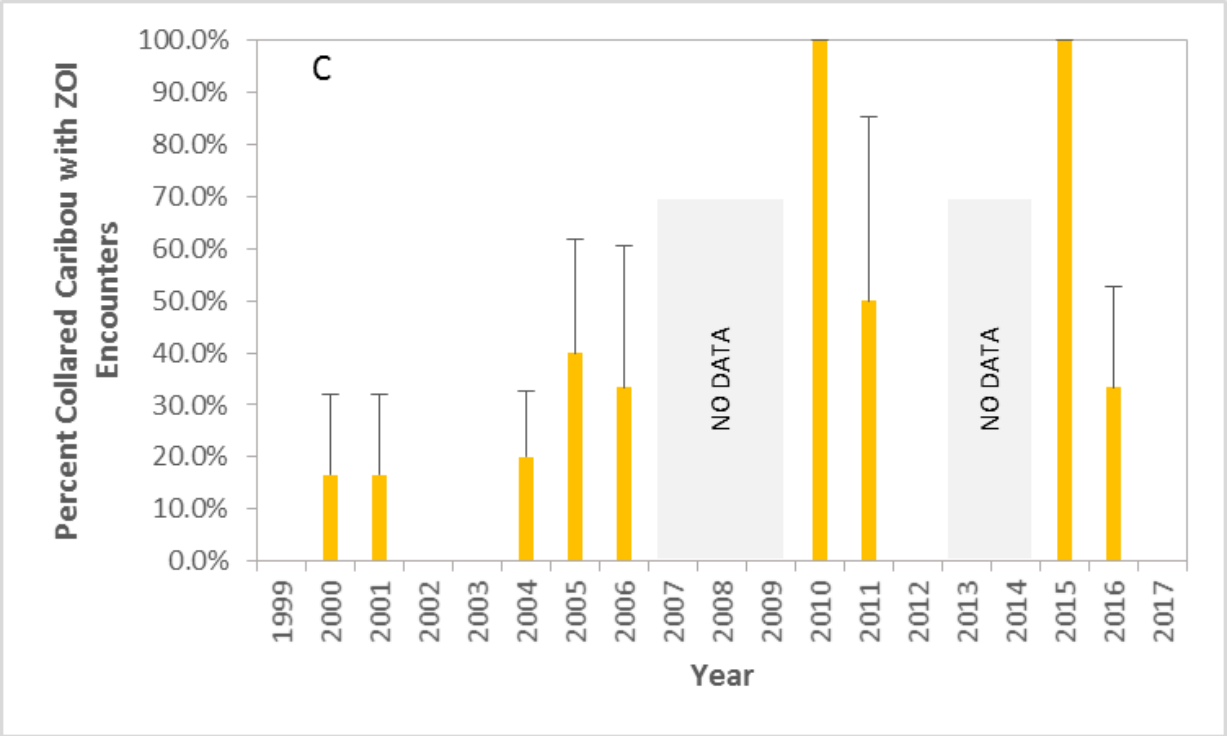
3.3.1 Spring Migration

The annual percentages of collared caribou interacting with at least one development ZOI in the Base Case ranged from 0.0% in 1999, 2002, 2003, 2012, 2015 2016 and 2017 to 100.0% in 2010 and has been variable across time (Figure 6A). For the Meadowbank Case, the annual percentages of collared caribou interacting with at least one development ZOI are the same as the Base Case except in 2015 and 2016 when the percent increased to 100.0% and 33.3%, respectively (Figure 6B). The increase in encounters resulted from all three collared caribou in 2015 and two of six in 2016 encountering a ZOI associated with the Meadowbank Mine and AWAR. For the Project Case, simulated annual percentages of collared caribou interacting with at least one development ZOI are the same as the Meadowbank Case. Simulated annual percentages of collared caribou encountering at least one development ZOI in the RFD Case ranged from 0.0% in 1999, 2002, 2003, 2012, 2015 2016 and 2017 to 100.0% in 2010 and 2015 (Figure 6D). Simulations in the RFD Case indicate no change in the percent of collars interacting with at least one ZOI from the Project Case.

Figure 6: Percent (± Standard Error) Collared Wager Bay Caribou Encountering at least Once Development Zone of Influence from 1999 to 2017 in the Base Case (A), Meadowbank Case (B), Project Case (C) and Reasonably Foreseeable Future Development Case (D) during the Spring Migration



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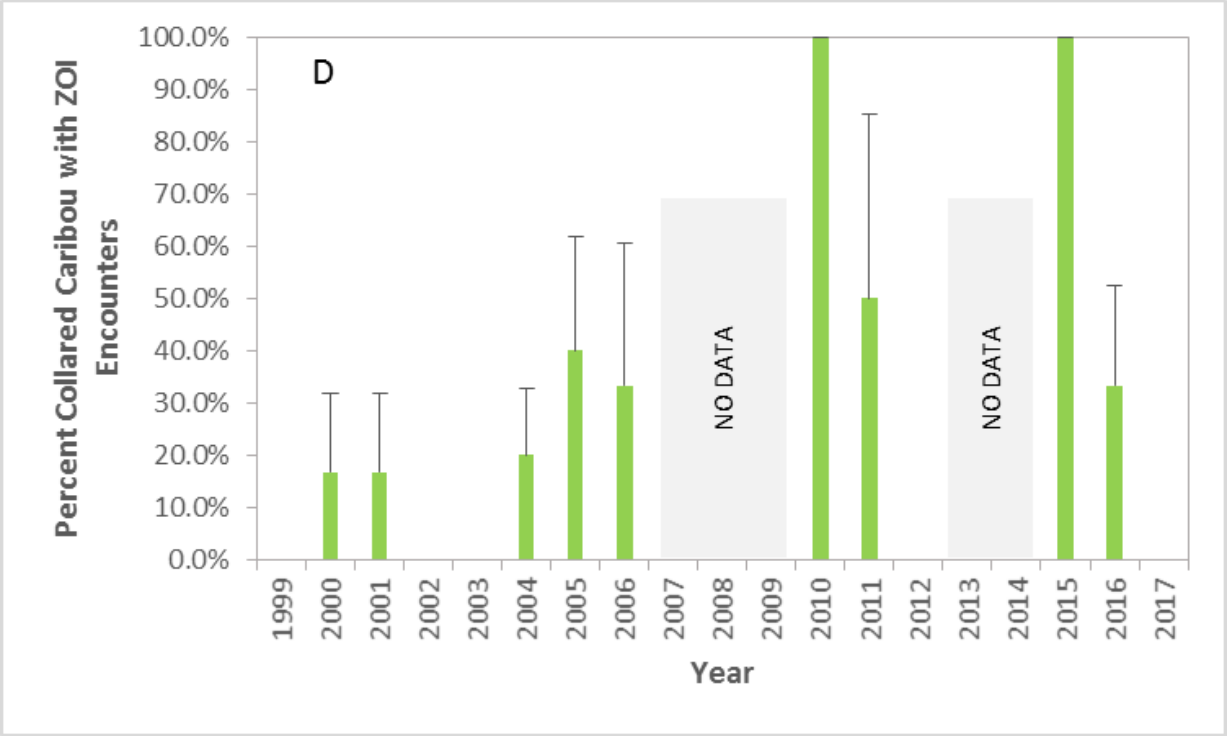
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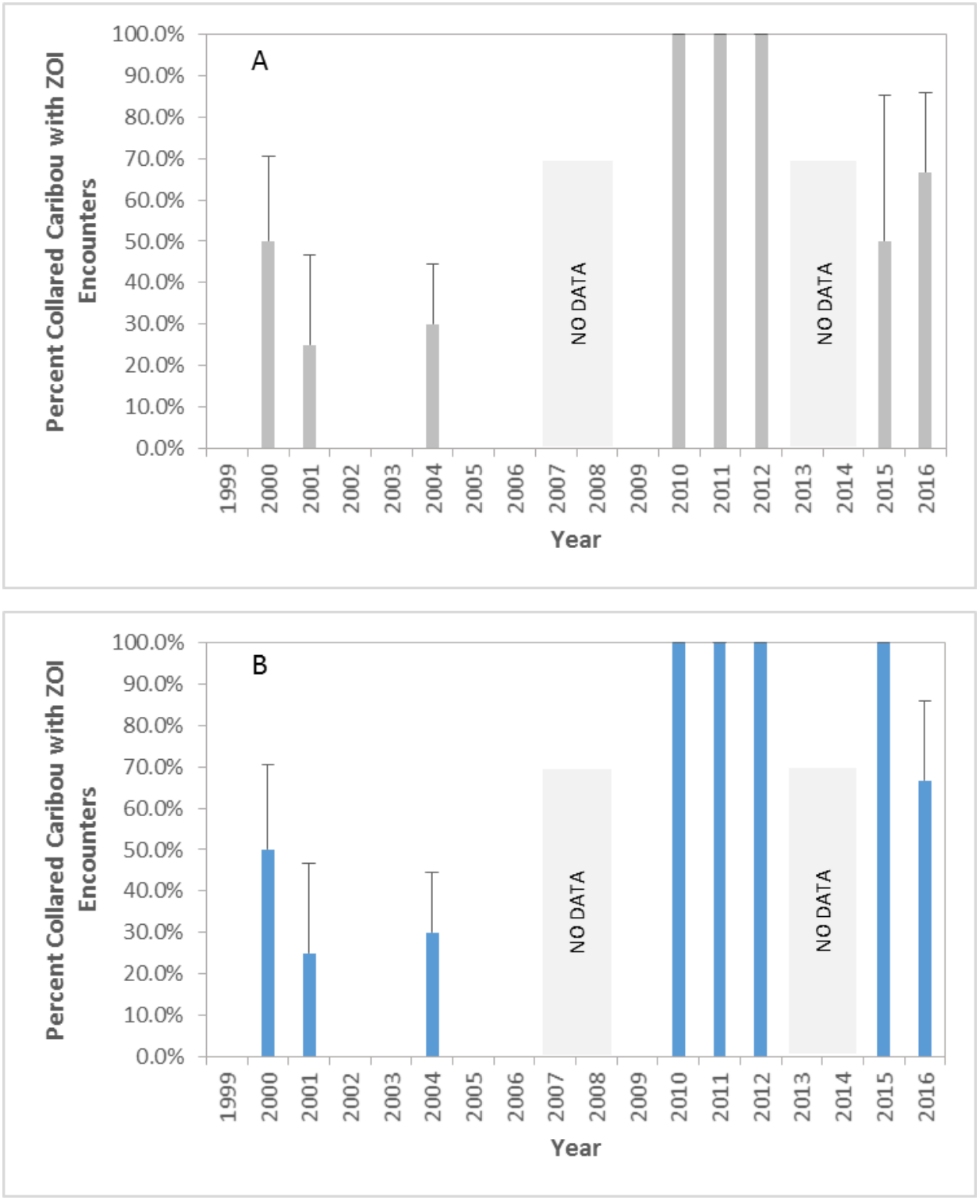
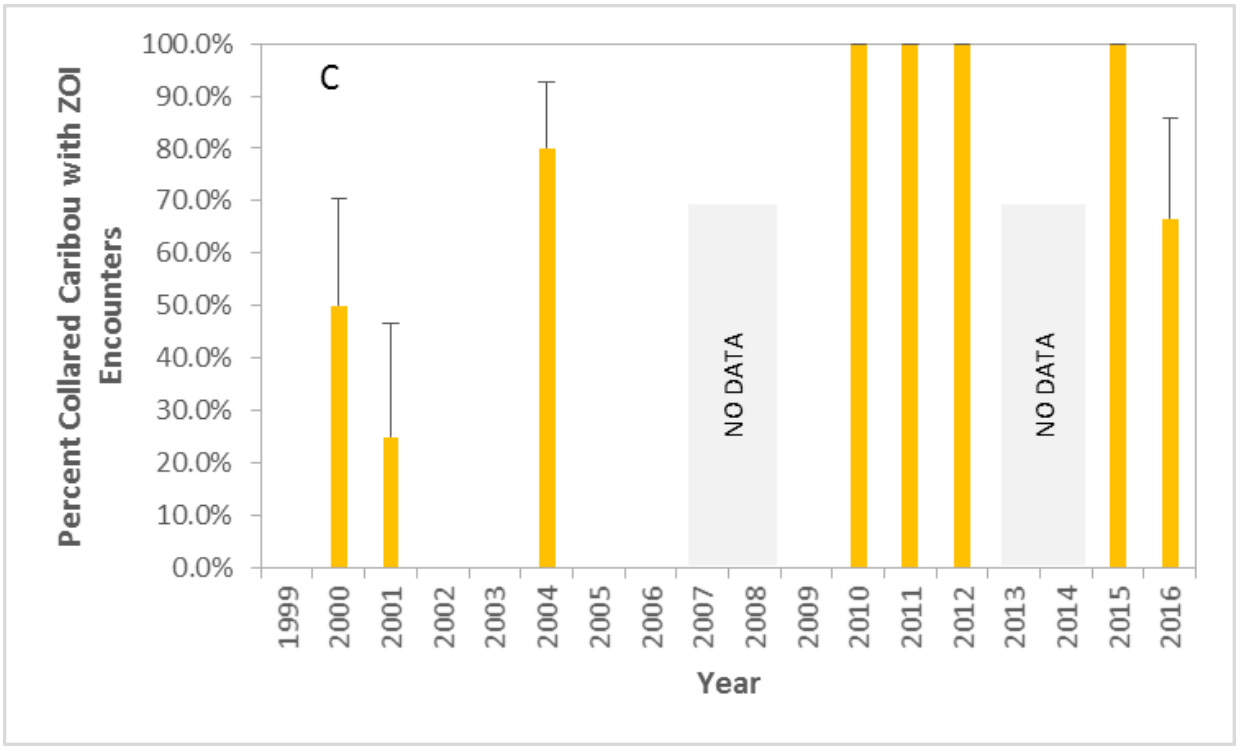
3.3.2 Fall Migration

