AGNICO EAGLE

MELIADINE GOLD PROJECT

Bulk Fuel Storage Facility: Environmental Performance Monitoring Plan

JANUARY 2024
VERSION 2_NWB

EXECUTIVE SUMMARY

The Meliadine Gold Project operated by Agnico Eagle Mines Limited - Meliadine Division (Agnico Eagle) is located approximately 25 kilometres (km) north of Rankin Inlet, and 80 km southwest of Chesterfield Inlet in the Kivalliq Region of Nunavut. Situated on the western shore of Hudson's Bay, the Project site is located on a peninsula between the east, south, and west basins of Meliadine Lake (63°1'23.8''N, 92°13'6.42''W), on Inuit owned land. The project components include the 28 km All Weather Access Road (AWAR) between Rankin Inlet and Meliadine, the Itivia fuel farm and laydown area, and the mine site.

This report discusses the design and operation of the Fuel Storage Facilities as specified under Water Licence 2AM-MEL1631 Part D, Item 1.

To adequately assess the environmental performance of the bulk fuel storage tanks at Meliadine, this report provides: a summary of the design, installation, operation and maintenance that follows the CCME (2003) Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum and Allied Petroleum Products; a summary of the location and environmental setting; a summary of the NWB Type A water license requirements; and an environmental assessment to support the recommended environmental monitoring for the ongoing evaluation of the secondary containment.

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1	10/08/19			Comprehensive plan for Meliadine Storage Facility	
2_NWB	January 2024	n/a		Submitted to Nunavut Water Board as part of the Meliadine Mine Water Licence Amendment. No changes were made as a result of the Amendment	Permitting Department

IMPLEMENTATION SCHEDULE IMPLEMENTATION SCHEDULE

As required by Water Licence 2AM-MEL1631, the proposed implementation schedule for this Plan is effective upon approval and subject to any modifications proposed by the NIRB and NWB as a result of the review and approval process.

DISTRIBUTION LIST

Agnico Eagle – General Mine Manager

Agnico Eagle – Environment Superintendent

Agnico Eagle – Environmental General Supervisor

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Agnico Eagle – Energy and Infrastructures Superintendent

Agnico Eagle – Field Services Supervisor

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ACRONYMS

AEMP	Aquatics Ecosystem Monitoring Program
Agnico Eagle	Agnico Eagle Mines Limited – Meliadine Division
API	American Petroleum Institute
CEPA	Canadian Environmental Protection Act
CCME	Canadian Council of Ministers of the Environment
CP1	Containment Pond 1
CWS	Canada-Wide Standard
E&I	Environment & Infrastructure
HDPE	High Density Polyethylene
NFCC	National Fire Code of Canada
NWB	Nunavut Water Board
PHC	Petroleum Hydrocarbons
RSA	Regional Study Area
TDS	Total Dissolved Solids

UNITS

cm/s	Centimetre per second
m^3	Cubic metre
masl	Metres above sea level
Mg/L	Milligrams per litre
ml	Millilitre
ML	Million Litres
mm	Millimetre
%	Percent

SECTION 1 • INTRODUCTION

Agnico Eagle Mines Limited – Meliadine Division (Agnico Eagle) is operating the Meliadine Gold Project. The Project includes the Rankin Inlet Marshalling Area, the All-weather Access Road (AWAR), the Bypass Road and the Meliadine Mine site.

The Meliadine Site consists of the following tanks:

- One 6.0 million litre bulk fuel storage tank;
- One 3.0 million litre bulk fuel storage tank;
- Two 0.25 million litre bulk fuel storage tanks.

To adequately assess the environmental performance of the bulk fuel storage tanks at Meliadine the report provides:

- a summary of the design, installation, operation and maintenance that follows the Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (SOR/2008-197). Article 14 (1) of this regulation indicates that for the installation of a fuel storage system, the system has to comply with the applicable requirements set out in CCME Code of Practice (CCME PN1326);
- a summary of the location and environmental setting;
- a summary of the NWB Type A water license 2AM-MEL1631 requirements; and
- an environmental assessment to support the recommended environmental monitoring for the ongoing evaluation of the secondary containment.

