

December 23, 2009

Via Email and Xpresspost

Mr. Richard Dwyer
Licensing Administrator
Nunavut Water Board
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Gjoa Haven, NU X0B 1J0
Phone: (867) 360-6338
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Dear Mr. Dwyer,

Re: Water License 2AM-MEA0815 Part I, Item 17: Bulk Fuel Storage Facility Environmental Performance Monitoring Plans

In accordance with Water License 2AM-MEA0815, Part I, Item 17: *'The Licensee shall submit to the Board for approval, within six (6) months following construction of each the Mine Site Bulk Fuel Storage Facility and Marshalling Area Bulk Fuel Storage Facility, a plan for the environmental and performance monitoring of each Facility.'*, please find a copy of the following documents enclosed with this letter:

- Baker Lake Bulk Fuel Storage Facility: Environmental Performance Monitoring Plan, Version 1; and
- Meadowbank Bulk Fuel Storage Facility: Environmental Performance Monitoring Plan, Version 1.

Should you require any further information, please contact me directly at 819-763-0229 or via email at stephane.robert@agnico-eagle.com.

Regards,



Stéphane Robert
Environment Superintendent

Encl (2)

cc: Ian Rumbolt, INAC
David Abernethy, INAC
Stephen Hartman, KIA



MEADOWBANK GOLD PROJECT

Baker Lake Bulk Fuel Storage Facility: Environmental Performance Monitoring Plan

In Accordance with Water License 2AM-MEA0815

Prepared by:
Agnico-Eagle Mines Limited – Meadowbank Division

Version 1
December 2009

EXECUTIVE SUMMARY

Agnico Eagle Mines Limited – Meadowbank Division (AEM) is currently developing the Meadowbank Gold Project approximately 70 km north of the Hamlet of Baker Lake. As part of the project, four 10 million litres bulk fuel storage tanks were constructed at the Baker Lake Marshalling Area to receive and store bulk shipments of diesel fuel for the Meadowbank Project. This document provides the details for the Baker Lake Bulk Fuel Storage Facility Environmental Performance Monitoring Plan required by Water License 2AM-MEA0815 Part I, Item 17.

To adequately assess the environmental performance of the bulk fuel storage tank at Meadowbank 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.

IMPLEMENTATION SCHEDULE

As required by Water License 2AM-MEA0815, Part B, Item 16, the proposed implementation schedule for this Plan is outlined below.

This Plan will be immediately implemented (December 2009) subject to any modifications proposed by the NWB as a result of the review and approval process.

DISTRIBUTION LIST

AEM – Environment Superintendent

AEM – Environmental Coordinator

DOCUMENT CONTROL

Version	Date (YMD)	Section	Page	Revision
1	09/12/22			Comprehensive plan for Baker Lake Bulk Fuel Storage Facility



Prepared and Approved By:

Stéphane Robert
Environment Superintendent

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SECTION 1 • INTRODUCTION

Agnico Eagle Mines Ltd. (AEM) is currently developing the Meadowbank Gold Project approximately 70 km north of the Hamlet of Baker Lake. As part of the project, four 10 million litres bulk fuel storage tanks were constructed at the Baker Lake Marshalling Area to receive and store bulk shipments of diesel fuel for the Meadowbank Project.

This document provides the details necessary to fulfill Part I, Item 17 of the Nunavut Water Board Type A License 2AM-MEA0815. In the license it states;

The Licensee shall submit to the Board for approval, within six (6) months following construction of each the Mine Site Bulk Fuel Storage Facility and Marshalling Area Bulk Fuel Storage Facility, a plan for the environmental and performance monitoring of each Facility. The Plans are to include:

- a. An assessment of performance;*
- b. Location, environmental setting and the potential for leaks or Seepage that could impact Water;*
- c. An assessment of the need for, and if required, the design for installation, monitoring, and maintenance of vertical Ground Water monitoring wells to be installed in accordance with the Environmental Code of Practice for Aboveground Storage Tank Systems Containing Petroleum Products, 2003; CCME; and*
- d. Recommended sampling for ongoing monitoring of the integrity of the secondary containment.*

To adequately assess the environmental performance of the bulk fuel storage tank at Meadowbank 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.

The requirements of Part I, Item 17 are addressed in the following sections:

- The assessment of performance (point a above) is provided in Sections 5.1, 5.2 and 5.3;
- The location (point b) of the facility is presented in Section 2.1;
- The environmental setting (point b) is described in Section 3.0;
- The potential for leaks and seepage that could impact water (point b) is discussed in Section 5.4;
- The assessment of the need for groundwater monitoring wells (point c) is discussed in Section 6.3; and
- The recommended sampling for ongoing monitoring of the integrity of the secondary containment (point d) is provided in Section 6.1.

SECTION 2 • SITE LOCATION, CONSTRUCTION AND OPERATION

2.1 SITE LOCATION

The Baker Lake Bulk Fuel Storage Tank Facility is located east of the hamlet of Baker Lake, on the north shore of Baker Lake. There are four (4) above ground storage tanks, each with a capacity of 10 million litres each. The GPS coordinates of these facilities is NAD 83 15W E 356874 N 7134486. A general site location is provided in Figure 2.1. A site layout of the infrastructure and tanks is provided in Figure 2.2.

2.2 DESIGN AND INSTALLATION SUMMARY

Following regulatory approval, during the summer of 2007, AEM built bulk fuel tanks #1 and #2; the construction of the secondary containment enclosure and installation of the HDPE liner in accordance with CCME (2003) specifications was also completed in 2007 (AEM, 2009a). Bulk fuel storage tanks #3 and #4 were completed in October 2008; the secondary containment enclosure and installation of the HDPE liner was completed for these tanks in July 2009 (AEM, 2009b).

All of the aboveground storage tanks were field erected. Construction activity was supervised by Hatch Engineering and Stavibel Engineering and included qualified steel fabricators and installers.

2.3 OPERATION AND MAINTENANCE SUMMARY

Inventory control of transfer and weekly volume inspections using manual or electronic dip reconciliation are conducted by Meadowbank mine operations staff. Weekly inspections are logged and reported by the operations staff. Weekly visual inspections and inventory reconciliation are used to evaluate and determine bulk fuel tank leakage.


The bulk fuel storage facility is maintained in accordance with best management practices.

The bulk fuel tanks are filled during barge season on an annual basis. During the period of re-filling there is the greatest risk of over-filling. Through regular visual inspections, inventory control and monitored fuel transfer, the risk of over-filling will be significantly reduced. In the case of a spill, the spill contingency plan will be implemented (AEM, 2008).





FIG. 2.1 : GENERAL LOCATION OF BAKER LAKE BULK FUEL STORAGE FACILITIES

KEY PLAN					
GENERAL NOTES					
<small>NO INFORMATION HERE IS IN THE PROPERTY OF AGNICO-EAGLE LTD. AND MUST BE RETURNED UPON REQUEST. NO COPY WRITER PERMISSIONS, AND COPYING TRANSMITTAL, TO OTHERS AND ANY USE EXCEPT THAT FOR WHICH IT IS LOANED ARE PROHIBITED. © AGNICO-EAGLE LTD.</small>					
TITLE			# DWG		
REFERENCE DRAWINGS					
REV.	DATE	DESCRIPTION	BY	APP.	CLIENT
REVISIONS					
 AGNICO-EAGLE MEADOWBANK DIVISION					
TITLE AGNICO-EAGLE - MEADOWBANK DIVISION					
DRAWN BY			DATE		
CHECKED BY					
APPROVED BY					
SCALE N.T.S.		DATE			
DRAWING NO.					
PROJECT NO.		REVISION	SHEET		
			1 / 1		

SECTION 3 • ENVIRONMENTAL SETTING

3.1 TOPOGRAPHY

The bulk fuel storage area is located east of the Hamlet of Baker Lake, approximately 350 m north of Baker Lake. The storage facility sits on a low terrace parallel with the shoreline of the lake. There is a gradual slope (5 to 10% grade) toward Baker Lake with an approximate elevation change of 35 m from the bulk fuel storage facility to the Baker Lake shoreline.

The Baker Lake shoreline is gently sloping, well-drained and is lined with marine gravels, sands and boulders.

3.2 GEOLOGY

The regional surficial geology is characterized by sandy till, bedrock outcrops, felsenmeer (ice-shattered bedrock) and shallow lakes (Golder, 2007). The most common soil type in this region is glacial till. Marine beach deposits are found along the north shore of Baker Lake.

The soil near the bulk fuel storage facility is comprised of silts, sands, gravels, cobble and boulders and frost-susceptible glacial till overlying weathered bedrock (Golder, 2007). The soil thickness is typically less than 1.4 m with permafrost or bedrock encountered at less than 2 m. Approximately 60% of the surface area surrounding the bulk fuel storage facility is comprised of bedrock outcrop.

3.3 FLORA AND FAUNA

There are no trees and few shrubs in the area surrounding the bulk fuel storage facility. The site is covered by low-lying vegetation; predominated by grassy hummocks, dwarf willow, sedge, green moss and lichen.

Arctic ground squirrels, ptarmigan and songbirds are inhabitants in the area surrounding the bulk fuel storage facility. Lake cisco, lake trout, arctic char, lake whitefish, round whitefish, slimy sculpin and stickleback are predominant species found in Baker Lake.

3.4 SUBSURFACE CONDITIONS

Test pits excavated in 2005 near the bulk fuel storage facility and between the tanks and the shoreline indicate a saturated top layer (0.2 m) of organic material (primarily green moss) (Golder, 2005; 2007). A layer of grey to black medium sand is present up to 0.7 m thickness throughout the area, below which a saturated, grey brown, sand and silt layer is found.

Bedrock is exposed at shallow depths throughout the site in locations where topsoil or till soils are present (Golder, 2005). Bedrock is encountered at a maximum depth of 1.4 m. As predicted by the soil conditions, seepage flows in test pits indicate high site drainage.

3.5 WATER QUALITY

Baker Lake water quality closely resembles distilled water as many conventional water chemistry parameters are at or below detection limits (BAER, 2005). The water column is generally well mixed and the water chemistry homogenous. During the open water season there is limited vertical stratification in temperature and dissolved oxygen, with observed higher salinity in the bottom strata.

SECTION 4 • NWB TYPE A WATER LICENSE CONDITIONS

The Nunavut Water Board (NWB) Type A Water License 2AM-MEA0815 requirements related to the bulk fuel storage facility in Baker Lake are provided below. AEM is committed to achieving all of these requirements.

Part F: Conditions Applying to Waste Disposal and Management

6. Effluent from fuel containment facilities that require Discharge to land, shall not exceed the following Effluent quality limits:

Parameter	Maximum Average Concentration
Benzene($\mu\text{g/L}$)	370
Toluene($\mu\text{g/L}$)	2
Ethylbenzene($\mu\text{g/L}$)	90
Lead($\mu\text{g/L}$)	1
Oil and Grease(mg/L)	15 and no visible sheen

7. The Licensee shall confirm compliance with Effluent quality limits in Part F, Items 2, 3, and 6 prior to Discharge.
8. The Licensee shall provide at least ten (10) days notice to the Inspector prior to any planned Discharges from any facilities. The notice shall include an estimated volume proposed for Discharge and the receiving location.
9. The Licensee shall, under Part Item 6, discharge effluent in such a manner as to minimize surface erosion at a distance of at least thirty (30) metres above the ordinary high water mark of any Water body, where direct flow into a Water body is not possible and no additional impacts are created, or as otherwise approved by the Board in writing.

23. All Effluent being discharged from the constructed facilities at the Baker Lake Marshalling Facility, including the Marshalling Area Bulk Fuel Storage Facility, ammonia storage and explosives storage and general marshalling area at Monitoring Stations ST-38 through ST-42 respectively, shall not exceed the following Effluent quality limits:

Parameter	Maximum Average Concentration (MAC)	Maximum Concentration of any single Grab Sample
pH	6.0 – 9.5	6.0 – 9.5
Total Arsenic (mg/L)	**0.5	1.00
Total Copper (mg/L)	**0.30	0.60
Total Lead (mg/L)	*0.05	0.10
Total Nickel (mg/L)	**0.50	1.00
Total Zinc (mg/L)	*0.50	1.00
Total Suspended Solids (mg/L)	*15.0	30.0
Ammonia (mg/L)	6.0	6.0
Total Cyanide	*0.1	0.2
Benzene (ug/L)	370	370
Toluene (ug/l)	2	2
Ethylbenzene (ug/L)	90	90
Lead (ug/L)	1	1
Oil and Grease (mg/L)	5.0 and no visible sheen	5.0 and no visible sheen

*Environmental Guideline for Industrial Waste Discharges, 2004

**Metal Mines Effluent Regulations (MMER)

Part H: Conditions Applying to Emergency Response and Contingency Planning

3. The Licensee shall prevent any chemicals, petroleum products or unauthorized Wastes associated with the project from entering Water.
4. The Licensee shall provide secondary containment for fuel and chemical storage as required by applicable standards and acceptable industry practice.
5. The Licensee shall perform weekly inspections of fuel containment facilities for leaks and settlement and shall keep a written log of inspections to be made available to an Inspector upon request.

SECTION 5 • ENVIRONMENTAL PERFORMANCE ASSESSMENT

To adequately assess the environmental performance of the bulk fuel storage tanks and facilities, a desk-top review of the design and installation reports (AEM, 2009a,b) were completed. In addition, on October 25th, 2009 AEM environmental personnel completed a site inspection to visually evaluate the site drainage, tank construction, and secondary containment and performed an environmental assessment of the bulk fuel storage facility.

5.1 DESK-TOP REPORT REVIEW

The Baker Lake bulk fuel storage facility was commissioned in 2007 (for tanks #1 and #2) and July 2009 (for tanks #3 and #4). The installation reports (AEM, 2009a,b; attached in Appendix A) indicated the use of best management practices during the installation of the aboveground fuel storage tanks. 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 (AEM, 2009a,b).

Under the supervision of Hatch Engineering, the construction of the secondary containment berms for tanks #1 and #2 was completed. Enviroline Services Inc. was hired in October 2007 to install the HDPE membrane liner in accordance with CCME (2003) specifications; this liner was subsequently covered with a surface layer of crushed stone. Under the supervision of Stavibel Engineering the secondary containment berms were constructed and the HDPE membrane liner was designed and installed for bulk fuel storage tanks #3 and #4.

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 (2003) code of practice, the Baker Lake bulk fuel storage tanks meet the volumetric requirements for a storage tank system (AEM, 2009a,b).

5.2 VISUAL TANK INSPECTION

AEM environmental personnel visually inspected the bulk fuel storage tanks on October 25th, 2009. At the time of the inspection there were no observed environmental concerns regarding the tanks, pipes or module installations (see photos in Appendix B). As reported and based on the visual inspection the primary containment structures are functioning as designed.

5.3 SECONDARY CONTAINMENT VISUAL INSPECTION

AEM environmental personnel visually inspected the bulk fuel secondary containment structures on October 25th, 2009. At the time of the inspection there were no observed environmental concerns regarding the installation, condition of the secondary containment and the HDPE liner at the bulk fuel storage facility (see photos in Appendix B). Based on construction reports and photos it is evident that the impermeable HDPE liner was installed according to the CCME environmental code of practice (CCME, 2003).

5.4 ENVIRONMENTAL ASSESSMENT

The management of 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 to contaminate the terrestrial environment, surface water and ground water are provided in the following sections. Much of the environmental protection strategy centres 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.

5.4.1 Terrestrial Environment

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, 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 is intercepted and directed into the impermeable HDPE lined secondary containment area.

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

5.4.2 Surface Water

The objective of water management around the bulk fuel storage facility 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 refuelling station is lined and sloped toward the secondary containment berm.

Seepage flows in test pits indicate high site drainage due to the high soil porosity. Therefore, should contact water reach the natural environment, the ultimate fate of the contaminants is likely to be in shallow groundwater or surface water (Golder, 2007).

5.4.3 Groundwater

It is not expected that groundwater would be impacted as there is no direct pathway for contaminated water to seep from the bulk fuel storage facility. 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; this would likely present the greatest source of hydrocarbon contamination to impact groundwater and receiving water.

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 bulk fuel storage facility 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 secondary containment structure are important because if the integrity of the berm walls or liner is compromised this presents the greatest potential for leaks or seepage into groundwater and ultimately the receiving environment.

Visual inspections will be conducted by operations staff once per week, at the same time as the manual or electronic dip tests are conducted for inventory reconciliation. The operations staff will inspect the facilities 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.

Environmental staff will follow-up with operations staff and conduct weekly visual inspections of the secondary containment area. A weekly written log will be completed and available upon request.

6.2 ROUTINE CONTACT WATER MONITORING

Due to snow accumulation, melting and precipitation, contact water will unavoidably collect inside the secondary containment area. Contact water from inside the secondary containment area will be sampled as described below prior to its release into the terrestrial environment. During water discharge, piping will be directed onto the nearby tundra at least 30 m from the high tide mark, to allow for natural attenuation and drainage (i.e. surface water will never be pumped directly into Baker Lake).

During visual inspections the quantity of contact water collected inside the secondary containment area will be evaluated. If there is a visible sheen on the contact water or if water withdrawal is deemed necessary, water samples will be collected and analyzed for the following parameters: pH, Total Arsenic, Total Copper, Total Lead, Total Nickel, Total Zinc, Total Suspended Solids, Ammonia, Total Cyanide, Benzene, Toluene, Ethylbenzene, Lead, and Oil and Grease. If the contact water exceeds the licensed limits, the portable oil-water separator will be used to treat the water. Prior to withdrawal, samples will be re-analyzed at a certified laboratory.

In addition, water samples from Baker Lake are collected as part of the Aquatic Effects Management Program (AEMP, 2008). The results of these analyzes are included in the annual report. These

samples are used to evaluate the performance of the overall water management plan for the Baker Lake Marshalling Area.

6.3 EVENT MONITORING

In the event of a spill occurrence at the bulk fuel storage facility, the spill contingency plan will be followed (AEM, 2008). 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. Baker Lake near-shore surface water), soil or groundwater.

6.3.1 Soil Sampling

Following the unlikely event where a spill is not contained within the secondary containment area, 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 silt-containing till below the surface 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, an environmental assessment will be conducted. Similar to routine contact water sampling (inside the secondary containment area), if there is a visible sheen on the contact water or if water withdrawal is deemed necessary, water samples will be collected and analyzed for the following parameters: pH, Total Arsenic, Total Copper, Total Lead, Total Nickel, Total Zinc, Total Suspended Solids, Ammonia, Total Cyanide, Benzene, Toluene, Ethylbenzene, Lead, and Oil and Grease. If the contact water exceeds the licensed limits, the portable oil-water separator will be used to treat the water. Prior to withdrawal, samples will be re-analyzed at a certified laboratory.

As part of the Aquatic Effects Management Program (AEMP, 2008), receiving environment surface and at- depth water samples will be taken in Baker Lake and analyzed for the same parameters as listed above.

6.3.3 Assessment of the Need for Groundwater Well Installation

Following a spill event, if soil sample results identify elevated concentrations of contaminants (i.e. exceeding the CCME Canada-Wide Standard (CWS) for Petroleum Hydrocarbons (PHC) in Soil, 2008) 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

AEM (2009a). Baker Lake Fuel Storage Installations: Interim Report of Phase 1 (2007) and Phase 2-A (2008). April 2009.

