



AGNICO EAGLE

WHALE TAIL ATTENUATION POND RAMP

Construction Summary Report

Submitted by:
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Meadowbank Division
P.O. Box 540
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X0C 0A0

Rev. 0

September 9, 2020

EXECUTIVE SUMMARY

Aginco Eagle (Agnico) has prepared this as-built report (construction summary) for the Whale Tail Attenuation Pond Ramp. The Attenuation Pond Ramp is the infrastructure needed to install the pumping infrastructure required to operate the Whale Tail Attenuation Pond.

As part of the Construction Phase, the Whale Tail Lake North Basin was dewatered. Once the dewatering phase was completed, part of the North Basin located outside the Whale Tail Pit footprint became the Whale Tail Attenuation Pond. The Attenuation Pond receives contact water from different sumps and ponds around site. Water from the Attenuation Pond will be pumped and discharged from the Attenuation Pond Ramp to approved diffusers and discharge points.

The Construction of the Attenuation Pond Ramp was done in 2 Phases from January 6, 2019 to July 15, 2019 and the infrastructure was commissioned on May 20, 2020. During Phase 1 a dewatering ramp was built and used for Whale Tail North dewatering consisting of an access road and ramp and a dewatering pad at elevation 152.5. For Phase 2 the dewatering ramp was extended to become the Whale Tail Attenuation Pond Ramp consisting of the construction of a new access road and a dewatering pad at elevation 146.

The Whale Tail Attenuation Pond Ramp was constructed by Aginco. The controls applied during the construction were used to ensure that construction was completed in compliance with the design intent of the construction document. In field quality control during construction activity comprised of visual observation and surveying. Despite the QA/QC program in place some rockfill material was placed on an unsuitable foundation consisting of ice blocks and snow which led to some instability of the Phase 1 ramp that had to be mitigated during construction.

During the course of the construction, 1 design change and 2 field adjustments were applied to take into account the site conditions and to remediate instability in the Phase 1 ramp.

DOCUMENT CONTROL

Document Version	Date	Revised Section	Revision
Rev 0	09/09/2020	Final Version	Final Version

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SECTION 1.0 – INTRODUCTION

The Whale Tail Attenuation Pond Ramp is the infrastructure required to install the pumping infrastructure needed for the operation of the Whale Tail Attenuation Pond.

As part of the Construction Phase, the Whale Tail Lake North Basin was dewatered. Once the dewatering phase was completed, part of the North Basin located outside the Whale Tail Pit footprint became the Whale Tail Attenuation Pond (on May 20, 2020). The Attenuation Pond receives contact water from different sumps and ponds around site. Water from the Attenuation Pond is pumped from the Attenuation Pond Ramp and discharged to approved diffusers and discharge points.

This document presents the construction summary report of the Whale Tail Attenuation Pond Ramp required by the Water License 2AM-WTP1830 Part D Item 16. This report presents a summary of the construction activities, the QA/QC activities, as well as the overall information used to produce the as-built drawings.

1.1 Roles and Responsibilities

The engineering design of the Whale Tail Attenuation Pond Ramp was developed by Agnico. Aginco was responsible for the construction of the ramp and the QA/QC program during the construction.

Table 1 presents a summary of the general roles and responsibilities for each of the parties involved during the construction of the Whale Tail Attenuation Pond Ramp. This table also includes the key companies and the key personnel that contributed to the various construction activities.

Table 1: Roles, Responsibilities, and Key Personnel

Company	Role	Responsibility	Key Personnel	Position
Agnico Eagle Mines Limited	Owner	Approve design and as-built reporting document	Pierre McMullen, Yan Côté / Miles Legault, Mark Morin	Engineering Superintendent / General Supervisor
		Design of the Attenuation Pond Ramp	Frédéric L. Bolduc	Geotechnical Coordinator
		Field construction follow-up, QA/QC, produce as-built report	Patrice Gagnon Pier-Eric McDonald	Geotechnical Specialist / Engineer
		Supervise field works	Jean-Francois Beland	Dike Construction Supervisor
		Supervise field works, provide frequent updates through meetings	Pascal Poirier / Eric Haley	Water Engineers
		Provide survey support	Guillaume Baril / Stephane Dubeau	Survey Leaders
		Provide rockfill from Mine Execute field works	Eric Rouleau / Jason Gaves	Pit Supervisors

1.2 Overall Project Schedule

The overall schedule for the construction of the Whale Tail Attenuation Pond Ramp was:

