AGNICO EAGLE

MELIADINE GOLD MINE

Ocean Discharge Monitoring Plan

NOVEMBER 2021

VERSION 5_NIRB

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ᐃᑲᔪᕐᓂᐊᖅᑐᖅ ᑕᕆᐅᕐᒧᑦ ᑯᕕᑎᑦᑎᓂᕐᒥᒃ ᖃᐅᔨᓴᐃᓂᕐᒧᑦ ᐸᕐᓇᐅᑎᒥᑦ, ᐊᐅᓚᑦᑎᓂᖅ ᒪᓂᕋᕐᒥᑦ ᐃᒪᕐᒥᒃ ᐅᖃᐅᓯᐅᒃᑲᓐᓂᖅᑐᖅ ᒪᓂᕋᕐᒥᑦ ᐃᒪᕐᒥᒃ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐸᕐᓇᐅᑎᒥᑦ, ᐅᖃᖅᓯᒪᓗᑎᒃ ᓇᐃᑦᑐᒥᑦ, ᕿᑎᐊᓂᑦ, ᐊᒻᒪᓗ ᐊᑯᓂᐅᔪᕐᒥᑦ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᖃᓄᖅᑑᕈᑎᓂᒃ, ᐃᓚᐅᑉᓗᑎᒃ ᑐᖅᖁᖅᑕᐅᓂᖓ ᑕᕆᐅᓕᒃ ᐃᒪᖅ ᐅᔭᕋᒃᑕᕆᐊᕐᒥᑦ ᐊᒻᒪᓗ ᑯᕕᑎᑕᐅᓂᖓ ᑕᕆᐅᕐᒧᑦ ᐃᑎᕕᐊᓂᑦ. ᐃᓚᒋᔭᐅᑉᓗᓂ, ᐊᑐᖅᑕᐅᔪᕐᒥᒃ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᐸᕐᓇᐅᑎ ᑎᑎᕋᐃᔪᖅ ᐱᔾᔪᑎᖃᖅᑐᓂᒃ ᐊᐅᓚᑦᑎᓂᕐᒧᑦ ᖃᓄᐃᓕᐅᕈᑎᓂᒃ ᐊᒻᒪᓗ ᐊᖏᓗᐊᖏᕆᐊᖅᑎᑦᑎᓂᕐᒨᖓᔪᓂᒃ ᐅᖃᖅᑕᐅᓯᒪᔪᑦ ᑎᑭᐅᑎᓂᕐᒧᑦ ᐅᖓᑕᐅᑦᑎᔭᕌᖓᑕ ᐱᑕᖃᖅᑕᐃᓕᑎᑦᑎᓂᕐᒧᑦ, ᓱᖁᓯᐊᖏᑎᓪᓗᒍ ᐅᕝᕙᓘᓐᓃᑦ ᐅᑎᖅᑎᑦᑎᓂᕐᒧᑦ ᐊᓯᐊᙳᖅᑐᓂᒃ ᐊᕙᑎᐅᑉ ᖃᓄᐃᖕᖓᓂᐅᔪᓄᑦ ᐅᕝᕙᓘᓐᓃᑦ ᒥᐊᓂᕆᓂᐊᕐᓗᒍ ᐊᕙᑎ.

EXECUTIVE SUMMARY

Agnico Eagle Mines Limited (Agnico Eagle) operates the Meliadine Gold Mine (Meliadine Mine or the Mine), located approximately 25 kilometres north of Rankin Inlet, and 80 kilometres southwest of Chesterfield Inlet in the Kivalliq region of Nunavut. The Approved mine plan includes open pit and underground mining methods for the development of the Tiriganiaq gold deposit, with two open pits (Tiriganiaq Pit 1 and Tiriganiaq Pit 2) and one underground mine; as well as conveyance of treated saline effluent via the waterline from the Mine to discharge at Itivia Harbour.

Meliadine Extension will include underground mining and associated saline water management infrastructures at the Pump, F Zone, and Discovery deposits, and development of a new portal and associated infrastructures in the Tiriganiaq-Wolf mining area. The life of the mine would be extended by an additional 11 years until 2043, closure will occur from 2044 to 2050, and post-closure from 2051 to 2060.

This document presents the Mine's Ocean Discharge Monitoring Plan for the discharge of treated saline effluent into the marine environment. It summarizes the field sampling study design strategy, methods, laboratory requirements, quality assurance and quality control, and reporting.

