CONSTRUCTION SUMMARY (AS-BUILT) REPORT FOR DIKE D-CP5, MELIADINE GOLD PROJECT, NUNAVUT

PRESENTED TO

AGNICO EAGLE MINES LTD.

MELIADINE GOLD PROJECT

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EXECUTIVE SUMMARY

Dike D-CP5 was constructed across the south portion of Lake A54. D-CP5 is a water retention dike approximately 300 m long with a maximum dike height of approximately 3.3 m. The primary water retention element in Dike D-CP5 is a geomembrane liner. The intent of D-CP5 is to create a contact water collection pond in the north portion of Lake A54; named CP5. The construction of Dike D-CP5 started in October 2016 and was completed in July 2017.

Tetra Tech Canada Inc. designed the dike, provided construction monitoring, earth-work quality control and quality assurance testing services during the construction of Dike D-CP5. Construction management was overseen by Agnico Eagle Mines Ltd. MTKSL Contracting Joint Venture produced construction materials and constructed the dike. Liner installation was performed by Texel Geosol Inc. (Texel) working as a sub-contractor for MTKSL. Liner QC testing and monitoring was performed by Texel.

Dike D-CP5 was generally completed according to its design intent and overall specifications with the available construction materials under the field site and construction conditions. Some variations were made during construction to accommodate the field material availability, constructability, construction method and schedule, and design changes. Variations are documented in this report, Request for Information (RFI), and Engineering Change Notices (ECN). The Tetra Tech design team was responsible for approval of all implemented RFIs. Agnico Eagle Mines Ltd. was responsible for approval of all ECNs. The variations are not expected to materially impact the performance of the dike structure. Key variations are as follows:

- Unsuccessful attempts at mixing and placing Type K (nearly-saturated 20 mm minus granular fill) at Dike D-CP1 resulted in the suspension of its use at D-CP1 and D-CP5. The bottom liner elevation was modified to accommodate not using Tyke K material.
- The key trench geometry was altered and its volume increased in areas due to ground conditions and to accommodate the deeper liner. Difficulties controlling ripping and excavation activities also contributed in the key trench over-excavation and increased volumes. The consequence of this increase volume was the use of more construction materials than originally estimated.
- Comparison of the as-built drawings with the design indicates that some sections of the dike have as-built dimensions slightly less than designed. The deficiencies are not critical and will not affect the dikes overall stability.

The QA/QC material testing results and construction records drawings are presented in this report.

Two (2) horizontal and three (3) vertical ground temperature cables and three (3) steel rod settlement monitoring hubs were installed to monitor the performance of Dike D-CP5.

Performance monitoring is an integral part of the operation of any water retention structure. The performance of Dike D-CP5 must be monitored throughout its operating life. Long-term monitoring of D-CP5 should include thermal monitoring, settlement monitoring, routine visual inspections, and annual inspections according to the regulatory requirements.

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ACRONYMS & ABBREVIATIONS

Acronyms/Abbreviations	Definition
AEM	Agnico Eagle Mines Ltd.
AEP	Annual Exceedance Probability
CAT	Caterpillar
CP	Collection Pond
DRE	Dike Resident Engineer
ECN	Engineering Change Notice
GTC	Ground Temperature Cable
HGTC	Horizontal Ground Temperature Cable
IDF	Inflow Design Flood
km	Kilometers
m	Meters
QA	Quality Assurance
QC	Quality Control
RFI	Request For Information
ROM	Run-Of-Mine
VGTC	Vertical Ground Temperature Cable

LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Agnico Eagle Mines Ltd. and their agents. Tetra Tech Canada Inc. (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 document is subject to the Limitations on the Use of this Document attached in the Appendix or Contractual Terms and Conditions executed by both parties.

1.0 INTRODUCTION

1.1 General

Agnico Eagle Mines Ltd. (Agnico Eagle) is currently developing the Meliadine Gold Project (the project). Dike D-CP5 was constructed at the project site as part of its development plan. Tetra Tech Canada Inc. (Tetra Tech) was retained by Agnico Eagle to prepare a construction summary (as-built) report for Dike D-CP5. The project is located approximately 25 km north from Rankin Inlet, 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). A general location plan for the project is shown in Figure 1.