SECTION 2 • SITE LOCATION, CONSTRUCTION AND OPERATION

2.1 Site Location

The Meliadine Bulk Storage Facility is located at Meliadine mine site at two separate locations. One fuel farm is located at the industrial site and contains two above ground storage tanks, 6.0 ML and 0.25 ML. This fuel farm is located at 539,364E 6,989,918N (NAD 83 Zone 15). The second fuel farm is located at the mine site and contains two above ground storage tanks, 3.0 ML and a 0.25 ML. Both locations have secondary containment. This fuel farm is located at 539,335E 6,989,096N (NAD 83 Zone 17). The general location of the two fuel farms is provided in Figure 2-1 below.

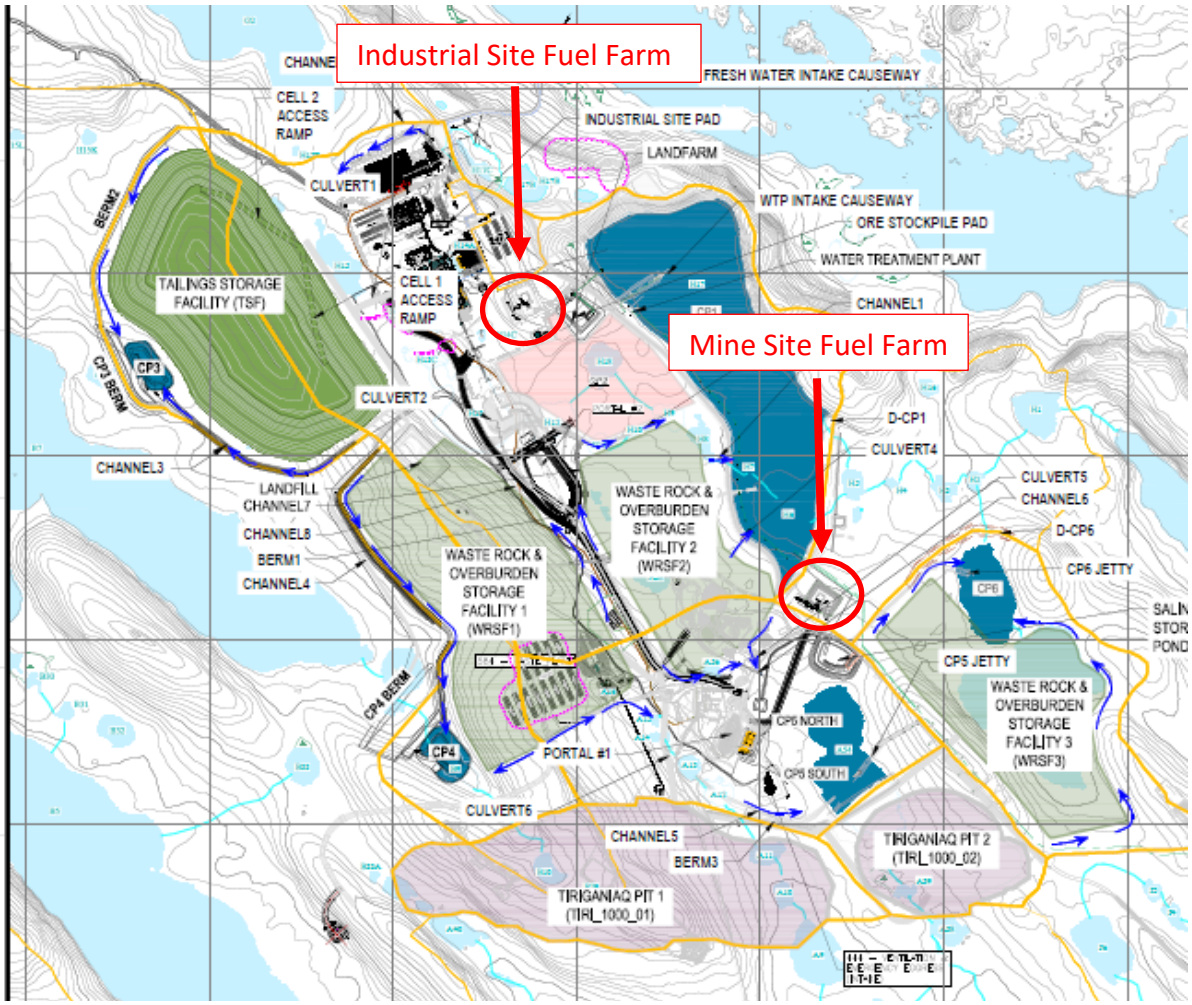

Figure 2-1. *Location Meliadine Tank Farms*

2.2 Design and Installation Summary

Following regulatory approval in 2017, Agnico Eagle built the bulk fuel tank and respective secondary containment at the Mine Site Fuel Storage and Industrial Site Fuel Storage and Containment Facilities. The Mine Site Fuel Tank Storage Facility was completed in October 2017 and the Industrial Site Fuel Storage and associated containment facilities was completed and commissioned by January 2019.

The secondary containment for the Mine Site Fuel Storage area has a capacity of approximately 3,928 m^3, which encloses two fuel tanks with a capacity of 3.0 and 0.25 ml of fuel. Industrial Site Fuel Storage area has a capacity of approximately 6,631 m^3, which encloses two fuel tanks with a capacity of 6.0 and 0.25 ML of fuel.

The secondary containment for the aboveground tank farms complies to NFCC standards. The base and walls of the containment basin were constructed to withstand a full hydrostatic head with a permeability of 1 x 10^{-13} cm/s while the required permeability is 1 x 10^{-6} cm/s. These tanks are located entirely within the diked area, with an impermeable membrane covered with a non-combustible material. Both tank facilities have exceeded the minimum requirement of secondary containment equaling or exceeding 110% of the volume of the largest tank in the Fuel Farm.

The construction monitoring of the facility was managed by Agnico Eagle. Several activities were conducted during the construction to ensure the quality of the work. This includes:

- Offsite and Onsite Fabrication Quality Control;
