



June 8<sup>th</sup> 2017

Karen Kharatyan  
Manager of Licensing  
Nunavut Water Board  
P.O. Box 119  
Gjoa Haven, NU  
X0B 1J0

**Re: Water License 2AM-MEL1631 Part D, Items 1&2 - Submission of Final Design and Construction Drawings for Culvert 14**

Mr. Kharatyan,

Agnico Eagle Mines Limited (Agnico Eagle) is developing the Meliadine Project (the Project), a gold mine located approximately 25 km north of Rankin Inlet, and 80 km southwest of Chesterfield Inlet in the Kivalliq Region of Nunavut. Situated on the western shore of Hudson Bay, the Project site is located on a peninsula between the east, south, and west basins of Meliadine Lake (63°1'23.8" N, 92°13'6.42"W) on Inuit Owned Land. Agnico Eagle is developing the mine for production in late 2019.

In accordance with Water License 2AM-MEL1631, Part D, Items 1 and 2, please find enclosed with this letter, a copy of the final design and construction drawings for Culvert 14 (West Exhaust Service Road).

Should you have any questions regarding this submission, please contact me.

Regards,

**Agnico Eagle Mines Limited – Meliadine Division**

A handwritten signature in blue ink, appearing to read "Manon Turmel", with a stylized flourish extending to the right.

Manon Turmel  
manon.turmel@agnicoeagle.com  
819-759-3555 x8136  
Environmental Compliance Counselor

## DESIGN REPORT FOR CULVERT #14 MELIADINE PROJECT, NUNAVUT



PRESENTED TO  
**Agnico Eagle Mines Ltd.**

MAY 2017  
ISSUED FOR USE  
TETRA TECH PROJECT NUMBER: 28920  
AGNICO EAGLE DOCUMENT NUMBER: 6515-E-132-005-132-REP-008

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## APPENDICES

### APPENDIX A

- Figure 1 – Site Location
- Figure 2 – Culvert #14 Location

### APPENDIX B

- Construction Drawing 65-444-230-200
- Construction Drawing 65-444-230-201

## 1.0 INTRODUCTION

### 1.1 Site Location and Access

Agnico Eagle Mines Limited (Agnico Eagle) is developing the Meliadine Project (the Project), a gold mine located approximately 25 km north from Rankin Inlet, and 80 km southwest from Chesterfield Inlet in the Kivalliq Region of Nunavut. The project site is located on the peninsula between the East, South, and West basins of Meliadine Lake (63°01'23.8"N, 92°13'6.42"W).

This report is located in the Meliadine Site area, more specifically in the 2017 construction work zone, near the West Exhaust. The area is accessible from the all-weather gravel road linking the Meliadine mine site with Rankin Inlet. A general location plan of the project is shown in figure 1 (appendix A).

### 1.2 Existing and Future Site Facilities

Current facilities at the Meliadine Project site include the exploration camp located on the shores of Meliadine Lake, approximately 2.3 km east of the Tiriganiaq deposit. The self-contained camp consists of four wings of new trailers that can accommodate up to 200 people and includes new kitchen facilities, complete with diesel generators. Power for the exploration camp is currently provided by diesel generators. Potable water for the exploration camp is pumped from Meliadine Lake.

Facilities that are planned to be constructed for the operation of the future Meliadine Mine include a process plant, power plant, maintenance facilities, tank farms for fuel storage, water treatment plant, sewage treatment plant, accommodations, and kitchen facilities for 520 people.

The Nunavut Water Board (NWB) has issued Type A Water License 2AM-MEL1631 to Agnico Eagle Mines Limited (Agnico Eagle) for the Meliadine Gold Project site authorizing the use of water and the disposal of waste required by mining and milling and associated uses.

### 1.3 Scope of Work

Agnico Eagle retained the services of Tetra Tech to carry out the planning and design works associated with the Water and Environment and the Civil Works components of the Project. As part of the scope of work, Agnico Eagle asked Tetra Tech to:

- Conduct a detailed design for the haul roads, service roads, and temporary roads part of the 2017 civil work construction schedule including the crossing culverts;
- Produce construction drawings and specification for the roads and culverts;
- Prepare a design report of the culverts.

This report summarizes the site conditions, design basis, and considerations of culvert #14 as part of the West exhaust service road.

## 2.0 DESIGN

### 2.1 Culvert Design Basis and Water Management Strategy

The overall objective of the water management strategy of this project is to develop a practical and feasible site wide water management plan to minimize the potential negative impacts of mining development on the surrounding environment including habitats for fish and wildlife, and to facilitate mine operation and long-term closure and reclamation of the mine site. To attain this objective, culverts are used to control and divert runoff underneath the roads.