Dike D-CP5 was designed by Tetra Tech. It was constructed between October 2016 and July 2017. Tetra Tech provided construction monitoring, quality assurance, and earthworks quality control testing services during its construction. Construction management was overseen by Agnico Eagle's Meliadine Division's Construction Department. MTKSL Contracting Joint Venture (MTKSL) produced construction materials and constructed the dike. MTKSL was also responsible for survey control during construction and compilation of as-built information. Liner installation was performed by Texel Geosol Inc. (Texel) working as a sub-contractor for MTKSL. Liner QC testing and monitoring was performed by Texel.

A technical advisory committee reporting to Agnico Eagle oversaw the dike construction. The committee included Mr. Thomas Lepine from Agnico Eagle, Mr. Luciano Piciacchia from BBA, and Mrs. Fiona Esford from Golder Associates. During the dike construction the team received the daily and weekly dike construction QA/QC reports, was involved in several key technical discussions, and had several field visits to the project site.

Dike D-CP5 is located across the south portion of Lake A54 South. A general site plan showing the location is presented in Figure 2. A description of the dike construction activities and the quality assurance and quality control test results are presented in this report. Construction record drawings are attached in Appendix B. The survey data used for producing Dike D-CP5 construction record drawings was provided by MTKSL.

Dike D-CP5 was generally completed according to its design intent and overall specifications with the available construction materials under the field site and construction conditions. Some variations were made during construction to accommodate the field material availability, constructability, construction method and schedule, and design changes made during the construction. These variations are described in Section 7.0. Variations are documented in this report, Request for Information (RFI), and Engineering Change Notices (ECN). The Tetra Tech design team was responsible for approval of all implemented RFIs. Agnico Eagle Mines Ltd. was responsible for approval of all ECNs.

This report, which is to be submitted to the Nunavut Water Board, is prepared to meet the requirements in the Type "A" Water Licence No. 2AM-MEL 1631 – Agnico Eagle Mines Limited for the Meliadine Gold Project (Part D, Item 3).

1.2 Dike Design Concept

The detailed design of Dike D-CP5 was presented in Design Report for D-CP5 Meliadine Gold Project, NU (Tetra Tech EBA 2016a). This dike is one of several water retention dikes required to manage the site contact water during pre-production, operation, and interim mine closure.

Located across the south portion of the existing shallow Lake A54, D-CP5 is a water retention dike approximately 300 m long with a maximum dike height of approximately 3.3 m above the original ground. The intent of D-CP5 is to create a contact water collection pond in the north portion of Lake A54; named CP5. The CP5 pond is created for the following main reasons:

- CP5 will serve as a seasonal water transfer and management pond with a limited water storage capacity. A water pumping system will be installed in CP5 to manage the water impounded by the D-CP5 dike;
- The water collected in CP5 will be actively pumped to CP1 (the main site water collection pond) during the open water season each year so that the CP5 pond will be nearly empty most of the time, except for several early days (up to 3 days) during the annual spring freshet for start-up of the pump system or during an extreme rainfall event; and
- CP5 will also serve as a water transfer pond to receive the contact water that is pumped from two proposed open pits (Tiri_1000_01 and Tiri_1000_02). The water from the two open pits will only be pumped to CP5 when the CP5 pumping station (pumping water from CP5 to CP1) is fully operable.

Dike D-CP5 was designed as a lined dike with the liner keyed in a key trench. The liner system consists of a geomembrane liner (Coletanche ES2). The liner is keyed into the ground at the base of a key trench with a layer of bentonite-augmented 20 mm minus material (Type F). The superstructure is constructed of run-of-mine rock (Types A and A1), transition rockfill (Types B and B1), and granular fill material (Type C). A general section of Dike D-CP5 design concept is presented in Figure 3.

1.3 Related Documents

The supporting and related documents for Dike D-CP5 construction are as follows:

- Design Report For Dike D-CP5, AEM Document Number: 6515-132-007-132-REP-004, Version 0 (Tetra Tech EBA 2016a);
- Geotechnical Specifications for the Construction of Dike D-CP5, AEM Document Number: 6515-E-132-007-132-SPT-003 R1, Revision 1 (Tetra Tech EBA 2016b);
- Construction Quality Plan for Dikes D-CP1 and D-CP5, AEM Document Number: 6515-132-007-132-QQP-000, Version 0 (Tetra Tech EBA 2016c); and
- Liner Installation QC Plan prepared by Texel.