AEM (2009b). Baker Lake Fuel Storage Installations: Final Report of Phase 2-B (2009). December 2009.

AEM (2008). Meadowbank Gold Project: Spill Contingency Plan. August 2008.

AEMP (2008). Aquatic Ecosystem Management Program- Receiving Environment Monitoring: Meadowbank Gold Project. March 2009.

BAER (2005). Meadowbank Gold Project Baseline Aquatic Ecosystem Report. October 2005.

CCME (2008). Canadian Council of Ministers of the Environment: Canada Wide Standards for Petroleum Hydrocarbons in Soil. PN 1398. January 2008.

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.

Golder Associates Ltd. (2007). Water Use and Management Plan: Baker Lake Marshalling Area Meadowbank Gold Project. March 2007.

Golder Associates Ltd (2005). Field Geotechnical Investigations Baker Lake Staging Area, Meadowbank Gold Project. Report N. 05-1413-040.

Appendix A1

Baker Lake Fuel Storage Installations: Interim Report Following Construction of Phase 1 (2007) and Phase 2-A (2008)



**AGNICO-EAGLE MINES LTD
MEADOWBANK DIVISION**

BAKER LAKE FUEL STORAGE INSTALLATIONS

**INTERIM REPORT
FOLLOWING THE CONSTRUCTION
OF
PHASE 1 (2007)
PHASE 2-A (2008)**



**AGNICO-EAGLE MINES LTD
MEADOWBANK DIVISION**

BAKER LAKE FUEL STORAGE INSTALLATIONS

INTERIM REPORT

FOLLOWING THE CONSTRUCTION

OF

**PHASE 1 (2007)
PHASE 2-A (2008)**

PREPARED BY :



Patrick Giard, P.Eng., CCE
Supervisor, Construction Department
AGNICO-EAGLE MINES LTD, *Meadowbank Division*



**AGNICO-EAGLE MINES LTD
MEADOWBANK DIVISION**

BAKER LAKE FUEL STORAGE INSTALLATIONS

**INTERIM REPORT
FOLLOWING THE CONSTRUCTION
OF PHASE 1 (2007) AND PHASE 2-A (2008)**

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- D VERIFICATIONS TO STORAGE CAPACITY WITHIN BERMS**

APPENDIX 1 : DRAWINGS

VD2259-BKL-001	VD2259-BKL-002	VD2259-BKL-003	VD2259-BKL-004
VD2259-BKL-005	VD2259-BKL-006	VD2259-BKL-007	VD2259-BKL-008
VD2259-BKL-009	VD2259-BKL-010	VD2259-BKL-011	VD2259-BKL-012

VENDOR DRAWINGS FROM CHAMCO INDUSTRIES LTD

APPENDIX 2

SAFE FILL LEVEL FOR ALL FUEL TANKS

EXECUTIVE SUMMARY

Agnico-Eagle Mines Limited is currently in the process of building a gold mining project in the Kivalliq region of Nunavut, about 70 km north of Baker Lake.

The yearly operations of this mining operation requires the storage of a minimum of forty million (40 000 000) liters of diesel fuel, which represents four (4) bulk fuel storage tanks, each with a nominal capacity of ten million (10 000 000) liters.

PHASE 1

During the summer of 2007, Agnico-Eagle Mines Limited has built the first two (2) bulk fuel tanks, with a combined capacity twenty million (20 000 000) liters of diesel fuel. An impervious enclosure was built around it in order to provide secondary containment around the fuel tanks. These first two (2) bulk fuel tanks were then in condition to be filled.

PHASE 2-A

During the summer of 2008, Agnico-Eagle Mines Limited has built another two (2) bulk fuel tanks, for a total combined capacity of forty million (40 000 000) liters of diesel fuel. Only a portion of the enclosure was built around it, with the final purpose being to provide secondary containment around the fuel tanks. These other two (2) bulk fuel tanks were completed in late October 2008, and they remain empty as of April 2009.

PHASE 2-B

During 2009, Agnico-Eagle Mines Limited plans to complete the installation of an impermeable HDPE membrane, which will provide adequate secondary containment around the fuel tanks. This will allow to fill up all four (4) bulk fuel tanks in the summer of 2009, once the piping installation has been completed

DESCRIPTION OF THE MANDATE

Agnico-Eagle Mines has given a mandate to the undersigned in order to verify the compliance with applicable regulations of its fuel storage installations in Baker Lake, Nunavut.

According to the terms of reference, the mandate consists summarily in the following activities.

- A. Review and compilation of the available documentation ;
- B. Collection of any information that may be missing ;
- C. REVISION OF CONSTRUCTION DRAWINGS
 - a. Preparation of *AS BUILT* drawings of the construction of PHASE 1 ;
 - b. Preparation of *AS BUILT* drawings of the construction of PHASE 2-A ;
 - c. Preparation of *IFC* drawings for the construction of PHASE 2-B ;
- D. Verifications to the storage capacity within the existing containment berms of PHASE 1 and verifications for PHASE 2 in regards to the applicable regulations.

A. DOCUMENTATION READILY AVAILABLE

GOLDER ASSOCIATES - Vancouver Office

For the Baker Lake bulk fuel storage facilities, this firm has produced some construction specifications on 2006-04-28, which were given reference SP-GAL-03 under their project number 06-1413-009.

NISHI-KHON / SNC-LAVALIN LTD - Vancouver Office

For the Baker Lake bulk fuel storage facilities, this firm has produced a set of drawings issued **for construction** on 2007-08-03, under their project number 017202. Some specifications for fuel piping and valves were also issued.

EARTHWORK DRAWINGS	017202-1000-41D1-0006	17202-1000-46ES-1001A	017202-8000-46DC-9150
017202-1000-41D1-0001	FUEL PIPING DRAWINGS	17202-1000-46ES-1001B	017202-8000-46DC-9152
017202-1000-41D1-0002	017202-1000-41D1-0007	ELECTRICAL DRAWINGS	017202-8000-46DC-9153
017202-1000-41D1-0003	017202-1000-46D4-1004	017202-1000-46D6-1001	017202-8000-46DC-9156
017202-1000-41D1-0004	017202-1000-46D4-1005	017202-1000-47D2-2001	017202-8000-46DC-9157
017202-1000-41D1-0005	017202-1000-46D4-1006	017202-8000-47DA-9004	017202-8000-46DC-9166

GEM STEEL EDMONTON LTD

This vendor has submitted a set of drawings issued **for review**, which consist in four (4) structural drawings showing the details of a fuel tank of 10 million liters nominal capacity. The original design of this fuel tank is shown on revision A of drawings BL-2007-1, BL-2007-2, BL-2007-3, and BL-2007-4.

CHAMCO INDUSTRIES LTD

This vendor has submitted a set of preliminary drawings issued **for approval** under their project number 1014938ABS, consisting of the following drawings. These documents have all been reviewed by HATCH.

DRAWING NUMBER	H325174-M268-VD-0040	H325174-M268-VD-0041	H325174-M268-VD-0010
H325174-M268-VD-0011	H325174-M268-VD-0012	H325174-M268-VD-0013	H325174-M268-VD-0014
H325174-M268-VD-0015	H325174-M268-VD-0016	H325174-M268-VD-0017	H325174-M268-VD-0019
H325174-M268-VD-0020	H325174-M268-VD-0021	H325174-M268-VD-0029	H325174-M268-VD-0030
H325174-M268-VD-0031	H325174-M268-VD-0032	H325174-M268-VD-0033	H325174-M268-VD-0034
H325174-M268-VD-0035	H325174-M268-VD-0036	H325174-M268-VD-0037	H325174-M268-VD-0039

B. ADDITIONAL COLLECTION OF INFORMATION

HATCH - Vancouver Office

Role during construction phase : Field Supervision during construction of PHASE 1 (2007).

Mr. Marlon Coakley and Jim Bonia, which were HATCH employees at the time, have supervised the construction of the fuel containment area around tanks #1 and #2, in phase 1 of this project. A specialized crew coming from Saskatoon (Enviroline Service inc.) was hired in October 2007 to install an HDPE membrane over the berms. This HDPE membrane has been covered with a layer of about 150 mm thickness of crushed stone. During August 2008, some additional HDPE membrane was installed under the tanks #3 and #4, but the final installation of the impermeable enclosure for phase 2-B remains to be done in 2009.

GEM STEEL EDMONTON LTD

Role during construction phase : Fabrication and field assembly of 10 M liters fuel tanks

Construction of phase 1 (tanks #1 and #2) took place from September to November 2007, with a crew of about 16 workers. During this time, a crew has welded a pipeline towards a booster pump and installed flanged connections and gate valves between fuel tank #1 and the fuel dispensing module manufactured by CHAMCO. The connection of the booster pump to the barge, using hoses, allowed for fuel tank #1 to be filled up in 2007. During August 2008, tanks #1 and #2 were also filled up with fuel by barge delivery.

Construction of phase 2-A (tanks #3 and #4) took place from August to October 2008. Following each phase of this field work, a crew from ACUREN has proceeded to X-RAY testing of horizontal and vertical welds according to specifications described in the latest edition of API Standard 650. According to the report made by ACUREN, no repairs of defective welds were required, either on the tank shell or nozzles.

MOSHER ENGINEERING LTD

Role during construction phase : Welding of pipelines and support brackets between the 10 M liters tanks and the sea hose connection.

In September 2008, a crew of four (4) workers has extended a pipeline towards the barge landing and installed pipes with flanged connections and gate valves between fuel tank #2 and the fuel dispensing module manufactured by CHAMCO. They have also installed check valves on both the inlet and outlet nozzles of tank #2, as well as a pressure relief valve set at 75 psi to bypass the gate valve on the outlet of tank #2.

This safety feature against thermal expansion of fuel inside the pipeline towards the fuel dispensing module remains to be installed on tank #1. The grade of material that was used for this pipeline was A333 cold temperature rated steel.

CHAMCO INDUSTRIES LTD

Role during construction phase : Manufacturing of the fuel dispensing module.

This fuel dispensing module was manufactured in 2006 and sent to the Meadowbank site. A representative from CHAMCO was present during the commissioning. Possibly due to vibrations during transport, there were many flanged connections that needed tightening.

C. REVISION OF CONSTRUCTION DRAWINGS

AEM has hired STAVIBEL Engineering Services, a firm based in Val-d'Or, in order to complete the drawings that were used in producing this report. Those twelve (12) drawings are enclosed in **Appendix 1** of this report.

Drawing VD2259-BKL-001 shows the general layout of fuel storage area. It has been compiled using surveying data collected by a crew from NUNA.

Drawing VD2259-BKL-002 shows the fuel storage area and existing piping for PHASE 1. It has been compiled using surveying data collected by NUNA.

Drawing VD2259-BKL-003 shows the fuel storage area and location of a sump for collection of surface water, to be built in PHASE 2-B. It shows the limits of the HDPE membrane that has been installed in 2008 under the fuel tanks.

Drawings VD2259-BKL-004, 005, and 006 show cross-sections of the containment area in PHASE 2 (to be completed in 2009). These cross-sections are derived from surfaces that were generated using the *Autocad Civil 3D* software, and are also based on information collected from existing land surveys. This drawing file was also used to verify containment volumes, as it is described further in section D.

Drawing VD2259-BKL-007 is an as-built version of structural drawing BL2007-1, which was designed and issued by Gem Steel Edmonton Limited. This drawing has been updated to reflect nozzle orientations that were noted during a visit. No significant changes were noted, except those made to the nozzle schedule.

Drawing VD2259-BKL-008 shows the proposed piping for PHASE 2. It contains a schedule of valves and fittings that remain to be installed.

Drawing VD2259-BKL-009 shows the location of the existing pipeline and sea hose connection with the barge for fuel unloading. Also, a spill containment sump is proposed on this drawing.

Drawing VD2259-BKL-010 is a process and instrumentation diagram. It shows the details of the existing and proposed piping, along with further details for the fuel dispensing module.

Drawing VD2259-BKL-011 is a general layout that shows the location of existing grounding wire and proposed layout to extend this grounding into PHASE 2.

Drawing VD2259-BKL-012 shows the details of the barge and laydown areas, along with the details of a ditch and culvert for diversion of surface water run-off.

Also enclosed are two (2) vendor drawings from CHAMCO INDUSTRIES LTD, which shows the piping details inside the fuel dispensing module.

D. VERIFICATIONS TO STORAGE CAPACITY WITHIN BERMS

STAVIBEL Engineering Services has completed verifications on the liquid storage capacity inside the containment berms, which create an impermeable enclosure around tank #1 and #2.

The method used was a volume calculation using *Autocad CIVIL 3D* software.

The maximum storage capacity of fuel tank #1 is 10 515 000 litres of diesel fuel at a standard temperature of fifteen degrees Celcius (15 °C).

The maximum storage capacity of fuel tank #2 is 10 480 000 litres of diesel fuel at a standard temperature of fifteen degrees Celcius (15 °C).

It has been verified using the above software that the impermeable enclosure built in PHASE 1 will effectively hold one hundred percent (100 %) of the maximum storage capacity of the biggest tank, plus ten percent (10 %) of the maximum storage capacity of the other tank. This calculation has been summarized in a worksheet that is shown on PAGE 8, hereunder.

The containment volume for tanks #1 and #2 is 11 586 cubic meters, of which 367 cubic meters were occupied by accumulation of surface water as of 2008-10-31.

Thus, the lowest point of the HDPE membrane that sits atop the containment area is sufficiently high (at elevation 33.86 m) to meet the above criteria.

A worst case scenario has been simulated, and consists in either a rupture of the first course of side plates in the tank shell, or a failure in the outlet piping, when either one of fuel tanks is 100% full.

This simulation shows that, in such a worst case scenario, the hydraulic balancing level inside the containment area would not exceed the point with the lowest elevation on the surrounding berms, providing that there is no substantial accumulation of surface water inside. There is a no additional safety margin.

However, with the upcoming completion in phase 2-B (summer 2009) of the impermeable enclosure around tanks #3 and #4, a breach will be made into the berm dividing the two containment areas. This is also shown on a sketch, hereby.

When phase 2-b is completed in summer of 2009, the containment volume for tanks #3 and #4 will be 10 855 cubic meters As a result, the new containment requirement of 130% of the biggest tank volume (or 13 647 cubic meters), expressed while considering all four (4) tanks as a whole, will then be exceeded.

DESIGN REVIEW - FOR FUEL SPILL CONTAINMENT BERMS AT BAKER LAKE

EQUIPMENT #	diam (ft)	rim el. (m)	radius (m)	surface (m2)	top el. (m)	height (m)	volume (m3)
740-TK-044 TANK # 1	110	32.99	16.764	882.89	44.90	11.910	10 515
740-TK-044 TANK # 2	110	33.03	16.764	882.89	44.90	11.870	10 480

Let's say berms are 5' 3" higher than the average tank floor (so 1.60 m total height) with variable slopes and that the tanks are sitting on cones made of crushed stone of 20 m diameter x 1.0 m height.

Volume
11 563 m3

Secondary Containment Requirement
according to ref. PN-1326, Section 3.9.1(1) 2-b-ii

110%

DESIGN OF BERM DIMENSIONS

elevation	height (m)	width (m)	length (m)	surface (m2)			cumulative volume (m3)
32.00	0.00	64.0	104.0	6656.00	slope ratio N-S		0
32.66	0.66	69.3	107.6	7452.03	horizontal	vertical	4656
32.76	0.76	70.1	108.1	7575.93	4.0	1	5407
32.86	0.86	70.9	108.6	7700.69	slope ratio E-W		6171
32.96	0.96	71.7	109.2	7826.31			6947
33.06	1.06	72.5	109.7	7952.80	horizontal	vertical	7736
33.16	1.16	73.3	110.3	8080.15	2.7	1	8538
33.26	1.26	74.1	110.8	8208.36			9352
33.36	1.36	74.9	111.3	8337.44			10 180
33.46	1.46	75.7	111.9	8467.38			11 020
33.56	1.56	76.5	112.4	8598.19			11 873
33.66	1.66	77.3	113.0	8729.86			12 739
33.76	1.76	78.1	113.5	8862.39			13 619
33.86	1.86	78.9	114.0	8995.79	GROSS CONTAINMENT		14 512
34.00							CUBIC METERS

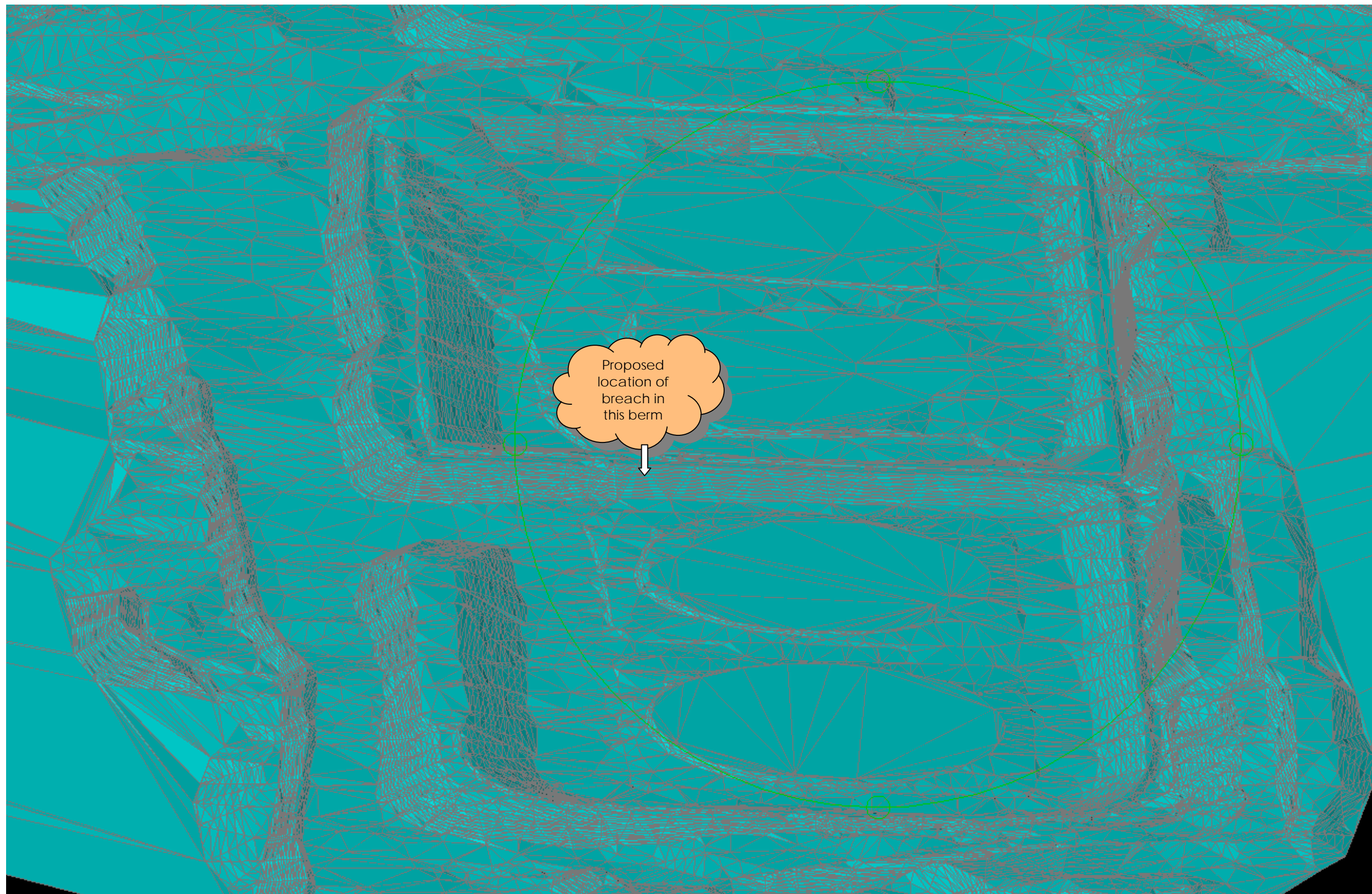
containment volume to be subtracted for the two (2) cones made of crushed stone