- Construction of the Phase 1 ramp to start Whale Tail North dewatering: from January 6 to January 20, 2019.
- Remediation of Phase 1 ramp (widening of access): April 9 to April 13, 2019 and July 11 to July 15, 2019
- Construction of the Phase 2 ramp to pursue the dewatering of Whale Tail North: from April 9 to April 20, 2019. This infrastructure will become the Whale Tail Attenuation Pond Ramp at the end of dewatering
- Operating period of Dewatering Ramp (Phase 1 & 2): March 6, 2019 to May 20, 2020
- End of dewatering and commissioning of the Whale Tail Attenuation Pond Ramp: May 20, 2020

1.3 Construction Documents

The Design Report and Construction Drawings of the Whale Tail Attenuation Pond Ramp was completed by Agnico. Table 2 presents the available construction documents. The construction drawings are included in Appendix A1.

Table 2: List of Construction Documents

Document Title	Date	Rev
Whale Tail Attenuation Pond Ramp – Design Report	2019/02/06	1
61-695-230-200 -Whale Tail Attenuation Pond Access Ramp Plan / Cross-Sections	2019/02/06	1

1.4 As-Built Drawings

Table 3 presents the as-built drawing list for the Whale Tail Attenuation Pond Ramp. The survey and as-built drawings were done by Agnico. The as-built drawings are included in Appendix A2.

Table 3: List of As-Built Drawings

Drawing Title	Date	Rev
Drawing 1 – Whale Tail Attenuation Pond Ramp As-built - Plan View	2020/07/31	1
Drawing 2 – Whale Tail Attenuation Pond Ramp As-built - Cross-section A-A	2020/07/31	1
Drawing 3 – Whale Tail Attenuation Pond Ramp As-built - Cross-section B-B	2020/07/31	1

SECTION 2.0 – CONSTRUCTION

Phase 1 Construction

Phase 1 consisted of the construction of the dewatering ramp used to initiate Whale Tail North dewatering consisting of an access road and a dewatering pad at El. 152.5. The Phase 1 ramp was built between January 4th and January 20th 2019 with NAG rockfill coming from the Whale Tail Pit.

For the portion of the ramp built over land, all snow, ice, large boulders, and any deleterious material were removed from the foundation before rockfill placement. Material was brought by 100T haul trucks and was placed with a D8 dozer. Compaction was achieved by trafficking on the ramp with haul trucks.

For the portion of the ramp located over water, rockfill was brought by 100T haul trucks and placed using an excavator (CAT 345 or CAT 390), always making sure the material was pushed towards the bottom of the lake with the excavator bucket to increase stability of the structure by pushing the soft sediments away from the advancement front of the structure. Ice was removed prior to placing rockfill and the ice blocks were placed on the side of the ramp.

During the dewatering activities, tension cracks and instabilities appeared in the vicinity of the ramp. These were first observed in March-April 2019 and were mainly located in the bumpers area where the ice blocks

were placed during construction. Remediation works were performed to create a new Phase 1 access ramp parallel to the original one.

In July 2019 other signs of instability such as settlement were observed in the original instability area and extended towards the new access. It was discovered that the original access and some parts of the new one had been built over snow and ice. Further remediation work was performed by widening the access further and re sloping the side of the ramp. Ice, snow, and soft sediment were removed from the foundation during this process.

A total of 52,800 T of rockfill was needed for the Phase 1 ramp. A total of 5,600 T was placed in the new access ramp to the Phase 1 pad at 152.5m.

Phase 2 Construction

During Phase 2, the dewatering ramp and pad were extended and lowered to El. 146 m to become the Whale Tail Attenuation Pond Ramp.

During this phase, the design of the ramp was modified. Instead of cutting and regrading the dewatering ramp (Phase 1) the Phase 2 access was built from the north shore and connected perpendicularly to the Phase 1 Ramp. Refer to Section 4 below for a complete discussion of the deviation to original design.

The Phase 2 access ramp was built using the same methodology as the Phase 1 Ramp. Due to the instability in the Phase 1 Ramp from ice and snow present in the foundation, the construction of this extension was performed under increased supervision to ensure a suitable foundation for the structure.

A total of 34,300 T of rockfill was needed to build the Phase 2 extension of the Ramp at elevation 146m.

SECTION 3.0 – QA/QC PROGRAM

Quality Assurance and Quality Control were performed by Agnico to confirm the construction activities and materials were in accordance with the Specifications. A visual inspection was performed on a daily basis to confirm the NAG material was within Specifications and that material placement methods were respected. QA activities were performed on day shift by qualified geotechnical personnel while the QC was done by the Pit Supervisor on day and night shift.

No deficiencies were noted during the QA/QC inspections and frequent reminders were done with Pit Supervisors to make sure the work methods were understood for night shift.