The annual percentages of collared caribou interacting with at least one development ZOI in the Base Case ranged from 0.0% in 1999, 2002, 2003, 2005, 2006, and 2009 to 100.0% in 2010, 2011 and 2012 and has been variable across time (Figure 7A). For the Meadowbank Case, the annual percentages of collared caribou interacting with at least one development ZOI are the same as the Base Case except in 2015 when the percent increased to 100.0% (Figure 7B). The increase in 2015 resulted from one additional collared caribou encountering a ZOI associated with the Meadowbank Mine and AWAR. For the Project Case, simulated annual percentages of collared caribou interacting with at least one development ZOI were the same as the Meadowbank Case except for an increase to 80% in 2004 (Figure 7C). Simulations in the RFD Case indicate no change in the percent of collars interacting with at least one ZOI from the Project Case (Figure 7D).

Figure 7: Percent (± Standard Error) Collared Wager Bay Caribou Encountering at least Once Development Zone of Influence from 1999 to 2017 in the Base Case (A), Meadowbank Case (B), Project Case (C) and Reasonably Foreseeable Future Development Case (D) during the Fall Migration

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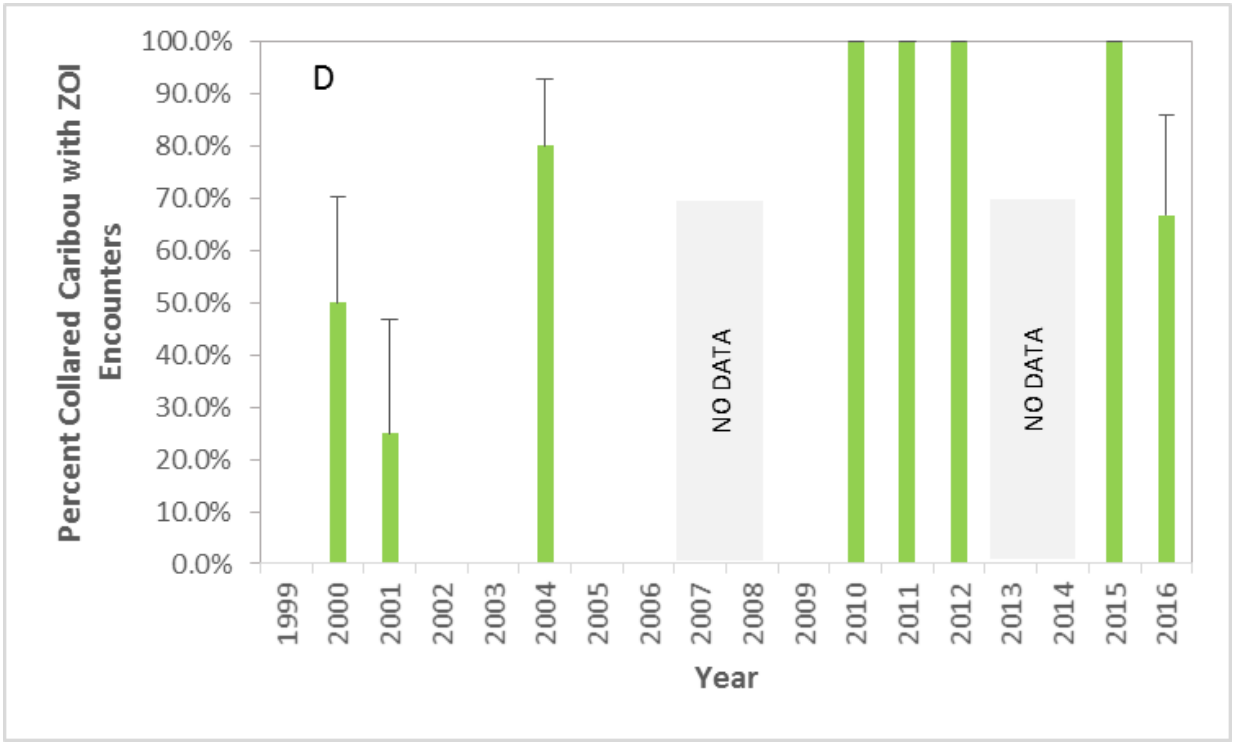
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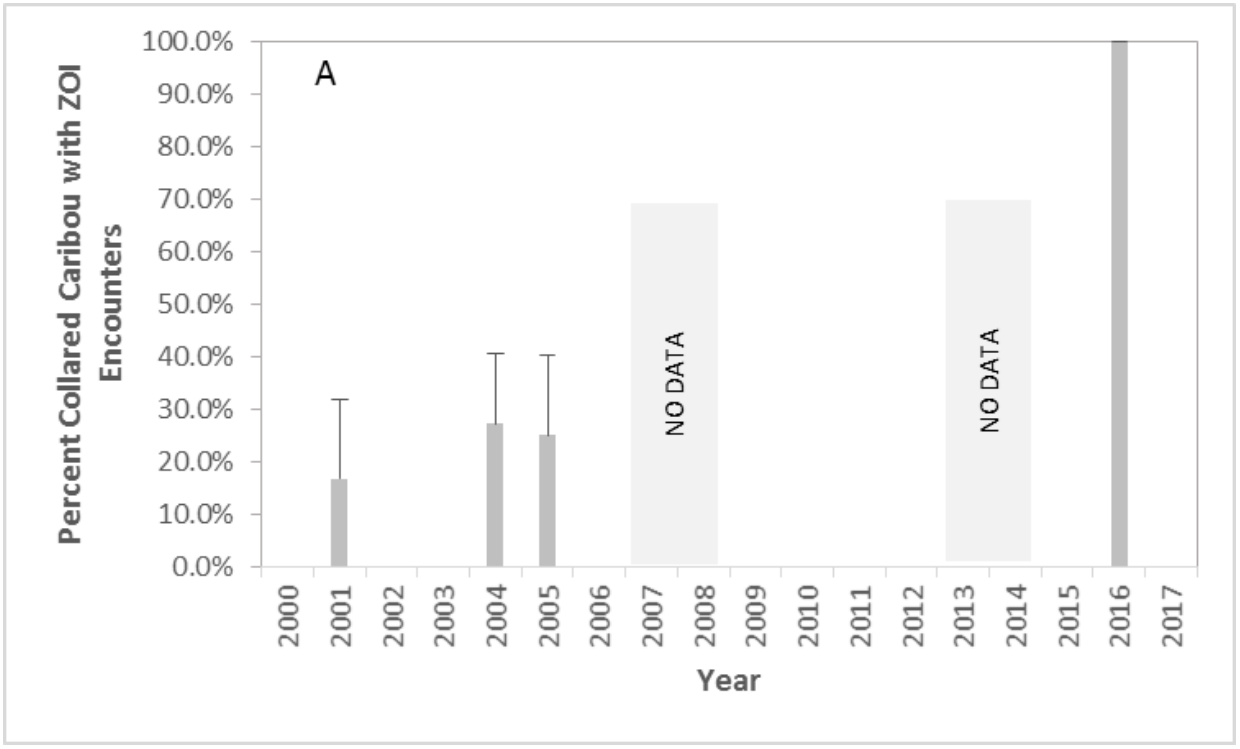
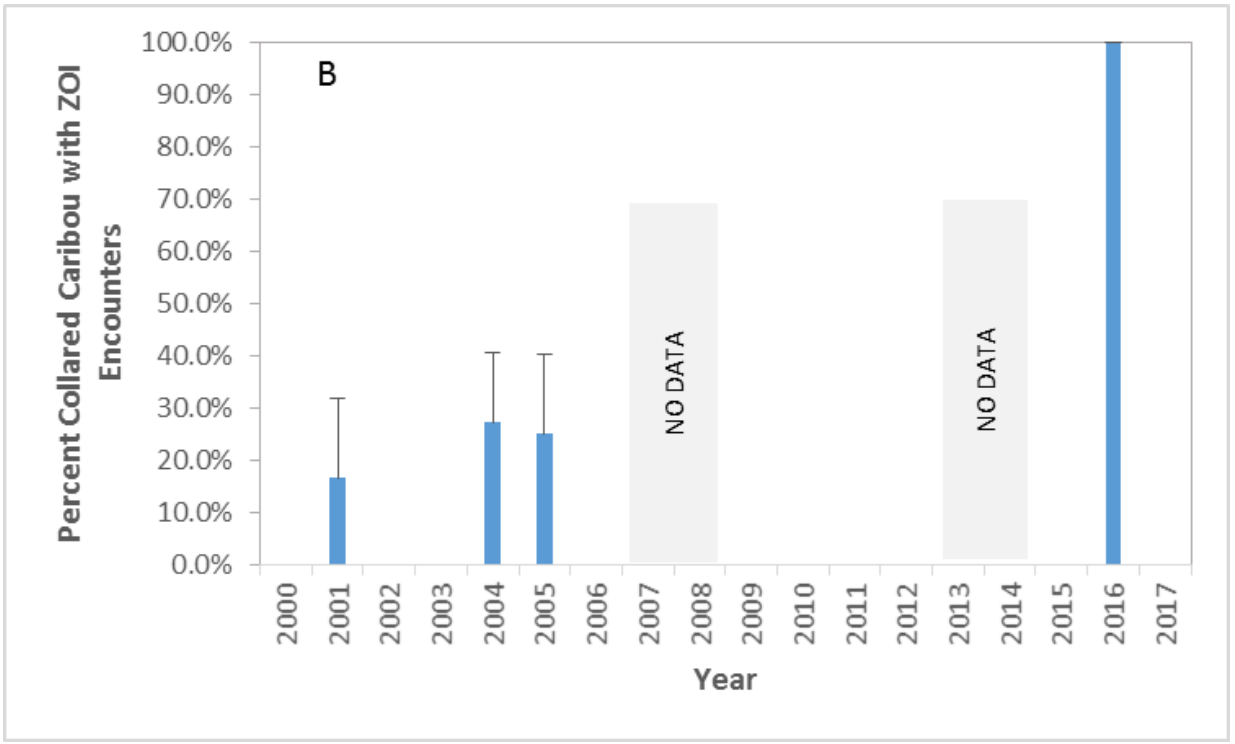
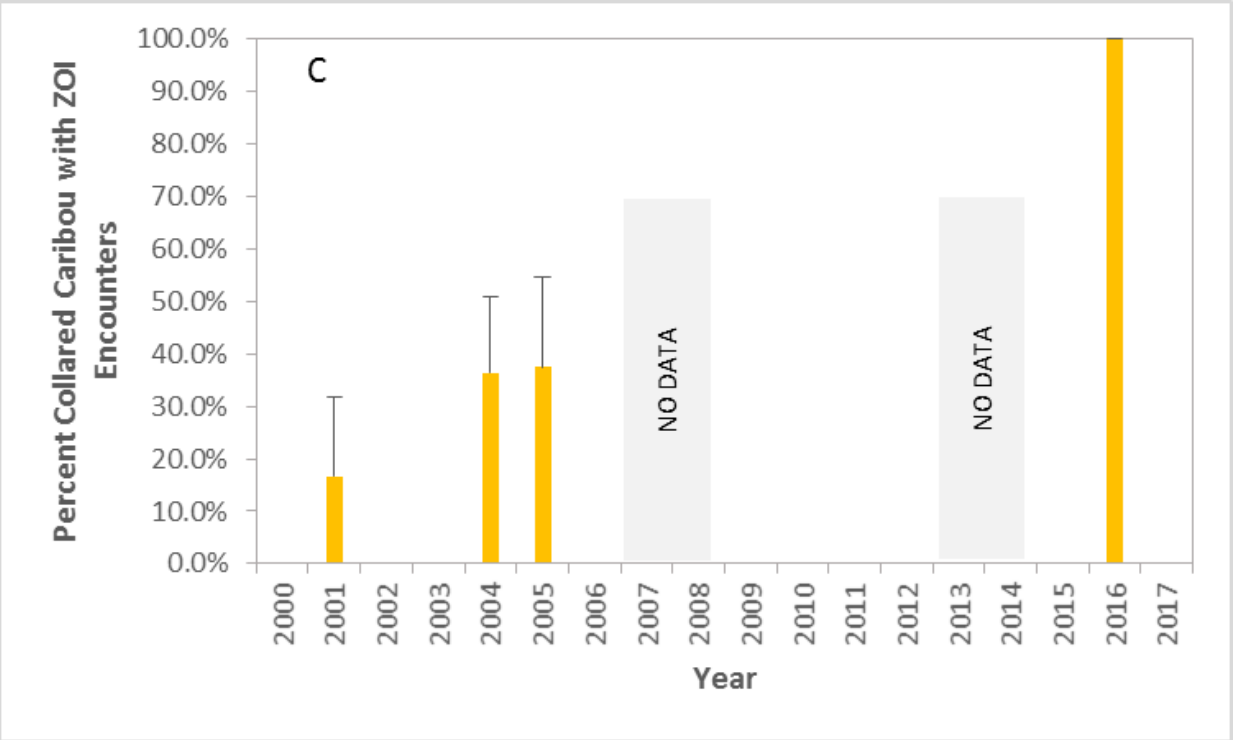
3.3.3 Winter Migration