	perimeter (m)	number	radius (m)	surface (m2)	height (m)	volume (m3)
CONES	126.0	2	20.05	1262.93	1.01	-2680
RAMP		1			variable	-246

containment volume to be subtracted for accumulation of surface water

elevation	volume (m3)
water level as of November 2008	-367.0
31.70	

	Volume
NET CONTAINMENT	11 219 m3
	or 107%



APPENDIX 1

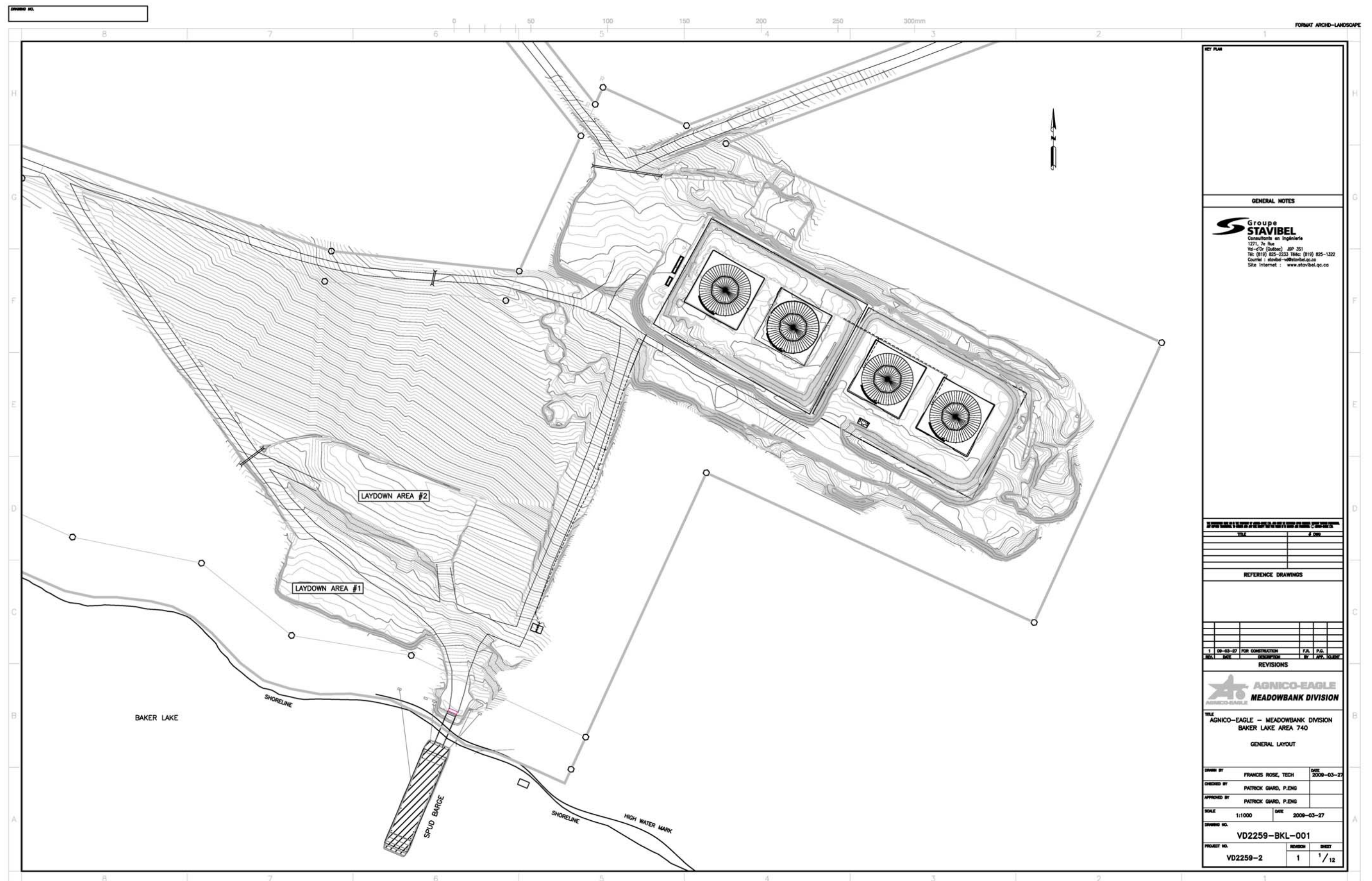
AS BUILT DRAWINGS for PHASE 2-A

IFC DRAWINGS (10) for PHASE 2-B

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VD2259-BKL-005	VD2259-BKL-006	VD2259-BKL-007	VD2259-BKL-008
VD2259-BKL-009	VD2259-BKL-010	VD2259-BKL-011	VD2259-BKL-012

**Plus two (2) drawings from
CHAMCO INDUSTRIES LTD**

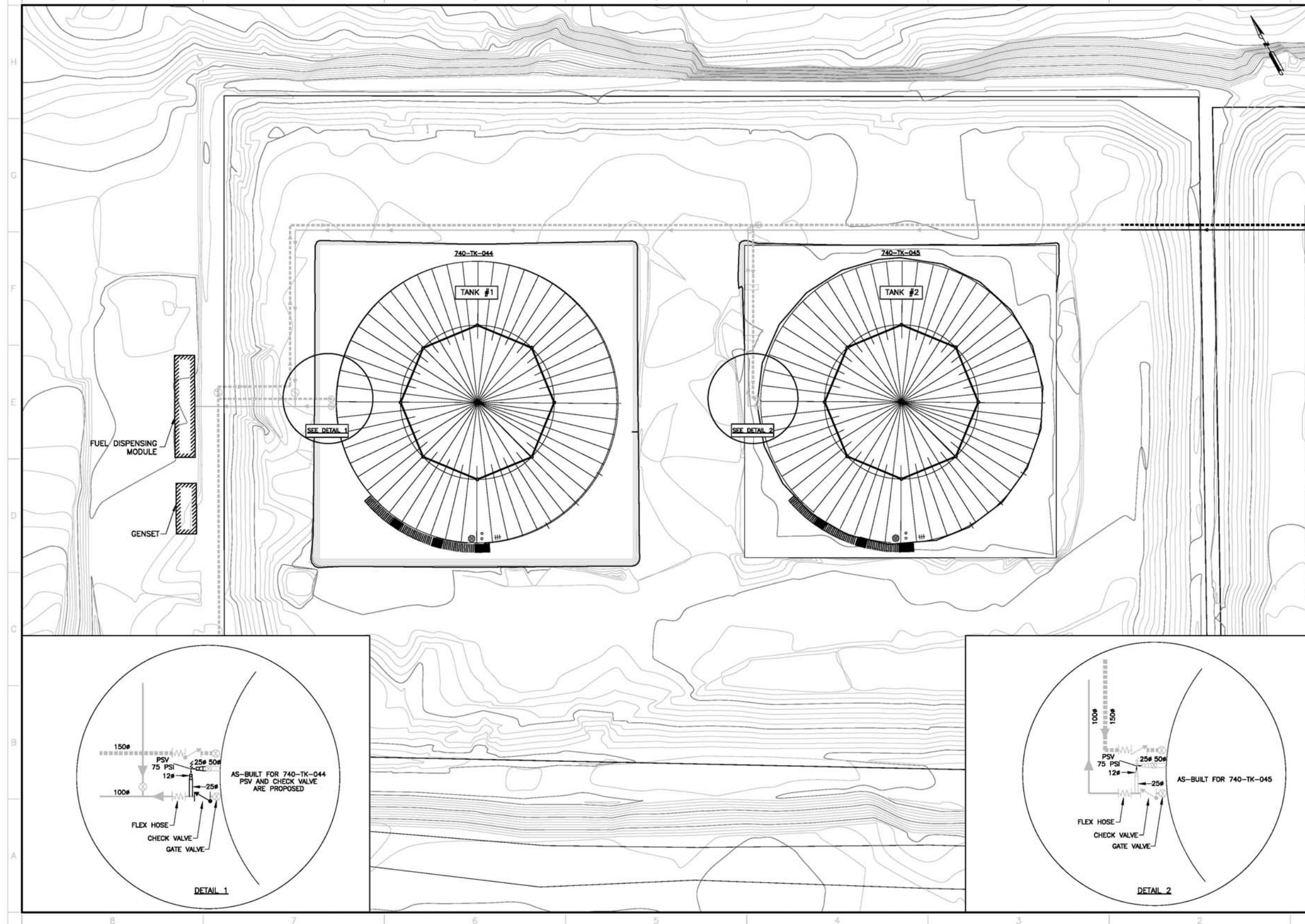
**Vendor ref. # CUP1014938-22
 CUP1014938-25**



DRAWING NO.

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FORMAT ARCHO-LANDSCAPE



KEY PLAN

GENERAL NOTES

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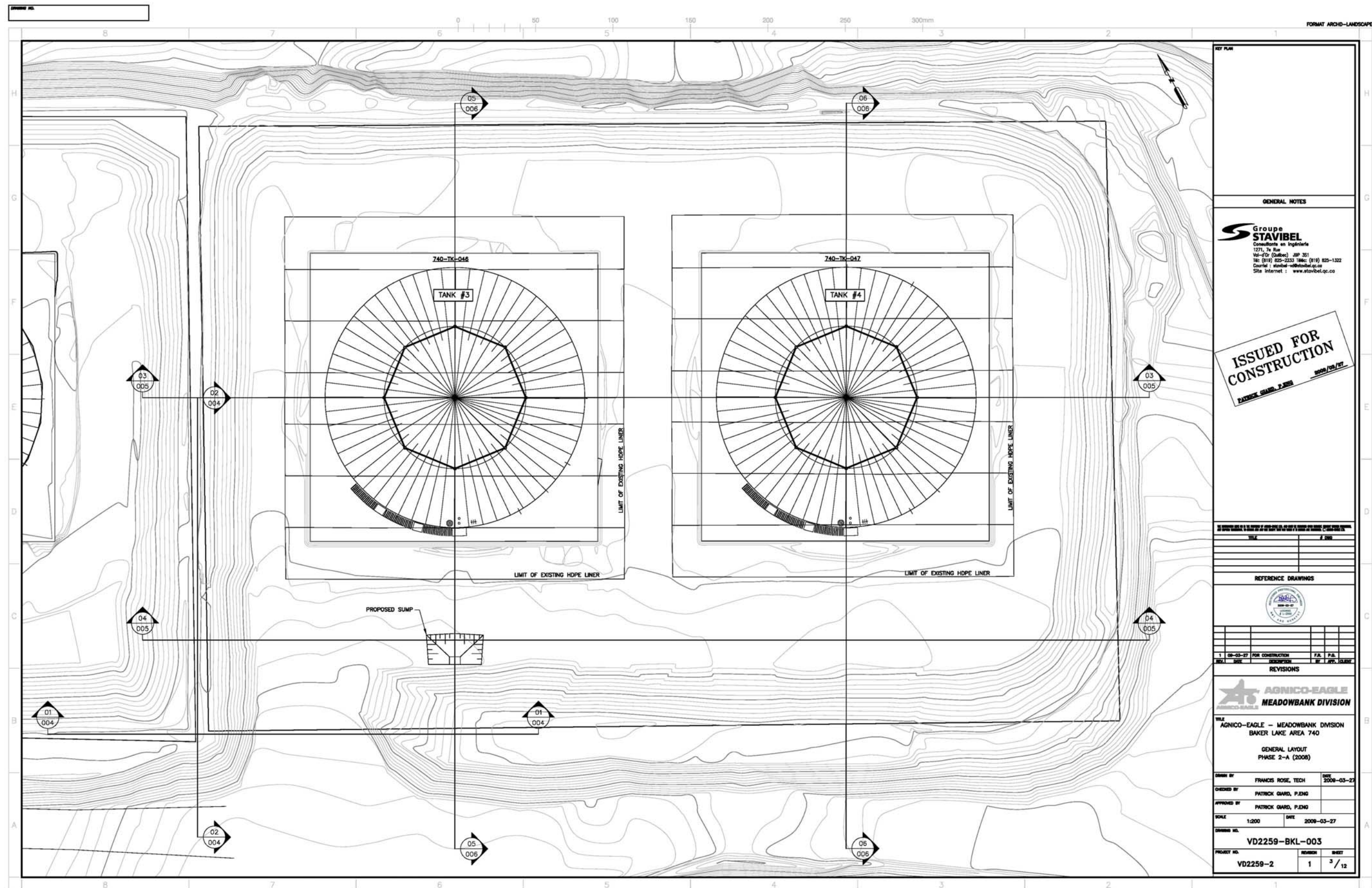
REVISIONS

NO.	DATE	DESCRIPTION	BY	APP.	DATE
1	08-03-27	FOR CONSTRUCTION	P.A.	P.A.	

AGNICO-EAGLE
MEADOWBANK DIVISION

AGNICO-EAGLE — MEADOWBANK DIVISION
BAKER LAKE AREA 740
GENERAL LAYOUT
PHASE 1

DRAWN BY: FRANCIS ROSE, TECH. DATE: 2008-03-27
CHECKED BY: PATRICK GARD, P.ENG.
APPROVED BY: PATRICK GARD, P.ENG.
SCALE: 1:200 DATE: 2008-03-27
DRAWING NO.: VD2259-BKL-002
PROJECT NO.: VD2259-2 SHEET: 1 / 12



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AGNICO-EAGLE
MEADOWBANK DIVISION

AGNICO-EAGLE — MEADOWBANK DIVISION
BAKER LAKE AREA 740
GENERAL LAYOUT
PHASE 2-A (2008)

DRAWN BY: FRANCIS ROSE, TECH DATE: 2008-03-27
CHECKED BY: PATRICK GARD, P.ENG
APPROVED BY: PATRICK GARD, P.ENG

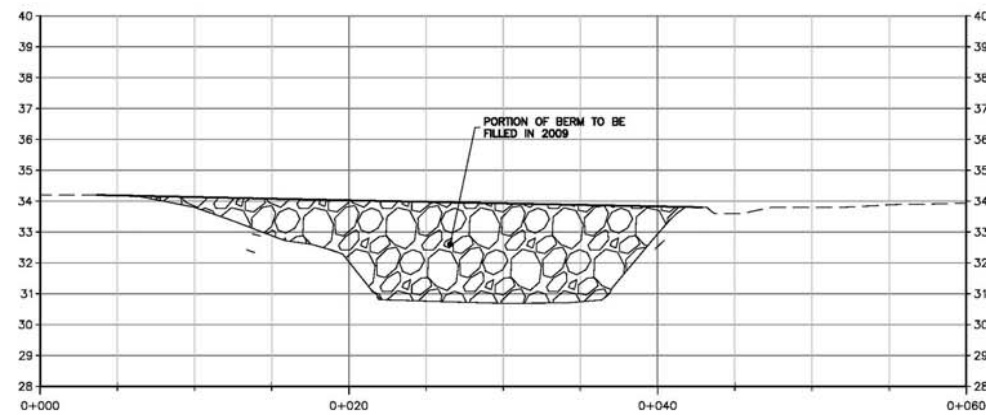
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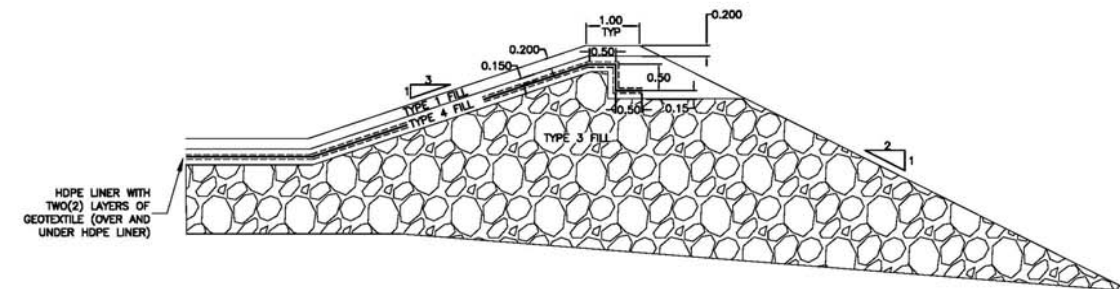
PROJECT NO.: VD2259-2 REVISION: 1 SHEET: 3 / 12

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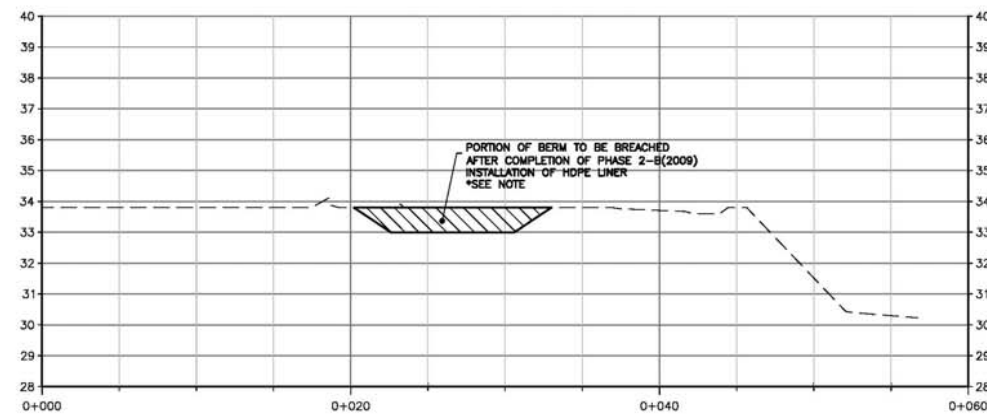
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CROSS-SECTION