- Industrial Site Fuel Module Quality Control;
- Asbuilt Drawings, Testing and Inspection Test Plans;
- Industrial Site Tank As-Built Inspections which include visual observations and the testing of welds etc.;
- Particle size analysis for the liner system;
- Civil Earthworks and inspection Test Plans; and
- Quality Control Final Report that included destructive and non-destructive testing on the liner to confirm and ensure the quality of the installation of the geosynthetic materials, including welding. This was managed by Texel Geosol who certified that all materials were installed according to the project plans and specifications.

2.3 Operation and Maintenance Summary

Inventory control of transfer and monthly volume inspections using manual or electronic dip reconciliation are conducted at Meliadine by operations staff. Weekly inspections are logged and reported by Agnico Eagle. Weekly visual inspections and inventory reconciliation are used to evaluate and determine bulk fuel tank leakage at the sites.

The bulk fuel storage facilities are maintained in accordance with best management practices. The bulk fuel tanks at Meliadine are re-filled by a fuel truck on a regular basis throughout the year. During the period of re-filling, there is the greatest risk of over-filling. Through regular visual inspections, inventory control and monitoring fuel transfer, the risk of over-filling is significantly reduced. In the case of a spill, the Spill Contingency Plan will be implemented.

SECTION 3 • ENVIRONMENTAL SETTING

3.1 Topography

The dominant terrain in the Project area comprises glacial landforms, such as drumlins (glacial till), eskers (gravel and sand), and lakes. A series of low relief ridges composed of glacial deposits-oriented northwest-southeast control the regional surface drainage patterns. The Tiriganiaq deposit is located on a large peninsula separating the east and west basins of Meliadine Lake.

The Project property is about 60 metres above sea level (masl) in low-lying topography with numerous waterbodies. The surveyed lake surface elevations in the Project area range from about 51 masl at Meliadine Lake to about 74 masl for local small, perched lakes. Kettle lakes, and other lakes formed by glacio-fluvial processes or glacial processes, are common throughout the Project area.