The annual percentages of collared caribou interacting with at least one development ZOI in the Base Case ranged from 0.0% in 2000, 2002, 2003, 2005, 2006, 2009, 2010, 2011, 2012, 2015, and 2017 to 100.0% in 2016 (Figure 8A). For the Meadowbank Case, the annual percentages of collared caribou interacting with at least one development ZOI are the same as the Base Case (Figure 8B). For the Project Case, simulated annual percentages of collared caribou interacting with at least one development ZOI were the same as the Meadowbank Case except for an increase to 36.4% in 3004 and 37.4% in 2005 (Figure 8C). Simulations indicated that one additional collared caribou encountered the Project ZOI in 2004 and 2005. Simulations in the RFD Case indicated that the percent of collars interacting with at least one ZOI increased to 33.3% and 21.7% in 2001 and 2002, respectively relative to the Project Case (Figure 8D).

Figure 8: Percent (± Standard Error) Collared Wager Bay Caribou Encountering at least Once Development Zone of Influence from 1999 to 2017 in the Base Case (A), Meadowbank Case (B), Project Case (C) and Reasonably Foreseeable Future Development Case (D) during the Winter Migration



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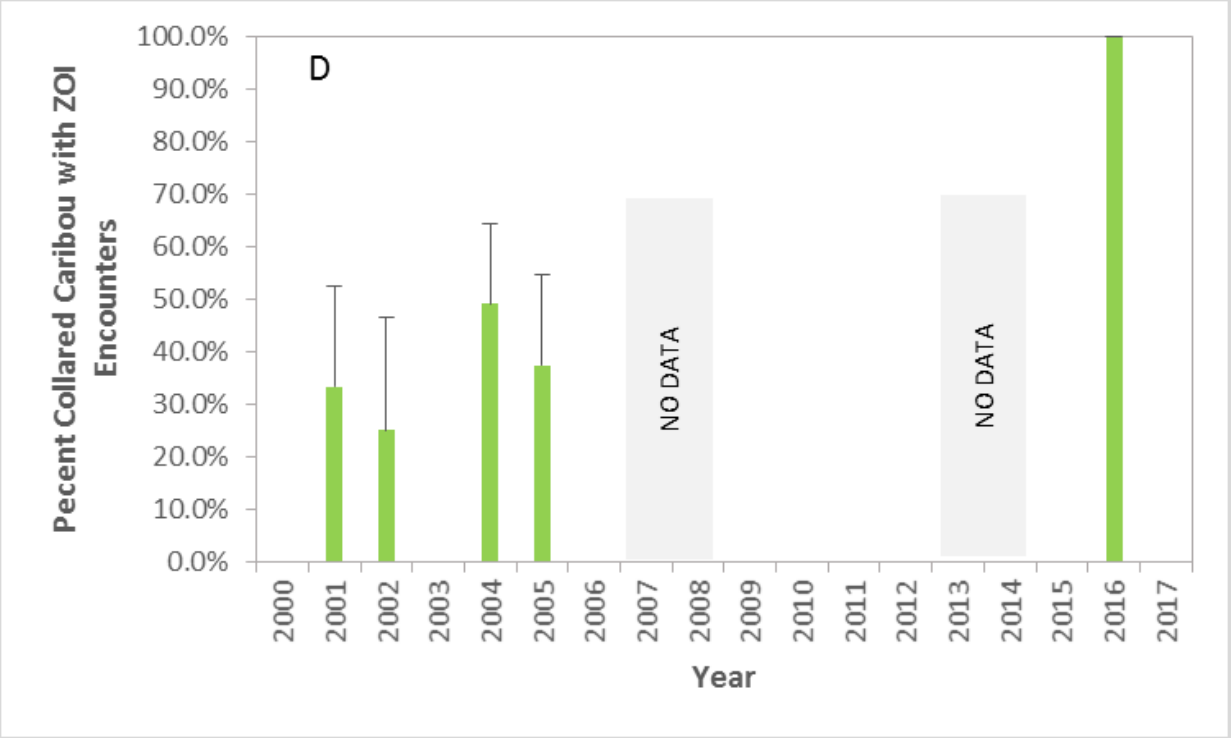
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4.0 CONCLUSIONS

The annual percent of collared caribou encountering at least one development ZOI was estimated for the Ahiak, Lorillard, and Wager Bay caribou herds during the spring, fall, and winter migration periods. Previous encounter and residency analysis indicated no collared Beverly caribou have interacted with either the Meadowbank Mine and AWAR or Project ZOIs (Golder 2017). For Ahiak, Lorillard, and Wager Bay herds annual season percent collars relative to the Base Case, Meadowbank Case, Project Case, and RFD Case development scenarios ranged from 0 to 100%. For all herds, incremental increases in the percent of collared caribou varied across time and included some large values but large increases were generally the result of low annual numbers of collared caribou. This is supported by the large standard errors associated with annual values, which convey uncertainty in the percent estimated. Given, the generally low annual numbers of collared caribou, the percent collared caribou encountering hypothetic development ZOIs may not be a reliable index of interaction.

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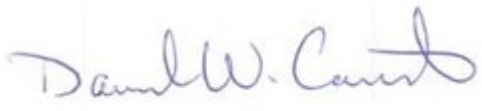

Daniel Coulton, PhD
Wildlife Biologist

Corey De La Mare, P.Biol.
Principal, Senior Wildlife Biologist

References

Golder (Golder Associates Ltd.). 2017. Cumulative Encounter and Residency Assessment for Caribou: Whale Tail Commitments 9 and 10. Prepared for Agnico Eagle Mines Limited by Golder Associates Ltd., Edmonton, AB.

DC/CD/jr

https://capws.golder.com/sites/1658927regulatoryaffairs/p6200final_hearing/00_intervenor_techreview/workingfiles_gn/1658927_137_tm_percent-collared-caribou_reva.docx

HEALTH CANADA

Interested Party:	Health Canada	Ref No.:	HC-1
Re:	Assessment of Risks from Consumption of Fish		

Technical Review Comment / Recommendation Made By Interested Party:

Health Canada's preferred approach for assessing potential risks from consumption of fish containing methyl mercury would be the calculation of Hazard Quotients. The results of the assessment of risk would then influence the decision respecting whether there is a need to identify risk management measures (e.g. food consumption limits).

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle agrees that Hazard Quotients (HQs) are a useful tool for presenting risk estimates in many cases. It should be noted that the *Whale Tail Pit Project: Predicted Changes in Fish Mercury Concentrations in the flooded area of Whale Tail Lake (South Basin)* (Azimuth 2017) report, while characterizing predicted changes to fish mercury concentrations and exploring the implications of those changes to human consumption of fish, was not intended as a risk assessment. One of the main challenges to deriving HQs for Whale Tail Lake is that available information suggests that although larger lakes in this area were used, lakes such as Whale Tail Lake were not commonly used for fishing (EIS Volume 7, Section 7.3). While subjective meal frequency assumptions could be made to allow the derivation of HQs, the resulting risk estimates would likely be misleading. Rather, Agnico Eagle used Health Canada's guidance to calculate the number of meals that could be consumed per month without exceeding Health Canada's tolerable daily intake. In our case, this approach: (1) precluded the need to make questionable assumptions about meal frequency; (2) relied on Health Canada's tolerable daily intake for mercury; and (3) helped to communicate risks in a more intuitive manner for this situation.

INDIGENOUS AND NORTHERN AFFAIRS CANADA

Interested Party:	**Indigenous and Northern Affairs Canada (INAC)**	**NIRB Ref No.:**	**INAC-FC-1**
		NWB Ref No.	**INAC-FC-1**
Re:	**Post-Closure WRSF Seepage Affecting Water Quality**		

Technical Review Comment / Recommendation Made By Interested Party:

NIRB

a. WRSF Cover: INAC recommends the Proponent update the waste rock management plans to reduce potential for cover contamination. The updated plans should include an ongoing monitoring program to ensure appropriate rock characterization and management practices are implemented. Results from the monitoring program should be submitted in the Annual Report and also used in seepage quality model revisions. The updated monitoring plan should be provided as part of the water licensing process.

b. WRSF Seepage Management: Based on the uncertainties regarding the likelihood of poor WRSF seepage quality and the severity of the potential impacts should contamination happen, INAC recommends the Proponent revise its seepage monitoring plans to ensure prolonged and intensive monitoring of the WRSF seepage. In addition, the updated monitoring plans should include detailed evaluation of the risks associated with WRSF seepage described above and contingency plans with appropriate mitigation measures to ensure seepage water quality postclosure remains below effluent discharge criteria. The updated monitoring plan should be provided as part of the water licensing process.

c. Conduct Hydrodynamic Modelling of Seepage Discharges: INAC recommends that the Proponent conduct detailed hydrodynamic modelling to evaluate the mixing of WRSF seepage discharges to Mammoth Lake during the post-closure phase of the project. The modelling should evaluate a range of potential seepage discharge scenarios (contaminated cover, increased active zone depth, etc.) and be provided as part of the water licensing process.

NWB

a. WRSF Seepage Management: To manage the low probability but high consequent scenario of water quality from the WRSF being above set criteria as proposed by the applicant at closure and post closure, INAC recommends i) that the waste rock management plan be revised and updated to include more waste rock sampling to provide improved confidence that cover contamination is not occurring, and ii) the monitoring plan for the WRSF and associated attenuation pond be updated to include WRSF seepage monitoring criteria that must be met before AEM considers breaching the dike/dam of the associated attenuation pond. This criteria in addition to specifying acceptable water quality, would include required number of acceptable sampling events that would be necessary to confirm that stable seepage had been attained and over a specified time frame (this may also include increased sampling events during certain times of year e.g., spring freshet).

b. Conduct Hydrodynamic Modelling of Seepage Discharges: INAC recommends that the Applicant conduct detailed hydrodynamic modelling to evaluate the mixing of WRSF seepage discharges to Mammoth Lake during the post-closure phase of the project. The modelling should evaluate a range of potential seepage discharge scenarios (clean/contaminated cover, increased active zone depth, etc.). Any results from the modelling should be incorporated into the appropriate monitoring plan for review and approval.

c. Incremental Security: Due to a number of uncertainties surrounding water quality INAC's security estimate has taken into account the potential for long-term treatment. If in the future, monitoring indicates no exceedances then the applicant can ask for a reduction in security.