TYPICAL CROSS-SECTION



CROSS-SECTION



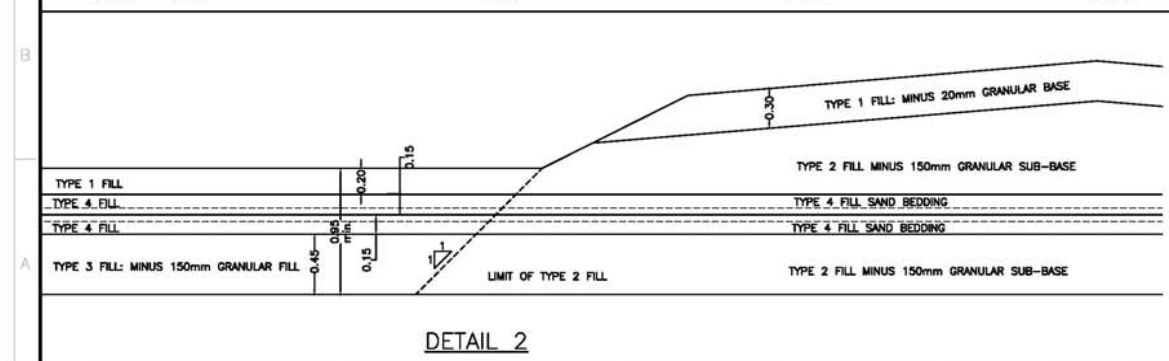
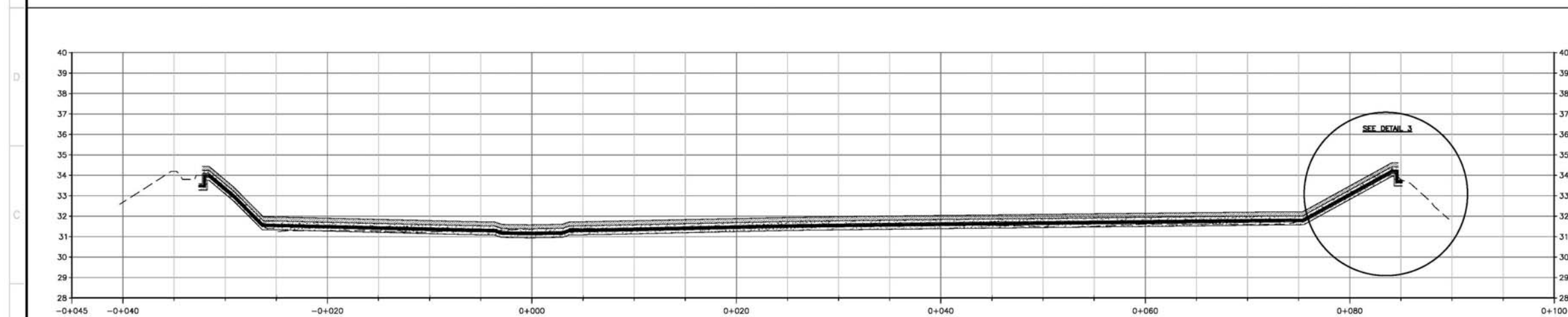
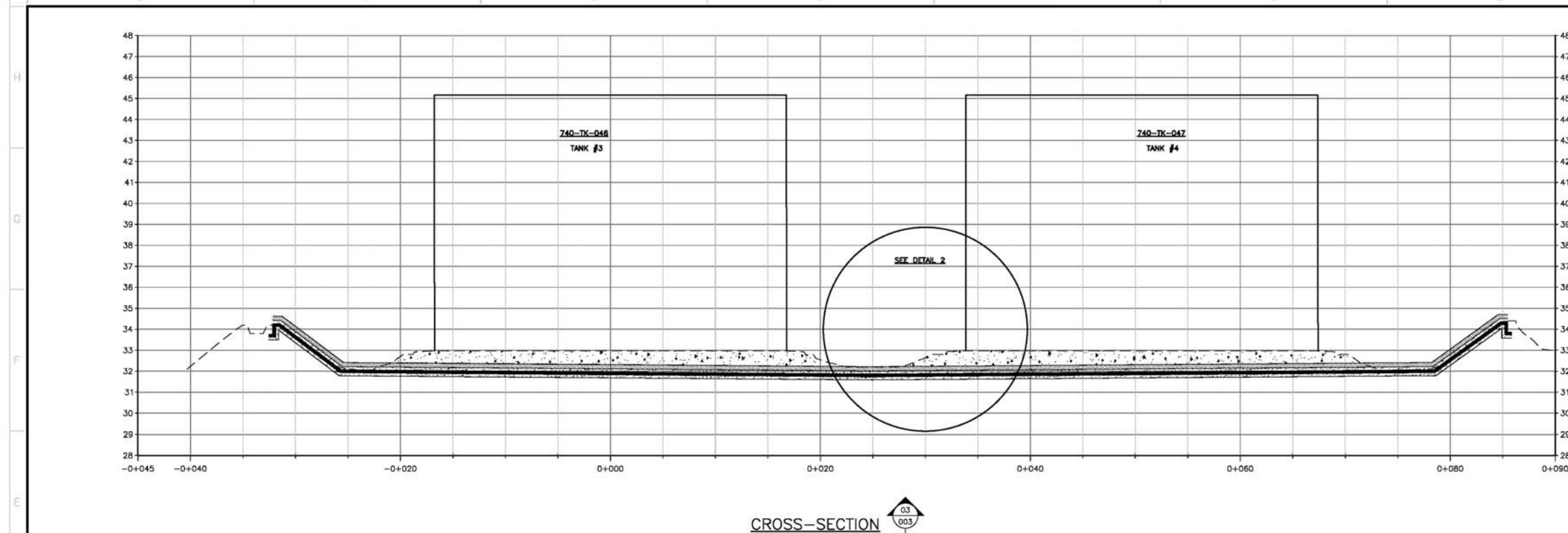
*NOTE:
HOPE LINER MUST BE WELDED BACK ON TOP OF EXISTING LINER ON BERM ONCE BREACH HAS BEEN EXCAVATED TO ENSURE IMPERMEABLE LINK BETWEEN BOTH BERM ENCLOSURES

KEY PLAN	
GENERAL NOTES	
 Groupe STAVIBEL Consultants en Ingénierie 1271, 7e Rue Val-d'Or (Québec) J9P 3S1 Tél: (819) 825-2233 Téléc: (819) 825-1322 Courriel: stavel@stavel.qc.ca Site Internet: www.stavel.qc.ca	
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1 08-03-27 FOR CONSTRUCTION P.A. P.A.	
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1 08-03-27 FOR CONSTRUCTION P.A. P.A.	
AGNICO-EAGLE MEADOWBANK DIVISION	
AGNICO-EAGLE - MEADOWBANK DIVISION BAKER LAKE AREA 740 CROSS-SECTIONS OF HOPE MEMBRANE PHASE 2-B (2009)	
DRAWN BY: FRANCIS ROSE, TECH DATE: 2008-03-27	
CHECKED BY: PATRICK GARD, P.ENG	
APPROVED BY: PATRICK GARD, P.ENG	
SCALE: HOR:1:200 VER:1:100 DATE: 2008-03-27	
DRAWING NO.: VD2259-BKL-004	
PROJECT NO.: VD2259-2	
REVISION: 1	
SHEET: 4/12	

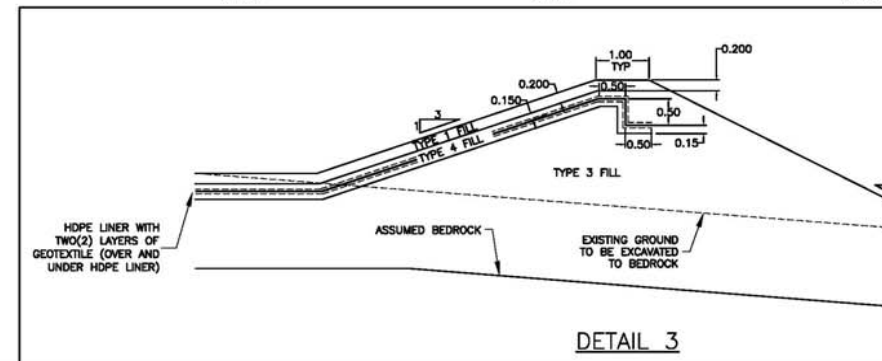
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FORMAT ARCHD-LANDSCAPE



CROSS-SECTION



KEY PLAN

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REFERENCE DRAWINGS



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MEADOWBANK DIVISION

AGNICO-EAGLE - MEADOWBANK DIVISION
BAKER LAKE AREA 740
CROSS-SECTIONS
PHASE 2-B (2009)

DRAWN BY: FRANCIS ROSE, TECH. DATE: 2008-03-27

CHECKED BY: PATRICK GARD, P.ENG

APPROVED BY: PATRICK GARD, P.ENG

SCALE: HOR: 1:200 VER: 1:100 DATE: 2008-03-27

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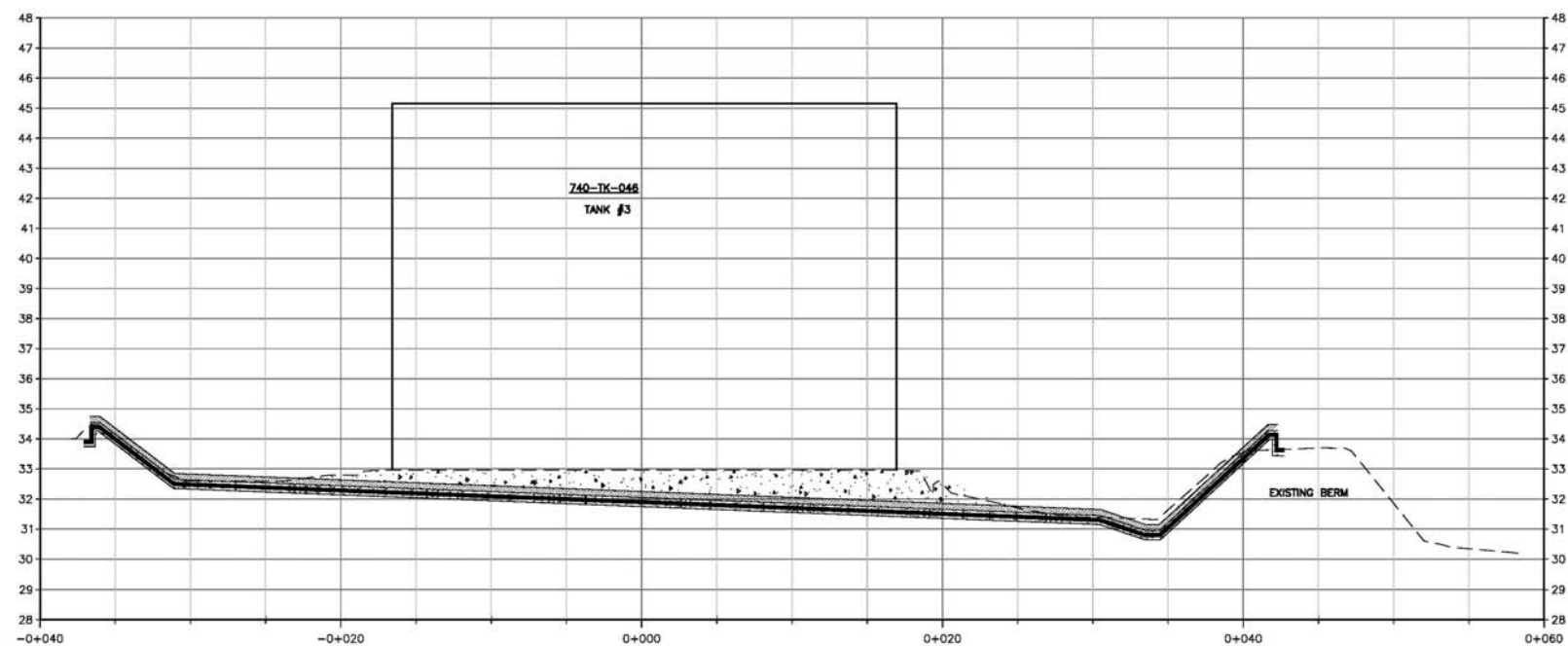
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REVISION 1 8/12

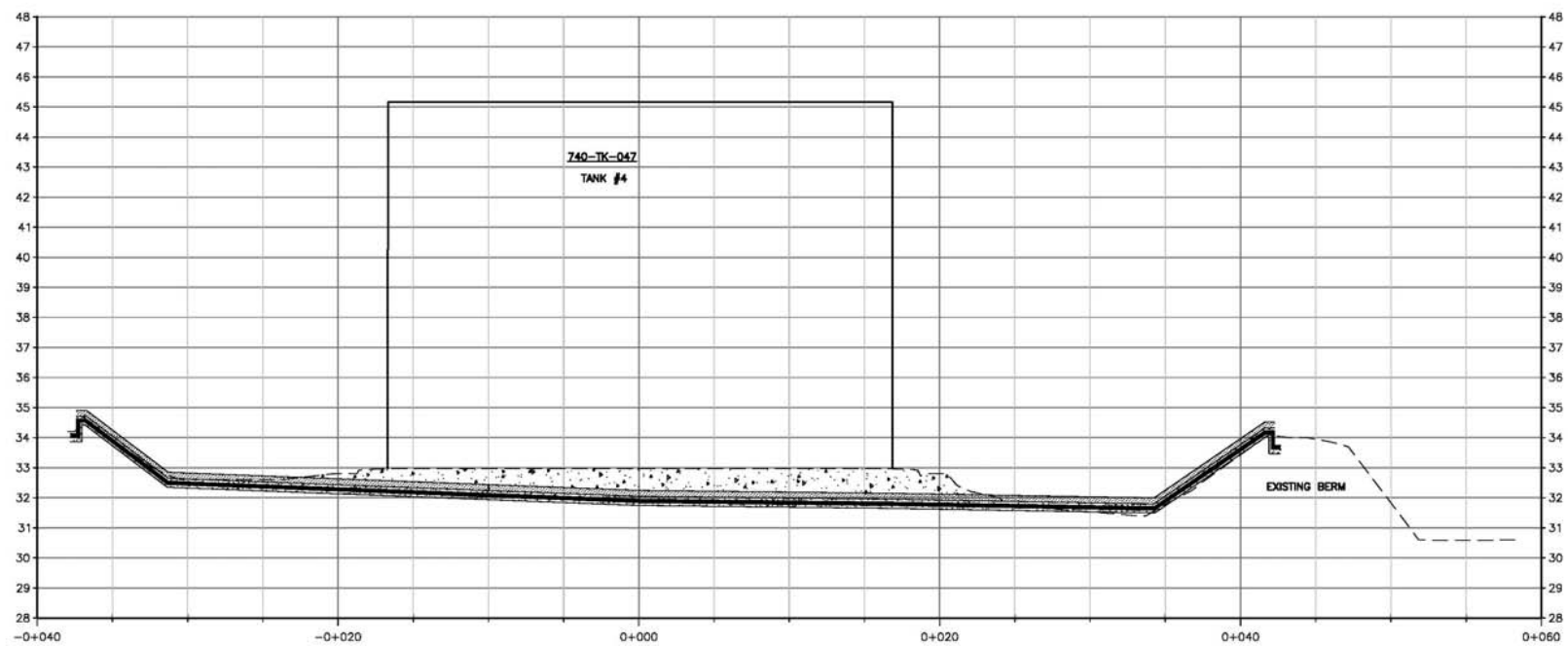
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FORMAT ARCHD-LANDSCAPE



CROSS-SECTION



CROSS-SECTION



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REVISIONS



AGNICO-EAGLE -- MEADOWBANK DIVISION
BAKER LAKE AREA 740
CROSS-SECTIONS
PHASE 2-B (2009)

DRAWN BY: FRANCIS ROSE, TECH DATE: 2008-03-27

CHECKED BY: PATRICK GARD, P.ENG

APPROVED BY: PATRICK GARD, P.ENG

SCALE: HOR: 1:200 VER: 1:100 DATE: 2008-03-27

DRAWING NO. VD2259-BKL-006

PROJECT NO. VD2259-2

REVISION 1

SHEET 8 / 12

[illegible]

- [illegible]

1. BOLTS, A-325	N4	1 250X4602	API 650 Fig 3-5	17"	15.63	INSPECTION - HATCH"
2. PIPE WOODS LBS A333 G-8						
3. FORGED FLANGES AND COUPLINGS A350M, G-LF2 AND ANSI B16.5 LF2 CLASS D	M643	1 24" SFL 1506F	API 2000	165"	15.048	EMERGENCY VENT/MANHOLE"

- | | | |
|-------------|--------|------------|
| | N.T.S. | 2006-03-27 |
| COVERED BY: | N.T.S. | |

Age Group	Number of people
0-4	8
5-9	7
10-14	6
15-19	5
20-24	4
25-29	3
30-34	2
35-39	1
40-44	1
45-49	1
50-54	1
55-59	1
60-64	1
65-69	1
70-74	1
75-79	1
80-84	1
85-89	1
90-94	1
95-99	1

GENERAL NOTES

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FAX. (780) 449-0001

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REFERENCE DRAWINGS

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REVISIONS

TITLE	RESEARCH AND DEVELOPMENT OF A NEW TYPE OF POLYMER-BLENDED POLYMER-CLAY NANOCOMPOSITE
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STRUCTURE

CHECKED BY	DATEBOOK CLERK, B. ENO
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SCALE	M.T.S	DATE	2000-03-27
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VD2259-BKL-007		
PROJECT NO.	REVISION	SHEET

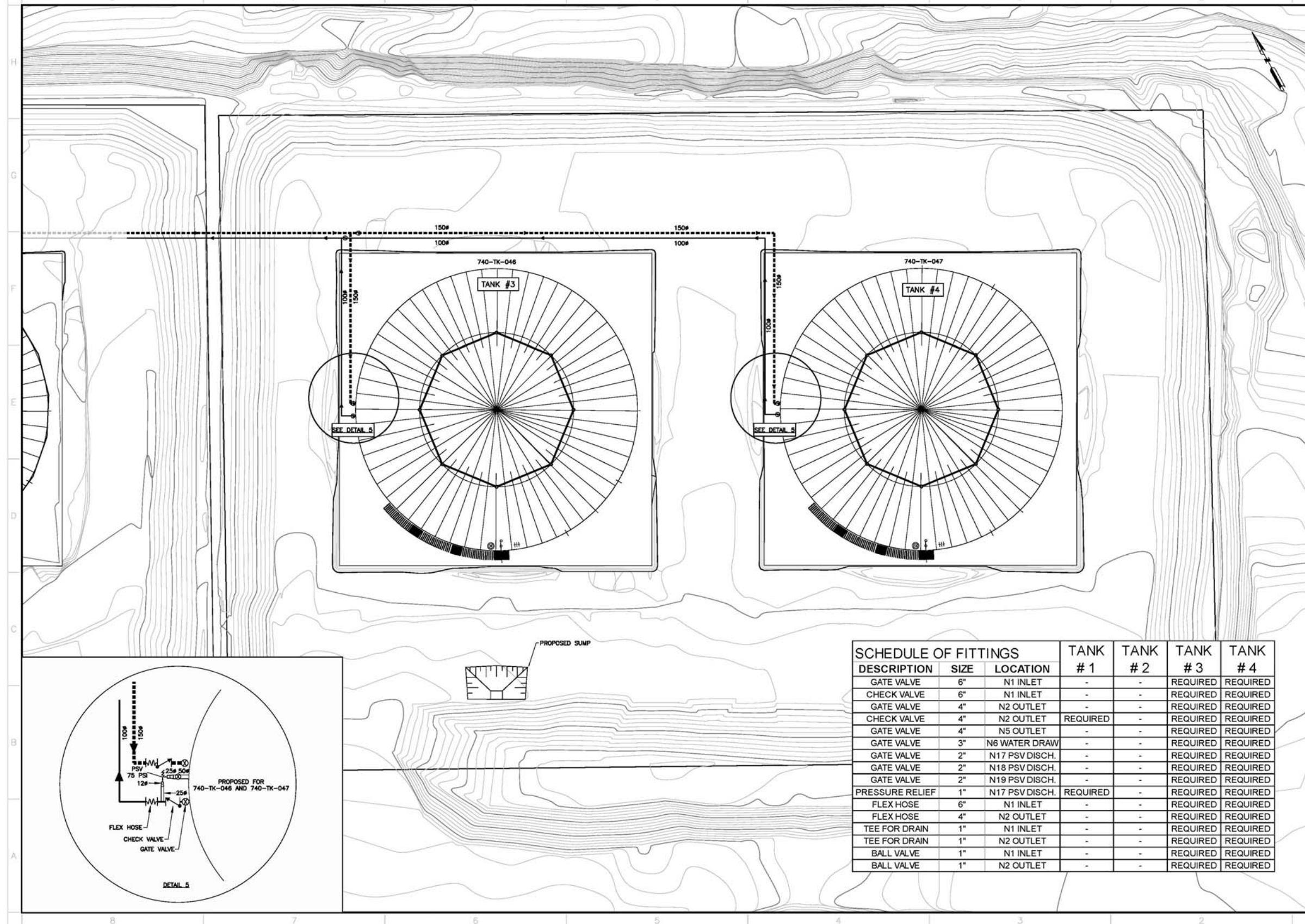
VD2259-2	1	$7/12$
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1

DRAWING NO.