The QA/QC program was not able to detect the presence of ice and snow in the foundation of the Phase 1 Ramp. Inspection frequencies were increased for Phase 2 construction to ensure the ramp would not be built over ice and snow.

SECTION 4.0 – DESIGN CHANGES AND FIELD ADJUSTMENTS

Design changes and field adjustments were implemented during the construction to adapt the design to the encountered field conditions. These changes were implemented by Agnico and are documented in this section.

Field Adjustment– Remediation of the Access Ramp to Phase 1 Ramp

As described in Section 2, the access ramp to the Phase 1 dewatering pad had to be reworked twice during the dewatering activity due to the observation of instability. These instabilities were due to placement of rockfill material over an unsuitable foundation (ice blocks and snow). Inspection frequencies were increased during construction as a result of the instability events.

Field Adjustment – Modification of the Phase 2 Dewatering Pad Location

The Phase 2 dewatering pad location was built with an offset of 20 m to the West from the design and as a result is further than intended from the deepest lake location. This was due to a stakeout error. That was discovered during construction as results of QA/QC checks. However, it was decided not to extend the pad further to avoid delaying the dewatering.

Design Change – New Access Ramp to the North of the Attenuation Pond for Pad Phase 2

The initial Design of the Whale Tail Attenuation Pond Ramp was to cut the Phase 1 ramp and regrade it until it reached elevation 146m.

When it was time to construct Phase 2 a design change had to be made as the Phase 1 Ramp was frozen and was presenting some instability. To avoid digging into a potentially unstable structure it was decided to modify the configuration of the Ramp and to build a new access that would connect to the targeted location of the Whale Tail Attenuation Pond Ramp dewatering pad. The access ramp to build the Phase 2 Pad was then moved towards the North shore using a geometry where most of the access was perpendicular to the Phase 1 access. This configuration also had the benefit of buttressing the Phase 1 Ramp, increasing its stability.

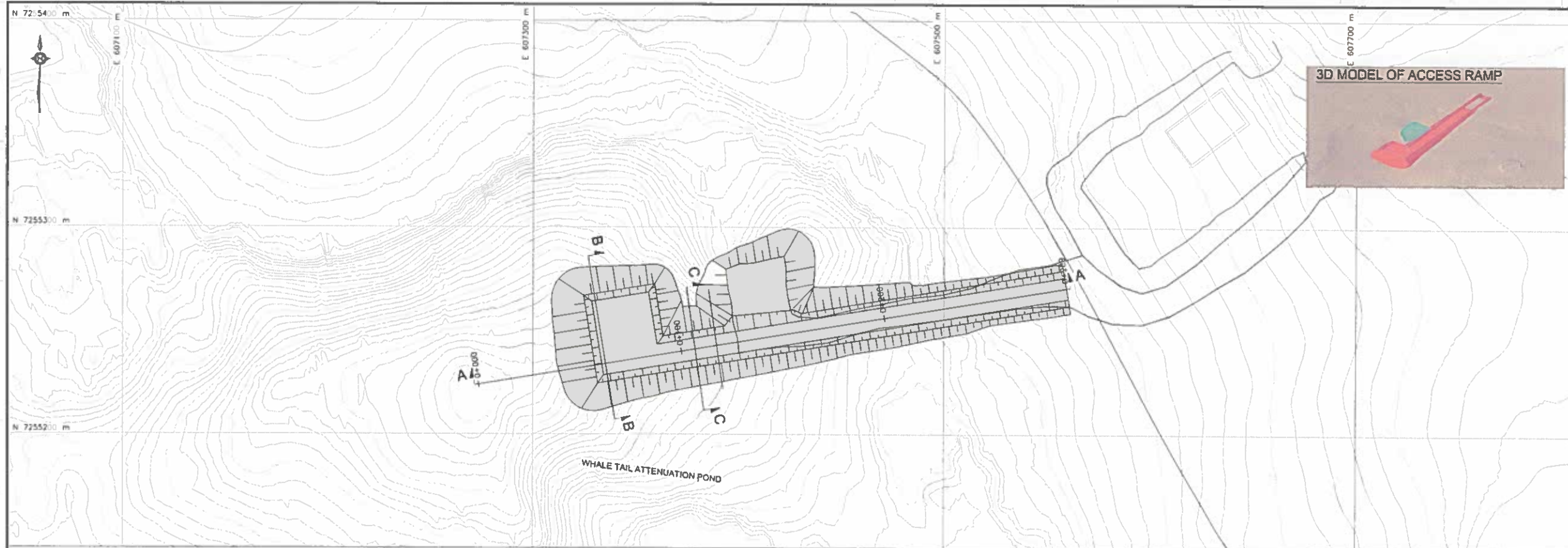
SECTION 5.0 – OPERATION, MAINTENANCE AND SURVEILLANCE

An Operation, Maintenance and Surveillance (OMS) program is essential to ensure the integrity of this structure. The OMS program for this structure is included within the Whale Tail Project Water Management Infrastructure OMS Manual and includes regular inspections, monitoring, and a maintenance program. If anomalous conditions are observed, a more detailed assessment will be performed and remedial action will be taken.