Agnico Eagle's Response to Comments / Recommendation:

Responses related to NIRB Final Submission Recommendations:

Response a) and b)

Agnico Eagle agrees with the INAC's recommendations and will adhere to the ARD/ML Testing and Sampling Plan (EIS Volume 8, Appendix 8.E-5), Waste Rock Storage Facility Management Plan (EIS Volume 8, Appendix 8-A.1), Water Management Plan (EIS Volume 8, Appendix 8-B.2), and Water Quality and Flow Monitoring Plan (EIS Volume 8, Appendix 8-B.3) during construction, operations, and closure to inform adaptive management at the Whale Tail Pit Project. Details of the steps involved in waste rock management planning to segregate and store waste rock in its correct location outlined in Golder (2017) will be included in the update to the Waste Rock Management Plan (Agnico Eagle 2017), as well as updates to the other Management Plans to be submitted 60 days prior to operations.

Monitoring of waste rock contact water quality will continue in post-closure as needed following the terms that will be developed for the updated water monitoring plans for the post-closure period of mining. It is expected that the monitoring frequency and duration will be evaluated at that time based on past trends and updated water quality modelling results. Should trigger levels be reached during post-closure monitoring it is understood that the frequency of monitoring may be temporarily increased until a return to satisfactory levels.

Experience and knowledge gained through operations and closure of Meadowbank facilities and that which is to be gained during the construction and operation of Whale Tail will continue to inform final closure and post-closure planning for the Project.

Response c)

Agnico Eagle agrees with INACs recommendation to conduct detailed hydrodynamic modelling to evaluate the mixing of the WRSF seepage into Mammoth Lake post-closure. This will be conducted during operation and closure with updated data on WRSF contact water quality and flow volume to

inform future closure and post-closure water management planning and support the terms of the water licence for the closure period.

Agnico Eagle believes that the information that has been provided to INAC and NIRB is sufficient to assess the impacts of the Whale Tail Pit Project on the environment and to make a determination on the Project.

Responses related to NWB Final Submission Recommendations:

Response a)

Agnico Eagle agrees with INAC's recommendations. Agnico Eagle proposes that specifics to modelling updates, waste rock monitoring frequency, sampling locations, water quality triggers and reporting frequency be detailed in revisions to the Management Plans that will be submitted 60 days prior to operations. The Waste Rock Storage Facility Management Plan (Agnico Eagle 2017), will include details of the steps involved in waste rock management planning to segregate and store waste rock in its correct location outlined in Golder (2017). Additionally, sampling may include, but not limited to, the following:

- Periodic inspection and sampling of waste rock targeted for use as cover material to verify and document the composition of the material
- Periodic inspection and sampling of the south wall and north wall ultramafic rock to verify and document total and leachable arsenic content
- Water quality monitoring at specified locations and frequency to document waste rock contact water quality. This may include accelerated leaching tests field studies to augment data collection given the dry site climate
- Continued studies on the composition and leachability of ultramafic rock. This material will continue to be studied during operation in order to verify model input parameters and inform closure planning
- Thermistor installation and data collection from existing and new instrumentation to be installed as the waste rock pile is built

The updated Management Plans will be submitted 60 days prior to operations.

Response b)

Agnico Eagle agrees with INACs recommendation to conduct detailed hydrodynamic modelling of the WRSF contact water mixing into Mammoth Lake post-closure to evaluate the effects on water quality in Mammoth Lake. This will be completed for scenarios of cover contamination with north wall ultramafic rock previously considered (Golder 2017) and for active layer depth ranges observed at Meadowbank WRSF. Results of this model will inform future closure and post closure water management planning which will be incorporated into the appropriate Monitoring Plans to be submitted 60 days prior to operations.

Response c)
Agnico Eagle agrees with INAC's recommendation and will work with INAC/KivIA to finalize the security estimate to take into account potential for long-term treatment and associated monitoring.

Agnico Eagle acknowledges that long-term monitoring is a component of security and Agnico Eagle proposes that reductions in monitoring requirements may be possible based on actual on-site monitoring data. Agnico Eagle will work cooperatively with INAC and the KivIA to develop a framework for reductions in monitoring requirements and the associated security amounts that may be applied by the NWB to reduce security requirements. Agnico Eagle proposes to submit the framework as an exhibit at the Final Hearing for consideration by the NWB and all parties.

Agnico Eagle anticipates the NWB will consider terms and conditions within the body of the licence (i.e., schedules to the licence) to allow implementation of this framework without requiring a Type A hearing.

Agnico Eagle's Proposed Terms and Conditions:

1. *Conduct detailed hydrodynamic modelling of the WRSF contact water mixing into Mammoth Lake post-closure. Modelling will include scenarios of cover contamination with north wall ultramafic rock previously considered (Golder 2017) and for active layer depth ranges observed at Meadowbank WRSF*
2. *Update the Waste Rock Storage Facility Management Plan (EIS Volume 8, Appendix 8-A.1) details of the steps involved in waste rock management planning to segregate and store waste rock in its correct location outlined in Golder (2017) adapted to Whale Tail open pit and WRSF and additional sampling and monitoring plans*
3. *Updated Monitoring and Management Plans will be submitted 60 days prior to operations*
4. *Finalize the security estimate to take into account potential for long-term treatment and establish a mechanism to progressively reduce the security to be approved by relevant parties*

References:

Agnico Eagle (Agnico Eagle Mines Ltd.). 2017. Whale Tail Pit – Waste Rock Management Plan, Version 1. Prepared by Agnico Eagle, Meadowbank Division. January 2017.

Golder (Golder Associates Ltd.) 2017. Revision 3 – Addendum to Agnico Eagle Mines Whale tail FEIS Appendix 6-H. Sensitivity Analyses on Water Quality Modelling in Support of Responses to Technical Commitments 30, 36, 37, and 42 and Intervenor Comments ECCC #15 and INAC-TRC #3 and #5, on the Water Licence A Application to the Nunavut Water Board. August 24, 2017. Ref: 1658927_Revision 3/6100/6130 Doc 125.

Interested Party:	**Indigenous and Northern Affairs Canada (INAC)**	**NIRB Ref No.:**	**INAC-FC-2**
		NWB Ref No.	**INAC-FC-2**
Re:	**Water Quality Affected by Maximum Thaw Depths in the WRSF Cover**		

Technical Review Comment / Recommendation Made By Interested Party:

NIRB

a. Revised Thermal Modelling: The thermal modelling should be calibrated and re-run using ground temperature monitoring data from the Meadowbank site. The findings of the revised thermal modelling should be submitted for review and should inform the detailed WRSF cover designs as part of the water licensing process.

b. Final WRSF Cover Designs: The Proponent's commitment #34 indicated they would use the results of the thermal modelling exercise to support the final design of the WRSF, including that of the proposed cover, and that the revised designs would be submitted prior to the final hearing. INAC notes that the 3.8 m recommended cover thickness determined by the thermal modelling falls within the 2-4 m range originally specified by the Proponent and, on that basis, a revised cover design is not required by INAC prior to the final hearing. However, INAC recommends that a detailed WRSF and cover design incorporates the revised thermal modelling results and be submitted for review and approval as part of the water licensing process.

NWB

a. Revised Thermal Modelling: The thermal modelling should be calibrated and re-run using ground temperature monitoring data from the Meadowbank site. The findings of the revised thermal modelling should be submitted for review and should inform the detailed WRSF cover designs as part of the final closure plan.

b. Final WRSF Cover Designs: The Applicant's commitment #34 indicated they would use the results of the thermal modelling exercise to support the final design of the WRSF, including that of the proposed cover and that the revised designs would be submitted prior to the final hearing. INAC notes that the 3.8 m recommended cover thickness determined by the thermal modelling falls within the 2-4 m range originally specified by the Applicant and, on that basis, a revised final cover design is not required by INAC prior to the final hearing. However, INAC still recommends that the applicant continue to provide constant updates to the modelling to be able to provide more accuracy and confidence in the Final WRSF cover design. The WRSF cover design should make up part of the final closure plan and thus be submitted to the NWB 12 months prior to closure.

c. Incremental Security: Due to a number of uncertainties surrounding the performance of the WRSF, our security estimate has taken into account for mitigation measures, such as long-term water treatment. If in the future, monitoring indicates no exceedances then the applicant can ask for a reduction in security.

Agnico Eagle's Response to Comments / Recommendation:

Responses related to NIRB Final Submission Recommendations:

Response a)

It is understood that INAC is referring to the use of thermal monitoring data from the Meadowbank WRSF (rather than Meadowbank native ground temperature) to calibrate the model. Meadowbank operation installed 14 thermistor strings between 2013 and 2015 at different locations at Portage RSF (Figure 1). Among these strings, 4 were installed in November 2013 (RSF-3 to RSF-6) and 10 in October 2015 (RSF-7 to RSF-16). Considering that on an annual basis the active layer reaches its maximum depth in October, the strings installed in 2013 provide 3 years of readings on the active layer behavior and the temperature of the waste rock pile while the strings installed in 2015 provide only 1 year of data which may not represent stable temperature conditions within the pile.

The 2015 thermistor strings is where an active layer depth greater than 4 m is documented. However, the data collected from these strings are not considered to reliably represent the equilibrium temperature conditions for the entire pile for the purpose of modelling and calibration given that their installation is too recent and the temperature profile provided may not yet be stabilized. Among the 4 thermistors installed in 2013, 2 of them (RSF-4 and RSF-5) are located in the middle of the Portage RSF and can be used for calibration of a 1D model. As these 2 strings show a maximum active layer depth of 4 m, Agnico Eagle considers that all the conclusions and recommendations presented as part of the commitment 39 are still appropriate.

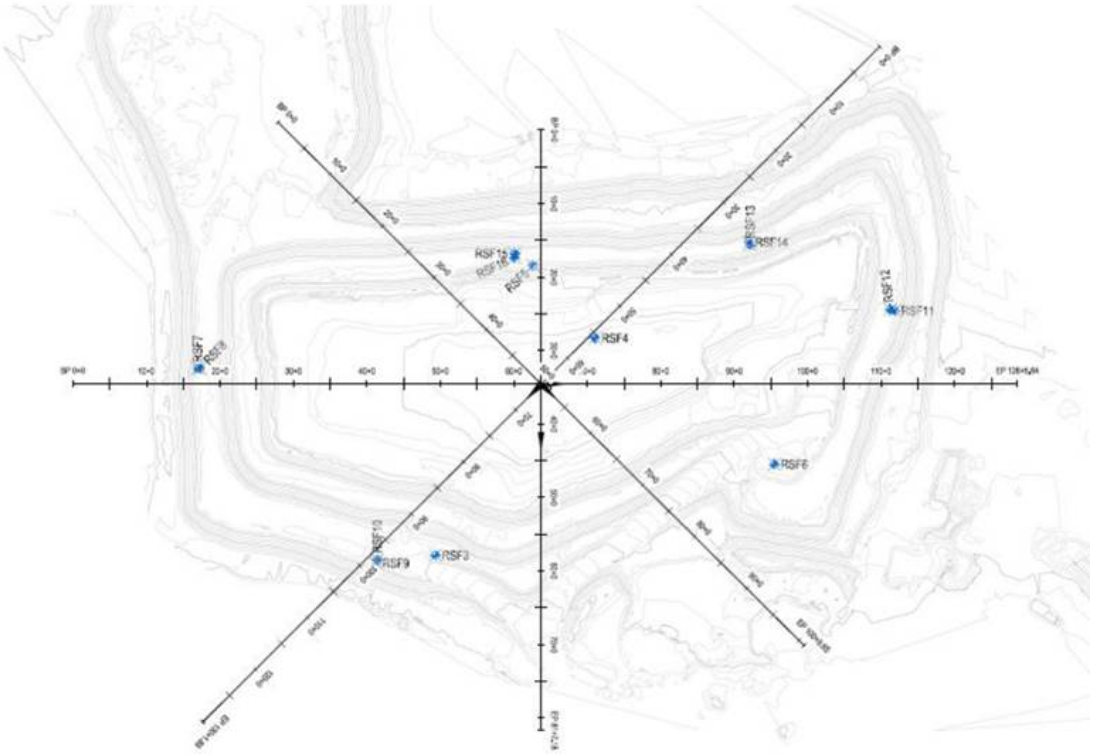

Figure 1: Thermistor strings installed at Portage RSF (provided by Meadowbank Operation)

Response b)
Agnico Eagle recognizes that a cover design based only on temperature data recorded at the Whale Tail WRSF would provide only few years of data for modeling and design. Accordingly, the detail design of the cover for the Whale Tail WRSF will combine Whale Tail WRSF and Meadowbank Portage RSF recorded thermistors data. Detailed design of the Whale Tail cover will be provided 60 days prior to construction, as per condition of Type A Water Licence.