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FORMAT ARCHI-LANDSCAPE



KEY PLAN

GENERAL NOTES

Groupe STAVIBEL
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Site Internet : www.stavisbel.qc.ca

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PATRICK GARD, P.ENG 2009/03/27

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NO.	DESCRIPTION
1	2009-03-27 FOR CONSTRUCTION

AGNICO-EAGLE
MEADOWBANK DIVISION

FILE
AGNICO-EAGLE - MEADOWBANK DIVISION
BAKER LAKE AREA 740

PIPING LAYOUT
FOR PHASE 2-B (2009)

DRAWN BY: FRANCIS ROSE, TECH DATE: 2009-03-27
CHECKED BY: PATRICK GARD, P.ENG
APPROVED BY: PATRICK GARD, P.ENG

SCALE: 1:200 DATE: 2009-03-27

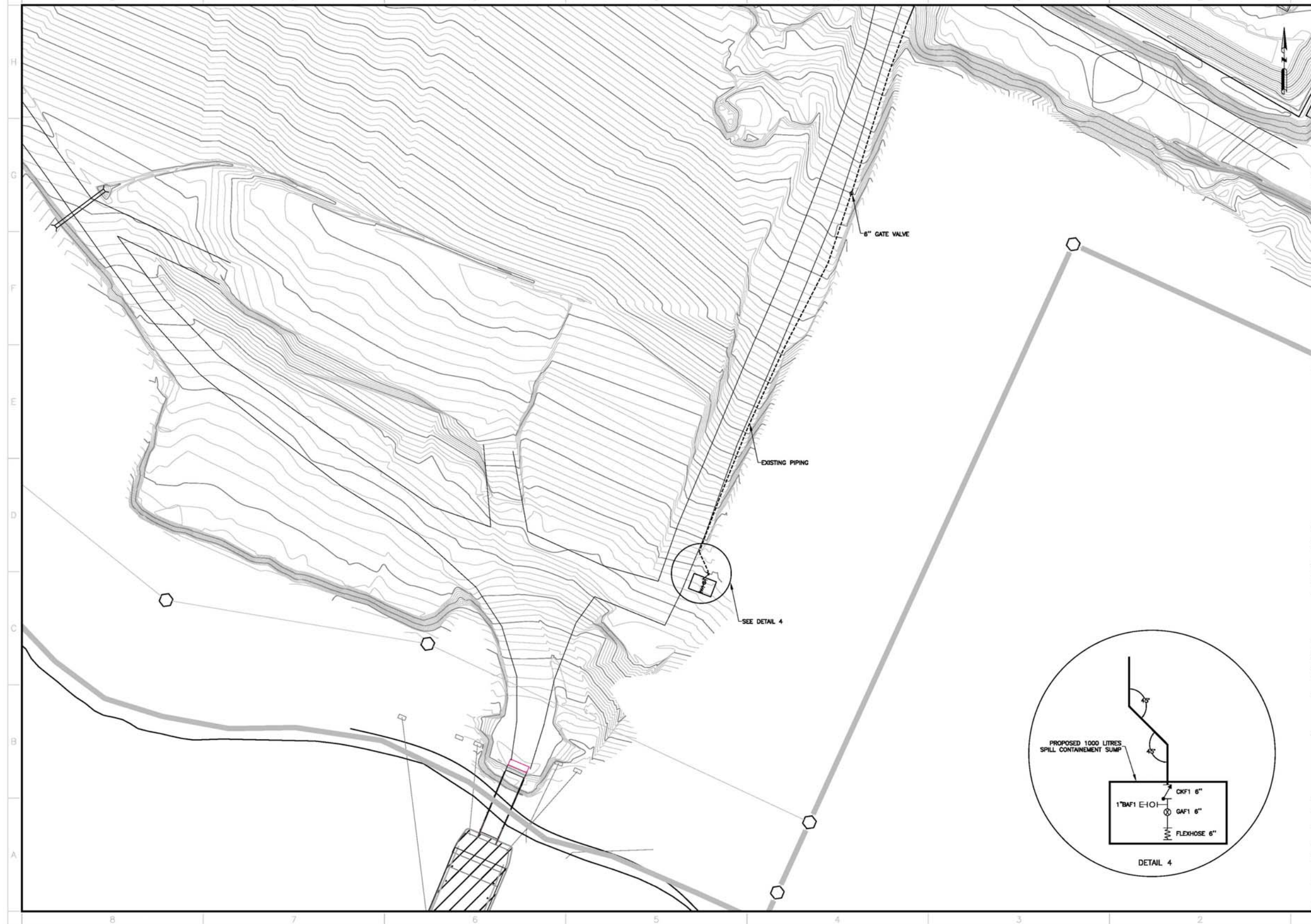
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PROJECT NO.: VD2259-2 REVISION: 1 SHEET: 12

DRAWING NO.

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FORMAT ARCHD-LANDSCAPE

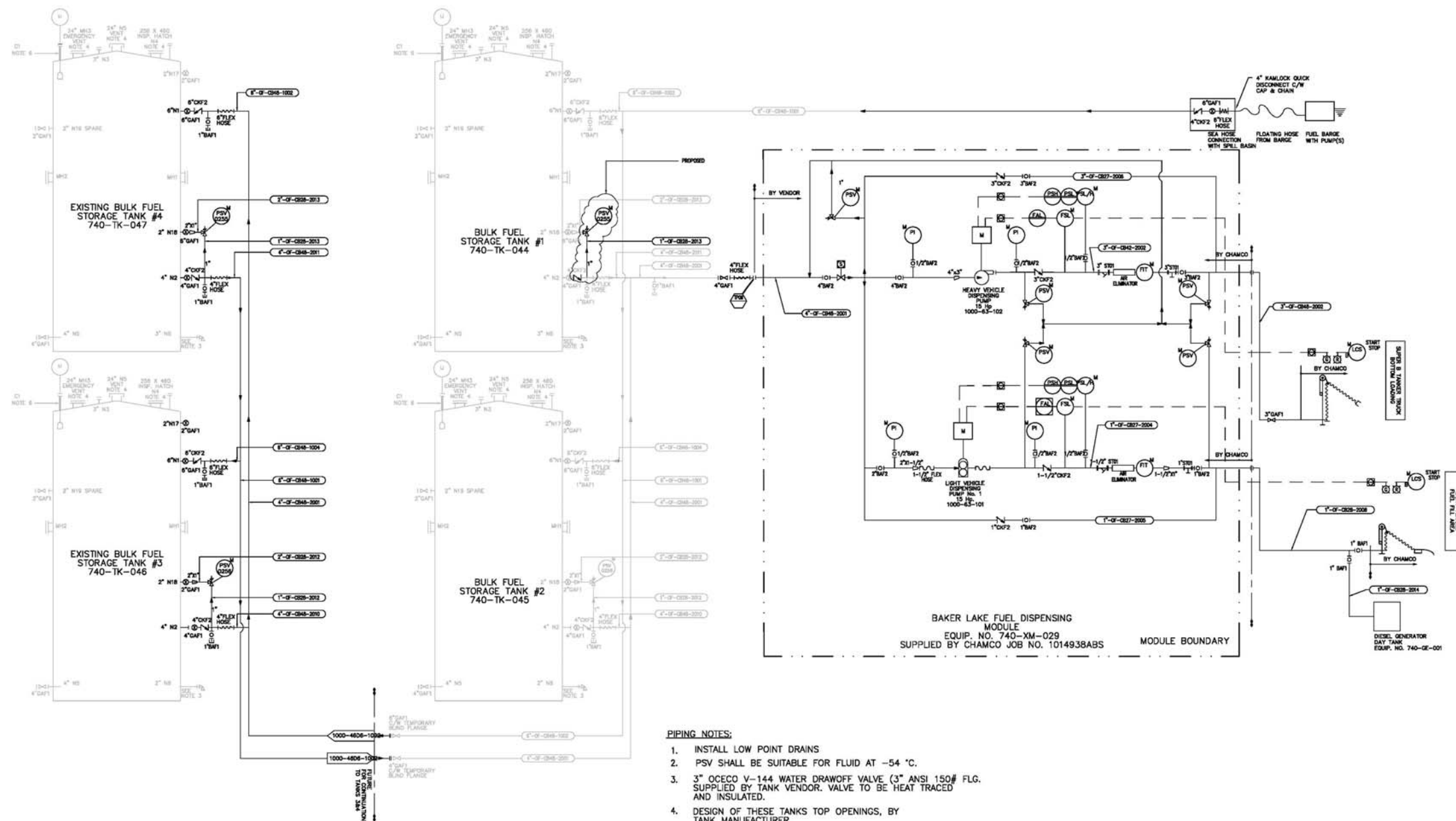


KEY PLAN													
GENERAL NOTES													
 Groupe STAVIBEL Consultants en Ingénierie 1271, 7e Rue Val-d'Or (Québec) J9P 3S1 Tél: (819) 825-2233 Téléc: (819) 825-1322 Courriel : stavel@stavibel.qc.ca Site Internet : www.stavibel.qc.ca													
ISSUED FOR CONSTRUCTION PATRICK GARD, P.ENG 2009/03/27													
<small>DESIGNER'S RESPONSIBILITY: TO VERIFY THAT THE DESIGN IS IN ACCORDANCE WITH THE REQUIREMENTS OF THE CLIENT AND THE REGULATORY AGENCIES.</small>													
<table border="1"><thead><tr><th>NO.</th><th>DATE</th><th>DESCRIPTION</th><th>BY</th><th>APP.</th><th>DATE</th></tr></thead><tbody><tr><td>1</td><td>09-03-27</td><td>FOR CONSTRUCTION</td><td>P.A.</td><td>P.A.</td><td></td></tr></tbody></table>		NO.	DATE	DESCRIPTION	BY	APP.	DATE	1	09-03-27	FOR CONSTRUCTION	P.A.	P.A.	
NO.	DATE	DESCRIPTION	BY	APP.	DATE								
1	09-03-27	FOR CONSTRUCTION	P.A.	P.A.									
REFERENCE DRAWINGS													
AGNICO-EAGLE MEADOWBANK DIVISION													
TITLE: AGNICO-EAGLE -- MEADOWBANK DIVISION BAKER LAKE AREA 740 PIPING LAYOUT													
DRAWN BY: FRANCIS ROSE, TECH DATE: 2009-03-27													
CHECKED BY: PATRICK GARD, P.ENG													
APPROVED BY: PATRICK GARD, P.ENG													
SCALE: 1:500 DATE: 2009-03-27													
DRAWING NO.: VD2259-BKL-009													
PROJECT NO.: VD2259-2													
REVISION: 1													
SHEET: 9 / 12													

00000 00

0 50 100 150 200 250 300mm

FORMAT ARCHD-LANDSCAPE



PIPING NOTES:

1. INSTALL LOW POINT DRAINS
2. PSV SHALL BE SUITABLE FOR FLUID AT -54°C .
3. 3" OCECO V-144 WATER DRAFF VALVE (3" ANSI 150# FLG. SUPPLIED BY TANK VENDOR. VALVE TO BE HEAT TRACED AND INSULATED.
4. DESIGN OF THESE TANKS TOP OPENINGS, BY TANK MANUFACTURER
5. FLEXIBLE SS BRAIDED HOSE, 750mm LG. (FLEXONIC SENIOR, OR EQUAL)
6. VAREC 2500 LEVEL INDICATOR BY TANK MANUFACTURER

*SEE PLAN 008 FOR SCHEDULE OF FITTINGS

KEY PLAN

GENERAL NOTES

Groupe STAVIBEL
Consultants en Ingénierie
1271, 7e Rue
Val-d'Or (Québec) J9P 3S1
Tél: (819) 825-2233 Téléc: (819) 825-1322
Courriel: stavel@stabilbel.qc.ca
Site Internet: www.stabilbel.qc.ca

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PATRICK GARD, P.ENG 2009/03/27

NO.	DATE	DESCRIPTION	BY	APP.
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REFERENCE DRAWINGS

AGNICO-EAGLE
MEADOWBANK DIVISION

FILE
AGNICO-EAGLE - MEADOWBANK DIVISION
BAKER LAKE AREA 740

PROCESS AND INSTRUMENTATION DIAGRAM

DRAWN BY: FRANCIS ROSE, TECH DATE: 2009-03-27

CHECKED BY: PATRICK GARD, P.ENG

APPROVED BY: PATRICK GARD, P.ENG

SCALE: N.T.S. DATE: 2009-03-27

DRAWING NO.: VD2259-BKL-010

PROJECT NO.: VD2259-2

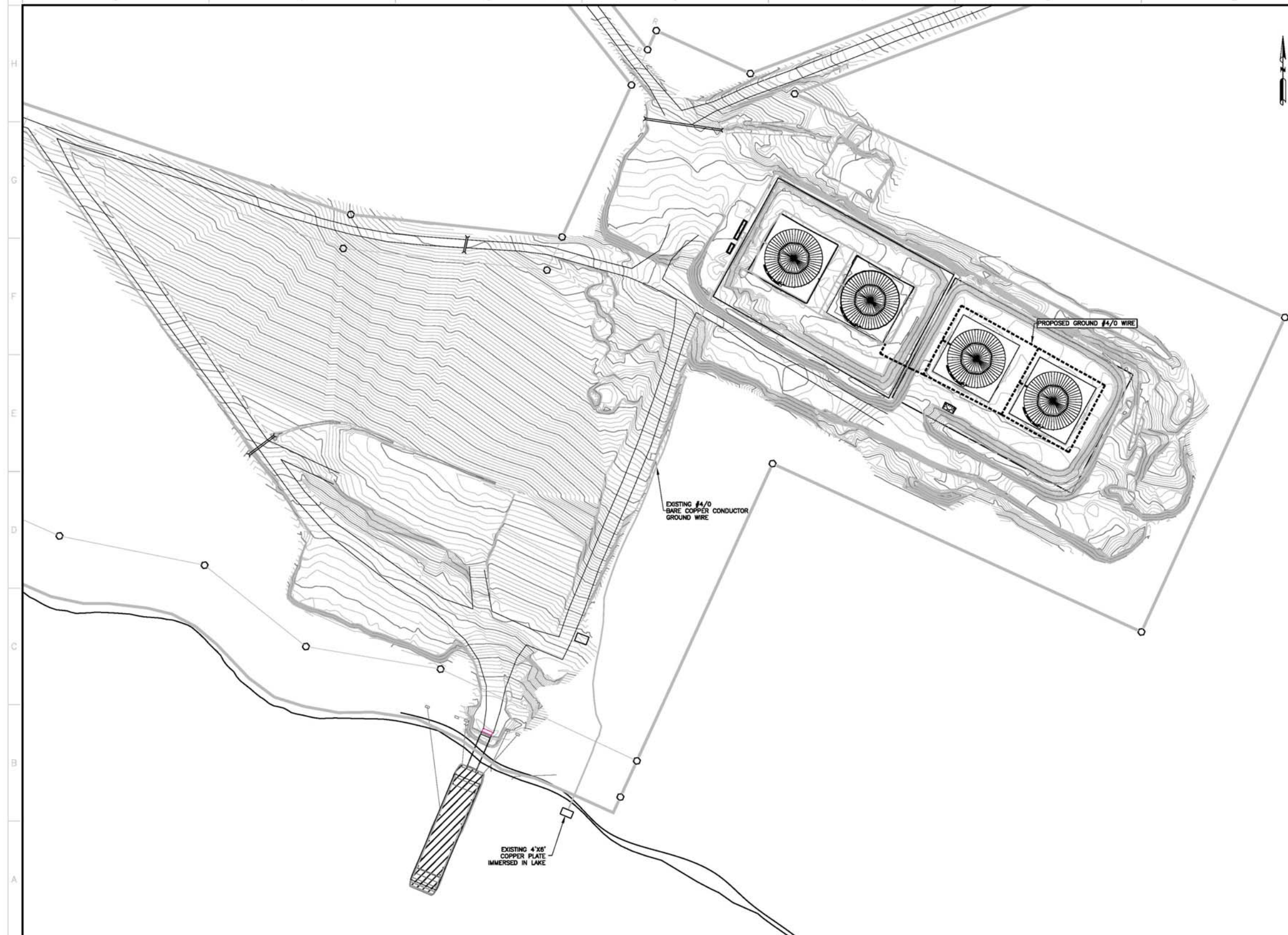
REVISION: 1

SHEET: 10/12

PROJECT NO.

0 50 100 150 200 250 300mm

FORMAT ARCHO-LANDSCAPE



KEY PLAN

GENERAL NOTES

Groupe STAVIBEL
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ISSUED FOR CONSTRUCTION
PATRICK GARD, P.ENG
2008/03/27

REVISIONS

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REFERENCE DRAWINGS



NO.	DATE	DESCRIPTION	BY	APP.
1	08-03-27	FOR CONSTRUCTION	P.A.	P.A.

