AGNICO EAGLE

Meliadine Gold Mine

Itivia Bulk Fuel Storage Facility

Environmental Performance Monitoring Plan

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DOCUMENT CONTROL

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1	August 2021			Submitted plan as per Part I, Item 11 of the Type A Amended Water Licence
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ACRONYMS

Agnico Eagle	Agnico Eagle Mines Limited
CCME	Canadian Council of Ministers of the Environment
E&I	Energy and Infrastructure
Facility	Itivia Bulk Fuel Storage Facility
IOL	Inuit Owned Lands
NFCC	National Fire Code of Canada
Mine	Meliadine Gold Mine
NIRB	Nunavut Impact Review Board
NWB	Nunavut Water Board
Plan	Itivia Bulk Fuel Storage Facility Environmental Performance Monitoring Plan

UNITS

h	hour
km	kilometre
km^2	square kilometre
mg/L	milligram per liter
Ml	million liter

SECTION 1 • INTRODUCTION

Agnico Eagle Mines Limited (Agnico Eagle) is developing the Meliadine Gold Mine (the Mine), located approximately 25 kilometres (km) north of Rankin Inlet, and 80 km southwest of Chesterfield Inlet in the Kivalliq Region of Nunavut.

The Mine is subject to the terms and conditions of both the amended Project Certificate 006 and Type A Amended Water Licence No. 2AM-MEL1631 (the Licence).

This document presents the Itivia Bulk Fuel Storage Facility Environmental Performance Monitoring Plan (the Plan) and is submitted as per Part I, Item 11 of the amended Licence.

To adequately assess the environmental performance of the bulk fuel storage facility at Itivia, the Plan provides:

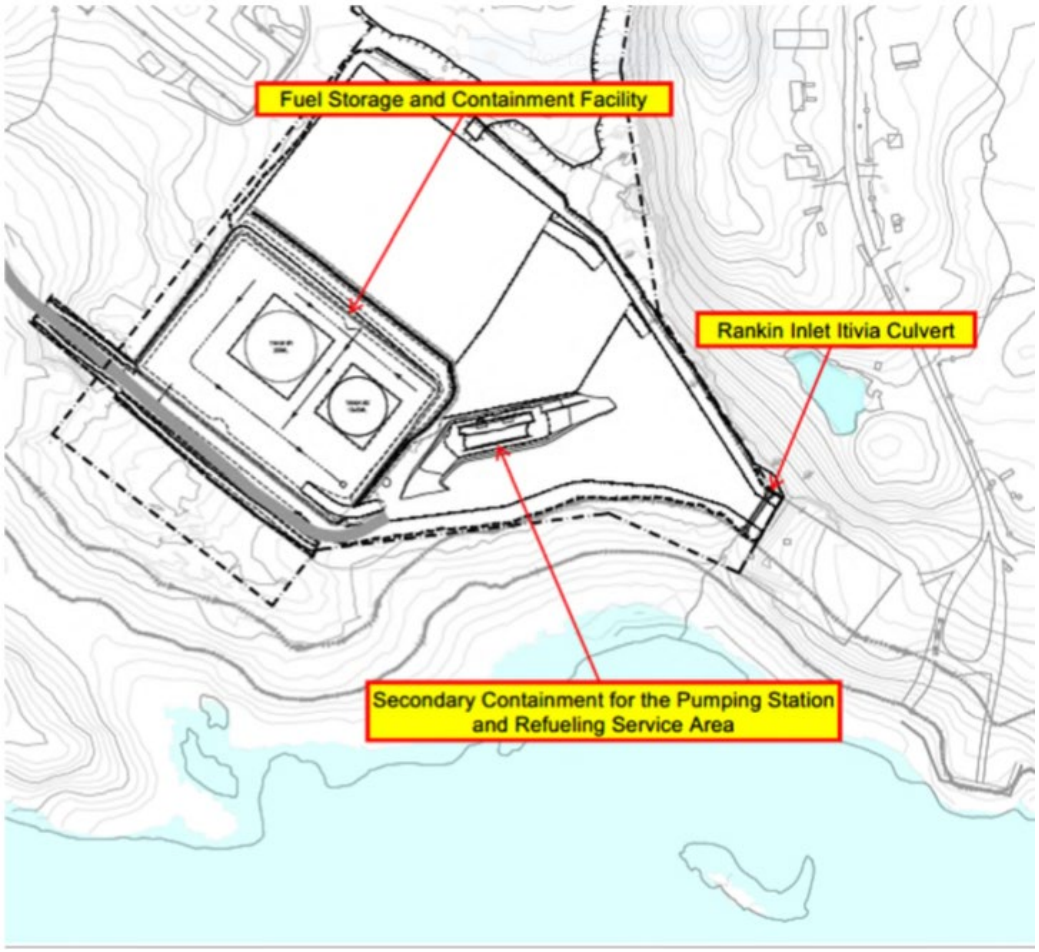
- a summary of the design, installation, operation and maintenance that follows the Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations (SOR/2008-197). Article 14 (1) of this regulation indicates that for the installation of a fuel storage system, the system has to comply 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 Licence 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 Itivia Bulk Fuel Storage Facility (the Facility) is located in Rankin Inlet (Nunavut) and consists of two above ground fuel storage tanks, associated containment area and auxiliary facilities. The fuel tanks have a capacity of approximately 20.0 million liter (Ml) and 13.5 Ml, respectively. The Facility is located at the approximate UTM coordinates (NAD83, Zone 15) 546070 E and 6963760 N; Figure 1 below presents the general site location plan.