Table 1-1 below presents the list of issued for construction drawings used for the construction of D-CP5.

Table 1-1: List of Issued for Construction Drawings used for the Construction of Dike D-CP5

AEM Design Drawing Number	Revision Number	Tittle
65-685-230-214	0	D-CP5 General Location Plan
65-685-230-215	0	D-CP5 Key Trench and Dike Layout
65-685-230-216	0	D-CP5 Profiles
65-685-230-217	0	D-CP5 Thermal Cover Layout Plan and Profiles
65-685-230-218	0	D-CP5 Typical Sections and Quantities
65-685-230-219-001	0	D-CP5 Sections Station 1+030 to 1+170
65-685-230-219-002	0	D-CP5 Sections Station 1+180 to 1+310
65-685-230-220	0	D-CP5 Instrumentation Plan and Details for Ground Temperature Cables
65-685-230-221	0	D-CP5 Instrumentation Plan and Details for Ground Temperature Cables and Settlement Survey Monuments
65-685-230-222	0	D-CP5 Typical Details

1.4 Request for Information (RFI)

An RFI register for Agnico Eagle's Meliadine Project (Project Number 6515) under Contract Number C-007 which included Dikes D-CP1 and D-CP5 was established during the dike's construction. Table 1-2 below summarizes the request for information (RFIs) related to Dike D-CP5 that were received from MTKSL or Agnico Eagle. Details of these RFIs and corresponding responses are attached in Appendix D1.

Table 1-2: Summary of RFIs for Dike D-CP5

RFI Number	Description	Date Submitted	Date Closed
RFI_6515-C-230-007_001	Missing bid Items for D-CP1 downstream water collection channel sump and D-CP1/D-CP5 Instrumentation	09/01/2016	09/01/2016
RFI_6515-C-230-007_002	20 mm minus material classification / Liner type for D-CP5	09/06/2016	09/06/2016
RFI_6515-C-230-007_004	Horizontal tolerances that will be acceptable for lift placement	10/11/2016	10/12/2016
RFI_6515-C-230-007_005	Stake out point for each material	10/14/2016	10/17/2016
RFI_6515-C-230-007_006	Type K Material Mixing	10/24/2016	11/10/2016
RFI_6515-C-230-007_007	D-CP5 Initial Lift & Water Management	10/26/2016	11/04/2016
RFI_6515-C-230-007_009	Variation of fill placement specification	11/01/2016	11/04/2016
RFI_6515-C-230-007_010	Key Excavation From 1.8 m to 2.8 m	11/04/2016	11/10/2016
RFI_6515-C-230-007_011	Liner termination details	11/16/2016	11/17/2016
RFI_6515-C-230-007_012	Crushing and screening material acceptance	11/29/2016	12/09/2016
RFI_6515-C-230-007_014	Solutions to address potential Type A1 material shortage	12/10/2016	12/22/2016
RFI_6515-C-230-007_015	This RFI was not submitted		
RFI_6515-C-230-007_016	Type K material mixing	01/05/2017	01/09/2017
RFI_6515-C-230-007_017	This RFI was not submitted		
RFI_6515-C-230-007_018	Type K placement	01/19/2017	01/20/2017
RFI_6515-C-230-007_019	Downstream excavation proposal	01/22/2017	01/22/2017
RFI_6515-C-230-007_020	Does RFIs #18 and 19 apply to D-CP5?	01/23/2017	01/25/2017
RFI_6515-C-230-007_022	Slope when excavating past 2.8	01/27/2017	01/27/2017
RFI_6515-C-230-007_024	Type B Material Shortage	02/20/2017	02/21/2017

1.5 Engineering Change Notice (ECN)

Table 1-3 below summarizes the Engineering Change Notices (ECNs) related to Dike D-CP5. Details of these ECNs and corresponding responses are attached in Appendix D2.