Responses related to NIRB Final Submission Recommendations:

Response a)
Refer to NIRB Response a).

Response b)
Agnico Eagle agrees with the recommendation to update the model to provide more accuracy and confidence in the Final WRSF cover design and to this end, proposes to update the model with stabilized thermistor data obtained from the Meadowbank WRSF in the fall of 2017 after 2 full years of data collection from the strings installed in 2015. Agnico Eagle agrees with the recommendation to include the WRSF cover design as part of closure.

Response c)
Refer to INAC FC-1 for response to this.

Interested Party:	**Indigenous and Northern Affairs Canada (INAC)**	**NIRB Ref No.:**	**INAC-FC-3**
		NWB Ref No.	**INAC-FC-3**
Re:	**Post-Closure Water Quality in the Flooded Pit and Whale Tail Lake**		

Technical Review Comment / Recommendation Made By Interested Party:

NIRB

a. Perform Hydrogeological Characterization Studies: INAC recommends that additional hydrogeological characterization studies be performed to address uncertainties and to validate the Proponent's current conclusions regarding hydraulic gradients and arsenic diffusion potential. INAC has looked at the proposed schedule of activities at Whale Tail and interprets there to be enough time during the 2018 field season to undertake these studies prior to the dewatering of Whale Tail Lake and the development of the pit. The studies will serve as an important pre-development baseline and will help to address current uncertainties regarding water quality in the back-flooded pit/lake. If the additional hydrogeological characterization studies indicate that future metals levels are of potential concern, then the importance of establishing a stable stratified pit would be amplified. In that case, INAC recommends the Proponent should undertake a detailed quantitative analysis confirming that stable meromictic conditions will occur within the flooded pit. The analysis should include modelling that demonstrates meromixis will remain stable under a range of conditions (groundwater discharge, high wind, pit wall failure, etc.).

b. Monitoring Plan: Based on the uncertainties regarding the hydrogeological characterization around the area of the projected pit and the severity of the potential impacts should diffusion happen, INAC recommends the Proponent revise its monitoring plans to ensure intensive monitoring of the flooded pit. In addition, the updated monitoring plans should include contingency plans with appropriate mitigation measures to ensure water quality in flooded pit post-closure remains below established discharge criteria. The updated monitoring plan should be provided as part of the water licensing process.

NWB

a. Perform Hydrogeological Characterization Studies: INAC recommends that additional hydrogeological characterization studies be performed to address uncertainties and to validate the Applicant's current conclusions regarding hydraulic gradients and arsenic diffusion potential. INAC has looked at the proposed schedule of activities at Whale Tail and interprets there to be enough time during the 2018 field season to undertake these studies prior to the dewatering of Whale Tail Lake and the development of the pit. The studies will serve as an important pre-development baseline and will help to address current uncertainties regarding water quality in the back-flooded pit/lake.

b. Evaluate Meromixis: If the additional hydrogeological characterization studies indicate that future metals levels are of potential concern, then the importance of establishing a stable stratified pit would

be amplified. In that case, the Applicant should undertake a detailed quantitative analysis confirming that stable meromictic conditions will occur within the flooded pit. The analysis should include modelling that demonstrates meromixis will remain stable under a range of conditions (groundwater discharge, high wind, pit wall failure, etc.).

c. Monitoring Plan: To supplement the monitoring plans already submitted by the Applicant, INAC recommends that a revised and updated monitoring plan for the flooded pit of the Whale Tail Project be submitted to the NWB for review and approval prior to construction. The updated plan would include specified criteria that must be met before the flooded pit is considered to be effectively closed and any breaching of dams/dikes to be considered. In addition to specifying acceptable water quality, the criteria would include a required number of acceptable sampling events that would be necessary to confirm that stable conditions had been attained (this may include increased sampling events during certain times of year, etc).

Responses related to NIRB Final Submission Recommendations:

Response a)

Agnico Eagle agrees with INACs recommendation to conduct detailed hydrogeological characterization studies to evaluate the hydraulic gradients and further assess the potential for arsenic diffusion of the pit walls. Data will be collected during construction and operation to verify inputs to water quality modelling. The results will inform hydrogeological modelling and will be conducted to inform future closure and post-closure water quality predictions. Should results of the hydrogeological modelling suggest that arsenic diffusion may result in elevated concentrations in the flooded pit in post-closure, then hydrodynamic modelling of the flooded pit lake will be performed to assess the occurrence and stability of meromixis. Of note is that the current open pit lake model considers fully mixed conditions within the open pit and within the above North Whale Tail Lake. Fully mixed conditions assume that constituent concentrations are equally distributed in the water body and thus, represent worst case concentrations at the open pit and North Whale Tail Lake surfaces than would occur if stable meromixis was to develop.

Agnico Eagle believes that the information that has been provided to INAC and NIRB is sufficient to assess the impacts of the Whale Tail Pit Project on the environment and to make a determination on the Project. Agnico Eagle proposes that specifics to modelling and monitoring the hydrogeology be included in updated Management Plans to be submitted 60 days prior to construction.

Agnico Eagle's Proposed Terms and Conditions:

1. *The Proponent shall conduct a hydrogeological characterization study plan to validate hydraulic gradients and verify the potential for arsenic diffusion from submerged Whale Tail pit walls. The results of the hydrogeological studies shall be provided for review on an annual basis.*

2. *If warranted, the pit design shall be revised and/or appropriate mitigation measures should be developed to incorporate the results from the additional studies. The Proponent shall report the results of the hydrogeological characterization and their implications to the pit design and relevant management plans for review prior to pit construction.*
3. *Should results of modelling suggest that arsenic diffusion may result in elevated concentrations in the flooded pit post-closure, the Proponent shall perform detailed hydrodynamic modelling of the flooded pit lake prior to closure to evaluate meromixis and flooded pit lake water quality. The results of modelling shall be provided for review prior to pit closure.*

Interested Party:	**Indigenous and Northern Affairs Canada (INAC)**	**NIRB Ref No.:**	**INAC-FC-4**
		NWB Ref No.	**INAC-FC-4**
Re:	**Availability of Cover Material**		

Technical Review Comment / Recommendation Made By Interested Party:
INAC is satisfied with the Proponent's responses and considers the issue resolved.

Agnico Eagle's Response to Technical Review Comment / Recommendation:
Agnico Eagle acknowledges that based information provided by Agnico Eagle (April 2017 Technical Comment Response INAC-TRC #1), INAC supports the conclusion that sufficient clean waste rock is available to construct the conceptual cover specified in the EIS (i.e., a cover that is 2 to 4 m thick) with sufficient contingency for design modifications.

Interested Party:	**Indigenous and Northern Affairs Canada (INAC)**	**NIRB Ref No.:**	**INAC-FC-5**
		NWB Ref No.	**n/a**
Re:	**Revegetation Research**		

Technical Review Comment / Recommendation Made By Interested Party:
INAC is satisfied with the Proponent's responses and considers the issue resolved.

Agnico Eagle's Response to Technical Review Comment / Recommendation:
Agnico Eagle acknowledges INAC is satisfied with the re-vegetation research strategy and maintains its commitment from April 2017 Technical Comment Response (INAC-TRC #8) to initiate the design and implementation of re-vegetation studies to better define re-vegetation strategies that are applicable to the reclamation of comparable northern developments.

Interested Party:	**Indigenous and Northern Affairs Canada (INAC)**	**NIRB Ref No.:**	**INAC-FC-6**
		NWB Ref No.	**INAC-FC-5**
Re:	**Ammonia and Nitrate Levels from Explosive Use**		

Technical Review Comment / Recommendation Made By Interested Party:
INAC is satisfied with the Proponent's responses and considers the issue resolved.

Agnico Eagle's Response to Technical Review Comment / Recommendation:
Acknowledged.

Interested Party:	**Indigenous and Northern Affairs Canada (INAC)**	**NIRB Ref No.:**	**n/a**
		NWB Ref No.	**INAC-FC-6**
Re:	**Meadowbank Tailings Management**		

Technical Review Comment / Recommendation Made By Interested Party:

NWB

a. Meadowbank Tailings Management: INAC recommends that the Applicant submit a stand-alone revised and updated tailings management plan for review and approval under the Meadowbank Water Licence 2AM-MEA1525. The plan should include but not be limited to: confirmation of capacity of the facility, details on how increase tailing loadings from Whale Tail will not have any adverse effects on the facility and details on the increase in berm height of the South Cell.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle agrees with the INAC recommendation and submitted a stand-alone Meadowbank Tailings Management Plan on January 25, 2017 to the NWB entitled Appendix WT – Meadowbank Tailings Management Plan, Whale Tail Pit. Agnico Eagle will also submit an updated and stand-alone Meadowbank Mine Waste Rock Storage Facility Plan that will be required, 60 days following approval of the amended Meadowbank Water Licence 2AM-MEA1525.

Interested Party:	**Indigenous and Northern Affairs Canada (INAC)**	**NIRB Ref No.:**	**INAC-FC-7**
		NWB Ref No.	**n/a**
Re:	**Public Consultation and Incorporation of Community Concerns in EIS**		

Technical Review Comment / Recommendation Made By Interested Party:

INAC recommends that the Proponent record issues identified through their Community Liaison system and report on the mitigation measures implemented to alleviate socio-economic concerns.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle agrees with INAC's recommendation INAC-FC-7 and will report issues brought-up in the Community Liaison Committee meetings annually to the NIRB and SEMC.

Agnico Eagle's Proposed Term and Condition:

> *The Proponent should file an annual report with NIRB identifying issues raised through the Community Liaison system, actions taken to resolve the issues, and status of the issues. The Proponent is also encouraged to provide these reports to the SEMC, and to use them when revisiting the SEMMP.*

Interested Party:	**Indigenous and Northern Affairs Canada (INAC)**	**NIRB Ref No.:**	**n/a**
		NWB Ref No.	**INAC-FC-7**
Re:	**Term of Meadowbank Water Licence**		

Technical Review Comment / Recommendation Made By Interested Party:

NWB

a. Meadowbank Licence Term: INAC recommends that the Applicant's amendment application for the Meadowbank water licence 2AM-MEA1525 include amending the term of licence to 2026 in order to reflect the planned and proposed water use.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle agrees with the INAC recommendation to extend the term of the licence 2AM-MEA1525 to 2026. To be consistent with this recommended extension, if deemed appropriate, Agnico Eagle also requests the NWB consider the term of 2AM- WTP---- to be until 2026.

Interested Party:	**Indigenous and Northern Affairs Canada (INAC)**	**NIRB Ref No.:**	**INAC-FC-8**
		NWB Ref No.	**n/a**
Re:	**Socio-Economic Component of Closure Plan**		

Technical Review Comment / Recommendation Made By Interested Party:

a. INAC recommends that the Proponent provide a revised interim closure plan that:

1. *links the socio-economic closure plans for Meadowbank and Whale Tail,*
2. *identifies regular update and multi-party review requirements,*
3. *shows evidence of consideration of socio-economic lessons learned from other northern mine closure experiences;*
4. *includes evidence of consultation with Kivalliq communities and governance bodies on socio-economic objectives/goals related to closure planning,*
5. *emphasizes plans, policies and programs to increase transferable skills of Inuit workers, including into trades and other skilled positions,*
6. *includes all plans, policies and programs related to socioeconomic factors in a temporary closure situation, and*
7. *identifies and addresses anticipated adverse socio-economic effects of closure to the Kivalliq region and communities related to loss of employment and income in the event of planned or unplanned, permanent or temporary, closure.*

The revised interim closure plan should be provided to the NIRB upon completion, and within one year of issuance of the Project Certificate.

b. INAC requests that prior to the Final Hearing, the Proponent clarify its expectations and workforce transition plans (using multiple scenarios if necessary) for the Inuit workers between the various Proponent's operations.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Response a)

Agnico Eagle recognizes that a socio-economic closure plan is required prior to closure but current regulatory standards do not require a socio-economic closure plan as part of interim closure planning. The Environment Impact Statement relied on current regulatory standards, including the most recent submissions to the Nunavut Impact Review Board (i.e., Sabina 2015), the Mine Site Reclamation Policy for Nunavut (AANDC 2002), and the Mine Site Reclamation Guidelines for the Northwest Territories (AANDC 2007).