To support the Ocean Discharge Monitoring Plan, the management of groundwater is further described in the Groundwater Management Plan, which entails the short, medium, and long-term management strategies, including storage of saline water on site and discharge to sea at Itivia Harbour. In addition, the Adaptative Management Plan (Agnico Eagle 2021) documents specific management actions and mitigation measures to be taken when specified thresholds are exceeded to prevent, stabilize or reverse a change in environmental conditions or to otherwise protect the receiving environment.

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TABLES

DOCUMENT CONTROL

Version	Date	Section	Page	Revision	Author
1	June 2018	All	All	Conceptual Plan developed for the Treated Groundwater Effluent Discharge into Itivia Harbour	Golder Associates Ltd.
2	July 2019	All	All	Updated Plan to comply with applicable commitments and/or approval conditions for the Mine, including incorporation of the 2018 Marine Reconnaissance results, 2018 Modelling Assessment for groundwater discharge and per requirements under MDMER for water quality.	Golder Associates Ltd.
3	June 2020	All	All	General Plan update	Agnico Eagle Mines Limited
		2	4-11	Updated Plan to reflect the increased discharge to sea of 1600 m^3/day	
		3	13-14	Updated to include toxicity testing of the effluent	
4	September 2021	All	All	General Plan update	Agnico Eagle Mines Limited
		3	11	Updated Plan to reflect minor changes to FDP (MEL-26)	
		3	13	Updated Plan to reflect MDMER amendment	
5_NIRB	November 2021	All	All	Updated to address Meliadine Extension application submission to NIRB for review and approval	Permitting Department

ACRONYMS

Agnico Eagle	Agnico Eagle Mines Limited
BC MOE	British Columbia Ministry of Environment & Climate Change Strategy
CCME	Canadian Council of Ministers of the Environment
ECCC	Environment and Climate Change Canada
EEM	Environmental Effects Monitoring
FEIS	Final Environmental Impact Statements
FDP	Final Discharge Point
Golder	Golder Associates Ltd.
ISQG	Interim Sediment Quality Guidelines
MDMER	Metal and Diamond Mining Effluent Regulations
Mine or Meliadine Mine	Meliadine Gold Mine
NIRB	Nunavut Impact Review Board
NTU	Nephelometric Turbidity Units
NWB	Nunavut Water Board
ODMP	Ocean Discharge Monitoring Plan
QA/QC	Quality Assurance and Quality Control
SARA	Species at Risk Act
TDS	Total Dissolved Solids
TGD	(Metal Mining) Technical Guidance Document
TSS	Total Suspended Solids
UCLM	Upper Confidence Level of the Mean
WQG	Water Quality Guideline

SECTION 1 • INTRODUCTION

Agnico Eagle Mines Limited (Agnico Eagle) operates the Meliadine Gold Project (Meliadine Mine or the Mine), located approximately 25 kilometres north of Rankin Inlet, and 80 kilometres southwest of Chesterfield Inlet in the Kivalliq region of Nunavut. The Approved mine plan includes open pit and underground mining methods for the development of the Tiriganiaq gold deposit, with two open pits (Tiriganiaq Pit 1 and Tiriganiaq Pit 2) and one underground mine; as well as conveyance of treated saline effluent via the waterline from the Mine to discharge at Itivia Harbour.

Meliadine Extension will include underground mining and associated saline water management infrastructures at the Pump, F Zone, and Discovery deposits, development of a new portal and associated infrastructures in the Tiriganiaq-Wolf mining area. The life of the mine would be extended by an additional 11 years until 2043, closure will occur from 2044 to 2050, and post-closure from 2051 to 2060.

The overall water management for the life of the Mine and post-closure is described in the Water Management Plan and the Groundwater Management Plan. The Water Management Plan provides descriptions of the Mine water control structures and associated design criteria, while the Groundwater Management Plan describes the short, medium, and long-term management of groundwater.

As outlined in this Ocean Discharge Monitoring Plan (ODMP), Agnico Eagle is approved to discharge treated saline effluent to Itivia Bay via an engineered diffuser. Saline effluent is treated to meet, as applicable, Metal and Diamond Mining Effluent Regulations (MDMER), Canadian Council of Ministers of the Environment water quality guidelines for the protection of aquatic life (marine; CCME), and/or background conditions at the edge of the mixing zone prior to discharge into Itivia Harbour. As per the MDMER, the regulation applies to effluent discharge from a mine exceeding a flow rate of 50 cubic metres (m^3) per day. The ODMP describes the following:

- Compliance with the federal MDMER.
- Adherence to relevant CCME Guidelines for the Protection of Aquatic Life and British Columbia Ministry of the Environment (BCMOE) Guidelines in the regulatory mixing zone.
- Measures to detect short and long-term effects of the discharge on the receiving environment.
- Identification of unforeseen adverse effects and provide early warnings of undesirable changes in the water quality.
- Inform potential mitigation measures based on results reported.