SECTION 6.0 – SIGNATURE

Mark Morin, Engineering General Supervisor
Agnico-Eagle Mines Limited
Meadowbank, Nunavut Division

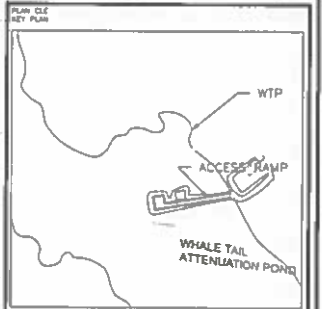
APPENDIX A1 – CONSTRUCTION DRAWINGS



PLAN VIEW

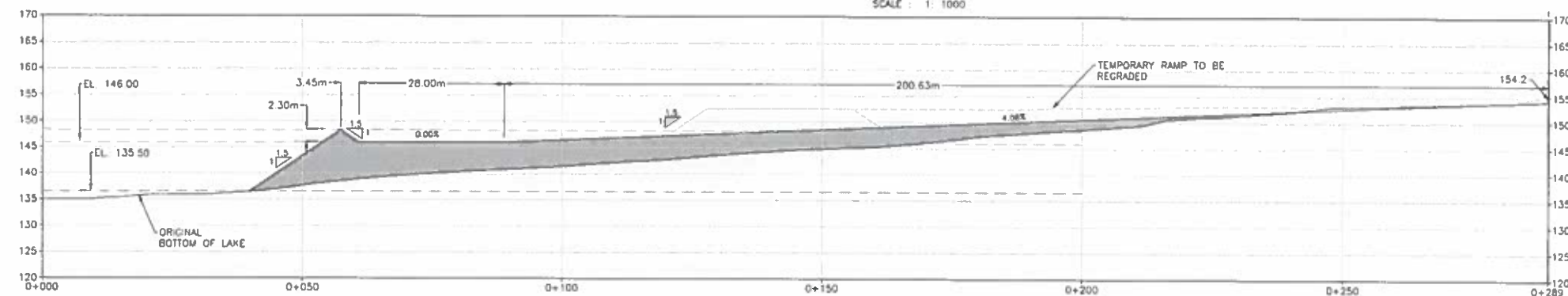
SCALE: 1: 1000

3D MODEL OF ACCESS RAMP



NOTES GÉNÉRALES / GENERAL NOTES

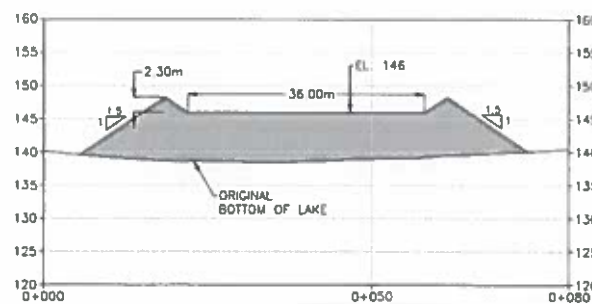
- NOTES
1. GROUND TOPOGRAPHY WAS PROVIDED BY AEM
 2. ALL UNITS ARE IN METERS
 3. SAFETY BERM CONFORM TO MINE ACT TO BE INSTALLED WHILE HEIGHT OF THE RAMP IS HIGHER THAN 3 M
 4. THE ATTENUATION POND RAMP WILL BE BUILT PROGRESSIVELY AS THE WATER LEVEL GOES DOWN AND WILL BE LEVELED GRADUALLY
 5. STABILITY OF THE RAMP TO BE ASSESSED ON A DAILY BASIS BY QUALIFIED GEOTECHNICAL PERSONNEL DURING CONSTRUCTION WORK SHALL BE SUSPENDED IF SIGNS OF INSTABILITY ARE OBSERVED