Agnico Eagle is committed, through the Whale Tail Inuit Impact and Benefit Agreements to commission a Socio Economic Inuit Impact and Benefit Review (SEIIBR) to "develop the appropriate parameters or

indicators, taking into consideration the Whale Tail Project's life of mine, including the Post Operation Phase, to facilitate a review of the socio-economic impacts and benefits on Inuit from the Whale Tail Project" (Agnico Eagle 2017). Furthermore, "The SEIIBR shall include a work plan and recommendations to monitor, evaluate and analyze the appropriate parameters and indicators for the Whale Tail Project over all phases" (Agnico Eagle, 2017). The scope of the SEIIBR is Meadowbank, Meliadine and Whale Tail and shall be updated in advance of 3-year IIBA reviews. The purpose of the SEIIBR is to provide information for the IIBA Employment and Culture Committee to provide recommendations to the Implementation Committee, including those recommendations required at least one (1) year ahead of the expected date of termination of the Operation Phase, in order to recommend modifications to the IIBA to make the Agreement applicable to the Post Operation Phase.

Agnico Eagle will also confer with the Kivalliq Socio Economic Monitoring Working Group, of which INAC is a member, in its planning with regards to socio-economic impacts caused by closure ahead of the expected date of closure, along with the socio-economic objectives , such that the feedback of the Working Group and KvSEMC can inform the socio-economic closure plan as part of the Final Closure Plan, taking into account the information collected through the Socio Economic Monitoring Program (SEMP).

Agnico Eagle believes that that a socio-economic closure plan should be developed using information collected through existing socio economic monitoring frameworks described above so that it can be implemented and effective, which requires a reasonably current employment with Agnico Eagle's Nunavut operations, and current socio-economic condition understanding in affected communities, based on other on-going opportunities in Nunavut. Agnico Eagle is currently investing heavily in Nunavut with exploration of the Amaruq property, the Meadowbank Mine, the Meliadine Mine, and the proposed Whale Tail Project. Depending on when closure occurs, there is the potential for other developments and/or opportunities to minimize socio-economic impacts from closure. It is Agnico Eagle's view that the requirement to develop a socio-economic closure plan with the level of detailed outlined above should be part of the Final Closure Plan, one year in advance of closure, which will be regulated through a Type A Water Licence.

Response b)

A workforce transition plan must be easily implemented and based on actual conditions; therefore, workforce transition plan will be based on the outcome of this regulatory process. Agnico Eagle maintains that workforce planning must be within the responsibilities of the proponent and not subject to this regulatory process. Through the Inuit Impact Benefits Agreement (IIBA) recently signed for Whale Tail, there is workforce oversite through the Employment and Culture Committee and studies (Labour Market Analysis and Inuit Workforce Barriers Study) that will be used to inform workforce management (Agnico Eagle 2017).

The potential impacts to the workforce from the Project have been provided in the Environmental Impact Statement. Through the regulatory process, Agnico Eagle has provided evidence to support our view that that in the event that the Whale Tail Project is delayed and the Meadowbank Mine is put in care and maintenance a significant number of Inuit employees would be unemployed, where possible, some of those employees may be able to support on the construction of Meliadine Mine, dependent on the skill sets. Where possible, Agnico Eagle would look to transfer employees with the proper skill sets. In the event that the Whale Tail Project is not approved, the Meadowbank Mine would enter the closure and reclamation phase and as per the agreement with INAC and the Nunavut Water Board, the Final Closure Plan would be provided and with that a socio-economic closure plan.

Agnico Eagle's Proposed Term and Condition:

Agnico Eagle will consult with the KvSEMC and Socio Economic Monitoring Working Group two (2) years before the expected date of closure in order to better inform the Socio-Economic Closure Plan, which will be provided as part of the Final Closure Plan for the Whale Tail Pit Project, one year in advance of closure.

References:

AANDC (Aboriginal Affairs and Northern Development Canada). 2002. Mine Site Reclamation Policy for Nunavut. Formerly Indian and Northern Affairs Canada (INAC).

AANDC. 2007. Mine Site Reclamation Guidelines for the Northwest Territories. Formerly Indian and Northern Affairs Canada (INAC). January 2007.

Agnico Eagle Mines Limited. 2011. Meadowbank Mine Inuit Impact Benefit Agreement between Agnico-Eagle Mines Limited / Mines Agnico-Eagle Limitée and Kivalliq Inuit Association.

Agnico Eagle Mines Limited. 2017. Whale Tail Project Inuit Impact Benefit Agreement between Agnico-Eagle Mines Limited / Mines Agnico-Eagle Limitée and Kivalliq Inuit Association.

Sabina (Sabina Gold & Silver Corp.) 2015. The Back River Project Final Environmental Impact Statement. Submitted to Nunavut Impact Review Board. November 2015.

Interested Party:	**Indigenous and Northern Affairs Canada (INAC)**	**NIRB Ref No.:**	**INAC-FC-9**
		NWB Ref No.	**n/a**
Re:	**Framework for Monitoring of Project Impacts**		

Technical Review Comment / Recommendation Made By Interested Party:

INAC recommends the following:

a. The Proponent is encouraged to report the results of the LMA and IWBS to the Kivalliq SEMC upon completion in 2018, which should integrate the findings into its ongoing work identifying gaps between the Kivalliq labour market and mining market needs, and how to activate latent labour pool in the Kivalliq region to maximize labour "capture" from mining for the region.

b. The Proponent commit to report the results and implications of the LMA and IWBS within its first year's Annual Report to NIRB, and show how the results have been integrated into an updated Socio-economic Monitoring Plan for the Whale Tail Pit Project.

c. The Proponent commit to conduct more detailed workforce surveys on an annual basis, for its three major Kivalliq operations, and integrate the results into ongoing updates to plans, policies and programs. FIFO effects, family support issues, other Inuit retention issues, and issues of particular importance to the female workforce all merit further attention.

d. In order to effectively monitor the socio-economic impacts of the Whale Tail Pit Project, it is recommended that the Proponent, in collaboration with INAC, the Government of Nunavut and the Kitikmeot Inuit Association, work to establish a socio-economic working group for the Project to develop and oversee an expanded joint Meadowbank-Whale Tail- Meliadine AEM Socio-Economic Monitoring Program. The Proponent is also encouraged to work with these agencies to review and finalize the Whale Tail Socio-Economic Monitoring Program.

Proposed Terms and Conditions:

1. The Proponent is strongly encouraged to participate in the work of the Kivalliq Socio-Economic Monitoring Committee along with other agencies and the communities of the Kitikmeot region, and to identify areas of mutual interest and priority for incorporation into a collaborative monitoring framework that includes socio-economic priorities related to the Project, communities, and the Kivalliq region as a whole.

2. The Proponent is encouraged to work in collaboration with other socio-economic stakeholders including, the Government of Nunavut, Indigenous and Northern Affairs Canada, the Kivalliq Inuit Association, and communities of the Kivalliq region, to establish a socio-economic working group for the Project to develop and oversee an expanded joint Meadowbank-Whale Tail- Meliadine AEM Socio-

Economic Monitoring Program. The working group should develop a Terms of Reference which outlines each member's roles and responsibilities with regards to, where applicable, project specific socio-economic monitoring throughout the life of the Project. The Terms of Reference for this multi-party, multi-project Working Group are to be provided to the Nunavut Impact Review Board upon completion, and within one year of issuance of the Project Certificate.

3. The Proponent shall work with the other parties to use the updated Meadowbank-Whale Tail-Meliadine Socio-Economic Monitoring Program to monitor the predicted impacts outlined in their respective EIS' as well as regional concerns identified by the Kivalliq Socio-Economic Monitoring Committee. The Proponent is encouraged to work in collaboration with all other socio-economic stakeholders such as the Government of Nunavut, Indigenous and Northern Affairs Canada, Kivalliq Inuit Association, and the communities of the Kivalliq region in developing this program, which should include a process for adaptive management and mitigation in the event unanticipated impacts are identified. The Proponent shall produce annual joint "AEM Projects" Socio-Economic Monitoring reports throughout the life of the Projects that are submitted to the Nunavut Impact Review Board and discussed with the wider Kivalliq Socio-Economic Monitoring Committee. Details of the Meadowbank-Whale Tail-Meliadine Socio-Economic Monitoring Program are to be provided to the Nunavut Impact Review Board upon finalization, and within one year of issuance of the Project Certificate.

Agnico Eagle's Response to Technical Review Comment / Recommendation / Proposed Terms and Conditions:

1. Agnico Eagle agrees to Project Term and Condition 1, with the exception of changing Kitikmeot region to Kivalliq region:

   The Proponent is strongly encouraged to participate in the work of the Kivalliq Socio-Economic Monitoring Committee along with other agencies and the communities of the Kivalliq region, and to identify areas of mutual interest and priority for incorporation into a collaborative monitoring framework that includes socio-economic priorities related to the Project, communities, and the Kivalliq region as a whole.

2. Agnico Eagle agrees to Project Term and Condition 2, with slight modifications to change Meliadine, Meadowbank, and Whale Tail to Kivalliq Projects.

   The Proponent is encouraged to work in collaboration with other socio-economic stakeholders including, the Government of Nunavut, Indigenous and Northern Affairs Canada, the Kivalliq Inuit Association, and communities of the Kivalliq region, to establish a socio-economic working group for the Project to develop and oversee a Kivalliq Projects AEM Socio-Economic Monitoring Program. The working group should develop a Terms of Reference which outlines each member's roles and responsibilities with regards to, where applicable, project specific socio-economic monitoring

throughout the life of the Projects. The Terms of Reference for this multi-party, multi-project Working Group are to be provided to the Nunavut Impact Review Board upon completion, and within one year of issuance of the Project Certificate.

3. Agnico Eagle agrees to Project Term and Condition 3, with slight modifications to change Meliadine, Meadowbank, and Whale Tail to Kivalliq Projects.

   The Proponent shall work with the other parties to use the updated Kivalliq Projects Socio-Economic Monitoring Program to monitor the predicted impacts outlined in the Projects' respective EIS' as well as regional concerns identified by the Kivalliq Socio-Economic Monitoring Committee. The Proponent is encouraged to work in collaboration with all other socio-economic stakeholders such as the Government of Nunavut, Indigenous and Northern Affairs Canada, Kivalliq Inuit Association, and the communities of the Kivalliq region in developing this program, which should include a process for adaptive management and mitigation in the event unanticipated impacts are identified. The Proponent shall produce annual joint "AEM Kivalliq Projects" Socio-Economic Monitoring reports throughout the life of the Projects that are submitted to the Nunavut Impact Review Board and discussed with the wider Kivalliq Socio-Economic Monitoring Committee. Details of the Kivalliq Projects Socio-Economic Monitoring Program are to be provided to the Nunavut Impact Review Board upon finalization, and within one year of issuance of the Project Certificate.

KIVALLIQ INUIT ASSOCIATION

Interested Party:	Kivalliq Inuit Association (KivIA)	Ref No.:	KivIA-Terrestrial-01
Re:	Uncertainty in caribou responses to Whale Tail haul road		

Technical Review Comment / Recommendation Made By Interested Party:

The high rates of traffic proposed for the Project haul road provide uncertainty for Project effects, and the monitoring thresholds to triggered enhanced monitoring and mitigation are not based on all available data. The KivIA requests that to reduce uncertainty in the effects of haul road traffic on caribou, the Nunavut Impact Review Board (NIRB) require AEM to provide analyses integrating the different data sets (height of land and road surveys and collars) to evaluate the applicability of the monitoring thresholds proposed in the Terrestrial Ecosystem Management Plan (TEMP) to trigger enhanced levels of monitoring and mitigation.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle agrees that all available data should be used to increase our understanding of the efficacy of adaptive management and increase our knowledge. These combined datasets will be used for monitoring caribou interactions with the Whale Tail Haul Road to understand the applicability of the monitoring thresholds proposed in the Terrestrial Ecosystem Management Plan (TEMP). This data will be used throughout construction and operations to evaluate the applicability of the monitoring thresholds and adaptive management. Furthermore, this information will be reported annually to NIRB as part of the annual submission of the TEMP. Technical discussions and collaborative feedback and improvement such as these are part of the Terms of Reference for the Terrestrial Advisory Group (TAG). Avenues and methods to use all data for determining monitoring thresholds for enhanced monitoring and mitigation will be discussed at the next TAG meeting.