Table 1-3: Summary of ECNs for Dike D-CP5

ECN Number	Description	Date Issued
6515-C-235-007-ECN-001_RA	Revision 1 for Construction Specifications of D-CP1 and D-CP5	11/10/2016
6515-C-235-007-ECN-002_RA	Design Change of Dike Liner Key-in Detail at Crest for D-CP1 and D-CP5	11/14/2016

2.0 CONSTRUCTION MATERIALS

2.1 General

The following materials were used for the construction of Dike D-CP5:

- Run-of-Mine Rockfill (600 mm minus) – Types A and A1;
- Transition Rockfill (150 mm minus) – Types B and B1;
- Granular Fill (20 mm minus) – Type C
- Bentonite-Augmented Material (20 mm minus) – Type F; and
- Geomembrane Liner (Coletanche ES2).

2.2 Run-of-Mine Rockfill (600 mm minus) – Types A and A1

Type A1 material consisted principally of greywacke ROM that was excavated from the saline water storage pond during its construction from September to October 2016. The material generally had a maximum particle size of about 600 mm. Type A material consisted principally of greywacke run-of-mine (ROM) from underground operations. The Type A material generally had a maximum particle size of about 600 mm. The principal difference between Types A and A1 material, is that the Type A material has a residual salinity as it was sourced from the underground operations.

Type A1 was specified to be used for the downstream shell of the dike. Because of a shortage of Type A1 material portions of the uppermost part of downstream shell was constructed with Type A material as per RFI_6515-C-230-007_014 from Station 1+110 to 1+315.

Type A was specified for the upstream shell of the dike and for thermal cover over the abutments.

Types A and A1 materials were placed in lifts with maximum thickness of about 900 mm. Care was taken during placement to avoid segregation and nesting of larger particles. Each lift was compacted with a 10 ton vibratory roller drum compactor (minimum of six complete passes) and haul truck traffic prior to placing the next.

2.3 Transition Rockfill (150 mm minus) Types B and B1

Transition rockfill (150 mm minus) was used to backfill most of the key trench and as a filter-graded material between the ROM and fine granular fill (Type C) materials.

The design called for the use of transition rockfill produced from Type A1 material. Due to the shortage of Type A1 material discussed in Sections 2.2 and 2.3 above, some of the transition rockfill used was produced using Type A material. Based on Tetra Tech QA/QC personnel field notes and daily reports, most of the transition material produced from Type A material was placed above the top liner (from approximately Elevation 66.8 m to 67.8 m). This information was not provided in MTKSL as-built survey data. To differentiate between these materials, transition material produced from Type A material is referred to in this report and the as-built drawings as Type B material while transition material produced from Type A1 material is referred to as Type B1 material.

The maximum particle size of the material was typically less than 150 mm. The 150 mm minus material was the product of the jaw crusher and did not require further processing. The specified gradation limits are presented in the design documents and shown on the particle size analyses in Appendix E1. Quality assurance particle size analysis testing conducted during the production of the material indicated that the average gradation was within the specified gradation limits.

The material was placed in lifts with maximum thickness of 300 mm. Despite the care taken during material handling and placement to avoid segregation and nesting of larger particles, minor segregation issues were observed in some instances. Following advice from QA/QC personnel, MTKSL generally mitigated this by ripping and mixing the stockpile and placing the material mostly with a dozer (as opposed to an excavator) when feasible.

In the months of February and March 2017, the Type B1 material stockpile was essentially frozen. MTKSL used a D8 or D9 CAT dozer to rip the stockpile. As a result, a few larger and frozen lumps were noticed in the material placed during those months. When observed by field QC staff, MTKSL was instructed to remove the frozen chunks prior to compaction.

Lifts of transition material were generally compacted, with a 10 ton vibratory roller drum compactor (minimum of six complete passes). The first lift of Type B1 material in the key trench over the Type C material and liner was lightly compacted to avoid damaging the liner.

2.4 Granular Fill (20 mm minus) – Type C

The granular fill material (20 mm minus) referred to as Type C was used to construct the key trench fillet zone and also serves as the bedding layers above and below the liner to protect it from damage.