Figure 1: Itivia Bulk Fuel Storage Facility Location Plan



2.2 Design and installation summary

Following regulatory approval in 2017, Agnico Eagle began the construction of the Itivia fuel farm in April 2017. Construction of fuel tank #2 (13.5 Ml), the secondary containment and auxiliary infrastructures was completed by October 2017, after which fuel tank #2 was operational. Construction of fuel tank #1 (20 Ml) began in May 2018 and it was commissioned in July 2018. Additional construction activities related to auxiliary facilities occurred until November 2018, at which point the Facility was completed.

The two diesel fuel tanks are contained within an impermeable lined and bermed containment with a capacity of approximately 22.033 m^3, which exceeds the minimum requirement of secondary containment equaling or exceeding 110% of the volume of the largest tank in the fuel Facility. The steel fuel tanks were field-erected and built to API-650 standards. The impermeable lined and bermed cell has the following:

- A granular base for the tank completed with an impermeable LLDPE liner system and granular dikes;
- A tank complete with the required appurtenances such as stairs, base manholes, water draw offs, re-supply nozzle, suction nozzle, tank lighting, tank level monitoring, roof manhole, manual gauge hatch, tank temperature and P/V vent;
- Piping for unloading and loading; and
- Site lighting via fixtures mounted from the dispensing building.

The Facility is designed to meet the following standards:

- National Fire Code 2010;
- Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations – 2008; and
- Canadian Council of Ministers of the Environment, “Environmental Code of Practice of Aboveground and Underground Storage Tank Systems Containing Petroleum Products and Allied Petroleum Products – 2003 (Updated in 2013) (PN1326)”.

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 of 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.

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;
- Itivia Site Fuel Module Quality Control;

- As-Built Drawings, Testing and Inspection Test Plans;
- Survey drawings conducted during and after the construction of the Rankin Inlet Itivia Site Fuel Storage and Containment Facilities and Rankin Inlet Itivia Culvert;
- Inspection Reports for the Inspection Test Plan (ITP);
- Inspection Reports and Quality Control Documents for the Offsite and Onsite Fabrication and the Fuel Modules;
- Inspection Reports for the Tank Farm Area Final Wall, Blasting Operations, Quality Control for Geomembrane installation;
- Particle size analysis for the liner system; and
- Quality Control Final Report prepared by Texel Geosol for Nuna Kivalliq Earthworks. 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.