#### 2.1.1 Erosion Control

Rip rap will be installed around the culvert inlet and outlet areas to control erosion. For an example of a rip rap section, see attached the typical culvert cross-section presented in appendix B.

During the installation of the culverts, if required, straw logs will be used in the work area to prevent total suspended solids from reaching downstream water bodies.

#### 2.1.2 Culvert Specifications

Standard galvanized, corrugated steel pipe culvert with a profile of 68x13 mm and a minimum thickness of 1.6 mm is proposed. The culvert will be in service for up to 15 years. It is understood that the haul trucks to be used at the project site will be CAT AD60 for underground trucks and Komatsu HD465 model or equivalent for open pit trucks.

For the West exhaust service road, a minimum of 300 mm granular fill cover should be placed on top of the culvert #14 for light traffic access. Additional cover may be required during the construction phase to allow the passage of heavy equipment. The backfill around the culvert will be granular fill 50mm MINUS, or an approved equivalent, and shall be placed in lifts not greater than 0.3 m thick and compacted to a minimum of 95% of Standard Proctor Maximum Dry Density (ASTM D698).

The location and details of the proposed culvert are presented in drawings 65-444-230-200 and 65-444-230-201 in appendix B.

The table below presents the characteristics of the proposed culvert.

*Table 1 Culvert specifications*

Item	Culvert #14
Location	West Exhaust Service Road
Number of culverts in group	1
Length of each culvert (m)	19.0
Diameter of each culvert (mm)	600.0
Granular fill cover over culvert (m)	0.3
Corrugation profile of each culvert (mm)	68x13
Thickness of each culvert (mm)	1.6

### 2.1.3 Figures and Drawings

Figures 1 and 2 in appendix A presents a general site layout plan and the location of the West exhaust and culvert #14, respectively. Drawings 65-444-230-200, and 65-444-230-201 in appendix B presents the construction plan view and details for culvert #14 respectively.

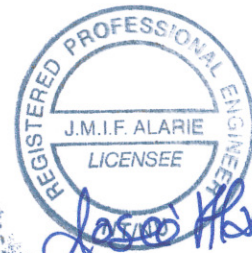
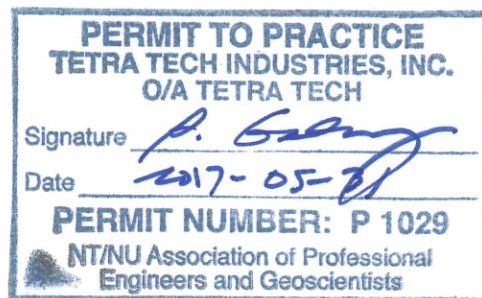
## 3.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Agnico Eagle Mines Ltd. and their agents. Tetra Tech does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Agnico Eagle Mines Ltd., or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in Tetra Tech's Services Agreement.

## 4.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,  
Tetra Tech



Prepared by: *[Signature]* *2017-05-31*  
Christopher Morin, Jr. Eng.  
Direct Line: 514.257.2427 x3240  
Christopher.morin@tetrattech.com