CROSS-SECTION A-A

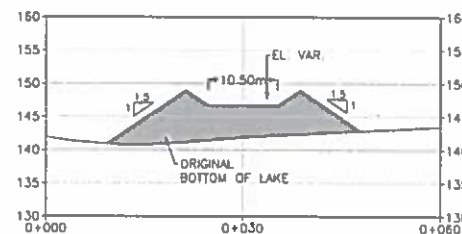
SCALE: 1: 500

ESTIMATED IN-PLACE QUANTITIES CONSTRUCTION - ACCESS RAMP		
AGGREGATE MATERIAL	Thickness (mm)	Required (m³)
Granular fill, 0 - 3/4" (final grade)	200	623
ROM, 0-1000mm.	±1010	35576



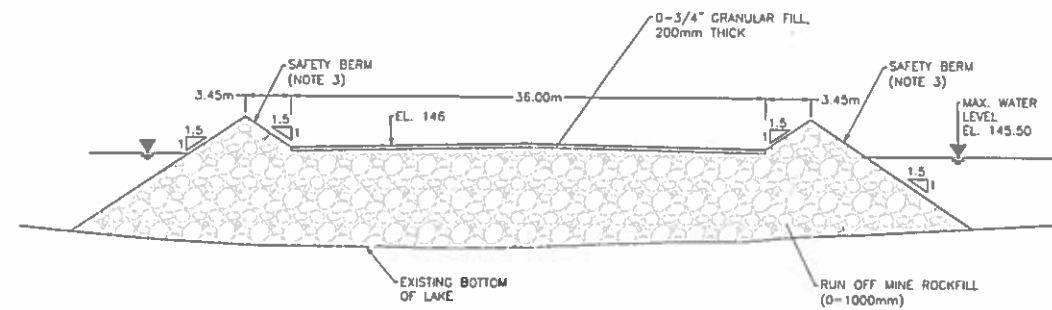
CROSS-SECTION B-B

SCALE: 1: 500



CROSS-SECTION C-C

SCALE: 1: 500



DETAILS OF CROSS-SECTION B-B

SCALE: 1: 1000

DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

PROJ. / SUITE	REVISIONS



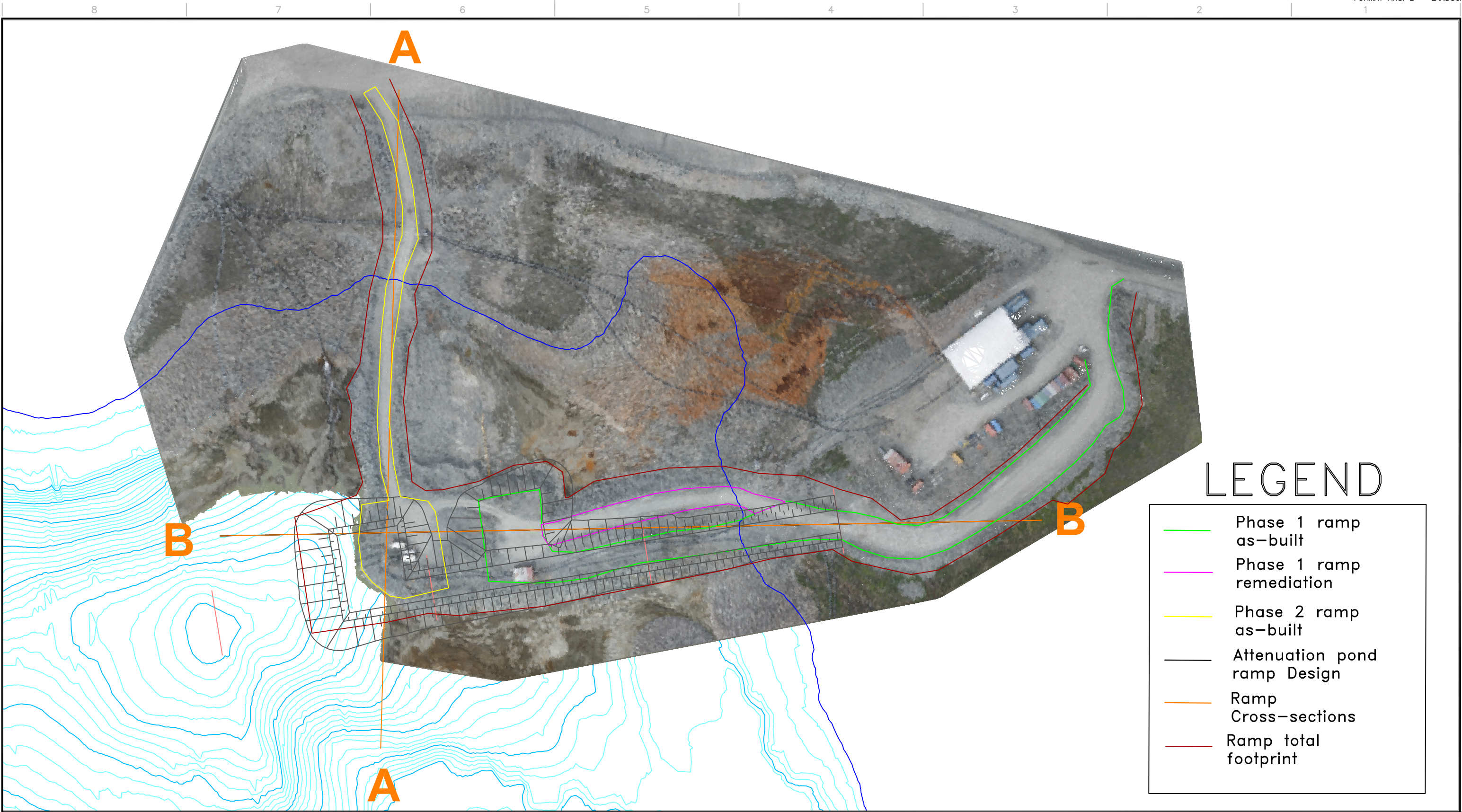
TYPE / PRO
AGNICO EAGLE
695 - WATER MANAGEMENT
230 - GENERAL EARTH WORKS
WHALE TAIL ATTENUATION POND ACCESS RAMP
PLAN / CROSS-SECTIONS