The ODMP will be updated as the Mine development advances, to include changes and/or regulatory conditions as applicable through construction, operations and closure.

1.1 Discharge Overview

Treated saline effluent will be transported via the waterline, which will initiate at the Saline Effluent Treatment Plant (SETP) on-site and will connect to an engineered diffuser, suited for discharge of up to 20,000 m^3/day, to Itivia Harbour.

The final configuration for the diffuser has the following details:

- Length of outfall: 75 m
- Length of diffuser: 25 m
- Diffuser depth: finishing at 21 m CD (based on CHS Chart 5628)
- Discharge type: multiport (5 ports)
- Port diameter: 100 mm
- Port spacing: 5 m
- Port on a 1 m long vertical riser (i.e., 90º bend from diffuser)
- Type of discharge: open port with no valve
- Tidal range varies between 2.0 and 4.6 m and mean currents flow southward at around 0.22 m/s at Rankin Inlet. Isobath lines are nearly parallel to coastline and depth rapidly increases reaching more than 20 m within 230 m off the coast.

The waterline, and subsequently the discharge to Itivia Harbour, will be carried out per the operating conditions outlined in the Adaptive Management Plan.

1.2 Environmental Conditions

Marine environmental baseline studies were completed in 2011 by Nunami Stantec (2012); and was provided in the 2014 FEIS (Agnico Eagle 2014). This information was again provided in the 2018 and 2020 FEIS Addenda (Agnico Eagle 2018, 2020a). In 2018, a marine reconnaissance survey was carried out to establish appropriate reference areas and collect data on physical properties of the water column, water and sediment quality, benthic substrate, benthic communities, and marine mammal occurrence (Golder 2019a). This information is summarized in the 2020 FEIS Addendum (Agnico Eagle 2020a).

1.3 Modelling Assessments

In 2020, Tetra Tech developed a model of the coastal areas of Rankin Inlet encompassing Itivia Harbour and covering the entirety of Itivia Harbour. The model simulated the discharge, mixing and transport of the saline effluent discharge during the open-water season. Three scenarios of different effluent discharge rates (6,000 m^3/day, 12,000 m^3/day and 20,000 m^3/day) were modelled. These scenarios identified strong flushing occurring due mostly to the tides, which resulted in no significant “pooling” of effluent over time in the bay, but also a rapid return to prior-to-discharge conditions once the discharge stopped at the end of the open-water season. Impact of the effluent discharge on

effluent concentrations, ocean temperature and salinity was limited and complied with the regulatory guidelines.

To support the Meliadine Extension Application, a sea ice module was developed and coupled to the existing 3-D hydrodynamic model from 2020. Validation was obtained with regards to ice formation and decay process, as well as ice thickness. Therefore, multiple consecutive years were simulated, covering both ice and ice-free seasons, instead of a simulation focusing on open-water season only.

The discharge season is from June to end of September. Three years, deemed conservative, were selected to model with respect to high effluent discharge rate (20,000 m^3/day) and various effluent TDS levels (either very high or very low, as this would lead to the most potential difference with ambient conditions):

Results from this updated model to reflect the Meliadine Extension do not change from those presented in the 2020 FEIS Addendum (Agnico Eagle 2020a) and thus the conclusions for the waterline assessment do not change for Meliadine Extension.

1.4 Potential Effects

The ODMP focuses on water quality. No adverse effects are predicted from the marine discharge, based on the environmental conditions recorded, hydrogeological investigations and modelling assessments completed, adherence to existing management plans in addition to this ODMP, and the effects assessed in the 2018 and 2020 FEIS Addenda (Agnico Eagle 2018, 2020a) and the Application for Meliadine Extension. This is based on the following rationale:

- Saline effluent will be treated prior to discharge to Itivia Harbour and will comply with MDMER.
- Modelling assessment results indicate that compliance with the applicable discharge criteria will be met well within the mixing zone (i.e., discharge will meet relevant CCME and BCMOE guidelines, as well as background concentrations, in Itivia Harbour as a result of diffusion well within the 100 m regulatory mixing zone).