The 20 mm minus material was produced by the crusher from natural esker material sourced from the Meliadine Esker. The specified gradation limits are presented in the design documents (Tetra Tech EBA 2016a and 2016b). Tetra Tech's QC site representatives performed quality assurance testing on the material produced for the dike's construction. The tests included particle size analysis (gradation test), moisture content, moisture-density relationship test (ASTM 698) and single point frozen soil dry density. Test results are attached in Appendix E2.

2.5 Bentonite-Augmented Material – Type F

Type F material was used to construct the key trench leveling course and to provide a low permeability seal between the liner and the underlying frozen till and bedrock foundation beneath the liner and a seal at the liner hinge point. Type F material was produced by blending Type C (20 mm minus) material with dry powdered bentonite to achieve an average bentonite content of not less than 10% (by weight) with a minimum of 8% (by weight) at any grab sample. Two different particle sizes of bentonite were supplied and used for dikes construction; bentonite in smaller-sized (2,500 pound) cylindrical bags which had a slightly finer grain size and bentonite in larger (3,000 pound) bags. Both materials were tested (swell tests and bulk density) by Tetra Tech QA/QC personnel and found suitable for dike construction.

Three 20 foot containers were used to construct a U-shaped area on the Industrial pad for the purpose of blending bentonite and Type C material. Materials were blended by dumping/spreading Type C material within the U-shaped area, followed by placing the appropriate volume of bentonite on top of it and mixing using either a CAT 980 or a CAT IT62 loader. The mix proportions developed by MTKSL are presented in Table 2-1 below. The material was loaded in CAT 740 haul trucks and hauled to the dike where it was dumped and placed along the key trench using a CAT Excavator which further assisted in the blending.

Table 2-1: Summary Mix Proportion of Bentonite Augmented (Type F) Material

Loader	Bag Type	Number of Loader Buckets of Type C Material	Number of Bentonite Bags
CAT IT62	Large Bag (3,000 Lbs.)	3 level	1
CAT IT62	Small Bag (2,500 Lbs.)	3 level	1
CAT 980	Large Bag (3,000 Lbs.)	1 level and 1 heaped	1
CAT 980	Small Bag (2,500 Lbs.)	2 level	1

Tetra Tech's QC representatives frequently observed the mixing station and mixing process and verified the number of bentonite bags and quantities of Type C material used were as indicated. The number of bentonite bags used for the blending were tracked by MTKSL on a daily basis and recorded by Tetra Tech's QC representatives.

Visual swell assessments on samples of placed Type F material were performed with satisfactory results. Density and moisture QA/QC test results on the Type F material are presented in Appendix E3.

2.6 Geomembrane Liner (Coletanche ES2)

The bituminous geomembrane liner system is the primary water retention element for Dike D-CP5. Coletanche bituminous geomembrane liner ES2 was used for D-CP5.

The liner was purchased from Coletanche and shipped to site by Agnico Eagle. Liner installation was performed by Texel working as a sub-contractor for MTKSL. MTKSL provided logistical and equipment support to the Texel team. Liner QC testing and monitoring was performed by Texel while QA was performed by the Dike Resident Engineer (DRE).

The Coletanche ES2 geomembrane was rolled and shipped to site in sea containers. It was un-rolled, placed in panels of varying lengths accordingly, and welded in place.

3.0 CONSTRUCTION EQUIPMENT

3.1 General

Most of the mobile equipment used for the construction of Dike D-CP5 was provided by MTKSL. Details of the principal equipment used for the dikes construction are presented in the following subsections.

3.2 Mobile Construction Equipment

Table 3-1 presents the major equipment used during Dike D-CP5 construction.

Table 3-1: Equipment Used During D-CP5 Construction

Haul Trucks	Bulldozers	Excavators	Loaders	Others
CAT 773	CAT D5K	CAT 330C	CAT 988G	Compactor CS563E
CAT 740	CAT D6M	CAT345B	CAT 980G	Compactor CS56
CAT D300	CAT D8T	CAT345C	CAT IT62	HAMM 3205
	CAT D9R	CAT336		Walk-behind Drum roller
		CAT320E		CAT Skid Steer
		Komatsu PC400		Hydra-Trac 400 RAB Drill

3.3 Crusher

MTKSL's aggregate crushing plant was used to produce the crushed granular materials (Types B, B1, and C). The crushing plant was operated by MTKSL employees. The crusher system consists of a primary jaw crusher, a vibratory screen deck, and a secondary cone crusher.