3.2 Geology

The Project is located in the northern portion of the Archean Rankin Inlet Greenstone Belt, which is situated in the Northwest Hearne Sub-domain of the Churchill Structural Province that forms part of the northern Canadian Shield. Supracrustal rocks of this belt consist of mafic volcanic rocks, felsic pyroclastic rocks, sedimentary rocks, and gabbro sills of about 2.7 billion years old that have been polydeformed and metamorphosed. These rocks were deformed in both the Archean and Proterozoic eras.

3.3 Flora and Fauna

Vegetation studies have been undertaken since the mid-1990s to establish a baseline prior to the development of the mine. In general, the community types identified within, or in the vicinity of the Project and AWAR areas include upland terrestrial vegetation classes, wetland classes, and un-vegetated classes.

The upland terrestrial vegetation is predominantly heath vegetation. Heath vegetation in this area is defined as land where the soils are not saturated for extended periods of the year. Heath refers to the presence of low growing evergreen shrubs, such as Labrador tea, bearberry, and black crowberry that are typical of these areas. Heath vegetation in the area also consists of heath tundra or heath boulder and bedrock associations.

Wetlands or riparian vegetation are defined as areas that are saturated for most, or all the growing season. Wetlands or riparian vegetation in the area consists of wet sedge meadows

or tussock-hummock areas and low shrubby riparian vegetation along the margins of lakes and rivers.

Wildlife baseline studies were completed for the Project between 1998 and 2009 in support of the environmental assessment. Aerial surveys documented the abundance and distribution of caribou in the RSA. Wildlife baseline is complemented by observations recorded in the Meliadine Camp Wildlife Observation Log and by an annual Hunter Harvest Survey.

Caribou are an important part of Inuit life, providing food, fuel (from caribou fat), and materials for clothing, tools, and traditional crafts. Other land animals important to the communities include ungulates, such as muskox and fur-bearing species, such as foxes, wolves, and wolverines. Birds and bird eggs are also important.

The region includes the major summer range and calving grounds for some of Canada's largest caribou herds. The Qamanirjuaq caribou herd uses the area near the Project. Agnico Eagle has committed to supporting the GN Department of Environment's caribou satellite-collaring program for the Qamanirjuaq herd.

Bird studies have been undertaken for the Project since the mid-1990s and include baseline studies completed from 1998 to 2000, 2008 to 2009, 2011 and these studies have continued to the present. These studies have used a variety of species-specific methods to quantify bird populations with a focus on loons and other waterfowl, upland birds, raptors, and on bird species at risk within the RSA.

Surveys recorded the presence and abundance of upland breeding birds, shorebirds, and water birds in the RSA. Ground and aerial surveys were used to locate swan and loon breeding areas and raptor nests in the RSA.

Arctic char, lake trout, and Arctic grayling, the valued ecosystem components in the assessment of fish and fish habitat, occupy top trophic positions in the Meliadine Lake ecosystem. At the base of the ecosystem phytoplankton in lake water and periphyton on shoreline rocks use nutrients and carbon sources for growth and provide food to benthic invertebrates and zooplankton. Zooplankton feed directly on phytoplankton, while benthic invertebrates feed on periphyton and decaying organic material that settle on the bottom of waterbodies. Fish feed on zooplankton and benthic invertebrates, and predatory fish feed on smaller fish.

3.4 Surficial Geology

In general, the local overburden stratigraphy in the Project area consists of a thin layer of topsoil overlying a layer of silty gravelly sand. Cobbles and boulders are observed throughout the entire site and at various depths in the boreholes. The grain angularity is found mainly to be sub-angular, and few are identified as sub-rounded. The bedrock surface at site is encountered between 2 to 18 m below the ground surface.

3.5 Water Quality

Water quality data in the Project area is collected and analyzed for general parameters (field and laboratory), major ions, nutrients (carbon, phosphorus, and nitrogen), total and dissolved metals, and selected organic compounds. Water quality data were compared to the most recent CCME *Canadian Water Quality Guidelines for the Protection of Aquatic Life* (CCME, 2012) and Health Canada's *Guidelines for Canadian Drinking Water Quality* (Health Canada, 2010).