DESIGNED BY: MARCUS MOYLA
CHECKED BY: ANH-LONG NGUYEN
APPROVED BY: FREDERICK L. BOLDUC

DATE: 2019-02-04
DATE: 2019-02-04
DATE: 2019-02-06

NO. DESIG: 61-695-230-200
NO. PROJ: 6118
REVISION: R0
FOUR / ONE

APPENDIX A2 – AS-BUILT DRAWINGS



LEGEND

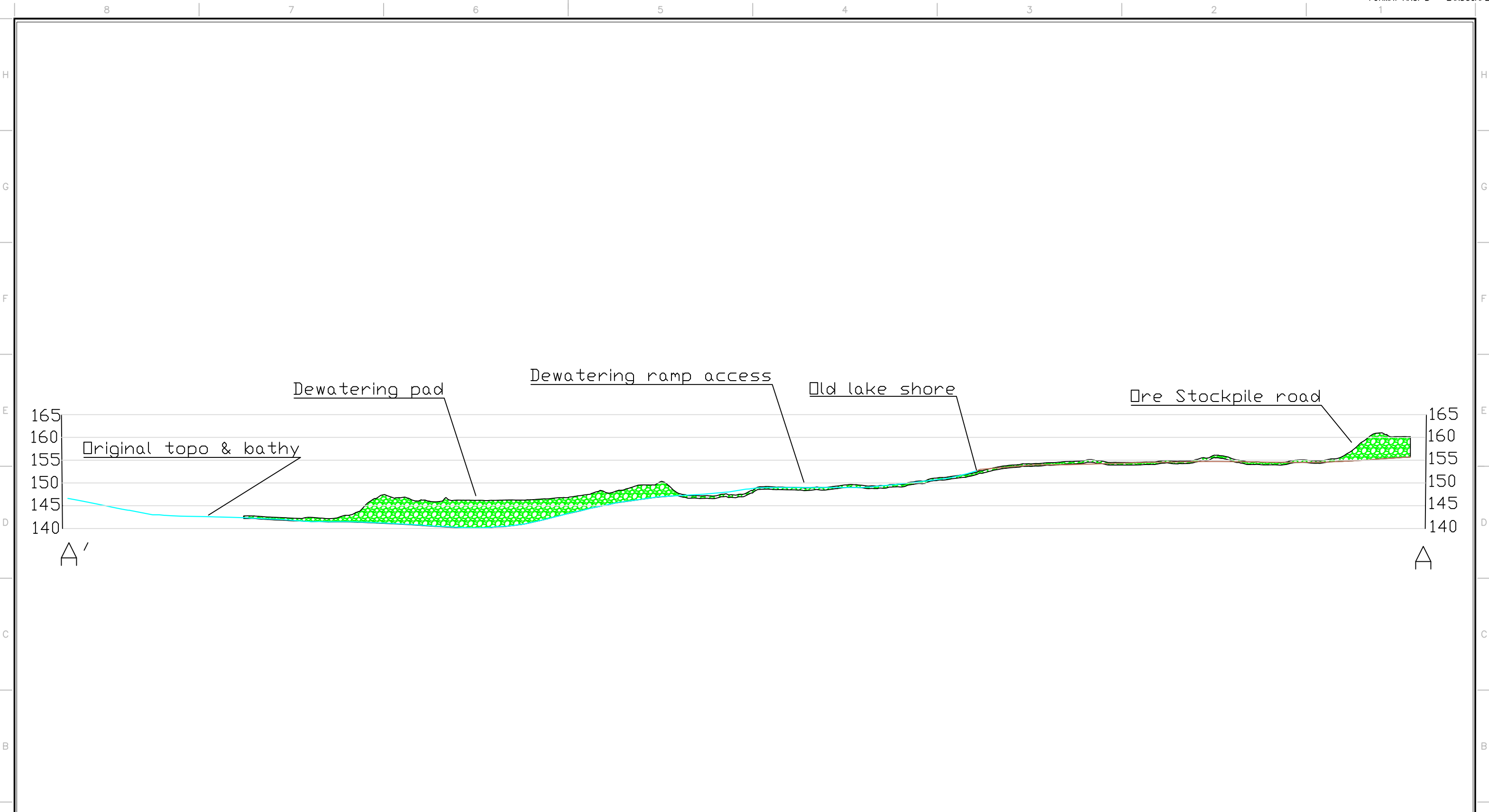
- Phase 1 ramp as-built
- Phase 1 ramp remediation
- Phase 2 ramp as-built
- Attenuation pond ramp Design
- Ramp Cross-sections
- Ramp total footprint