2.3 Operation and Maintenance Summary

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

The Facility is maintained in accordance with best management practices. The bulk fuel tanks at Itivia are re-filled by a fuel barge over the ice-free season, typically from July to October. During the period of fuel transfer, there is the greatest risk of over-filling the tanks and fuel spill during transfer from the barge. The necessary actions to stop or minimize the potential loss of fuel at the Itivia Site Fuel Storage and Containment Facility during the ship-to-shore fuel transfer are outlined in the Oil Pollution Emergency Plan (OPEP/OPPP). The associated Oil Pollution Prevention Plan (OPPP) is designated to ensure the necessary planning to prevent a spill was undertaken.

In summary, the transfer of the fuels uses sound, well-rehearsed practices, including an adequate number of trained and alert personnel, have sufficient materials, and use well maintained, thoroughly tested equipment. Agnico has at least 2 trained personnel on the land to observe for any leak detection: a third-party contractor and the Rankin Inlet Supervisor. During the ship-to-shore transfer, Agnico has competent personnel on location at all times to monitor the fuel transfer and maintain contact with the tanker's crew. During the transfer, regular monitoring is undertaken for detection of incipient spills and leaks between the tanker and the tank farm. Transfer operations will be suspended should any leak be detected, or filling alarm are activated. 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 Physical Environment

Hudson Bay is one of the world's largest inland seas, with a total surface area of approximately 830,000 km^2. It is connected to the Atlantic Ocean by Hudson Strait and Labrador Sea; and to the Arctic Ocean by the Foxe Basin, Fury and Hecla Straight. Hudson Bay is a relatively shallow waterbody, with an average depth of approximately 100 m.

Marine baseline environmental data was gathered at Itivia by Numami Stantec in 2012. This study included bathymetry, water and sediment quality, aquatic ecology and fisheries values in Itivia harbor and reference sites in Itivia Harbour, as well as a desktop study on marine mammals and birds. Results indicated dominant substrates being cobble and/or gravel in the near shore area, including smaller substrates (gravels and fines) on a gently slope at the barge location. Tidal ranges in Itivia Harbor range from 3 to 6 m depending on the time of the day and the lunar cycle.

3.2 Marine Environment

The marine ecosystem of Hudson Bay encompasses a large geographical area that includes the James Bay, Hudson Bay, Fox Bay, and Hudson Strait. Four important features characterize this unique ecosystem:

- an extreme southerly penetration of Arctic marine water from the north;
- a very large volume of freshwater runoff that enters the Hudson Bay watershed each year from land;
- seasonal coverage of sea-ice; and
- the dynamic coastal geomorphology of the coastal zone where exposure of new shoreline (made up of coastal salt marshes and wide tidal flats) presently occurs at a rate of up to 15 m/year (horizontal) as part of an isostatic rebound of the land from the weight of the Laurentide Ice Sheet, which once covered this entire region.

These key features combine to form critical habitat areas for many species of marine fauna including anadromous fish and large concentrations of migratory species including shorebirds, waterfowl, seabirds, and marine mammals.

Approximately 60 species of fish are known to inhabit estuarine waters of Hudson Bay and James Bay. Fewer species are present near Rankin Inlet where arctic species predominate. Arctic char, Arctic cod, and other species contribute directly to the domestic fishery, and indirectly to the food chain of marine and terrestrial mammals and birds. Those species are considered important to the local commercial, recreational, and subsidence fisheries.

The Hudson Bay marine ecosystem provides resources of critical importance to resident and migrant marine birds throughout the year. At least 43 species, shorebirds, waterfowl, and marine-associated

raptors frequent offshore, inshore, intertidal, or salt marshes of the Hudson Bay marine ecosystem. Few of these species are year-round residents. Most pass through the area during summer for staging, moulting, nesting, and breeding purposes prior to transiting to their traditional wintering grounds to the south. Marine bird species present year-round in Hudson Bay/Hudson Strait are limited to common elder, king eides, black guillemot, and ivory gull. These species have adapted to accessing prey in polynyas, where current and tidal action keep water ice-free throughout the winter.