1.5 Related Documents

The following documents support the ODMP:

- Adaptive Management Plan;
- Groundwater Management Plan;
- Spill Contingency Plan; and
- Sediment and Erosion Management Plan.

SECTION 2 • MONITORING DESIGN

The following are the main components of the ODMP:

- Effluent monitoring at the Final Discharge Point (FDP; end-of-pipe monitoring), to verify compliance of saline effluent properties with the discharge criteria and to characterize effluent quality under MDMER.
- Monitoring to assess short- and long-term effects to water quality from the discharge of treated saline effluent on marine environment (Receiving Environment, Exposure Area and Reference Area A), in relation to CCME and BCMOE guidelines as well as background concentrations.

Monitoring locations and sampling stations for Meliadine Extension are the same as those proposed during the waterline application.

The objectives of the ODMP are to:

- Comply with applicable regulatory requirements.
- Detect short and long-term effects of the discharge on the receiving environment based on the results obtained, identify unforeseen adverse effects and provide early warnings of undesirable changes in the water quality.
- Inform mitigation through adaptive management measures, as appropriate, based on the results and trends observed.

Monitoring locations for the ocean discharge activities are listed in Table 1. Monitoring locations may be updated prior to discharge and per final diffuser design.

Table 1: Ocean Discharge Monitoring Program – Monitoring Location

Description	Location
Final Discharge Point (FDP; end-of-pipe monitoring)	MEL-26, Sampling Valve (downstream of the pumping station) 62°48’01.99” N 92°06’00.05” W[1]
Receiving Environment	MWE-1a, Diffuser Location
Exposure Area	Itivia Harbour
Reference Area A	Itivia Harbour

3.1 Sampling Summary

A summary of monitoring components, sampling frequency and design is provided in Table 2.

Table 2: Ocean Discharge Monitoring Program – Sampling Summary

Monitoring Component	Sampling Frequency	Monitoring Location	Sample Replication and Number of Samples
Deleterious Substances (MDMER Schedule 4)	Once per week	▪ FDP	One grab sample.
Effluent Characterization	Four times a year, at least one month apart, during discharge	▪ FDP	One grab sample.
In situ Water Column Measurements	Four times a year, once a month during discharge	▪ Receiving Environment ▪ Exposure Area ▪ Reference Area A	7 stations in the Receiving Environment and Exposure Area, 3 stations in Reference Area A. One vertical profile per station.
Water Quality	Four times a year, once a month during discharge	▪ Receiving Environment ▪ Exposure Area ▪ Reference Area A	7 stations in the Receiving Environment and Exposure Area, 3 stations in Reference Area A. One sample at 1 m below the surface and one sample at 5 m above the bottom at each station.
Acute lethality	Every month (sampled concurrently with effluent characterization)	▪ FDP (end-of-pipe)	One grab sample
Sublethal toxicity	Twice a year, at the start and finish of the discharge	▪ FDP (end-of-pipe)	One grab sample

Notes:
Sampling requirements per Metal and Diamond Mining Effluent Regulations (GC 2021).
FDP = Final Discharge Point (end of pipe).
Receiving Environment = Diffuser Location.

3.1.1 Deleterious Substances

Treated saline effluent at the FDP (end-of-pipe) will be measured for pH and analyzed for concentrations of deleterious substances listed in MDMER Schedule 4 (GC 2021) once per week during discharge.

3.1.2 Effluent Characterization

Effluent characterization is conducted at least one month apart, four times a year. Effluent is sampled and analysed for the following parameters:

- General parameters, including pH, TDS, total suspended solids, hardness, alkalinity, specific conductivity, salinity and temperature;
- anions including sulphate and chloride;
- nutrients, including phosphorus and nitrate;
- total metals, including those listed in MDMER Schedule 5, paragraph 4 (1).

3.1.3 Water Quality Monitoring

Agnico Eagle adheres to MDMER Environmental Effects Monitoring (EEM) requirements for water quality assessments outlined in Table 2. Overall, samples are collected four times a year, at least one month apart during discharge, at seven stations in the Exposure Area and three stations in Reference Area A. Further details on sampling and analytical requirements are provided below.