In the Canadian Shield, concentrations of Total Dissolved Solids (TDS) in groundwater increase with depth, primarily in response to upward diffusion of deep-seated brines. The chemicals that contribute to TDS in shield brines are typically chloride and calcium, with sodium to a lesser degree. By comparison, seawater is mostly composed of chloride and sodium. At the Project, three groundwater samples were collected in 2011 as follows:

- groundwater sample from about 100 m bgs with a TDS of about 4,700 milligrams per litre (mg/L);
- groundwater sample from about 450 m bgs with a TDS of about 60,900 mg/L; and
- groundwater sample from about 600 m bgs with a TDS of about 61,000 mg/L.

These values are greater than has been observed at other sites in the Canadian Shield at corresponding depths. This difference, together with the relatively high proportion of sodium relative to calcium in groundwater samples likely indicates the presence of relic seawater in bedrock. It is known that this area was largely overlain by seawater during the last period of glaciation. Such occurrences have been observed at other areas where land was submerged by oceans in the past.

SECTION 4 • NWB TYPE A WATER LICENSE CONDITIONS

Agnico Eagle will continue to adhere and will apply the conditions of the Nunavut Water Board (NWB) Type A water license 2AM-MEL1631 requirements, related to the Meliadine mine site bulk fuel storage facility and is committed to achieving all of these requirements.

SECTION 5 • ENVIRONMENTAL PERFORMANCE ASSESSMENT

To adequately assess the environmental performance of the Meliadine bulk fuel storage tanks and facilities, an annual Geotechnical inspection of the facilities occurs on Meliadine bulk fuel storage tanks and facilities. In the summer of 2019, a fuel audit is proposed to occur to look at the operation of the fueling system. In addition to this, environmental staff generally, on a weekly basis, complete a visual inspection of the facility. Other departments, such as Energy and Infrastructure, complete weekly and monthly inspections of the facilities.

5.1 Desk-Top Report Review of The Meliadine Bulk Fuel Storage Facilities

The last Meliadine bulk fuel storage facility was commissioned in January 2019. The installation report of the two facilities (Agnico Eagle, 2009) indicates the use of best management practices occurred during the installation of the aboveground fuel storage tank. Following the tank construction, X- Ray testing of horizontal and vertical welds was completed. All of the welds met the specifications outlined in the API Standard 650.

Under the supervision of Agnico Eagle Construction, the construction of the secondary containment for both fuel facilities was completed by MTKSL. The surface of the liner was covered by 30 mm minus aggregate, which was placed on the geotextile placed on the HDPE. The installation of the liner was completed by Texol Geosol with the Quality Control Final Report prepared by Texel Geosol for Nuna Kivalliq Earthworks Inc. Testing, both non-destructive and destructive, was performed to ensure the quality of the installation of the geosynthetic materials, including welding. Texel Geosol certified that all materials were installed according to the project plans and specifications.

A secondary containment volume calculation using AutoCAD Civil 3D was completed to provide verification on the liquid storage capacity of the storage tank system. The CCME Environmental Code of Practice for Aboveground Storage Tanks (2003) states:

> *"a storage tank system that consists of more than one storage tank which should have a volumetric capacity of not less than the sum of the capacity of the largest storage tank located in the contained space and 10% of the capacity of the largest tank or the aggregate capacity of all other storage tanks located in the contained space."*

In accordance with the CCME code of practice and National Fire Code of Canada (NFCC) requirements, the Meliadine bulk fuel storage tank facilities meet the volumetric requirements for a storage tank system.

5.2 Secondary Containment Visual Inspections

A consultant performs a geotechnical inspection annually and inspects the bulk fuel secondary containment structures at the Meliadine Bulk Fuel Storage Facilities, the report is sent to NWB annually.