Quality control testing of the material produced was performed daily by Tetra Tech's QC site representatives. Test results for materials produced and used throughout the dike construction period are provided in Appendixes E1 to E3.

4.0 DIKE D-CP5 CONSTRUCTION ACTIVITIES

4.1 General

Construction of Dike D-CP5 occurred between October 2016 and July 2017. Dike D-CP5 was generally constructed according to the guidelines and requirements stated in the design documents. Variations from the design were documented in RFIs and ECNs and are discussed in Section 7.0.

Dike D-CP5 construction management was performed by Agnico Eagle's Meliadine Construction Division. The construction crew constituting a site superintendent, foremen, mobile equipment operators, truck drivers, laborers, drill/blast personnel, and surveyors was provided solely by MTKSL. The drill/blast of the downstream channel/sump was conducted by a sub-contractor (McCaw South). MTKSL sub-contracted Texel for liner installation and liner QC.

A technical advisory committee reporting to Agnico Eagle oversaw the dike construction. The committee received the daily and weekly dike construction QA/QC reports, was involved in several technical discussions, and had several field visits to the project site during the dike construction.

Tetra Tech's quality control team carried out quality control testing for the earthworks, prepared daily reports for their work on site, and maintained a photographic record of the work completed during construction. Liner quality control was performed by Texel technicians.

DREs from Tetra Tech carried out quality assurance and overall quality monitoring for the construction activities. They produced daily and weekly reports which covered construction activities on site. The daily and weekly reports are not attached to this report but can be provided upon request.

Figure 4 summarizes the relationship between various stake holders during the dike's construction.

Selected photographs showing various aspects and activities during the dike's construction are presented in the Photographs section of the report. The major components of the construction are listed below and summarized in detail in the following sections:

- Surveying (Section 4.2);
- Working Platforms Construction (Section 4.3);
- Key Trench Excavation and Cleaning (Section 4.4);
- Bentonite-Augmented Material Placement (Section 4.5);
- Fillet Zone Material Placement (Section 4.6);
- Key Trench Backfilling (Section 4.7);
- Run-of-Mine Placement (Section 4.8);
- Liner System Installation (Section 4.9); and
- Instrumentation Installation (Section 5.0).

4.2 Survey

MTKSL surveyors provided the following survey services throughout the construction of Dike D-CP5:

- Original ground surface surveying prior to construction;

- Layout for key trench excavation;
- Construction grade control;
- Detailed survey of as-built dike fills, liner panel layout, and final graded slopes for material zones;
- Modeled surfaces of placed material zones; and
- Survey of instrumentation installations.

4.3 Working Platforms Construction

Prior to key trench excavation, working platforms were constructed on the upstream and downstream sides of the key trench to facilitate the movement of equipment and personnel. The working platforms were basically the first and second lifts of either Type A (upstream side) and a combination of Types A and A1 (downstream side) materials which constitute the upstream and downstream shells of the dike respectively. They were approximately 1 m thick and were placed and compacted following specifications for the material.

Foundation preparation was necessary such that there was good contact between the fill materials for the working platforms as this material constitutes the base of the dike's shell. Foundation preparation activities included removing loose boulders and cobbles, and snow and ice within the footprint of upstream and downstream shells.

Foundation preparation was executed principally with the CAT dozers and excavators (see Photos 1, 2, and 3). Lake A54 South was pumped to A54 North to reduce seepage into the dike footprint. Seepage was reduced to the extent that it didn't impact material placement and compaction. The loose boulders and cobbles, snow and ice was hauled to a dump location designated by Agnico Eagle.

4.4 Key Trench Excavation and Cleaning

Key trench excavation and ripping began in January 2017 and was completed in March 2017. The ground was frozen during this time. Excavating and ripping with the CAT D8T and D9R dozers was challenging because of the frozen ground and the narrow width of the key trench. Ripping with the excavators (PC400 and CAT 330C) with rock breakers attached was the main digging mechanism. Cleaning and removing excavated and ripped material was done with the CAT excavators. Various aspects of key trench excavation are presented in Photos 3 to 6.