3.1.3.1 Sampling Locations

Sampling locations and the central coordinates for the monitoring locations are presented in Table 3 and Figure 1 for the FDP, Receiving Environment, the Exposure Area and the Reference Area A. Locations are sampled based on the following rationale:

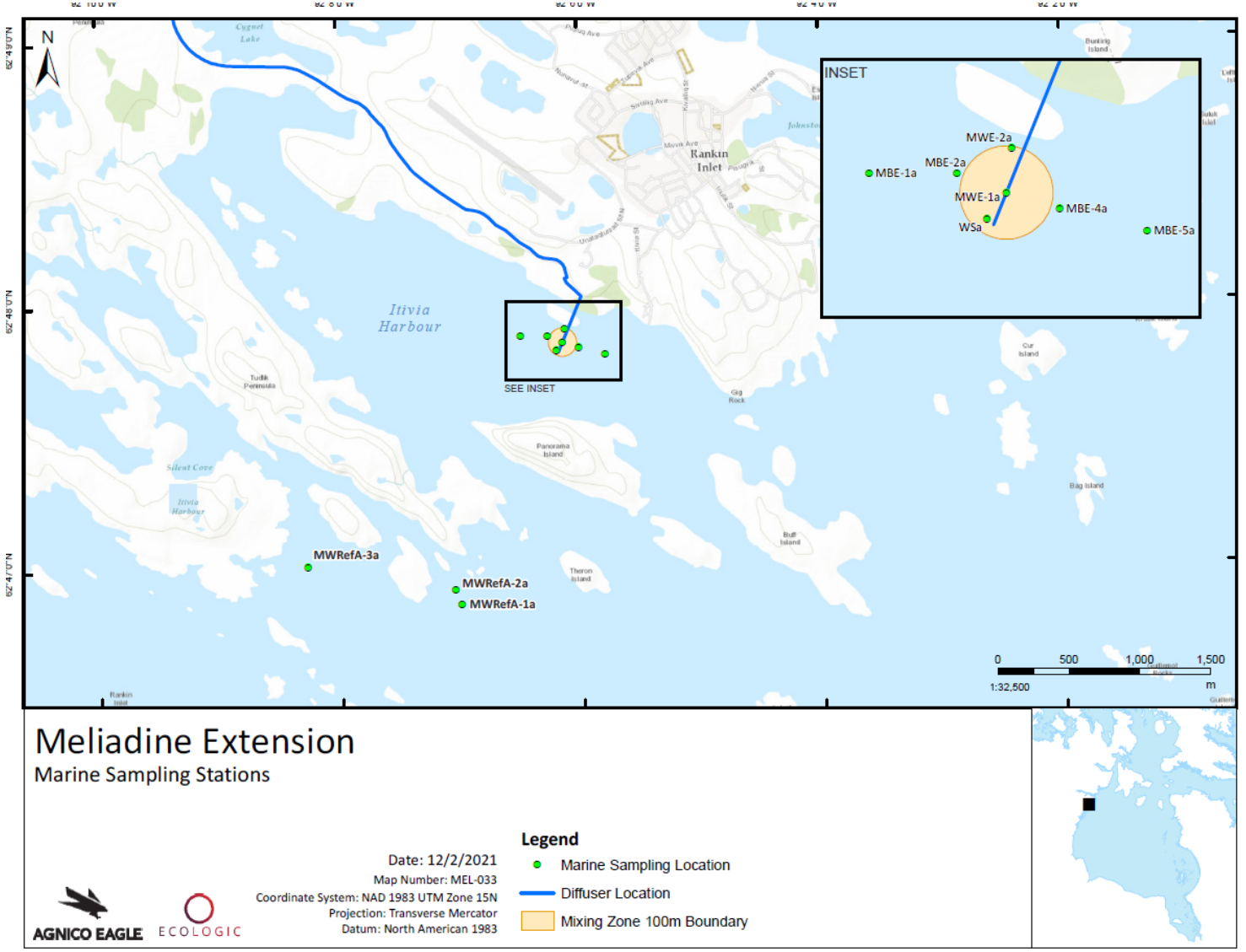
- One station at the FDP (sampling valve downstream of the pumping station).
- One station at the Receiving Environment location to characterize water quality at the point of the discharge.
- Four stations at 100 m in the Exposure Area – these stations are at the edge of the mixing zone and can be downstream of the Receiving Environment discharge point depending on current direction (i.e., tidal and wind-driven).
- Two stations at 250 m in the Exposure Area – as per MDMER Schedule 5, these are additional stations to estimate concentration of effluent in the Exposure Area at 250 m from the discharge point.
- Two water depths are sampled at each station to account for horizontal and vertical dispersion of the discharge plume due to oceanographic conditions of water column structure, e.g., horizontal and vertical currents, mixing/stratification. These are 1 m below the water surface and 5 m above the bottom.
- At Reference Area A, three sampling stations are visited to comply with the recommended minimum requirement to account for variability, as per the Metal Mining Technical Guidance Document (TGD; GC 2012). Samples are collected from two depths at each sampling station.