5.3 Environmental Assessment

The management at the site drainage, surface water collection, and water/fuel removal within the secondary containment area is an important measure in the protection of the terrestrial environment, surface water, and ground water from potential sources of contamination. The environmental protection objectives, strategy, and an evaluation of the potential of leaks or seepage that could contaminate the terrestrial environment, surface water and ground water are provided in the following sections. Much of the environmental protection strategies focus on the control of contact water. In this report contact water is defined as any water that may be physically or chemically affected by the nearby operational activities.

At Meliadine, the bermed and lined tank farm provides secondary containment. If fuel escapes from the tanks holding the fuel, the bermed and lined area will not allow the fuel to escape to the receiving terrestrial and aquatic environment. As there is expected to be a high volume of fuel transfer and activity around the modular fuel dispenser and refueling station, inadvertent fuel spills during refueling are expected but will be retained on the impermeable, lined pad at the industrial site. The Mine site facility is proposing to have a lined pad installed in the summer/fall of 2019. The liner is sloped such that any fuel spilled on the pad would flow to a sump where it collects and can be recovered.

5.3.1 Environmental Assessment

The primary objective of the terrestrial management plan is to minimize any adverse impacts to the terrestrial (soil, flora and fauna) environment. To meet this objective, the Meliadine bulk fuel storage facility structures have been constructed, to minimize the operational footprint and control contact run-off water within the secondary containment area. Due to the site grading, all water that comes into contact with the bulk fuel storage facility (including the modular fuel dispenser) is intercepted and directed into the impermeable HDPE lined secondary containment area.

The ground beneath the secondary containment area has been graded to ensure berm stability.

5.3.2 Surface Water

The objective of water management around the Meliadine bulk fuel storage facilities is to minimize impacts on the quantity and quality of surface water and groundwater. To meet this objective, the bulk fuel storage facility structures have been constructed to intercept and direct contact run-off water to the impermeable HDPE lined secondary containment area. As there is a high volume of fuel transfer and activity around the modular fuel dispenser, the pad below the modular fuel dispenser and refueling station is lined and sloped toward the secondary containment berm. The Mine site facility is proposing to have a lined pad installed in the summer/fall of 2019.

Due to the high compaction of the surrounding mine site pad, natural topography of the site, shallow topsoil and predominate bedrock, should contact water reach the natural environment at Meliadine, the ultimate fate of the contaminants is to the CP1 storm water management pond.

5.3.3 Groundwater

It is not expected that groundwater would be impacted as there is no direct pathway for contaminated water to seep from the Meliadine. Due to the site grading, all contact water from the bulk fuel storage facility is directed inside the HDPE lined secondary containment area. Should the integrity of the liner become compromised, there could be leakage into the below grade soil, which is within a zone of continuous permafrost.

SECTION 6 • PERFORMANCE MONITORING PLAN

The environmental performance monitoring plan is a tiered approach with an emphasis on visual and operational inspections; routine surface water sampling to control and monitor the quality of the contact water; and event monitoring (in the case of a spill emergency or occurrence). Management of the Meliadine fuel storage facilities will be guided by the monitoring results.

6.1 Visual and Operational Inspections

Visual and operational inspections are a central component of the environmental performance monitoring plan. Visual inspections of the Meliadine secondary containment structures are important because if the integrity of the berm walls or liner is compromised, this presents the greatest potential for leaks or seepage.

Visual inspections are conducted by the environmental department once per week and monthly manual or electronic dip tests are conducted for inventory reconciliation by the Procurement Department. Staff will inspect the bulk fuel storage facilities pad for: tank and piping condition, secondary containment berm structure and integrity, indicators of liner damage, precipitation/ run-off accumulation, evidence of tampering or misuse, any structural abnormalities and visible sheens on contact water pools and crush material inside the secondary containment. In addition, Energy and Infrastructure (E&I) carry out weekly/monthly inspections at various components of the infrastructure.

The Environment staff will follow-up with the E&I Department if any non-compliances are observed. A weekly written inspection sheet will continue to be completed and signed by the E&I supervisor and is available upon request.