AGNICO-EAGLE
MEADOWBANK DIVISION

AGNICO-EAGLE - MEADOWBANK DIVISION
BAKER LAKE AREA 740
GENERAL LAYOUT
ELECTRICAL GROUND

DRAWN BY: FRANCIS ROSE, TECH DATE: 2008-03-27

CHECKED BY: PATRICK GARD, P.ENG

APPROVED BY: PATRICK GARD, P.ENG

SCALE: 1:1000 DATE: 2008-03-27

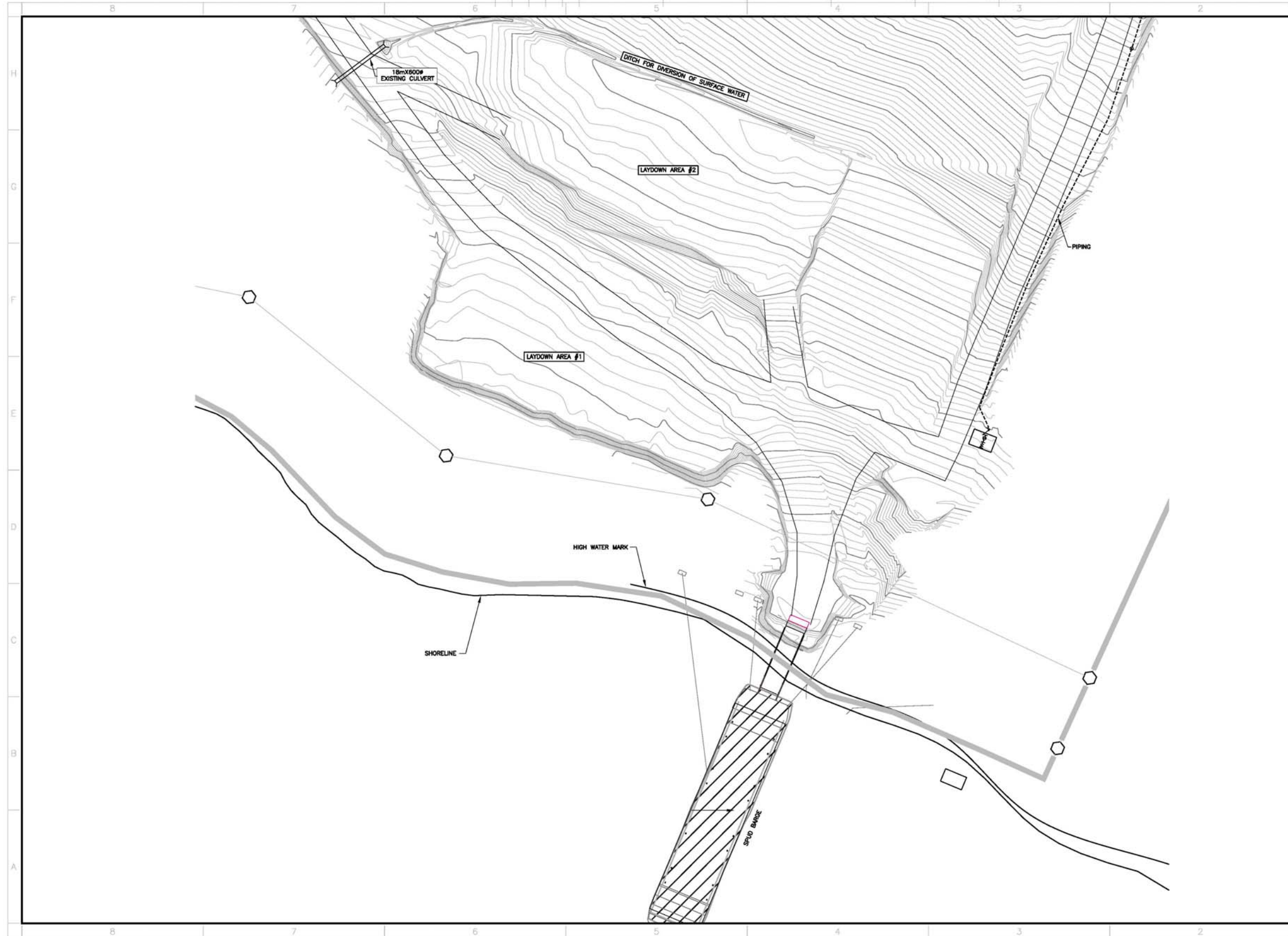
DRAWING NO.: VD2259-BKL-011

PROJECT NO.: VD2259-2 REVISION: 1 SHEET: 11/12

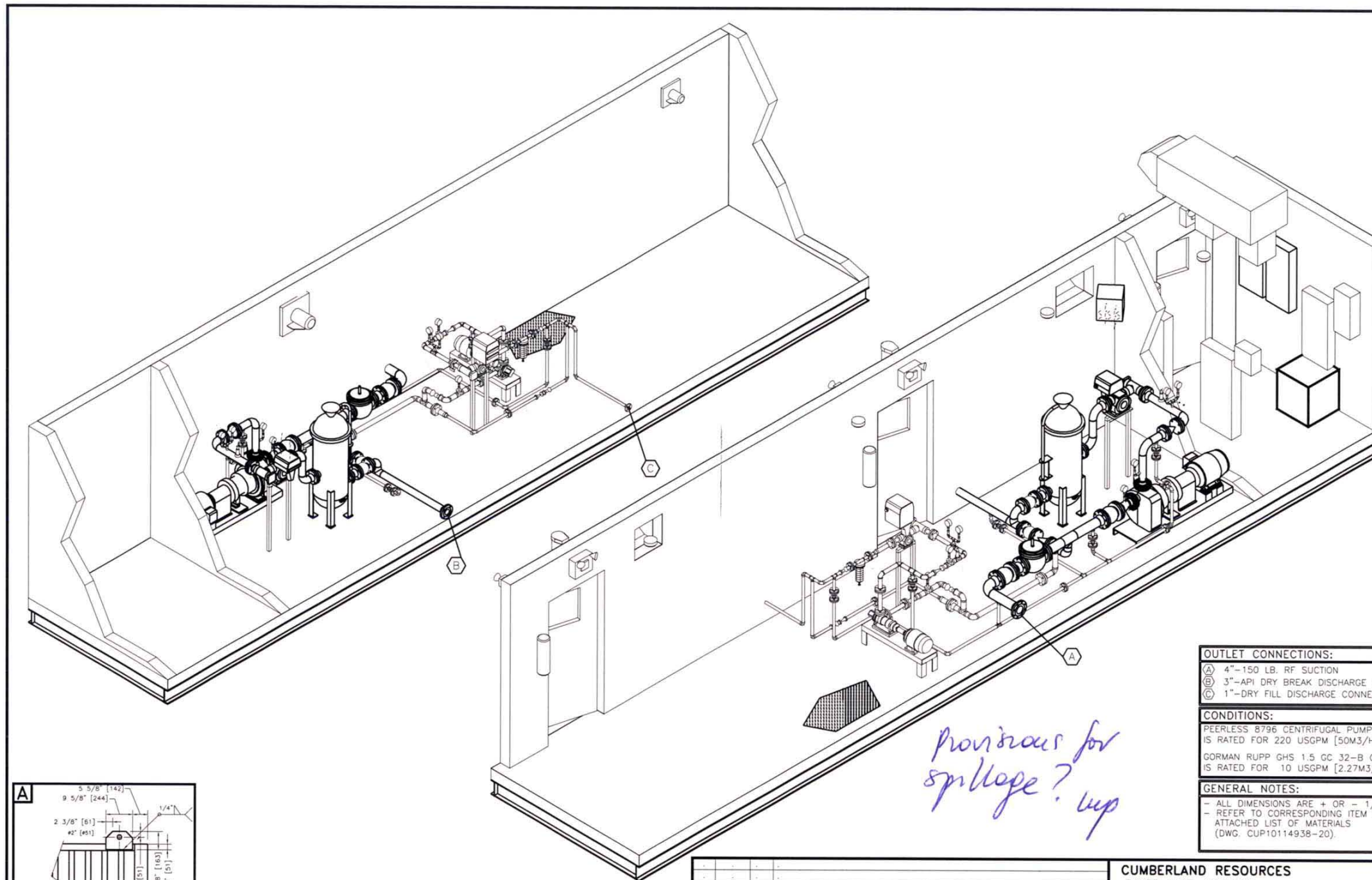
DRAWING NO.

0 50 100 150 200 250 300mm

FORMAT ARCHD-LANDSCAPE



KEY PLAN	
GENERAL NOTES	
Groupe STAVIBEL Consultants en Ingénierie 1271, 7e Rue Val-d'Or (Québec) J9P 3S1 Tél: (819) 825-2233 Téléc: (819) 825-1322 Courriel : stavel@stabilbel.qc.ca Site Internet : www.stabilbel.qc.ca	
REVISIONS	
REFERENCE DRAWINGS	
AGNICO-EAGLE MEADOWBANK DIVISION	
AGNICO-EAGLE - MEADOWBANK DIVISION BAKER LAKE AREA 740 GENERAL LAYOUT	
DESIGNED BY	FRANCIS ROSE, TECH
CHECKED BY	PATRICK GARD, P.ENG
APPROVED BY	PATRICK GARD, P.ENG
SCALE	1:500
DATE	2009-03-27
VD2259-BKL-012	
PROJECT NO.	VD2259-2
REVISION	1
SHEET	12 / 12



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☐ Code 3 "Do not Proceed, Revise as Noted and Re-submit"

☐ Code 4 "Information Only"

Reviewed only for general conformity with the drawings and specifications. The Consulting Engineer does not warrant or represent that the information contained on this drawing is either accurate or complete. Sole responsibility for correct design, details and dimensions shall remain with the party submitting the drawing.

HATCH

By _____

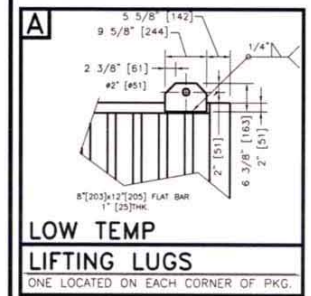
Date _____

RECEIVED

JUL 18 2007

DRAWING CONTROL

HATCH



OUTLET CONNECTIONS:

(A) 4"-150 LB. RF SUCTION

(B) 3"-API DRY BREAK DISCHARGE CONNECTION (HEAVY FILL)

(C) 1"-DRY FILL DISCHARGE CONNECTION (LIGHT FILL)

CONDITIONS:

PEERLESS 8796 CENTRIFUGAL PUMP AT DISCHARGE HEAD IS RATED FOR 220 USGPM [50M3/HR] AT 100' [30M] TDH.

GORMAN RUPP GHS 1.5 GC 32-B GEAR PUMP AT DISCHARGE HEAD IS RATED FOR 10 USGPM [2.27M3/HR] AT 110' [33.53M] TDH.

GENERAL NOTES:

- ALL DIMENSIONS ARE + OR - 1/2" [13 mm].

- REFER TO CORRESPONDING ITEM NUMBER ON THE ATTACHED LIST OF MATERIALS (DWG. CUP1014938-20).

Provisions for spillage? up

PRELIMINARY

FOR APPROVAL

CHAMCO INDUSTRIES LTD.

REV.	DATE	BY	DESCRIPTION

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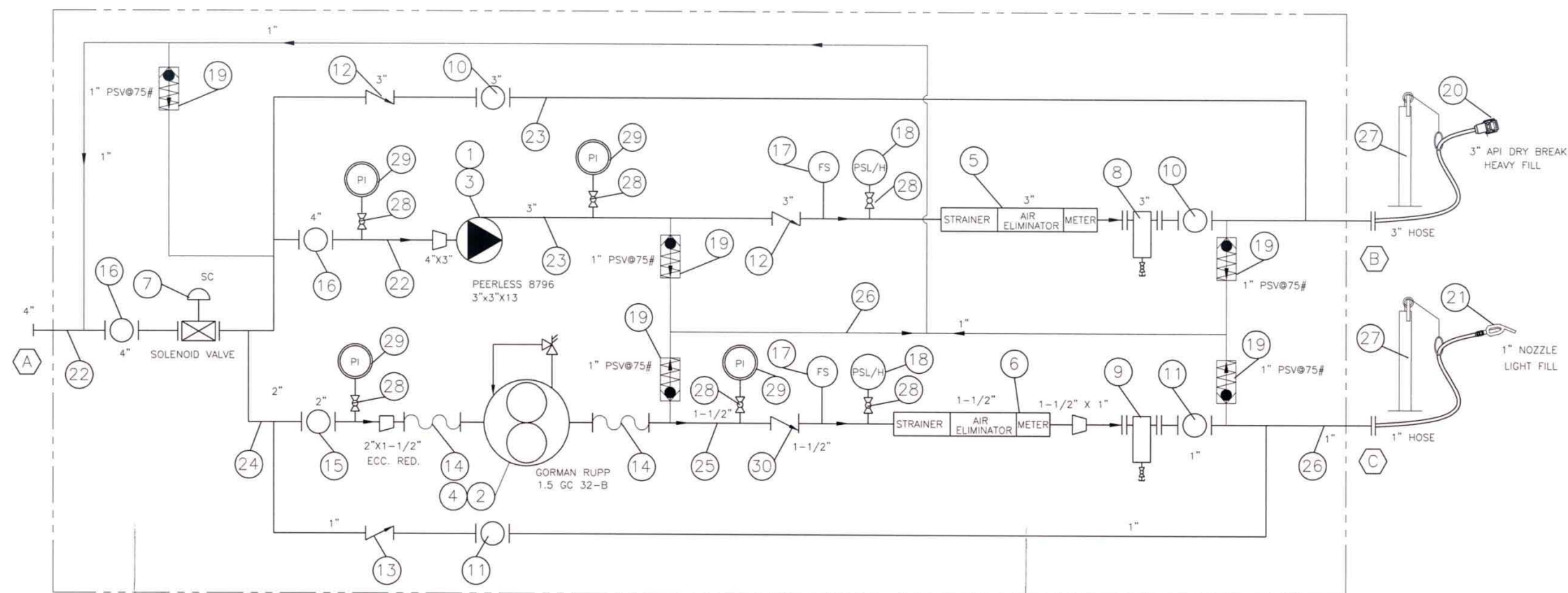
CHAMCO

CHAMCO INDUSTRIES LTD.

VANCOUVER - CALGARY - EDMONTON - PRINCE GEORGE

CUMBERLAND RESOURCES		DESIGNED BY	D.J.C.
BAKER LAKE, NUNAVUT		DRAWN BY	G.R.M.
P.O. No. M268		CHECKED BY	
BAKER LAKE DISPENSING FUEL TRANSFER MODULE		JOB No.	1014938ABS
PEERLESS 8796, 3x3x13MTP CENTRIFUGAL PUMP (1)			
GORMAN RUPP GHS 1.5 GC 32-B GEAR PUMP (1)			
ISOMETRIC VIEW GENERAL ARRANGEMENT			
DATE	25-APRIL-07	SCALE	N.T.S.
DWG No.	CUP1014938-22	REV.	0

4-30-1741-M268-VD-0012



BAKER LAKE
DISPENSING MODULE

LEGEND

- ① PEERLESS - 3" X 3" - 13 MTP 8796 HEAVY FILL PUMP RATED AT 220 USGPM (1)
- ② GORMAN RUPP GHS 1.5 GC 32-B PUMP RATED AT 10 USGPM - LIGHT FILL (1)
- ③ ELECTRIC MOTOR (15HP, 1800 RPM, 254T, 3/60/575V) - NOT SHOWN
- ④ ELECTRIC MOTOR (1.5HP, 1200 RPM, 182T, 3/60/575V) - NOT SHOWN
- ⑤ TCS 700-30 3" AIR ELLIMINATOR, DISCHARGE STRAINER AND FLOW METER
- ⑥ TCS 700-15 1-1/2" ELLIMINATOR, DISCHARGE STRAINER AND FLOW METER
- ⑦ 4" 120VAC SOLENOID FIRE SAFE VALVE
- ⑧ 3" BASKET FILTER
- ⑨ 1" BASKET FILTER
- ⑩ 3" BALL VALVE
- ⑪ 1" BALL VALVE
- ⑫ 3" CHECK VALVE
- ⑬ 1" CHECK VALVE
- ⑭ 1-1/2" FLEX HOSE
- ⑮ 2" BALL VALVE
- ⑯ 4" BALL VALVE
- ⑰ FLOW SWITCH
- ⑱ PRESSURE SWITCH HIGH/LO DISCHARGE PRESSURE ALARM
- ⑲ 1" PSV SET AT 75PSI
- ⑳ 3" API DRY BREAK (HEAVY FILL)
- ㉑ 1" NOZZLE (LIGHT FILL)
- ㉒ 4" LOW TEMP PIPE AND FITTINGS
- ㉓ 3" LOW TEMP PIPE AND FITTINGS
- ㉔ 2" LOW TEMP PIPE AND FITTINGS
- ㉕ 1-1/2" LOW TEMP PIPE AND FITTINGS
- ㉖ 1" LOW TEMP PIPE AND FITTINGS
- ㉗ HIGH HOSE RETRIEVER AND BUN
- ㉘ 1/2" BALL VALVE
- ㉙ PRESSURE GAUGE
- ㉚ 1-1/2" CHECK VALVE

HATCH

- ☐ Code 1 "Proceed, No Exception Taken"
- ☐ Code 2 "Proceed, with Exceptions as Noted and Re-submit"
- ☐ Code 3 "Do not Proceed, Revise as Noted and Re-submit"
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Reviewed only for general conformity with the drawings and specifications. The Consulting Engineer does not warrant or represent that the information contained on this drawing is either accurate or complete. Sole responsibility for correct design, details and dimensions shall remain with the part submitting the drawing.

HATCH

By _____



OUTLET CONNECTIONS:

- ① 4"-150# RFWN FLANGE
- ② 3"-API DRY BREAK- HEAVY FILL
- ③ 1"-DISCHARGE NOZZLE-LIGHT FILL

CONDITIONS:

EACH PEERLESS 8796 CENTRIFUGAL PUMP AT DISCHARGE HEAD IS RATED FOR 220 USgpm [50M3/HR] AT 100' [30M] TDH.
EACH GORMANN RUPP GHS 1.5 GC 32-B GEAR PUMP AT DISCHARGE HEAD IS RATED FOR 10 USgpm[2.27M3/HR] AT 110'[33.53M] TDH.

GENERAL NOTES:

- ALL DIMENSIONS ARE + OR - 1/2" [13 mm].

REV.	DATE	BY	DESCRIPTION

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VANCOUVER - CALGARY - EDMONTON - PRINCE GEORGE

CUMBERLAND RESOURCES BAKER LAKE, NUNAVUT P.O. No. M268 BAKER LAKE DISPENSING FUEL TRANSFER MODULE PEERLESS 8796, 3x3x13MTP CENTRIFUGAL PUMP (1) GORMAN RUPP GHS 1.5 GC 32-B GEAR PUMP (1) FLOW DIAGRAM	DESIGNED BY D.J.C. DRAWN BY G.R.M. CHECKED BY . JOB No. 1014938ABS
DATE 25-APRIL-07 SCALE N.T.S. DWG No. CUP1014938-25 REV. 0	

APPENDIX 2

SAFE FILL LEVELS FOR ALL FUEL TANKS

TEMPERATURE OF FUEL in the barge at discharge	MAXIMUM FUEL LEVEL to be read on the VAREC float level			
	TANK #1	TANK #2	TANK #3	TANK #4
0°C	11.68 m	11.64 m	11.70 m	11.70 m
+ 5°C	11.73 m	11.69 m	11.75 m	11.75 m
+10°C	11.79 m	11.75 m	11.81 m	11.81 m
+15°C	11.84 m	11.80 m	11.86 m	11.86 m

NOTE : EACH TANK HAS A SLIGHTLY DIFFERENT ELEVATION, SO CARE MUST BE TAKEN DURING HYDRAULIC BALANCING OF TANKS, ESPECIALLY WHEN THOSE ARE FULL.