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SURVEY CHECK	DATE		
GEOLOGY CHECK	DATE		
ENGINEERING CHECK	DATE		

MEADOWBANK DIVISION
GEOTECHNICAL ENGINEERING
ATTN. POND RAMP AS-BUILT

SCALE N.T.S.	DATE	FILE .DWG
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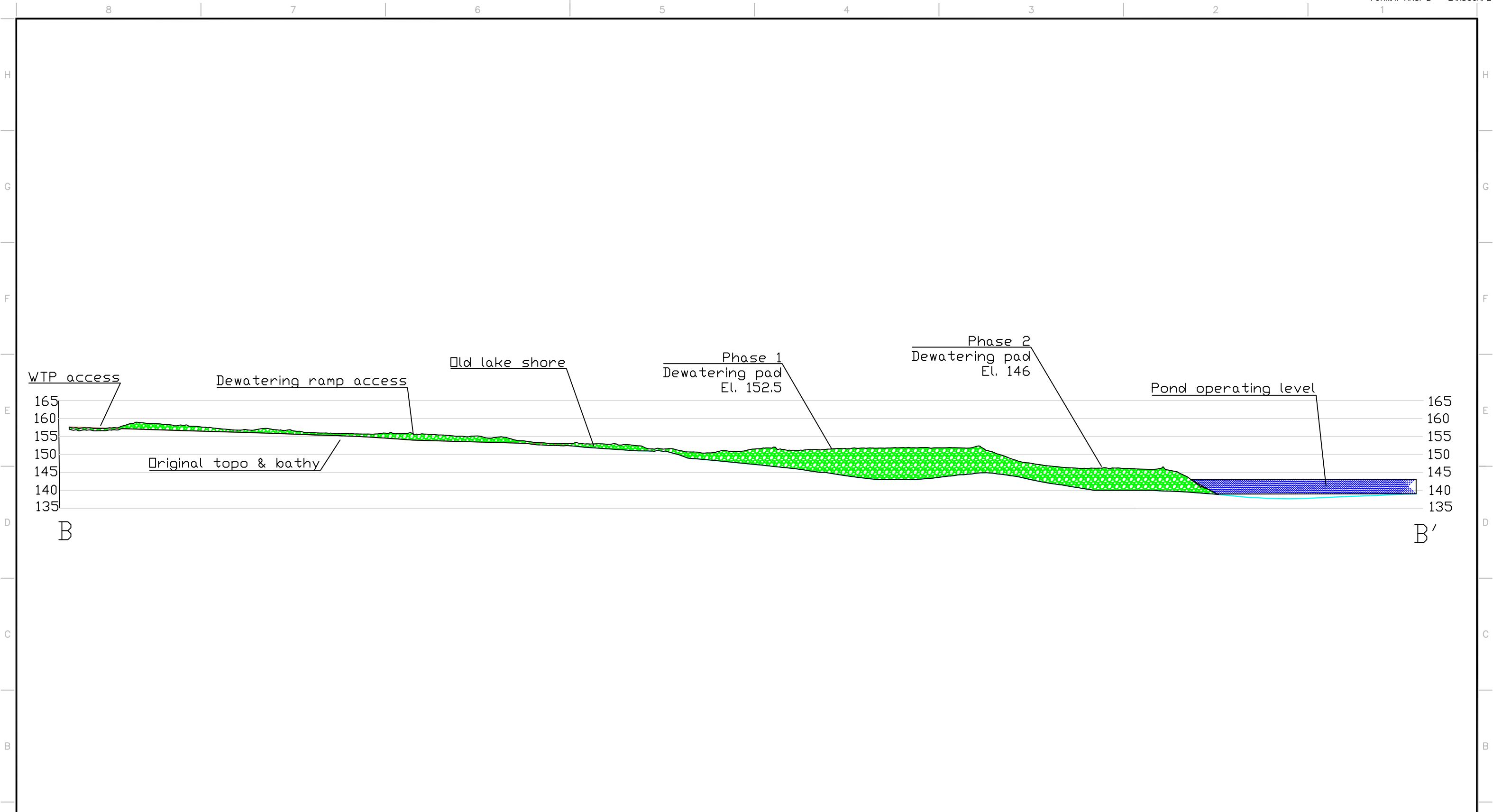