Table 3: List of Sampling Stations and Coordinates in Itivia Harbour

Sampling Area	Station Name	UTM Coordinates NAD 83 Zone 15		Geographical Coordinates System NAD 83	
		Easting (m)	Northing (m)	Longitude (DMS)	Latitude (DMS)
Receiving Environment (Discharge Point)	MWE-1a	545775	6963358	92° 6' 8.91" W	62° 47' 51.37" N
Exposure Area	WSa	545733	6963302	92° 6' 11.91" W	62° 47' 49.57" N
	MWE-2a	545787	6963454	92° 6' 7.97" W	62° 47' 54.47" N
	MBE-1a	545481	6963400	92° 6' 29.568" W	62° 47' 54.607" N
	MBE-2a	545670	6963400	92° 6' 16.28" W	62° 47' 52.78" N
	MBE-4a	545890	6963325	92° 6' 0.83" W	62° 47' 50.26" N
	MBE-5a	546077	6963276	92° 5' 47.68" W	62° 47' 48.59" N
Reference Area A	MWRefA-1a	545070	6961511	92° 7' 0.48'' W	62° 46' 51.96'' N
	MWRefA-2a	545025	6961609	92° 7' 3.36'' W	62° 46' 55.2'' N
	MWRefA-3a	543985	6961768	92° 8' 16.8'' W	62° 47' 0.96'' N

Notes: UTM = Universal Transverse Mercator coordinate system; NAD 83 = North American Datum 83.

Figure 1: Ocean Discharge Monitoring Plan – Marine Sampling Stations



3.1.4 Acute Lethality

End-of-pipe effluent is sampled once per month over the open water season for acute lethality testing per MDMER requirements. Acute lethality testing is conducted on in accordance with the procedures set out in sections 5 or 6 of the MDMER amendments. Effluent characterization samples (Section 3.1.2) are collected at the same time to aid in interpretation of acute lethality test results.

3.1.5 Sublethal Toxicity Testing

Sublethal toxicity testing of effluent is conducted twice a year at least one month apart, at the beginning and at the end of discharge for three years, and once a year after the third year. The following tests are conducted:

- Fish early life stage development test on inland silverside (*Menidia beryllina*) or topsmelt (*Atherinops affinis*) (US EPA 2002)
- Invertebrate reproduction test on echinoids (sea urchins or sand dollars) (Environment Canada 1992)
- Algae toxicity test on giant kelp (*Macrocystis pyrifera*) (US EPA 1995).

These tests are conducted on aliquots of the same sample collected for effluent characterization. It should be noted that species for sublethal toxicity testing could change, for example if logistical issues are encountered (such as unavailable species or hold time issue). The species will meet MDMER requirements.

3.2 Field and Laboratory Requirements

To provide sufficient information for the interpretation of the results, *in situ* profile measurements are taken with a conductivity, temperature, depth probe at every water quality sampling station to assess water column physical properties (i.e., temperature, salinity, and turbidity). Dissolved oxygen point measurements will be taken.

Samples are stored in clean laboratory-provided containers, preserved accordingly and sent to accredited commercial laboratories for analysis as quickly as feasible. For parameters with short hold-time requirements (i.e., 72 h or less: pH, turbidity, ammonia, nitrate, nitrite or toxicity tests), hold-time exceedances are expected to occur.

Laboratory analysis follow the MDMER detection limit requirements as per Schedule 3 and include deleterious substances listed in Schedule 4 and Schedule 5 paragraph 4(1), as well as other metals and additional parameters recommended by TGD (GC 2012).

Table 4 provides a list of parameters to be analyzed, minimum recommended detection limits and recommended hold-time for analysis.