There are 11 species of marine mammals potentially present within the study area for variable periods of time and at different times of the year. This includes four species of cetaceans (3 toothed whales and baleen whale), six species of pinnipeds (seals and walrus) and the polar bear. Narwhal, Beluga, and bowhead whales are known to overwinter in Hudson Strait and in polynyas within Hudson Bay. Atlantic walrus, bearded seal, ringed seal, and harbor seal are year-round residents to portions of Hudson Bay.

Phytoplankton abundance, richness and diversity were similar across all study areas around Rankin Inlet, with 33 taxa recorded. Dinoflagellates were the dominant taxa at all areas and included Peridinium/Gonyaulax spp., and Dinophysis spp. The clilate Tintinnida was present at low percentages at some of the sites. Zooplankton abundance, richness, and diversity differed between the study areas, and 44 taxa were recorded. An unidentified rotifer species, possibly Notommatidae, was identified at the dominant taxa at all sites. Calanoid copepods was also present during the study.

Benthic invertebrate abundance, richness, and diversity differed amongst study areas. Polychaetes were the dominant taxa at all sites and included Plychaeta: Sedentaria, Capitellidae, Cirratulidae, and/or Paraonidae. Polychaeta: Errantia were the next dominant taxa and included Nephtyidae, Syllidae, and Pholoidae. Also present was nematode subclass Hoplonemertea, the Mydiae and Tellinidae clams, the amphipod families of Ischyroceridae, Oedicerotidae, and Zopfiaceae, as well as 11 additional plychaete families.

3.3 Water Quality

Water quality profiles were collected at one location in the study area. These parameters included temperature, conductivity, pH, dissolved oxygen, salinity, and oxidation-reduction potential. Mean surface water temperature (at 1 m depth) in the harbor was 8.86 +/- 0.52 degrees Celsius with a salinity of 29.32 +/- 0.3 ppt, and a pH of 8.08 +/- 0.03. Bottom water was slightly colder than the surface water at 8.49 +/- 0.57 C with similar salinity and pH values. No thermal stratification was observed. The pH was nearly constant across the study area (range from 8.05 to 8.10) and throughout the water column. Mean conductivity ranged from 45.6 +/- 0.1 mS/cm at the surface to 45.7 +/- 0.1 mS/cm at the bottom. Dissolved oxygen ranged from 114.5 +/- 1.0% at the surface to 114.1 +/- 1.2% at the bottom.

Water samples were collected at one location in the study area using a Van Dorn sampler deployed at mid-depth. Parameters analyzed included major anions, alkalinity, total suspended solids, total

dissolved solids, pH, conductivity, total metals, total Kjeldahl nitrogen, ammonia, nitrate and nitrite, total phosphate, and total organic carbon. Results were compared to Canadian Council of Ministers of the Environment (CCME) guidelines (maximum values) for Protection of Marine Aquatic Life (PMAL). Total Alkalinity in the study area ranged from 142 to 144 mg/L, with bicarbonate as the major representative ion. Nitrate, nitrite, total Kjeldahl nitrogen, dissolved orthophosphate, and total phosphorous were below detection limits. Total organic carbon values were low (ranging from 2.8 to 3.6 mg/L). Approximately 78% of all analyzed metals (33 of 42) were below detection limits. All sample parameters for which CCME PMAL guidelines exist were within acceptable values.

SECTION 4 • NWB Type A Amended Water Licence Conditions

Agnico Eagle will continue to adhere and will apply the conditions of the Nunavut Water Board (NWB) Type A Amended Water Licence 2AM-MEL1631 requirements related to the Itivia Fuel Farm and is committed to achieving all of these requirements.

SECTION 5 • ENVIRONMENTAL PERFORMANCE ASSESSMENT

To adequately assess the environmental performance at the Itivia Bulk Fuel Storage Tanks and facilities, several inspections are conducted:

- An annual geotechnical inspection performed by a qualified Engineering firm (reported annually through the Annual Water Licence report);
- Visual inspections are completed on a weekly basis by the Environment department;
- Other departments, such as Energy and Infrastructure, complete weekly and monthly inspections of the facilities.