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SURVEY CHECK	DATE		
GEOLOGY CHECK	DATE		
ENGINEERING CHECK	DATE		

MEADOWBANK COMPLEX		
ENGINEERING		
DEWATERING RAMP AS-BUILT		
CROSS SECTION A-A		
SCALE N.T.S.	DATE	FILE .DWG



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SURVEY CHECK	DATE		
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ENGINEERING CHECK	DATE		

MEADOWBANK DIVISION
ENGINEERING
ATTN. POND RAMP AS-BUILT
CROSS SECTION B-B

SCALE N.T.S.	DATE	FILE .DWG
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APPENDIX B – CONSTRUCTION PHOTOGRAPHS



Picture 1 – View of Whale Tail North prior to the construction of the Whale Tail Attenuation Pond Ramp (January 5, 2019)



Picture 2 – Removal of ice and snow and placement of rockfill material over land for the Dewatering Ramp construction (January 11, 2019)



Picture 3 – Construction of the Dewatering Ramp access. Ice blocks are excavated and placed on the side of the ramp (January 14, 2019)



Picture 4 – Construction of the Dewatering Ramp access. Ice blocks are excavated and placed on the side of the ramp (January 17, 2019)



Picture 5 – Construction of the Dewatering Ramp pump pad. Placement of rockfill material in water with an excavator (January 20, 2019)



Picture 6 – Construction of the Dewatering Ramp pump pad (January 21, 2019)



Picture 7 – Observation of tension crack in the bumper area of the access to the Dewatering Ramp (March 25, 2019)



Picture 8 – Observation of tension crack in the bumper area of the pump pad of the Dewatering Ramp (March 25, 2019)



Picture 9 – Dewatering Ramp with pumping system installed (March 25, 2019)



Picture 10 – Widening of the Dewatering Ramp access (construction of a parallel access) to mitigate instability (April 10, 2019)



Picture 11 – Widening of the Dewatering Ramp access (construction of a parallel access) to mitigate instability (April 10, 2019)



Picture 12 – View of the new Dewatering Ramp access built to mitigate instability (April 12, 2019)



Picture 13 – Construction of new access to lower the dewatering ramp pump pad (Phase 2) (April 14, 2019)



Picture 14 – Construction of the Phase 2 of the Ramp. Placement of rockfill material to construct the access road perpendicular to the Phase 1 Ramp. Picture taken from Phase 1 dewatering pad (April 16, 2019)



Picture 15 – Construction of the Phase 2 of the Ramp. Placement of rockfill material to construct the access road perpendicular to the Phase 1 Ramp. Picture taken from Phase 1 dewatering pad (April 20, 2019)



Picture 16 – Instability observed in the old access to the Phase 1 Dewatering Ramp (July 8 2019)



Picture 17 – Observation of ice and snow in the foundation of the old access to the Phase 1 Dewatering Ramp (July 8 2019)



Picture 18 – Observation of instability in the widened portion of the Phase 1 Dewatering Ramp (July 10 2019)



Picture 19 – Removal of snow to mitigate instability in the widened access road to the Phase 1 Dewatering Ramp (July 11 2019)



Picture 20 – Removal of snow and ice in the widened access road to the Phase 1 Dewatering Ramp (July 11 2019)



Picture 21 – View of the access road to the Phase 1 Dewatering Ramp after the mitigation (July 28 2019)



Picture 22 – View of the Whale Tail Attenuation Pond Ramp after commissioning (August 11 2020)



Picture 23 – View of the Whale Tail Attenuation Pond Ramp after commissioning (August 16 2020)