Table 4: List of Sampling Parameters for Water Quality Monitoring

Parameter Group	Parameter	Units	Method Detection Limit Required	RecommendedHold-Time for Analysis[(a)]
Conventional Parameters	pH	-	-	0.25 h
	Total Dissolved Solids	mg/L	-	7 days
	Total Suspended Solids	mg/L	2	7 days
	Specific Conductivity	µS/cm	1	28 days
	Hardness	mg $CaCO_3$/L	1	180 days
	Alkalinity	mg $CaCO_3$/L	2	14 days
	Salinity	-	-	28 days
Major Ions	Calcium	mg/L	-	180 days
	Chloride	mg/L	60	28 days
	Fluoride	mg/L	-	28 days
	Magnesium	mg/L	-	180 days
	Potassium	mg/L	-	180 days
	Sodium	mg/L	-	180 days
	Sulphate	mg/L	0.6	28 days
Nutrients	Ammonia	mg-N/L	0.05	3 days
	Nitrate	mg-N/L	1.47	3 days
	Nitrite	mg-N/L	-	3 days
	Total Kjeldahl Nitrogen	mg-N/L	-	28 days
	Orthophosphate	mg-P/L	-	3 days
	Total Phosphorus	mg-P/L	0.05	3 days
	Silicate	mg/L	-	28 days
	Total Organic Carbon	mg/L	-	28 days
	Dissolved Organic Carbon	mg/L	-	28 days
Total Metals	Aluminium	mg/L	0.005	180 days
	Antimony	mg/L	-	180 days
	Arsenic	mg/L	0.0025	180 days
	Barium	mg/L	-	180 days
	Beryllium	mg/L	-	180 days
	Bismuth	mg/L	-	180 days
	Boron	mg/L	-	180 days
	Cadmium	mg/L	0.000045	180 days
	Chromium	mg/L	0.00445	180 days
	Cobalt	mg/L	0.00125	180 days
	Copper	mg/L	0.001	180 days
	Iron	mg/L	0.15	180 days
	Lead	mg/L	0.0005	180 days
	Manganese	mg/L	0.005	180 days
	Mercury	mg/L	0.00001	28 days
	Molybdenum	mg/L	0.0365	180 days
	Nickel	mg/L	0.0125	180 days
	Selenium	mg/L	0.0005	180 days
	Silver	mg/L	-	180 days
	Strontium	mg/L	-	180 days
	Thallium	mg/L	0.0004	180 days
	Tin	mg/L	-	180 days
	Titanium	mg/L	-	180 days
	Uranium	mg/L	0.0075	180 days
	Vanadium	mg/L	-	180 days

Parameter Group	Parameter	Units	Method Detection Limit Required	RecommendedHold-Time for Analysis[a]
	Zinc	mg/L	0.010	180 days
Radionuclides	Radium 226	Bq/L	0.01	180 days
Other	Cyanide	mg/L	0.005	14 days

(a) Provided by ALS and may vary depending on the laboratory responsible for analysis or as methods change.

3.3 Quality Assurance/Quality Control (QA/QC)

Quality assurance (QA) refers to plans or programs that encompass a wide range of internal and external management and technical practices designed to ensure the collection of data of known quality that matches the intended use of the data. Quality control (QC) is a specific aspect of QA that refers to the internal techniques used to measure and assess data quality.

Quality assurance protocols is followed so data are of known, acceptable, and defensible quality. To make certain that field data collected are of known, acceptable, and defensible quality, field staff are trained to be proficient in standardized sampling procedures, data recording using standardized forms, and equipment operations applicable to the monitoring program. Field work will be completed according to specified instructions and established technical procedures for sample collection, preservation, handling, storage, and shipping. Canadian Association for Laboratory Accreditation accredited laboratories will be selected for sample analysis. Accreditation programs are utilised by the laboratories so that performance evaluation assessments are conducted routinely for laboratory procedures, methods, and internal quality control. A data management system is utilized so that an organized consistent system of data control, data analysis, and filing will be applied to the program.

The QC component consists of applicable field and sample handling procedures, and the preparation and submission of two types of QC samples for laboratory analysis: blank (e.g., travel, field, equipment) and duplicate/split samples. Quality control procedures implemented for this program will consist of the preparation and submission of field blanks, trip blanks, and duplicate water samples. QC samples will be collected with a frequency of approximately 5 to 10% of the total number of samples as duplicates, per current Mine site practices.

SECTION 4 • BENCHMARKS AND DIFFERENCE CRITERIA

This section sets quality benchmarks and difference criteria against which the effluent and/or the marine environment will be monitored, and whose exceedance will be considered to indicate effects of the treated effluent discharge. The following criteria are discussed:

- A benchmark is a set concentration of a substance in water that is expected to be protective of aquatic life, e.g., CCME WQGs for the protection of aquatic life.
- A difference criterion is a magnitude of environmental change, which, if reached, indicates a change outside of background variability. As per the TGD (GC 2012), a factor of two will be used as difference criteria for water quality parameters when comparing exposure data to reference or baseline.