6.2 Routine Contact Water Monitoring

Due to snow accumulation, melting and precipitation, contact water is unavoidably collected inside the secondary containment area. Contact water from inside the secondary containment area is sampled as described below before being discharged. The water accumulated in the Meliadine secondary containment will be released in accordance with the Type A Water License 2AM-MEL1631.

During visual inspections, the quantity of contact water collected inside the secondary containment area and sump will be evaluated. If there is a visible sheen on the contact water or if water withdrawal to the environment is deemed necessary, water samples will be collected and analyzed as per Water License 2AM-MEL1631. If the contact water exceeds the

licensed limits, a portable oil-water separator can be used to treat the water. Prior to withdrawal, samples are analyzed at a certified laboratory and a 10-day notice is sent to the inspector if the water is discharged to the environment.

In addition, water samples from lakes and rivers near the Meliadine Project site are collected as part of the Aquatics Ecosystem Monitoring Program (AEMP). The results of these analyzes will continue to be included in the annual report. These samples are used to evaluate the performance of the overall water management plan for the Meliadine Site.

6.3 Event Monitoring

In the event of a spill occurrence at fuel storage facilities, the Spill Contingency Plan will be followed. As a follow-up to the spill response, the environmental staff will conduct an environmental assessment to determine the extent of impacts of the spill occurrence on the nearby environment. This will include the identification of the potential environmental pathways of concern that may result in impacts to surface water (i.e., channels and containment ponds around site), soil or groundwater.

6.3.1 Soil Sampling

Following the unlikely event where a spill is not contained within the secondary containment area or on the lined pad, soil sampling may be required to locate and prevent further impact to the terrestrial and aquatic receiving environment. Depending on the quantity of the spill, the organic surface soils and shallow till are a likely sink for hydrocarbons, thus soil samples will be taken at selected locations to horizontally and vertically delineate the impacted areas. Furthermore, the soil samples will provide valuable information used to determine the necessity of installing groundwater wells (see Section 6.3.3 below).

6.3.2 Water Sampling

Following a spill event escaping secondary containment, an environmental assessment will be conducted. Similar to routine contact water sampling (inside the secondary containment area or on the lined pad), water samples will be collected and analyzed as per Water License 2AM-MEL1631. If the contact water exceeds the licensed limits, a portable oil-water separator can be used to treat the water before it was disposed to the management ponds. Prior to withdrawal, samples will be analyzed at a certified laboratory. As part of the licence conditions and AEMP, receiving environment surface and at-depth water samples will be taken from selected locations around the site depending on the location of the spill and the migration of the contaminant.

6.3.3 Assessment of the Need for Groundwater Well Installation

Following a spill event escaping secondary containment, if soil sample results identify elevated concentrations of contaminants (i.e., exceeding the CCME Canada-Wide Standard (CWS) for Petroleum Hydrocarbons (PHC) in Soil) and/or if water samples identify elevated receiving environment water samples (i.e., exceeding licensed limits caused as a result of the spill event), an assessment of the need for groundwater wells will be conducted. The assessment, and if required, design for installation, monitoring and maintenance of vertical ground water monitoring wells will be in accordance with CCME (2003) procedures.

REFERENCES

Tetra Tech (2018). Construction Summary (As-Built) Report for Mine Site Storage and Containment Facilities Meliadine Project, Nunavut.

Tetra Tech (2019). Construction Summary (As-Built) Report for Industrial Site Storage and Containment Facilities Meliadine Project, Nunavut.

Agnico Eagle. 2018 Annual Geotechnical Inspection, Meliadine Gold Project, Rankin Inlet, Nunavut

Agnico Eagle (2019). Meliadine Spill Contingency Plan.

Golder Associates (2015). Aquatic Effects Monitoring Program (AEMP) Design Plan 6513-REP-03 Version 1.

Canadian Council of Ministers of the Environment (CCME). (2003). Canadian Council of Ministers of the Environment: Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products. ISBN 1-896997-33-3.

Canadian Environmental Protection Act (CEPA). (2008). Canadian Environmental Protection Act. Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations. June 12, 2008.