Appendix A2

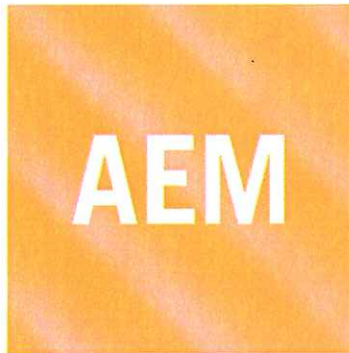
Baker Lake Fuel Storage Installations: Final Report Following Construction of Phase 2-B (2009)



**AGNICO-EAGLE MINES LTD
MEADOWBANK DIVISION**

BAKER LAKE FUEL STORAGE INSTALLATIONS

**FINAL REPORT
FOLLOWING THE CONSTRUCTION
OF
PHASE 2-B (2009)**



**AGNICO-EAGLE MINES LTD
MEADOWBANK DIVISION**

BAKER LAKE FUEL STORAGE INSTALLATIONS

**FINAL REPORT
FOLLOWING THE CONSTRUCTION
OF
PHASE 2-B (2009)**

PREPARED BY :

Patrick Giard, P.Eng., CCE

2009-12-07



AGNICO-EAGLE MINES LTD
MEADOWBANK DIVISION

BAKER LAKE FUEL STORAGE INSTALLATIONS

FINAL REPORT

FOLLOWING THE CONSTRUCTION

TABLE OF CONTENTS

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2.0	SECONDARY CONTAINMENT BERMS	3
2.1	Final completion of berm enclosure	3
2.2	Breach in middle berm.....	3
3.0	HDPE MEMBRANE WELDING	3
4.0	GEOTEXTILE INSTALLATION	4
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7.0	PRESSURE TESTING OF PIPELINE.....	5
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APPENDIX 1 : AS-BUILT DRAWINGS

VD2259-BKL-001 (revision 2), VD2259-BKL-008 (revision 3)

APPENDIX 2

QUALITY CONTROL DOCS : HDPE welding log and instrument qualification

1.0 EXECUTIVE SUMMARY

Agnico-Eagle Mines Limited has undertaken construction of a gold mining project in the Kivalliq region of Nunavut, about 70 km north of Baker Lake.

The yearly operations of this mining operation requires the storage of a minimum of forty million (40 000 000) liters of diesel fuel, which represents four (4) bulk fuel storage tanks, each with a nominal capacity of ten million (10 000 000) liters.

PHASE 1 (2007)

During the summer of 2007, Agnico-Eagle Mines Limited has built the first two (2) bulk fuel tanks, with a combined capacity twenty million (20 000 000) liters of diesel fuel. An impervious enclosure was built around it in order to provide secondary containment around the fuel tanks. These first two (2) bulk fuel tanks were then in condition to be filled.

PHASE 2-A (2008)

During the summer of 2008, Agnico-Eagle Mines Limited has built another two (2) bulk fuel tanks, for a total combined capacity of forty million (40 000 000) liters of diesel fuel. Only a portion of the enclosure was built around it, with the final purpose being to provide secondary containment around the fuel tanks. These other two (2) bulk fuel tanks were completed in late October 2008, and they have remained empty during the winter of 2008-09.

PHASE 2-B (2009)

During 2009, Agnico-Eagle Mines Limited has completed the installation of an impermeable HDPE membrane, which provides adequate secondary containment around the fuel tanks. This has allowed to fill up all four (4) bulk fuel tanks in the summer of 2009, with the piping installation towards tanks 3 and 4 being completed.

PHASE 3

Consideration is currently being given to an expansion project for the fuel storage facilities in Baker Lake. The scale of the project has been defined in a set of drawings and technical specifications, which will be used for the permitting process.

2.0 SECONDARY CONTAINMENT BERMES

2.1 Final completion of berm enclosure

During the construction of fuel tanks 3 and 4 there was a small part of the secondary containment enclosure built in 2008 had been left open to provide easy access.

The granular material and rock fill that was used for civil works was taken from an approved quarry, which has been demonstrated not to produce Acid Rock Drainage and to be non-Metal Leaching.

Given that these fuel tanks were to be filled up in August 2009, the berm enclosure was fully completed in July 2009, exactly as shown on the construction drawings and at a minimal crest elevation of 34.20 m.

2.2 Breach in middle berm

Once the berm enclosure was fully completed, a breach was made in the middle berm between fuel tanks 2 and 3. At that moment, fuel tanks 1 and 2 had been fully drawn with truck tankers, and were totally empty. Meanwhile, the mine operations relied on the fuel tanks located at the Meadowbank site.

The breach section in this middle berm was capped with an HDPE membrane at the 33.00 m elevation mark, which is the same as the tank rim elevation. This HDPE membrane was welded to the existing ones on the berm crests, thus ensuring an impermeable transition from one side to the other of both secondary containment areas. An access ramp was built over this breach to provide vehicle access inside the secondary containment area around fuel tanks 3 and 4.

3.0 HDPE MEMBRANE WELDING

A specialized crew from Saskatchewan was mobilized to Baker Lake for the completion of the HDPE membrane installation. The contractor was Enviroline Services inc.

During July 2008, or prior to the construction of fuel tanks 3 and 4, some HDPE panels were laid out under the fuel tanks. The edges of this HDPE membrane had been protected with plywood sheets and covered with a layer of screened sand.

The work that took place in 2009 was to weld some HDPE membrane rolls to those existing panels, and extend all those HDPE membrane rolls right up to the berm crest. The membrane was anchored into a trench, as indicated on the construction drawings.

Detailed reports of wedge welder seam logs and qualification tests, as well as logs for extrusion welder and qualification tests are enclosed herein, in Appendix 1.

4.0 GEOTEXTILE INSTALLATION

As indicated on the construction drawings, a geotextile was placed directly under and over the HDPE membrane, as a means to reduce the risk of puncturing this membrane.

5.0 SCREENED SAND COVER

As indicated on the construction drawings, a layer of screened sand was placed directly under and over the geotextile, as an additional means to reduce the risk of puncturing the HDPE membrane. This sand was screened at the Blueberry Hill pit and hauled to the worksite by local truckers.

6.0 WELDING OF PIPELINE

A crew from the ABF Mines contractor, composed of a qualified welder and a pipefitter, have completed the extension of the barge discharge pipeline towards tanks 3 and 4.

Also, some additional piping was installed from the tank 3 and 4 towards the fuel dispensing module, thus allowing to draw fuel from these tanks, after barge delivery.

Some pressure release valves were installed on each of these pipelines, with a discharge pressure set at 75 psi and piped back into the fuel tanks. This constitutes a protection feature against the effects of thermal expansion of fuel which was indicated on the construction drawings.

Another feature of the modifications implemented in 2009 is the installation of some swing check valves at the N₂ nipple outlets of all fuel tanks. This will most likely help the fuel dispensing pump keeps its prime when the fuel levels get low in the tanks.

The only exception to the complete compliance of these installations with the piping drawings is that the containment sump for the fuel sea hose connection shown on section A of drawing 017202-1000-46D4-1004 from SNC-Lavalin has not been installed.

The flanges and gaskets that were use for mechanical joints are rated for 150 psi.

7.0 PRESSURE TESTING OF PIPELINE

7.1 Selection of test method and suitable air pressure for testing

The purpose of the leak detection program is to proof the fuel delivery system in a non-destructive manner. Fuel pipelines were pressure tested with a non-inert gas, given that no petroleum product had ever entered the pipelines prior to testing.

Section 6.2 of CCME PN_1326 states that the testing pressure must be greater than 350 kPa (50.8 psi), but without exceeding the manufacturer specifications for flanges and gaskets of 1034 kPa (150 psi). For that purpose, an evaluation was made of the maximum operating pressure at the fuel sea hose connection of the barge discharge pipeline. The results are as follows :

Expected discharge flow rate : 0.090 m³/s

Maximum operating pressure = static pressure + velocity pressure + friction loss

Maximum operating pressure = 29.64 m + 1.24 m + 35.80 m = **94.7 psi**

Whereas static pressure = elevation of (tank overflow - pump intake) x 0.8396
static pressure = (44.90 m - 9.60 m) x diesel fuel density @ 2°C

Whereas friction loss was evaluated to be :

Pressure Loss (psi): 50.95 psi **Head Loss (ft):** 139.83 ft of diesel fuel

for the barge discharge pipeline

Fluid: diesel fuel

Pipe/Tubing ID (in): 6" or 150 mm

Flow Rate (USGPM): 1426.5 USGPM or 0.090 m³/s

Dynamic Viscosity of diesel fuel (cP): 5.0 cP

Specific Gravity (water=1): 0.8396 at 35°F

Temperature (F): 35°F or 2°C

Pipe Roughness (ft): 0.00015

Fluid Velocity (ft/sec): 16.19 ft/s or 4.93 m/s

Friction Factor: 0.019

Piping Length (ft): 900

Pressure Loss (psi): 50.84 psi

Head Loss (ft): 139.88 ft or 42.64 m of diesel fuel @ 0.8396

7.2 Results of air pressure testing of fuel piping

The test pressure has been set at 690 kPa (100 psi), and the stabilization of pressure due to ambient temperature was noted after pressurization at 100 psi was achieved for testing. The piping system was not considered to be leaking due to a pressure variation occurrence of less than 2% within at least two (2) hours, after noted stabilization of air pressure. Detailed results are stated hereunder.

TESTING DAY ONE

Section of piping tested	100 mm pipe	from TANK 3 to TANK 4	
DATE OF TESTING :	2009-07-24	Air temperature :	N/A
TEST STARTED AT :	07:55 AM	TEST WAS ENDED AT :	02:57 PM
INITIAL PRESSURE	99 PSI	FINAL PRESSURE READING	102 PSI

Section of piping tested	150 mm pipe	from TANK 3 to TANK 4	
DATE OF TESTING :	2009-07-24	Air temperature :	N/A
TEST STARTED AT :	10:25 AM	TEST WAS ENDED AT :	02:55 PM
INITIAL PRESSURE	99 PSI	FINAL PRESSURE READING	102 PSI

TESTING DAY TWO

Section of piping tested	100 mm pipe	from TANK 2 to TANK 3	
DATE OF TESTING :	2009-07-25	Air temperature :	18°C
TEST STARTED AT :	01:08 PM	TEST WAS ENDED AT :	VOID TEST
INITIAL PRESSURE	100 PSI	FINAL PRESSURE READING	NIL

The cause of air pressure drop was located (missing gasket) and testing resumed.

Section of piping tested	100 mm pipe	from TANK 2 to TANK 3	
DATE OF TESTING :	2009-07-25	Air temperature :	18°C
TEST STARTED AT :	02:12 PM	TEST WAS ENDED AT :	06:15 PM
INITIAL PRESSURE	100 PSI	FINAL PRESSURE READING	100 PSI

TESTING DAY THREE

Section of piping tested	150 mm pipe	from TANK 2 to TANK 3	
DATE OF TESTING :	2009-07-26	Air temperature :	15°C
TEST STARTED AT :	09:30 AM	TEST WAS ENDED AT :	VOID TEST
INITIAL PRESSURE	100 PSI	FINAL PRESSURE READING	80 PSI

The cause of air pressure drop was located (tightening bolts) and testing resumed.

Section of piping tested	100 mm pipe	from TANK 2 to TANK 3	
DATE OF TESTING :	2009-07-26	Air temperature :	18°C
TEST STARTED AT :	11:45 AM	TEST WAS ENDED AT :	04:25 PM
INITIAL PRESSURE	100 PSI	FINAL PRESSURE READING	101 PSI

AGNICO EAGLE MINES LTD
MEADOWBANK DIVISION
PROJECT REF. VD2415-000

BAKER LAKE: TANK FARM

IMPERMEABLE ENCLOSURE AROUND TANKS #3 AND #4

CONTRACTOR: ENVIROLINE SERVICES INC.

- Contents
- 1) AS BUILT
 - 2) WEDGE WELDER SEAM LOG
 - 3) WEDGE WELDER QUALIFICATIONS
 - 4) EXTRUSION LOG
 - 5) EXTRUSION WELDER QUALIFICATIONS

Enviroline Services Supervisor


DEREK PROVOST

JULY 08, 2009
ENVIROLINE

 2009/07/08
PATRICK GIARD, P.Eng.

July 1 - 8 2009

—E

BAKER LAKE: TANK FARM

AN

ENVIKOLINE

08/07/09

60 mil / geotextile x2

400°C @ 35%

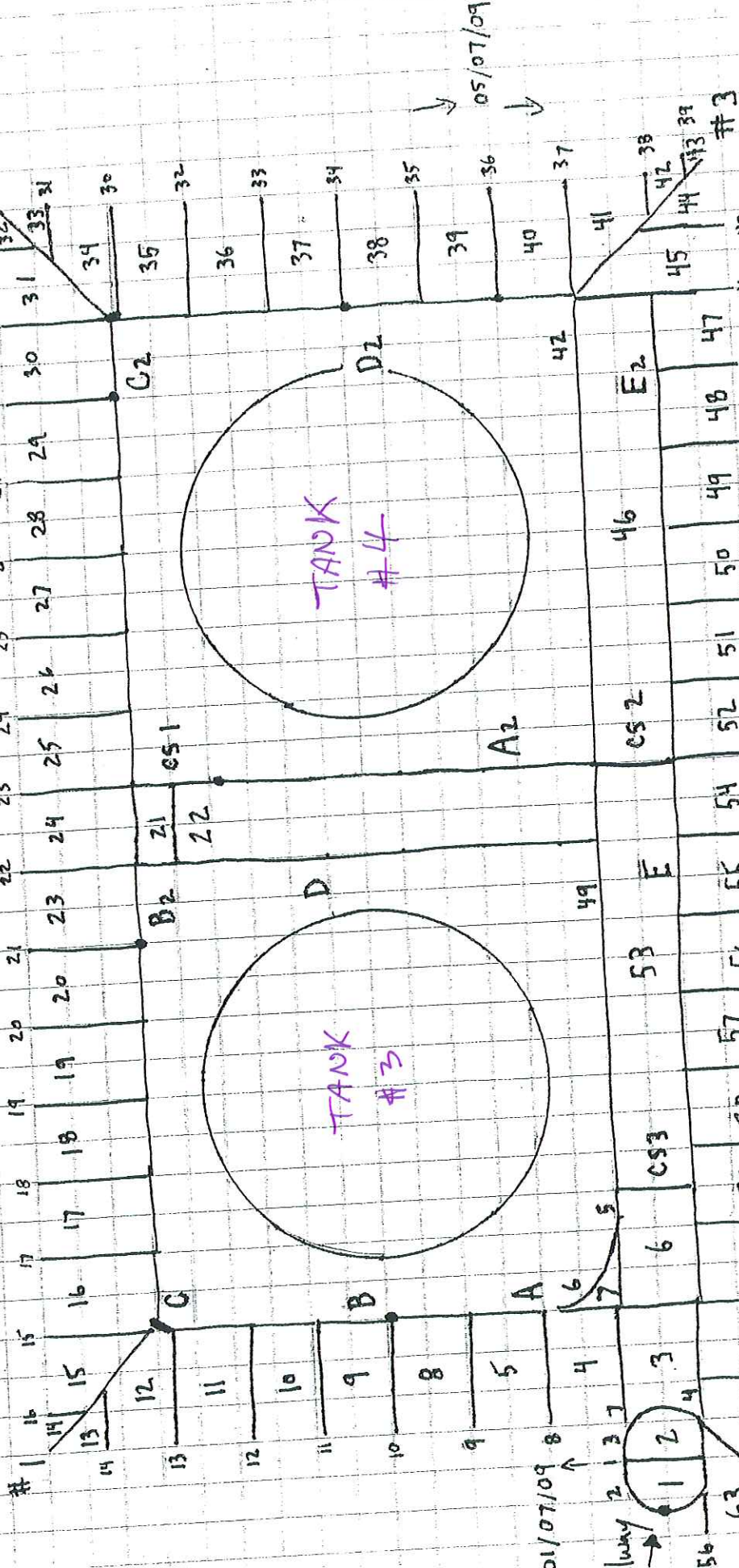
DAP C4

ATP @ 60psi / MP

→ 04/07/09 →

→ 03/07/09 →

→ 02/07/09 →



* Seams are highlighted

234 corners

A-E + A2 - E2 - Tie in seams

End.

avioline services inc.
Box 7539 Sackatoon, SK S7N 4J4 Tel 306 242 8836 Fax 306 249 6721 Email info@avioline.com

Edge Welder Seam Log

Project	QC Tech.	Drive Pressure
TANK FARM	MD	60
Wedge Temp.	400°C	Dwell Pressure
BAKER LAKE	Wedge Gap	Comments
60 mil		

Fusion Information				Testing Information				Date				Comments
HDPE Weld				Air Test		60 psi		Date		Date		
mm #	Tech.	Temp	Speed	Vise Grip	Start	Finish	Start	Finish	Welded		Tested	
1	DAR	400	35%	✓	6:35	6:40	60	60	01	02	July 2009	
2				✓	5:30	5:35			01	02		
3				✓	5:55	6:00			01	02		
4				✓	6:40	6:45			01	02		
5				✓	6:29	6:34			01	02		
6				✓	1:05	1:11			01	02		
7				✓	1:12	1:17			01	02		
8				✓	11:42	11:47			02	03		
9				✓	11:49	11:54			02	03		
10				✓	11:56	12:01			02	03		
11				✓	10:00	10:05			02	03		
12				✓	10:06	10:11			02	03		
13				✓	10:12	10:17			02	03		
14				✓	10:18	10:23			02	03		
15				✓	10:24	10:29			02	03		
16				✓	8:45	8:50			03	04		
17				✓	8:51	8:56			03	04		
18				✓	8:57	9:02			03	04		
19				✓	9:30	9:35			03	04		
20				✓	9:03	9:08	✓	✓	03	04		

Edge Welder Seam Log

Project	TANK FARM	QC Tech.	MP	Drive Pressure	60
Location	BAKER LAKE	Wedge Temp.	400°C	Dwell Pressure	
Serial	60 mil	Wedge Gap		Comments	

Fusion Information				Testing Information										Date Tested	Comments
m #	Tech.	HDPE Temp	Weld Speed	Vise Grip	Peel Test Inside	Peel Test Outside	Air Test Start	Air Test Finish	60 psi Start	60 psi Finish	Date Welded				
1	DAP	400	35%	✓	116	121	8:16	8:21	60	60	04	05	July 2009		
2				✓	117	123	8:22	8:27			05	05			
3				✓	112	119	2:25	2:30			05	05			
4				✓	108	117	2:31	2:36			05	05			
5				✓	114	119	2:37	2:42			05	05			
6				✓	115	121	2:49	2:54			05	05			
7				✓	110	120	2:55	3:00			05	06			
8				✓	113	118	6:10	6:15			05	06			
9				✓	117	114	6:16	6:21			05	06			
10				✓	117	113	6:22	6:27			05	06			
11				✓	116	117	6:28	6:33			05	06			
12				✓	112	119	6:15	6:20			06	06			
13				✓	113	121	6:21	6:26			06	06			
14				✓	115	120	6:27	6:32			06	06			
15				✓	117	116	6:33	6:38			06	06			
16				✓	114	115	6:39	6:44			06	06			
17				✓	112	117	6:45	6:50			06	06			
18				✓	118	120	6:51	6:56			06	07			
19				✓	113	114	6:57	7:02			06	07			
20				✓	113	118	7:03	7:08	✓	✓	06	07			

Welder Seam Log

TANK FARM	QC Tech. M7	Drive Pressure 60
BAKER LAKE	Wedge Temp. 400°C	Dwell Pressure
60 mil	Wedge Gap	Comments