5.1 Desktop Report Review of the Itivia Bulk Fuel Storage Facility

The second Itivia bulk fuel storage tank was commissioned in July 2018 with the facility being completed by November 2018.

Under the supervision of Agnico Eagle Construction department, the construction of the secondary containment for the 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 Itivia 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 Itivia Bulk Fuel Storage Facility. The report is sent to NWB annually through the Annual Water Licence report as per Part I, Item 14 of the Licence.

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 groundwater 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 groundwater are provided in this section. The environmental protection strategies mainly 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 Itivia, 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 Itivia transfer facility. The liner is sloped such that any fuel spilled on the pad would flow to a sump where it collects and can be recovered.

When fuel is off loaded from the barge into the two storage tanks, Agnico Eagle contracts a third party to conduct the fuel transfer. During the fuel transfer, all joints from the receiving line have temporary secondary containers placed under them. During the transfer, the contractor walks the fuel line hourly to verify that there are no leaks in the system. If a fuel leak occurs, the contractor contacts the ship captain and the fuel transfer is immediately stopped. In addition, the fuel transfer system has a pressure monitoring system, which will automatically stop the fuel transfer if a pre-defined pressure drop is recorded in the system.

Terrestrial Environment

The primary objective of the Terrestrial Environment Management and Monitoring Plan (TEMMP) is to minimize any adverse impacts to the terrestrial (soil, flora and fauna) environment. To meet this objective, the Itivia 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 in each respective area.

Surface Water

The objective of water management around the Itivia bulk fuel storage facilities is to minimize impacts on the quantity and quality of surface water and groundwater. To meet this objective and as mentioned above, 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 tanker fuel dispenser, the pad below the modular fuel dispenser is lined and sloped towards a sump.

Discharge of surface water from the secondary containment is discussed in section 6.2.

Groundwater

It is not expected that groundwater would be impacted as the two fuel tanks and refueling service area are installed within secondary containments. The secondary containment areas are inspected on a regular basis to confirm that no fuel leak has occurred. Should the integrity of the liner become compromised, there could be leakage into the below grade soil, which is within a zone of continued permafrost.

As stated above, when fuel is off loaded from the barge into the two storage tanks, Agnico Eagle contracts a third party to conduct the fuel transfer. During the fuel transfer, all joints from the receiving line have temporary secondary containers placed under them. During the transfer, the contractor walks the fuel line hourly to verify that there are no leaks in the system. If a fuel leak occurs, the contractor contacts the ship captain and the fuel transfer is immediately stopped. In addition, the fuel transfer system has a pressure monitoring system, which will automatically stop the fuel transfer if a pre-defined pressure drop is recorded in the system.

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 in containment; and event monitoring (in the case of a spill emergency or occurrence). Management of the Itivia 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 Itivia 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 generally conducted by the environmental department once per week and monthly manual or electronic dip tests are conducted for inventory reconciliation by 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 department 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 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. The water accumulated in the Itivia secondary containment will be discharged onto land in accordance with the Licence.

Water samples will be collected and analyzed to confirm compliance with the Effluent quality limits referred to in Part F, Item 5 of the Licence prior to discharge.

As per Part F, Item 11 of the Licence, Agnico Eagle will provide at least 10-day notice to the Regulators prior to the discharge, and include the estimated volume proposed for discharge and receiving location. All Effluent at monitoring station MEL-25 that exceeds the Licence criteria will be transferred to CP1.

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 department 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., Itivia Harbour), soil or groundwater.

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 (further detailed below).

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 the Licence. If the contact water exceeds the licensed limits, water will be transferred to CP1 or treated at the oil-water separator prior to disposal into CP1. As part of the Licence conditions, the receiving environment surface and at-depth water samples will be taken from selected locations around Itivia Harbourdepending on the location of the spill and the migration of the contaminant.

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.

SECTION 7 • REFERENCES

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.