The actual key trench geometry varied are as a result of variable ground conditions and adjustments made following RFI_6515-C-230-007_019 and RFI_6515-C-230-007_021 to achieve the design slope and dimensions of the bottom liner. The key trench excavation depths were governed by where competent bedrock or non-ice-rich, ice-saturated frozen till (with an ice saturation of no less than 90%) was encountered or a maximum depth of 2.8 m was achieved. The key trench was generally excavated to a maximum depth of 3.2 m. Table 4-1 below summarises final key trench excavation depths and material encountered at the base of the key trench. Details of the key trench excavation materials are provided in Appendix E4.

Table 4-1: Summary of of Final Key Trench Excavation Depths

Station	Final Depth Range (m)	Material at Final Key Trench Base
0+10 to 0+40	1.6 to 2.0	Ice-saturated soil
0+45 to 0+60	1.5 to 1.8	Bedrock
0+65 to 0+80	1.8 to 2.0	Ice-saturated soil
0+85 to 0+245	1.6 to 2.3	Bedrock
0+245 to 0+255	2.5 to 2.8	Ice rich soil at 2.3 m
0+255 to 0+265	2.5 to 2.8	Ice-saturated soil
0+265 to 0+285	3.0 to 3.2	Ice rich soil at 2.8 m

The till material and weathered rock from the excavation was hauled to the dump area designated by Agnico Eagle while some of the rock was hauled to the crusher and used for making Type B1 material.

Key trench base bulk cleaning was carried out with CAT excavators. Final and dental cleaning was carried out with hand tools which included, shovels, brooms, and compressed air. Loose, broken, or altered material from the base of the key trench was blown out with compressed air. Snow and ice was also hand shovelled and blown out with compressed air prior to fill placement. Local depressions, open joints, and voids on the rugged bedrock surface were filled with bentonite-augmented material. The quality of bedrock encountered was good such that no grout treatment was required. Key trench cleaning was inspected and approved by Tetra Tech's QC personnel and the DRE prior to fill placement.

4.5 Bentonite-Augmented Material (Type F) Placement

The bentonite-augmented material (Type F) material was produced by mixing Type C material with dry bentonite powder at the mixing station described in Section 2.6.

The Type F material was required to provide a seal with the foundation beneath the liner and at the hinge point. The material was placed in lifts approximately 200 mm thick. The number of lifts depended on the final key trench excavation depth and the liner depth which ranged from 1.45 m to 2.65 m below original ground level. Type F material was placed using either the CAT D5K dozer along the key trench bottom and the upstream fillet zone or CAT excavators for the downstream fillet zone and the liner hinge point. The compaction of the Type F material was performed with the CAT CS563E or CS56 compactors for the most part. The downstream fillet was compacted with a walk-behind drum roller.

The key trench bottom was cleaned and inspected to make sure it was free of deleterious material prior to placement of the Type F material. The placement and compaction of Type F material is shown in Photos 7 to 9.

Material placement and compaction was monitored by Tetra Tech's QC site representatives. Density testing was carried out using a nuclear densometer and/or the "modified" sand cone method. Test results are attached in Appendix E3.

4.6 Fillet Zone Materials Placement

The fillet zone is a wedge of Type C material underlined by a layer of Type F material. The upstream fillet was constructed prior to liner placement. Fillet construction is shown in Photos 10 to 12.

The Type C fillet was constructed in maximum 300 mm thick lifts using haul trucks, the CAT D5 dozer, CAT excavators, and a CAT skid steer. The compaction of the lifts of material for fillet was performed by the CAT CS563E or CS56 compactors or the HAMM 3205 towards the top of the upstream fillet. The final surface of the upstream lifts of material were shaped using an excavator to provide a flat surface to lay the liner on. Placement and compaction was monitored and tested by Tetra Tech's QC personnel as described in Section 4.5.

4.7 Key Trench Backfill

Following liner installation within the key trench, the key trench was backfilled with Types B1 and C materials. Type C material; approximately 500 mm thick was placed above the liner to serve as a bedding layer, followed by Type B1 material up to approximately original ground elevation.