Agnico Eagle believes that the assessment within the EIS is conservative, valid, and is further supported with the additional mitigation measures built into the TEMP that have been developed through caribou specific workshops with the KivIA, GN, NTI, and the Baker Lake HTO over the past year. Agnico Eagle agrees that further monitoring of mitigation and adaptive management is required to understand effectiveness of these measures and will continue to do so with the TAG and built into the TEMP. Agnico Eagle will continue to consult with the KivIA, GN, NTI, and the Baker Lake HTO over the life of the project (via the TAG) to incorporate all relevant data into the mitigation and monitoring programs set out in the TEMP.

Interested Party:	Kivalliq Inuit Association (KivIA)	Ref No.:	KivIA-Terrestrial-02
Re:	Uncertainty in cumulative effects on caribou distribution		

Technical Review Comment / Recommendation Made By Interested Party:
Given uncertainty about the cumulative effects assessment for the project, KivIA recommends that the magnitude of the cumulative effects on migration should be moderate.

Agnico Eagle's Response to Technical Review Comment / Recommendation:
Agnico Eagle stands by the original assessment that the magnitude of the cumulative effects on migration should be low. The additional information provided in the Cumulative Encounter and Residency Assessment for Caribou report (Golder 2017) further reduces uncertainty about the cumulative effects assessment for the project and supports that the number of developments and subsequent encounters of Zones of Influence (ZOIs) by caribou is low. The GN indicated in their submission that a value of 11 encounters should be assumed for Lorillard and Wager Bay caribou herds as the potential effect for the Project and that this rate of ZOI encounters represents significant disturbance to barren-ground caribou. Results of the ZOI encounter and residency analysis (Golder 2017) indicate that there are also many years where Lorillard and Wager Bay collared caribou do not encounter hypothetical development ZOIs. In other words, disturbance associated with development does not affect all caribou in all years.

Similar ZOI encounter analyses have been completed for Dominion Diamond's Jay project (Dominion Diamond 2014) and the Kiggavik project (AREVA 2014), which indicate that 11 encounters is unlikely to result in a significant adverse effect to caribou energetics and population growth. For example, AREVA (2014) simulated 13 ZOI encounters by collared Qamanirjuaq caribou in their cumulative effects case and did not detect a significant reduction to caribou energetics or population growth. Similarly, Dominion Diamond (2014) demonstrated that 34 simulated ZOI encounters by Bathurst collared caribou in their future development case and in a severe insect year would not significantly influence caribou calving rates or influence the population trajectory of this herd in either a declining or increase phase using energetics models with conservative assumptions.

Consequently, the realized infrequent encounter rate of 11 hypothetical ZOI encounters, which was observed in the residency analysis for the Wager Bay herd in winter, would not change the conclusions of Agnico Eagle's cumulative effects summary report (Golder 2017). In general, the maximum range of cumulative encounter rates for the Lorillard and Wager Bay herds was 6 encounters or less (Golder 2017). For these reasons, Agnico Eagle stands behind the assessment that the Project would result in no measurable changes to the energetic state of Ahiak, Beverly, Lorillard, and Wager Bay caribou, and no demographic consequences to the populations.

References:

AREVA (AREVA Resources Canada Inc.). 2014. Kiggavik Project Effects: Energy-Protein and Population Modeling of the Qamanirjuaq Caribou Herd. September, 2014.

Dominion Diamond (Dominion Diamond Ekati Corporation). 2014. Developer's Assessment Report for the Jay Project. December, 2014.

Golder (Golder Associates Ltd.). 2017. Cumulative Encounter and Residency Assessment for Caribou; Whale Tail Commitments 9 and 10. July, 2017.

Interested Party:	Kivalliq Inuit Association (KivIA)	Ref No.:	KivIA-Terrestrial-03
Re:	Caribou mitigation in the Terrestrial Ecosystem Management Plan (TEMP)		

Technical Review Comment / Recommendation Made By Interested Party:

The KivIA requests that to provide protective mitigation and to reduce potential sensory disturbance for caribou that AEM commit to, or NIRB require AEM to update the TEMP as follows:

1. *Define "non-essential vehicles" and clarify how removal of these vehicles from circulation will reduce sensory disturbance;*
2. *Provide details of implementation and thresholds for employment of convoys for all three project segments (mine operations, haul road, and AWAR);*
3. *Clarify use of convoys for mitigation, including the maximum number of vehicles and the resultant duration of gaps (hours) for caribou to cross*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle agrees with the GN-08 definitions and for additional clarity proposes the following (to be incorporated in the TEMP):

- *"non-essential vehicles" include vehicles and equipment used to continue mining operations or hauling of ore.*
- "*essential vehicles" include vehicles operated for the purpose of maintaining the safety of personnel, Emergency Response Team (ERT), security and wildlife monitoring.*

Agnico Eagle values the input of the KivIA and recognizes that the TEMP will continue to evolve as monitoring data informs decision making through the Terrestrial Advisory Group (TAG). Agnico Eagle acknowledges that there is still much understanding to gain regarding when to implement traffic convoys and initial conservative paradigms (e.g., slow speeds) may now be challenged, whereby increasing speed of vehicles but increasing the gap between convoys may be a better mitigation. Agnico Eagle is willing to work with the TAG to collect information on various convoy schemes (i.e., altering # of vehicles, speed, and gap duration between convoys). The request of KivIA should be discussed at the next TAG meeting for a collaborative discussion on the implementation of convoys, the composition of those convoys and convoy scenarios.

Although standard responses and mitigation are desired for adaptive management for caribou, there must be flexibility to adapt to real scenarios. However, Agnico Eagle has experience dealing with large caribou movements through their mine site at Meliadine north of Rankin Inlet. Although there is a similar decision tree and process as the Whale Tail Pit TEMP for caribou mitigation response, real-time adaptive management strategies are discussed collaboratively with the KivIA, NTI, GN, and HTO and then management of operations are decided on and implemented. This past July, the KivIA and NTI were

on-site at Meliadine during the post-calving movements of the Qamanirjuac herd. There were several positive comments and commendation from the KivIA and NTI on how Agnico Eagle handled the adaptive management strategies. This experience is shared among all environmental staff within Agnico Eagle so that experiences gained at one operation can be applied at other similar operations.

Interested Party:	Kivalliq Inuit Association (KivIA)	Ref No.:	KivIA-Terrestrial-04
Re:	**Uncertainty in effects of Whale Tail pit and haul road activities on caribou distribution (Zone of Influence)**		

Technical Review Comment / Recommendation Made By Interested Party:

KivIA requests that AEM reanalyze the extent and magnitude of the Zone of Influence around the existing Meadowbank mine and AWAR using the collared caribou using an alternative analysis method that does not rely on comparison with pre-development collar data. In the absence of a reanalysis of the data, the KivIA recommends that based on the uncertainty of the results in the current Zone of Influence analysis the effect of the Project on caribou distribution is predicted to be moderate.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

As requested, Golder (2017) completed an analysis of caribou collar data (i.e., distribution and abundance) to determine the existence and extent of a potential zone of influence (ZOI) for all caribou herds that interact with the Meadowbank and Whale Tail Project and for the spring and fall migration periods, and the winter period.

The KivIA is questioning the use of pre-development (i.e., baseline) data in the analytical methods. The KivIA recommends that the analysis be repeated without considering the baseline data and following the approach of Boulanger et al. (2012). Boulanger et al. (2012) makes an assumption about expected use by comparing habitat selection at a larger spatial scale and using only development phase data, because baseline data were not available. If baseline data were available for use in the same area, then the reliability of this assumption could be evaluated empirically, or alternatively the data could be used to estimate expected use of habitats as a function of distance from the anticipated mine footprints. However, because there are no baseline data available for Boulanger et al. (2012), this assumption cannot be evaluated empirically, which increases uncertainty about the results and conclusions. For example, numerous studies have documented that habitat selection patterns by caribou differ by spatial scale (e.g., Rettie and Messier 2000; Vistnes and Nelleman 2008; Johnson and Russell 2014; and references within these papers), so at face value the validity of this assumption appears questionable. In contrast, the analysis completed by Golder had baseline data available, consequently the need to make an assumption about expected use of habitat at different scales that may or may not be valid is not required. As the patterns of the baseline results demonstrate, development phase use and amount time spent by caribou in hypothetical ZOIs has actually increased or been similar relative to baseline use in two of three seasons and in the seasons where the number of collars (sample points) are greatest and more balanced (i.e., spring and fall migration periods).

Ignoring baseline phase results would lead to incorrect conclusions with much less certainty about changes in the distribution of these variables. The approach and results of the statistical analysis do not

support the contention by the KivIA that stronger and more certain inferences could be made with an analytical design and method that does not consider baseline data. Agnico Eagle believes the original assessment in the EIS is valid, conservative, and defensible based on the use of all existing data.

The KivIA also focusses their conclusions on the result for standardized amount time spent in ZOIs, which describes a ZOI of 30 km to 35 km observed during the development phase in the winter season. As noted in the report (Golder 2017), the development phase generating this result also has annual gaps and low numbers of collared caribou, which supports the report conclusion that there is uncertainty that this result is accurate. The uncertainty associated with results is that the low sample size of collared caribou in the development phase (and unbalanced with baseline phase) for winter inflates Type I and II error rates. Type I error is the incorrect rejection of the null hypothesis (i.e., there is no difference) and the Type II error is the failure to reject the null when it is false (i.e., when there really is a difference). Low sample sizes inflate error rates because they do not correctly represent the actual variability leading to an incorrect conclusion about the limited results. For example, tossing a fair coin five times may result in 4 or 5 (e.g., 80% or 100%) heads by chance, which would lead to the conclusion that coin is not fair when it is known to be fair (i.e., a Type I error). As this same fair coin is tossed more frequently the number of times heads or tails is achieved will be approximately equal and support the null hypothesis that the coin is fair. Consequently, additional data may suggest that the ZOI in winter is not realized. However, Golder agrees with the KivIA that there is uncertainty with the winter results due to lower sample size during this period. Agnico Eagle would also like to remind the KivIA that the spring and fall results have greater certainty (given larger numbers of collared caribou and greater interaction) and show no avoidance of Meadowbank Mine and the All Weather Access Road (AWAR) (Golder 2017a).

Although Agnico Eagle stands behind the ZOI analysis report (Golder 2017), we are open to revisiting the analysis in the future, as the accumulation of caribou collar data increases. However, we strongly feel that the KivIA submissions with respect to the methods and results of the ZOI analysis are incorrect and the reviewer is suggesting an invalid approach to re-analysis. Consequently, Agnico Eagle does not agree with the KivIA's recommendation, rather the ZOI data analysis corroborates with the current assessment of the effects of the project on caribou distribution.

References:

Boulanger, J., K.G. Poole, A. Gunn, and J. Wierzchowski. 2012. Estimating the zone of influence of industrial developments on wildlife: a migratory Caribou and diamond mine case study. Wildlife Biology 18: 164-179.

Golder (Golder Associates Ltd.). 2017. Meadowbank Mine and All-weather Access Road Caribou Zone of Influence Assessment; Whale Tail Commitments 8. July, 2017.

Johnson CJ, Russell DE. 2014. Long-term Distribution Responses of a Migratory Caribou Herd to Human Disturbance. Biol Conserv 177:52-63.

Rettie WJ, Messier F. 2000. Hierarchical Habitat Selection by Woodland Caribou: its Relationship to Limiting Factors. Ecography 23: 466 478.

Vistnes I, Nellemann C. 2008. The Matter of Spatial and Temporal Scales: a Review of Reindeer and Caribou Response to Human Activity. Polar Biology 31: 399-407.

Interested Party:	Kivalliq Inuit Association (KivIA)	Ref No.:	KivIA-Terrestrial-05
Re:	Herd management planning and cumulate effects		

Technical Review Comment / Recommendation Made By Interested Party:

KivIA recommends that to offset uncertainty about cumulative impacts, the adaptive mitigation and monitoring at the herd level be strengthened through completion and implementation of Government of Nunavut's caribou strategy framework. KivIA requests that NIRB requires Government of Nunavut to complete the 2010 caribou strategy framework within 2 years.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle agrees with the KivIA that completion of the Caribou Strategy Framework, could strengthen adaptive mitigation and monitoring. This information, if completed, should be provided to the TAG for review and used to inform adaptive management for the Project. Agnico Eagle defers to the GN in terms of the Government of Nunavut caribou strategy framework and timing of completion.