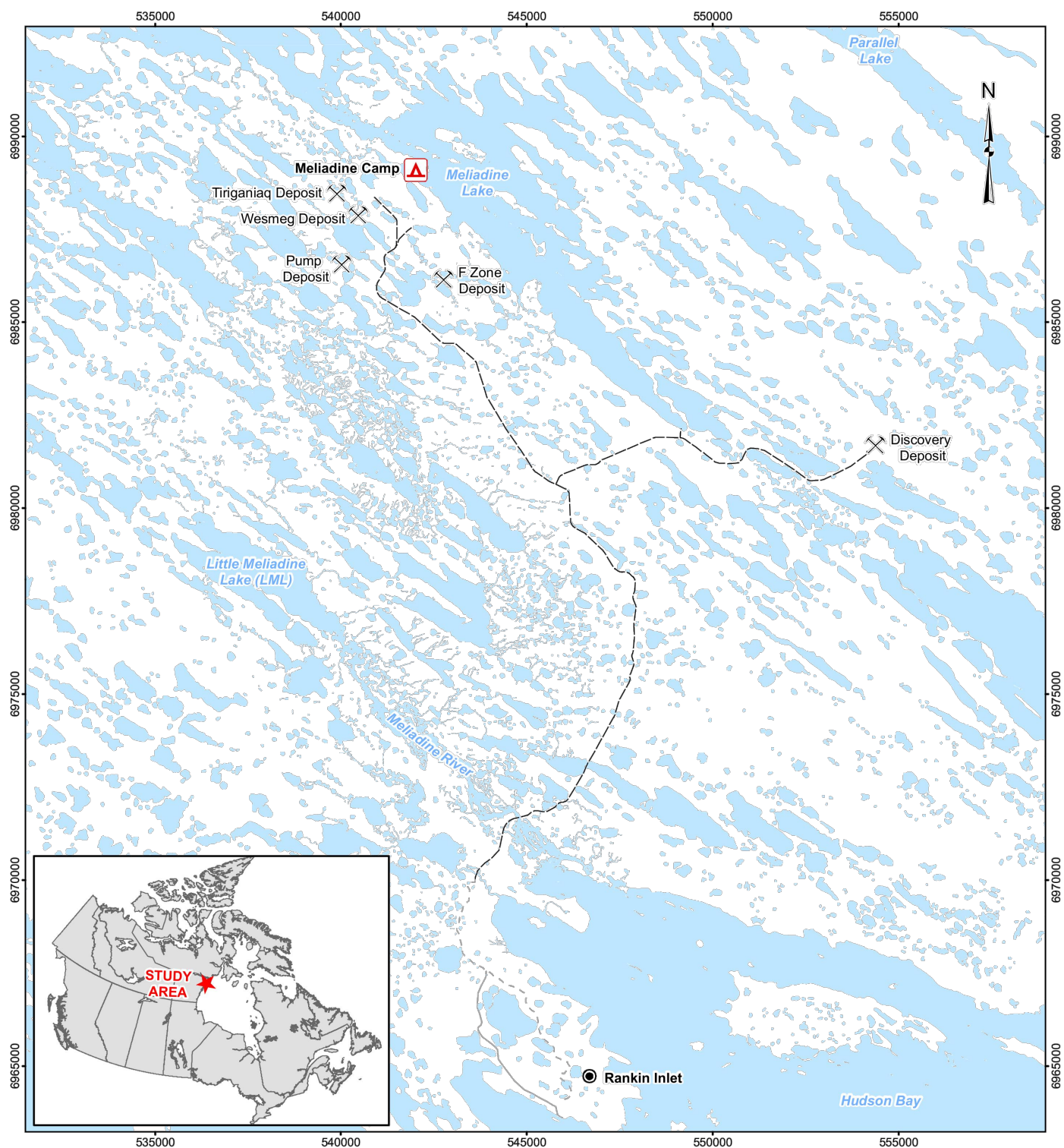
Reviewed by: *[Signature]* *2017-05-31*  
Josée Alarie, Eng.  
Direct Line: 514.257.2427 x3323  
Josee.Alarie@tetrattech.com

## **APPENDIX A**

Figure 1 – Site Location

Figure 2 – Culvert #14 Location





**LEGEND**

- Camp
- Proposed Mine Site
- All-weather Access Road (AWAR)
- Road - New
- Road - Existing
- Watercourse
- Waterbody