Testing Information

HDPE Weld			Peel Test			Air Test			60 psi 60			Date			Date			Comments		
Tech.	DAP	Temp	Speed	Weld	Vis	Grip	Inside	Outside	Start	Finish	Start	Finish	Start	Finish	Welded	Tested	Comments			
✓	✓	400	35%	✓	✓	✓	109	114	6:09	7:14	6:09	7:14	6:09	7:14	06	06	06	July 2009		
✓	✓	✓	✓	✓	✓	✓	114	118	2:30	2:35	✓	✓	✓	✓	06	06	06			
✓	✓	✓	✓	✓	✓	✓	115	116	2:36	2:41	✓	✓	✓	✓	06	06	06			
✓	✓	✓	✓	✓	✓	✓	114	118	2:42	2:47	✓	✓	✓	✓	06	06	06			
✓	✓	✓	✓	✓	✓	✓	113	112	2:48	2:53	✓	✓	✓	✓	06	06	06			
✓	✓	✓	✓	✓	✓	✓	112	111	3:00	3:05	✓	✓	✓	✓	06	06	06			
✓	✓	✓	✓	✓	✓	✓	113	113	3:06	3:11	✓	✓	✓	✓	06	06	06			
✓	✓	✓	✓	✓	✓	✓	110	115	3:12	3:17	✓	✓	✓	✓	06	06	06			
✓	✓	✓	✓	✓	✓	✓	116	117	6:20	6:25	✓	✓	✓	✓	06	08	08			
✓	✓	✓	✓	✓	✓	✓	118	118	6:26	6:31	✓	✓	✓	✓	06	08	08			
✓	✓	✓	✓	✓	✓	✓	112	116	6:32	6:37	✓	✓	✓	✓	07	08	08			
✓	✓	✓	✓	✓	✓	✓	114	117	6:38	6:43	✓	✓	✓	✓	07	08	08			
✓	✓	✓	✓	✓	✓	✓	119	118	6:44	6:49	✓	✓	✓	✓	07	08	08			
✓	✓	✓	✓	✓	✓	✓	117	116	6:50	6:55	✓	✓	✓	✓	07	08	08			
✓	✓	✓	✓	✓	✓	✓	115	118	6:56	7:01	✓	✓	✓	✓	07	08	08			
✓	✓	✓	✓	✓	✓	✓	114	115	7:06	7:11	✓	✓	✓	✓	07	08	08			
✓	✓	✓	✓	✓	✓	✓	112	118	7:12	7:17	✓	✓	✓	✓	07	08	08			
✓	✓	✓	✓	✓	✓	✓	109	119	7:18	7:23	✓	✓	✓	✓	07	08	08			
✓	✓	✓	✓	✓	✓	✓	111	114	7:24	7:29	✓	✓	✓	✓	07	08	08			
✓	✓	✓	✓	✓	✓	✓	115	117	7:30	7:35	✓	✓	✓	✓	07	08	08			

Welder Seam Log		QC Tech.	Drive Pressure
TANK FARM	MY		60
BAKER LAKE	400 °C		Dwell Pressure
	Wedge Gap		Comments
1 60 mil			

on Information				Testing Information											
TANK FARM				QC Tech.		MP		Wedge Temp.		400 °C		Drive Pressure		60	
1 BAKER LAKE				Wedge Temp.				Wedge Gap				Dwell Pressure			
1 60 mil				Wedge Gap								Comments			
HDPE Weld				Peel Test		Air Test		psi		Date		Date		Comments	
Tech.	Temp	Speed	Vise	Grip	Inside	Outside	Start	Finish	Start	Finish	Welded	Tested			
DAP	400°C	35%	✓	✓	116	117	11:30	11:35	60	60	02	02			July 2009
			✓	✓	114	112	11:36	11:41			02	02			
			✓	✓	114	114	11:42	11:47			02	02			
			✓	✓	117	116	1:24	1:29			03	04			
			✓	✓	113	119	1:30	1:35			04	04			
			✓	✓	109	121	6:55	7:00			05	05			
			✓	✓	111	109	7:00	7:05			05	05			
			✓	✓	112	112	7:12	7:17			05	05			
			✓	✓	118	117	7:18	7:23			05	05			
			✓	✓	115	121	2:24	7:29			05	05			
			✓	✓	112	119	11:42	11:47			02	02			
			✓	✓	118	117	11:00	11:05			03	03			
			✓	✓	116	112	1:10	1:15			06	07			
			✓	✓	117	119	1:25	1:30			07	07			
			✓	✓	116	114	2:31	2:36			03	03			
			✓	✓	112	121	1:30	1:35			07	07			
			✓	✓	119	117	8:00	8:05	✓	✓	07	07			
											</				

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Wedge Welder Qualification Data

Date	July 1, 2009	Wedge Welder #	04
Project	Tank Farm	Travel Speed	35%
Work Area	Baker Lake	Drive Pressure	* 60
Material	60 mil	Dwell Pressure	*
QC tech.	MD	Wedge Setting	*
Welder/Operator	DAP	Wedge Temp.	400°C
Test Identification	A.M.	Sheet Temp.	*
Test Location	ON SITE	Testing Temp.	14°C

Destructive Testing Results

Vice Grip Peel	
Outside Track	Inside Track
✓	✓
✓	✓

Tensometer Peel				
Outside Track		Inside Track		Comments
Lb/Inch	%Separation	Lb/Inch	% Separation	
118	0	117	0	P
104	0	107	0	P
116	0	116	0	P
102	0	122	0	P
107	0	104	0	P

Seam Tensile		
Lb/Inch	% Elongation	Comments
181	*	P
172	*	P

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Wedge Welder Qualification Data

Date	July 2, 2009	Wedge Welder #	C4
Project	Baker Lake	Travel Speed	40%
Work Area	Tank Farm	Drive Pressure	60
Material	60 mil	Dwell Pressure	
QC tech.	MD	Wedge Setting	
Welder/Operator	DAP	Wedge Temp.	400°C
Test Identification	R.M.	Sheet Temp.	
Test Location	ON SITE	Testing Temp.	13°C

Destructive Testing Results

Vice Grip Peel	
Outside Track	Inside Track
✓	✓
✓	✓

Tensometer Peel				
Outside Track		Inside Track		Comments
Lb/Inch	% Separation	Lb/Inch	% Separation	
114	0	107	0	P
116	0	109	0	P
111	0	112	0	P
114	0	114	0	P
115	0	114	0	P

107 - 117

Seam Tensile		
Lb/Inch	% Elongation	Comments
179		P
188		P

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Wedge Welder Qualification Data

Date	July 02, 2009	Wedge Welder #	C4
Project	Baker Lake	Travel Speed	35%
Work Area	Tank Farm	Drive Pressure	60
Material	60 mil	Dwell Pressure	
QC tech.	MD	Wedge Setting	
Welder/Operator	DAP	Wedge Temp.	400°C
Test Identification	P.M.	Sheet Temp.	
Test Location	ON SITE	Testing Temp.	18°C

Destructive Testing Results

Vice Grip Peel	
Outside Track	Inside Track
✓	✓

Tensometer Peel				
Outside Track		Inside Track		Comments
Lb/Inch	%Separation	Lb/Inch	% Separation	
113	0	116	0	P
112	0	115	0	P
114	0	114	0	P
110	0	111	0	P
119	0	113	0	P

Seam Tensile		
Lb/Inch	% Elongation	Comments
181		P
185		P

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Wedge Welder Qualification Data

Date	July 03, 2009	Wedge Welder #	C4
Project	Baker Lake	Travel Speed	35%
Work Area	Tank Farm	Drive Pressure	60
Material	60 mil	Dwell Pressure	
QC tech.	MD	Wedge Setting	
Welder/Operator	DAP	Wedge Temp.	400°C
Test Identification	A.M.	Sheet Temp.	
Test Location	ON SITE	Testing Temp.	13°C

Destructive Testing Results

Vice Grip Peel	
Outside Track	Inside Track
✓	✓
✓	✓

Tensometer Peel				
Outside Track		Inside Track		Comments
Lb/Inch	% Separation	Lb/Inch	% Separation	
112	0	109	0	P
114	0	111	0	P
115	0	107	0	P
113	0	109	0	P
114	0	110	0	P

Seam Tensile		
Lb/Inch	% Elongation	Comments
183		P
185		P

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Wedge Welder Qualification Data

Date	July 04, 2009	Wedge Welder #	C4
Project	Baker Lake	Travel Speed	35%
Work Area	Tank Farm	Drive Pressure	60
Material	60 mil	Dwell Pressure	
QC tech.	MD	Wedge Setting	
Welder/Operator	DAP	Wedge Temp.	400°C
Test Identification	A.M	Sheet Temp.	
Test Location	ON SITE	Testing Temp.	12°C

Destructive Testing Results

Vice Grip Peel	
Outside Track	Inside Track
✓	✓
✓	✓

Tensometer Peel				
Outside Track		Inside Track		Comments
Lb/Inch	%Separation	Lb/Inch	% Separation	
116	0	118	0	P
120	0	117	0	P
121	0	119	0	P
114	0	112	0	P
114	0	119	0	P

Seam Tensile		
Lb/Inch	% Elongation	Comments
191		P
180		P

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Wedge Welder Qualification Data

Date	July 02, 2009	Wedge Welder #	04
Project	Baker Lake	Travel Speed	35%
Work Area	Tank Farm	Drive Pressure	60
Material	60 mil	Dwell Pressure	
QC tech.	MD	Wedge Setting	
Welder/Operator	DAP	Wedge Temp.	400°C
Test Identification	P.M.	Sheet Temp.	
Test Location	ON SITE	Testing Temp.	18°C

Destructive Testing Results

Vice Grip Peel	
Outside Track	Inside Track
✓	✓
✓	✓

Tensometer Peel				
Outside Track		Inside Track		Comments
Lb/Inch	% Separation	Lb/Inch	% Separation	
119	0	113	0	P
116	0	119	0	P
118	0	115	0	P
112	0	114	0	P
113	0	116	0	P

Seam Tensile		
Lb/Inch	% Elongation	Comments
177	200	P
181	200	P

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Wedge Welder Qualification Data

Date	July 05, 2009	Wedge Welder #	C4
Project	Baker Lake	Travel Speed	35%
Work Area	Tank Farm	Drive Pressure	60
Material	60 mil	Dwell Pressure	
QC tech.	MP	Wedge Setting	
Welder/Operator	DAP	Wedge Temp.	400°C
Test Identification	A.M.	Sheet Temp.	
Test Location	ON SITE	Testing Temp.	14°C

Destructive Testing Results

Vice Grip Peel	
Outside Track	Inside Track
✓	✓
✓	✓

Tensometer Peel				
Outside Track		Inside Track		Comments
Lb/Inch	%Separation	Lb/Inch	% Separation	
116	0	118	0	P
113	0	112	0	P
117	0	110	0	P
119	0	116	0	P
118	0	115	0	P

Seam Tensile		
Lb/Inch	% Elongation	Comments
184	200	P
180	200	P

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Wedge Welder Qualification Data

Date	July 06, 2009	Wedge Welder #	C4
Project	Baker Lake	Travel Speed	35%
Work Area	Tank Farm	Drive Pressure	60
Material	60 mil	Dwell Pressure	
QC tech.	MD	Wedge Setting	
Welder/Operator	DAP	Wedge Temp.	400°C
Test Identification	A.M.	Sheet Temp.	
Test Location	ON SITE	Testing Temp.	14°C

Destructive Testing Results

Vice Grip Peel	
Outside Track	Inside Track
✓	✓
✓	✓

Tensometer Peel				
Outside Track		Inside Track		Comments
Lb/Inch	% Separation	Lb/Inch	% Separation	
116	0	115	0	P
113	0	115	0	P
112	0	119	0	P
119	0	121	0	P
117	0	113	0	P

Seam Tensile		
Lb/Inch	% Elongation	Comments
185	200	P
189	200	P

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Wedge Welder Qualification Data

Date	July 07, 2009	Wedge Welder #	C4
Project	Baker Lake	Travel Speed	35%
Work Area	Tank Farm	Drive Pressure	60
Material	60 mil	Dwell Pressure	
QC tech.	MD	Wedge Setting	
Welder/Operator	DAP	Wedge Temp.	400°C
Test Identification	A.M.	Sheet Temp.	
Test Location	ON SITE	Testing Temp.	12°C

Destructive Testing Results

Vice Grip Peel	
Outside Track	Inside Track
✓	✓
✓	✓

Tensometer Peel				
Outside Track		Inside Track		Comments
Lb/Inch	%Separation	Lb/Inch	% Separation	
112	0	119	0	P
119	0	116	0	P
116	0	111	0	P
117	0	117	0	P
114	0	113	0	P

Seam Tensile		
Lb/Inch	% Elongation	Comments
180	200	P
184	200	P

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Wedge Welder Qualification Data

Date	July 07, 2009	Wedge Welder #	C4
Project	Baker Lake	Travel Speed	35%
Work Area	Tank Farm	Drive Pressure	60
Material	60 mil	Dwell Pressure	
QC tech.	MP	Wedge Setting	
Welder/Operator	DAP	Wedge Temp.	400°C
Test Identification	P.M	Sheet Temp.	
Test Location	ON SITE	Testing Temp.	16°C

Destructive Testing Results

Vice Grip Peel	
Outside Track	Inside Track
✓	✓
✓	✓

Tensometer Peel				
Outside Track		Inside Track		Comments
Lb/Inch	%Separation	Lb/Inch	% Separation	
112	0	112	0	P
117	0	111	0	P
114	0	116	0	P
116	0	121	0	P
115	0	112	0	P

Seam Tensile		
Lb/Inch	% Elongation	Comments
181	200	P
182	200	P

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Extrusion Welding Log

Extrusion Welding Log

QC Tech. MD

Material: 60 mil HDPE

Project: BAKER LAKE

Work Area: TANK FARM

Comments

QC

Pik Test

Vac Test

Test Date

Operator

Weld Date

Location

Type

Extrusion #

1

2

3

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6

7

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9

10

11

Patch

S 2

S 10

corner #1

S 21

S 23

S 28

corner #2

S 34

S 36

S 55

corner #4

01/07/09

02/07/09

02/07/09

03/07/09

03/07/09

04/07/09

04/07/09

05/07/09

05/07/09

07/07/09

07/07/09

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Extrusion Welding Qualification Data

Date	July 1, 09	Extruder#	X2-2
Project	Baker Lase	Operator	DAP
QC Tech:	MD	Preheat Temp.	280°C
Material	60 mil	Barrel Temp.	245°C
Test Identification	P.M.	Shoe Height	1/4"
Temp.	20	Weld Type	Flat

Destructive Testing Results

Vice Grip Peel	
Type of failure	Comments

Tensometer Peel		
Lb/Inch	% Separation	Comments

106	0	P
115	0	P
115	0	P
107	0	P
114	0	P

Seam Tensile		
Lb/inch	% Elongation	Comments

181	200	P
172	200	P

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Extrusion Welding Qualification Data

Date	July 2, 2009	Extruder#	X2-2
Project	Baker Lake	Operator	DAP
QC Tech:	MP	Preheat Temp.	280°C
Material	60 mil	Barrel Temp.	245°C
Test Identification	A.M.	Shoe Height	1/4"
Temp.	8°C	Weld Type	Flat

Destructive Testing Results

Vice Grip Peel

Type of failure	Comments

Tensometer Peel

Lb/Inch	% Separation	Comments
113	0	P
117	0	P
116	0	P
115	0	P
116	0	P

Seam Tensile

Lb/inch	% Elongation	Comments
179	200	P
178	200	P

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Extrusion Welding Qualification Data

Date	July 03, 2009	Extruder#	XZ-2
Project	Baker Lake	Operator	DAP
QC Tech:	MD	Preheat Temp.	280°C
Material	60 mil	Barrel Temp.	230°C
Test Identification	A.M.	Shoe Height	1/4"
Temp.	10°	Weld Type	Flat

Destructive Testing Results

Vice Grip Peel

Type of failure	Comments

Tensometer Peel

Lb/Inch	% Separation	Comments
	0	P
117	0	P
114	0	P
112	0	P
112	0	P
118	0	P

Seam Tensile

Lb/inch	% Elongation	Comments
		P
183	200	P
177	200	

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Extrusion Welding Qualification Data

Date	July 4 2009	Extruder#	X2-Z
Project	Baker Lake	Operator	DAP
QC Tech:	MD	Preheat Temp.	280°C
Material	60 mil	Barrel Temp.	245°C
Test Identification	AM	Shoe Height	1/4"
Temp.	14°C	Weld Type	flat

Destructive Testing Results

Vice Grip Peel

Type of failure	Comments

Tensometer Peel

Lb/Inch	% Separation	Comments
117	0	P
114	0	P
116	0	P
112	0	P
113	0	P

Seam Tensile

Lb/inch	% Elongation	Comments
183	200	P
177	200	P

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Extrusion Welding Qualification Data

Date	July 5 2009	Extruder#	X2-2
Project	Baker Lake	Operator	DAP
QC Tech:	MP	Preheat Temp.	270°C
Material	60 mil	Barrel Temp.	235°C
Test Identification	A.M.	Shoe Height	1/4"
Temp.	7°	Weld Type	Flat

Destructive Testing Results

Vice Grip Peel

Type of failure	Comments

Tensometer Peel

Lb/Inch	% Separation	Comments
	0	P
110	0	P
117	0	P
109	0	P
111	0	P
118	0	P

Seam Tensile

Lb/inch	% Elongation	Comments
	200	P
178	200	P
173		

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Extrusion Welding Qualification Data

Date	July 6, 2009	Extruder#	X2-2
Project	Baker Lake	Operator	DAP
QC Tech:	MD	Preheat Temp.	272°C
Material	60 mil	Barrel Temp.	238°C
Test Identification	A.M.	Shoe Height	1/4"
Temp.	11°C	Weld Type	Flat

Destructive Testing Results

Vice Grip Peel

Type of failure	Comments

Tensometer Peel

Lb/Inch	% Separation	Comments
114	0	P
115	0	P
118	0	P
112	0	P
117	0	P

Seam Tensile

Lb/inch	% Elongation	Comments
181	200	P
176	200	P

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Extrusion Welding Qualification Data

Date	July 2, 09	Extruder#	X2-2
Project	Baker Lake	Operator	DAP
QC Tech:	MP	Preheat Temp.	270°C
Material	60 mil	Barrel Temp.	239°C
Test Identification	A.M.	Shoe Height	1/4"
Temp.	7°C	Weld Type	Flat

Destructive Testing Results

Vice Grip Peel

Type of failure	Comments

Tensometer Peel

Lb/Inch	% Separation	Comments
	0	P
114	0	P
115	0	P
115	0	P
119	0	P
114	0	P

Seam Tensile

Lb/inch	% Elongation	Comments
		P
183	200	P
188	200	

Appendix B

Baker Lake Environmental Performance Monitoring Plan: Environmental Assessment October 25, 2009

Title: Baker Lake Environmental Performance Monitoring Plan: Environmental Assessment

Date: October 25/09

Photographer : Ryan VanEngen



Photo No 1: Bulk Fuel Storage Facility is located up-gradient from the marshalling area and Baker Lake. Note proximity to Baker Lake north shore.



Photo No 2: Photo taken looking north from the Baker Lake shoreline. Note gradient and vegetation / soil conditions between the bulk fuel storage facility and shoreline.



Photo No 3: South side of the Baker Lake bulk fuel secondary containment area.



Photo No 4: North side of the Baker Lake bulk fuel secondary containment area.



Photo No 5: Bulk fuel storage tank.



Photo No 6: Baker Lake bulk fuel storage facility – fuel tanks and refueling module.