4.1 Effluent Monitoring

The benchmarks applicable for effluent monitoring (i.e., end-of-pipe) for deleterious substances are the authorized limits outlined in Schedule 4 of the MDMER. The maximum authorized concentrations for monthly mean, composite and grab samples are presented in Table 5.

Table 5: Authorized Limits of Deleterious Substances in Effluent

Deleterious Substance	Maximum Authorized Monthly Mean Concentration	Maximum Authorized Concentration in a Composite Sample	Maximum Authorized Concentration in a Grab Sample
Arsenic	0.30 mg/L	0.45 mg/L	0.60 mg/L
Copper	0.30 mg/L	0.45 mg/L	0.60 mg/L
Cyanide	0.50 mg/L	0.75 mg/L	1.00 mg/L
Lead	0.10 mg/L	0.15 mg/L	0.20 mg/L
Nickel	0.50 mg/L	0.75 mg/L	1.00 mg/L
Zinc	0.50 mg/L	0.75 mg/L	1.00 mg/L
Suspended Solids	15.00 mg/L	22.50 mg/L	30.00 mg/L
Radium 226	0.37 Bq/L	0.74 Bq/L	1.11 Bq/L
Un-ionized ammonia	0.50 mg/L expressed as nitrogen (N)	Not applicable	1.00 mg/L expressed as nitrogen (N)

Note: The concentrations for items 1 to 8 are total values

Source: MDMER, Schedule 4, Table 2

In compliance with MDMER Section 14.2 saline effluent is not expected to be acutely lethal to threespine stickleback. As previously indicated, the saline effluent is treated prior to discharge in compliance with MDMER requirements, and the modelling assessments (Section 1.3) show that the required dilution is met well within the regulatory mixing zone from the diffuser, under the assumed conditions. If the salinity value of the effluent is equal to or greater than ten parts per thousand, the

mine will evaluate whether the effluent is acutely lethal by conducting an acute lethality test in accordance with the procedures set out in section 5 or 6 of Reference Method EPS 1/RM/10.

4.2 Water Quality

The benchmarks used for water quality variables in the receiving environment are water quality guidelines currently in effect, consisting of the CCME WQG for the Protection of Marine Aquatic Life, British Columbia Ministry of Environment & Climate Change Strategy (BC MOE 2019) Approved WQG for Marine Aquatic Life (Short-Term) and BC MOE Working WQG for Marine Aquatic Life (BC MOE 2021) at the edge of the mixing zone, located 100 m from the diffuser.

For parameters for which no WQGs exist, concentrations from the exposure area will be compared to baseline concentrations and concentrations in the reference area.

Concentration of a parameter will be considered elevated in the exposure area in comparison to baseline or reference area data based on a difference of more than a factor of two. A factor of two is recommended to ensure that differences observed are real differences, rather than a result of background or analytical variation (GC 2012).

SECTION 5 • REPORTING

Reporting will include the raw data obtained during sampling programs, as well as data interpretation, graphical presentation and comparison to applicable guidelines, baseline data and literature data, where applicable. Monitoring results will be integrated to evaluate the presence and overall direction of change to marine water quality. Report structure will follow applicable MDMER reporting requirements.

Reports will be prepared and delivered to ECCC (as per the MDMER requirements), and to NIRB and NWB annually following the discharge of treated groundwater effluent to the marine environment.

SECTION 6 • REFERENCES

Agnico Eagle. 2014. Final Environmental Impact Statement (FEIS) - Meliadine Gold Project, Nunavut from: ftp://ftp.nirb.ca/02-REVIEWS/ACTIVE%20REVIEWS/11MN034-Agnico Eagle%20MELIADINE/2-REVIEW/09-FINAL%20EIS/FEIS.

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GC (Government of Canada) – Environment Canada. 2012. Metal Mining Technical Guidance for Environmental Effects Monitoring. Available at: https://www.canada.ca/en/environment-climate-change/services/managing-pollution/environmental-effects-monitoring/metal-mining-technical-guidance.html.

GC. 2021. Metal and Diamond Mining Effluent Regulations (SOR/2002-222), last amended June 10, 2021, current to November 17, 2021.

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Stewart, D.B., and W.L. Lockhart. 2005. An overview of the Hudson Bay marine ecosystem. Canadian Technical Report of Fisheries and Aquatic Sciences 2586: 487 p.