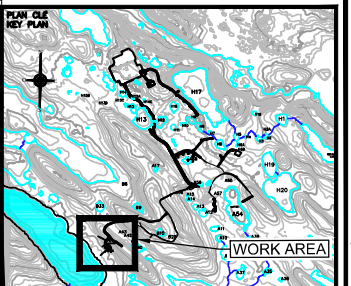
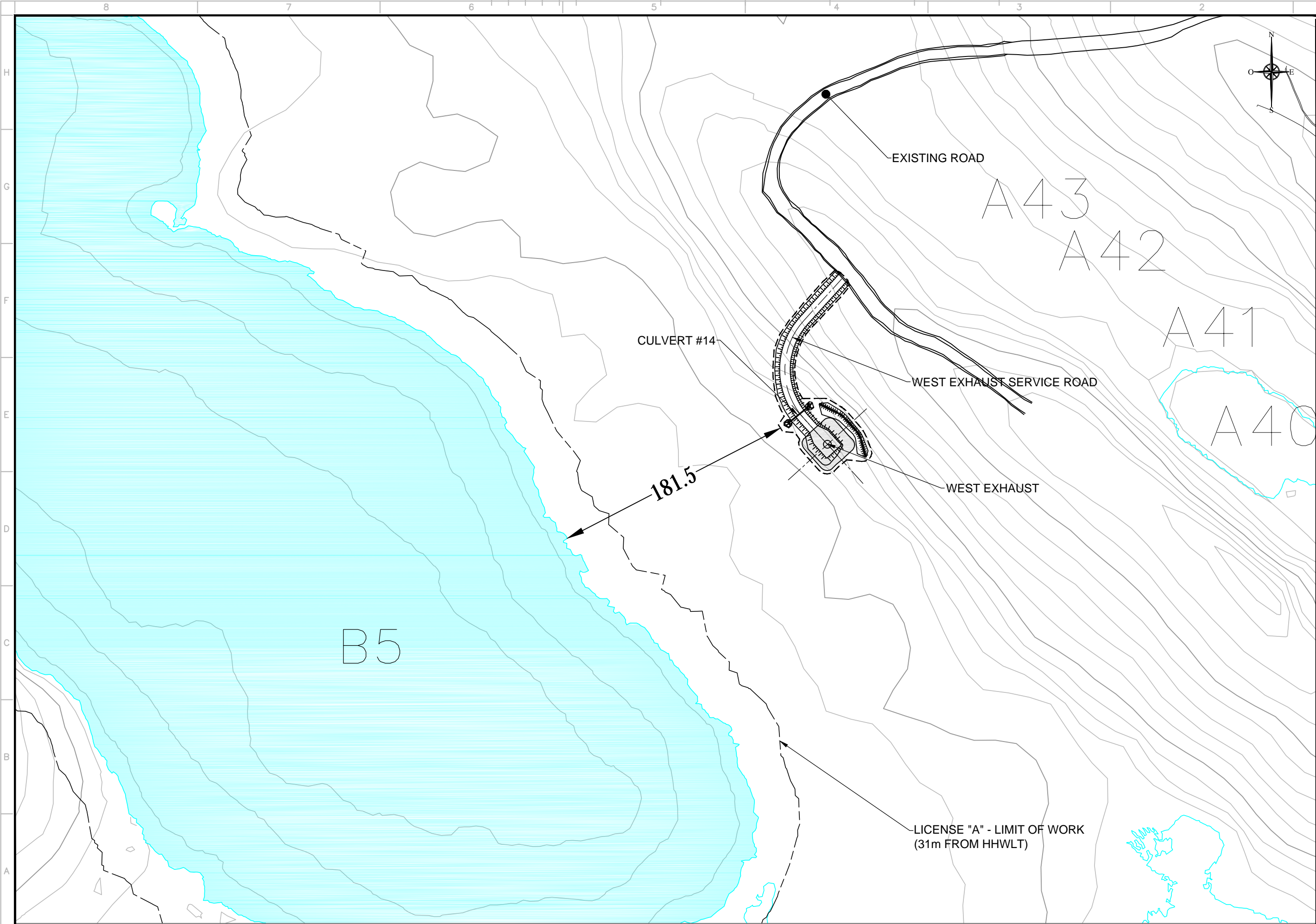
**AGNICO EAGLE – MELIADINE DIVISION**



**AGNICO EAGLE – MELIADINE DIVISION**  
GENERAL PROJECT LOCATION PLAN

No. PROJECT PROJECT No.		DATE 2017-05-04	
DESSINE PAR DRAWN BY M. SENNADJ		FEUILLE/SHT 1 / 1	
APPROUVE PAR APPROVED BY R. PANAZAN		REVISION A	
NO. DESSIN DRAWING NO.		FIGURE 1	





NOTES GÉNÉRALES / GENERAL NOTES

L'INFORMATION CONTENUE EST LA PROPRIÉTÉ DE AGNICO EAGLE LTD. ET NE DOIT ÊTRE RÉPÉTÉE PAR AUTRUI. TOUTE AUTRUI DOIT OBTENIR LA PERMISSION ÉCRITE D'AGNICO EAGLE LTD. POUR RÉPÉTER L'INFORMATION. L'INFORMATION EST FOURNIE EN L'ÉTAT, SANS GARANTIE. AGNICO EAGLE LTD. NE S'ASSUME PAS DE RESPONSABILITÉ POUR LES DOMMAGES, RÉELS OU FICTIFS, EN DÉPENDANCE DE L'USAGE DE L'INFORMATION. L'INFORMATION EST FOURNIE EN L'ÉTAT, SANS GARANTIE. AGNICO EAGLE LTD. NE S'ASSUME PAS DE RESPONSABILITÉ POUR LES DOMMAGES, RÉELS OU FICTIFS, EN DÉPENDANCE DE L'USAGE DE L'INFORMATION.

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITLE / TITRE	# DWG



AGNICO EAGLE

REV.	DATE	DESCRIPTION	PREP/CHK	APP.	CLIENT

REVISIONS

TITLE / TITRE  
AGNICO EAGLE - MELIADINE DIVISION  
000 - SITE PREP  
444 - VENTILATION AND EMERGENCY EGRESS  
CULVERT #14  
LOCATION PLAN VIEW

DESIGNÉ PAR DRAWN BY	CHRISTOPHER MORIN	DATE	
VÉRIFIÉ PAR CHECKED BY	RENÉ PANAZAN		
APPROUVÉ PAR APPROVED BY	JOSÉE ALARIE		

SCHELLE SCALE	1:500	DATE	2017-05-30
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NO. DESIGN  
DRAWING NO. FIGURE 2

NO. PROJET PROJECT NO.	6515/28920	REVISION	1	FOLIOLE / SHEET	1 / 1
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## **APPENDIX B**

### **Drawings – Proposed Culvert Location & Details**