Interested Party:	Kivalliq Inuit Association (KivIA)	Ref No.:	KivIA-Terrestrial-06
Re:	Uncertainty in using collars to describe incremental and cumulative effects		

Technical Review Comment / Recommendation Made By Interested Party:

KivIA requests that NIRB require Government of Nunavut to complete a caribou collaring review of statistical design and applicability to environmental assessment and adaptive monitoring within 2 years.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle position is that a caribou collaring review would be of value for mitigation and monitoring, to be reviewed by Agnico Eagle through the TAG and used to inform adaptive management. Agnico Eagle defers to the GN in terms of the Government of Nunavut's collaring program and the timing of completion caribou collaring review.

Interested Party:	Kivalliq Inuit Association (KivIA)	Ref No.:	KivIA-Freshwater
Re:	**Freshwater Environment (Commitment numbers 30, 36, 37 and 42 Appendix F, NIRB's pre-hearing conference decision)**		

Technical Review Comment / Recommendation Made By Interested Party:

Commitments 30, 36, 37 and 42 are related to the potential impacts of arsenic and phosphorus on the site and receiving environment water quality. AEM responded to these commitments with technical memorandum 1658927_Revision 1/6100/6130 Doc. 125. Given the expertise within INAC and ECCC on water quality issues the KivIA will rely on this expertise to resolve any water quality issues.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle acknowledges and thanks KivIA for their comment that they will rely on INAC and ECCC to resolve issues related to water quality.

Interested Party:	Kivalliq Inuit Association (KivIA)	Ref No.:	KivIA-Atmospheric
Re:	**Atmospheric Environment (Commitment number 7, Appendix F, NIRB's pre-hearing conference decision)**		

Technical Review Comment / Recommendation Made By Interested Party:

Commitment 7 is related to the use of dustfall monitoring stations on the Vault Pit haul road to validate and improve modelling of the Whale Tail haul road. AEM responded on June 27, 2017 to this commitment with technical memorandum 1658927 /6100/6130. The KivIA accepts the conclusions presented in this technical memorandum. However, given the importance of dust as a potential issue with the Inuit of the Kivalliq Region the KivIA requests that some of the monitoring which led to these conclusions be continued for the operating life of the Whale Tail Pit Project. This monitoring is:

3) Ongoing monitoring at affixed location 480 metres from the Vault pit haul road (ie. DF-4);
4) Dustfall measurements during June and August along transects perpendicular to the Baker Lake to Meadowbank AWAR.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle agrees with KivIA's recommendation and will continue ongoing monitor at DF-4 on the Vault pit haul road. Agnico Eagle will update Appendix 8-E.1 Air Quality and Dustfall monitoring plan 60 days following issuance of the Project Certificate.

As previously discussed, August represents the driest month with the greatest traffic volume along the AWAR (due to the shipment of supplies during the barge season), thus represents the most conservative monthly dustfall for comparison to relevant guidelines. Nevertheless, as recommended by KivIA, Agnico Eagle will collect dustfall measurements along transects perpendicular to the Baker Lake to Meadowbank AWAR in June and August, 2018. Depending on the findings of these results, Agnico Eagle will work with the KivIA and NIRB to update the Air Quality and Dustfall Monitoring Plan accordingly.

NATURAL RESOURCES CANADA

Interested Party:	Natural Resources Canada (NRCan)	Ref No.:	NRCan-Issue 1-Permafrost & Terrain
Re:	**Baseline Permafrost and Terrain Conditions in the Project Area**		

Technical Review Comment / Recommendation Made By Interested Party:

NRCan recommends that the Proponent complete the geotechnical investigations planned and update the characterization of ground ice conditions in the project area to support detailed and final design of project components.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

At this time, Agnico Eagle believes the information that has been provided to NRCan and NIRB is sufficient to assess the impacts of the Whale Tail Pit Project on the environment and to make a determination on the Project. Agnico Eagle agrees with NRCan's recommendations to support detailed and final design of Project Components for the purpose of the Type A Water Licence, Agnico Eagle proposes to provide the geotechnical characterizations within the applicable final designs required 60 days prior to construction.

Interested Party:	Natural Resources Canada (NRCan)	Ref No.:	NRCan-Issue 2-Permafrost & Terrain
Re:	**Design Cover Thickness for the Waste Rock Storage Facility**		

Technical Review Comment / Recommendation Made By Interested Party:

NRCan recommends:

- *The Proponent conduct 2D thermal modelling to support detailed and final design of the WRSF including refinement of the cover thickness, and*
- *The Proponent continue to utilize data generated from the Meadowbank monitoring program and data collected from any thermistors installed in the Whale Tail WRSF as well as additional information on material properties of the site, to refine their thermal analysis to support final design and cover design.*

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Although an updated model was submitted to NIRB/NWB on July 11, 2017, Agnico Eagle agrees with NRCan and will continue to complete thermal modelling to support detailed and final design of the WRSF during the construction and operational phase. Furthermore, Agnico Eagle agrees with NRCan to use data generated from Meadowbank monitoring to refine the thermal analysis to support the final design and cover for the Whale Tail Pit WRSF.

At this time, Agnico Eagle believes that the information that has been provided to NRCan and NIRB is sufficient to assess the impacts of the Whale Tail Pit Project on the environment and to make a determination on the Project.

Agnico Eagle proposes that specifics to modelling and monitoring the Whale Tail Waste Rock Facility be considered in further detail during the water licensing process. If deemed appropriate by NIRB and NWB, Agnico Eagle submits NRCan's recommendation could be reflected in the Type A Water Licence. Recommendations can be incorporated to support detailed and final design of Project Components and Agnico Eagle proposes to provide the information within the applicable final designs required 60 days prior to construction.

Interested Party:	Natural Resources Canada (NRCan)	Ref No.:	NRCan-Issue 3-Permafrost & Terrain
Re:	**Permafrost and Talik Distribution in the Project Area**		

Technical Review Comment / Recommendation Made By Interested Party:

In their response to NRCan's submission, the Proponent described, but did not provide details of additional thermal analysis similar to that suggested by NRCan, along a transect north of the pit southward through the middle of Whale Tail Lake. The results were consistent with the EIS with a north to south transition from no talik to closed talik to open talik south of the pit. NRCan appreciates the efforts of the Proponent to conduct the additional analysis. NRCan notes that the Proponent does recognize that the talik in the pit area is not completely closed and there is likely to be a hydraulic connection between the pit and the deeper groundwater system due to the open talik to the south of the pit. NRCan agrees that the Proponent has conducted a reasonable analysis at this stage to determine the distribution of permafrost in pit and adjacent areas. The Proponent however, might consider for final design and to refine groundwater modelling, to conduct a sensitivity analysis to deal with any uncertainties in thermal model parameters such as ground thermal regime, thermal properties and thermal gradient

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle appreciates NRCan's review comments. Agnico Eagle agrees with NRCan and will continue to update and refine the ground water modeling to support Whale Tail Pit site wide hydrogeological model.

At this time, Agnico Eagle believes that the information that has been provided to NRCan and NIRB is sufficient to assess the impacts of the Whale Tail Pit Project on the environment and to make a determination on the Project.

Agnico Eagle agrees with NRCan's recommendations to support detailed and final design of Project Components for the purpose of the Type A Water Licence Agnico Eagle proposes to provide the additional hydrogeological model report within the applicable final designs required 60 days prior to construction.

Interested Party:	Natural Resources Canada (NRCan)	Ref No.:	NRCan-Issue 1-Hydrogeology
Re:	**Groundwater Sampling**		

Technical Review Comment / Recommendation Made By Interested Party:

NRCan is satisfied with the proponent's sampling strategy (Volume 6 Freshwater Environment, Section 6.2.5 Monitoring and Follow-Up).

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle acknowledges that NRCan is satisfied with the groundwater sampling strategy outlined Volume 6, Section 6.2.5 of the FEIS.

Interested Party:	Natural Resources Canada (NRCan)	Ref No.:	NRCan-Issue 2-Hydrogeology
Re:	**Long-term Water Quality in the Flooded Pit**		

Technical Review Comment / Recommendation Made By Interested Party:

NRCan is satisfied with the monitoring programs provided in the Water Quality and Flow Monitoring Plan (Version 2, May 2017).

NRCan is in agreement with the proponent's approach to continue to verify the hypothesis that the pit acts as a recharge area using continuous monitoring throughout the mine's life. Commitment # 32 (NRCan #6) in the PHC decision table.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle acknowledges that NRCan is satisfied with the water quality monitoring programs as outlined in Version 2 of the Water Quality and Flow Monitoring Plan, submitted May 24, 2017 to the NIRB and NWB.

Further, Agnico Eagle maintains its commitment from April 2017 Technical Comment Response (NRCan 6) to continue to verifying the hypothesis that the pits acts as a recharge area using continuous monitoring throughout the mine's life which will be reported in the annual monitoring report.

Interested Party:	Natural Resources Canada (NRCan)	Ref No.:	NRCan-Issue 3-Hydrogeology
Re:	**Groundwater Quality**		

Technical Review Comment / Recommendation Made By Interested Party:

NRCan has reviewed the new information provided in the Water Quality and Flow Monitoring Plan, version 2, May 2017 and is satisfied with the responses provided including updating the groundwater model, the water management plan and the inclusion of additional water quality monitoring locations annually and during all phases of the project.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle acknowledges that NRCan is satisfied with the updates made in Version 2 of the Water Quality and Flow Monitoring Plan, submitted May 24, 2017 to the NIRB and NWB.

Interested Party:	Natural Resources Canada (NRCan)	Ref No.:	NRCan-Issue 4-Hydrogeology
Re:	**Groundwater Modelling**		

Technical Review Comment / Recommendation Made By Interested Party:

NRcan has reviewed the new information provided (Water Quality and Flow Monitoring Plan, version 2, May 2017), and the PHC decision table and is satisfied with the responses provided. Commitment # 33 for NRCan recommendation # 7 that the proponent will continue to monitor the groundwater conditions and the hydrogeological characterization of the Whale Tail Pit according to the EIS volume 8, Appendix 8-E3.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle acknowledges NRCan's comment and maintains its commitment from April 2017 Technical Comment Response (NRCan 7) to continue to monitor the groundwater conditions and the hydrogeological characterization of the Whale Tail Pit according to the FEIS Volume 8, Appendix 8-E.3.

TRANSPORT CANADA

Interested Party:	Transport Canada (TC)	Ref No.:	TC-01
Re:	Dewatering of Mammoth Lake and Whale Tail Lake		

Technical Review Comment / Recommendation Made By Interested Party:

Transport Canada has reviewed the information submitted by Agnico Eagle Mines Ltd. to date and has determined that Mammoth and Whale Tail Lake are not navigable for the purposes of the NPA, and Section 23 will not apply. Agnico Eagle Mines Ltd. will not have to seek an exemption from the Governor in Council with respect to the two lakes.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Agnico Eagle acknowledges they will not have to seek an exemption from the Governor in Council with respect to the Mammoth and Whale Tail lakes as they are non-navigable for the purposes of the NPA.

Interested Party:	Transport Canada (TC)	Ref No.:	TC-02
Re:	Intake on Nemo Lake and Whale Tail Lake, Diffuser on Mammoth Lake, Water Management Infrastructure, and Haul Roads		

Technical Review Comment / Recommendation Made By Interested Party:

Agnico Eagle Mines Ltd. has chosen not to Opt-In for their project related in-water works on non-Scheduled waterways reviewed under the NPA. Transport Canada recommends that Agnico Eagle Mines Ltd. undertake a full assessment on impacts to navigation for the in-water works on non-Scheduled waterways. The responsibility to assess and address potential impacts to navigational access and safety resulting from these works rests with Agnico Eagle Mines Ltd.

Agnico Eagle's Response to Technical Review Comment / Recommendation:

Transport Canada's comment acknowledges that the public right of navigation is protected irrespective of whether the navigable water is listed on the schedule to the NPA or not. Agnico Eagle will continue to consider the potential for impacts to navigational access and safety resulting from project facilities and activities over the life of the project. However, Agnico Eagle notes that as Section 1.1.10.2 of the addendum states Agnico Eagle does not believe that waterways at the Whale Tail site are navigable (i.e., Whale Tail Lake, Nemo Lake, Mammoth Lake). Although these lakes could support a small boat or canoe, specific use of these lakes for navigability was not identified by community members/land users during consultation for the Project and therefore is not presently, nor in the future, expected to be an aqueous route for navigational purposes.