The backfill materials were placed and compacted in 250 mm thick lifts in the case of Type C and 300 mm thick lifts in the case of Type B1. The first lift of Type C material over the liner was not compacted, while the second lift was compacted with a walk-behind drum roller. The first lift and second lifts of the Type B1 material were compacted with the HAMM 3205 packer while subsequent lifts were compacted with the CAT CS563E or CS56 compactors.

Material placement and compaction was monitored and tested by Tetra Tech's QC personnel.

Various aspects of key trench backfilling are shown in Photos 13 and 14.

4.7.1 Granular Fill Material (20 mm minus) – Type C

Two zones of Type C material were placed; one below and one above the liner system. The Type C material serves as the bedding layer for the liner system. The Type C material was placed over the base liner in approximately 200 mm to 300 mm thick lifts using the skid steer loader, CAT excavators above the key trench slope liner and below the dike slope liner, and CAT D5 dozer above the liner on the dike slope. The compaction of the 20 mm minus material was performed by the walk-behind drum roller, HAMM 3205 packer, and/or the excavator bucket. Various aspects of the 20 mm minus material placement are shown in Photos 13 to 15.

4.8 Transition Rockfill (150 mm minus)

Transition rockfill was used to backfill the key trench and on the dike crest from approximately Stations 1+160 to 1+250. It was placed below and above the liner system as transition above the key trench between the ROM and the Type C liner bedding material.

Transition rockfill was placed in lifts approximately 300 mm in thickness using CAT excavators or the CAT D5 dozer. The compaction of the transition rockfill material was performed by the CAT CS563E or CS56 packers or the HAMM 3205 packer. The placement of the transition rockfill material on the crest is shown in Photo 16.

4.9 Run-of-Mine (ROM) Placement

ROM material (Types A and A1) constitutes the upstream and downstream shells of the dike. The thermal cover above the dike is built with Type A material. As stated in Sections 2.2 and 2.3, parts of the downstream shell was constructed with Type A material instead of the specified Type A1 due to material shortage.

The material was placed in lifts with maximum thickness of about 900 mm to 1,000 mm using the CAT D5 dozer and excavators. Care was taken during placement to avoid segregation and nesting of larger particles. Each lift was compacted with the CAT CS563E or CS56 packer (minimum of six complete passes) and haul truck traffic prior to placing the next.

The material was visually inspected by Tetra Tech's QC site representatives to verify that, in general, the particles adhered to the maximum particle size and that deleterious materials such as snow or till were not present. Additionally, Tetra Tech observed that the specified lift thickness was maintained and that the material was compacted sufficiently. ROM placement and compaction are shown in Photos 17 and 18.

4.10 Liner Installation

The geomembrane liner (Coletanche ES2) was installed by Texel. The liner was installed in two phases. The first phase consisted of placing the liner within the key trench and the second phase consisted of placing liner material on the upstream slope.

The first phase of the liner placement included placing the liner panels within the key trench. The liner extended out of the key trench to a hinge point as shown in Photos 19 and 20. The liner hinge point was covered with sheets of plywood and 20 mm material placed on the plywood to protect the liner while construction continued.

For the second phase of liner placement on the upstream slope, the liner hinge was uncovered and inspected for damage. The liner flap had an approximately 0.5 m horizontal tie-in length at the hinge.

The construction methods employed during the second phase of the liner installation were the same as those employed in the first phase of liner installation. Photos 21 to 22 show aspects of the second phase of liner installation.

Liner installation quality assurance was carried out by the DRE and quality control testing by Texel. Quality control testing and monitoring was carried out following the QC plan developed by Texel. The QA/QC procedure that was executed each day when liner was installed was as follows;

- DRE reviewed as-built survey data for the sub-grade to confirm it was built to design;
- DRE reviewed subgrade fill material placement QC monitoring and testing results to make sure design specifications were achieved;
- A subgrade inspection was carried about 30 minutes before the planned installation time by the DRE, Texel's foreman, and Texel's QC technician to verify that the subgrade was free of deleterious substances, snow and ice, compaction specifications were met, and an adequate liner base was present;
- Test welding was performed by a Texel welder on a piece of liner besides or in the key trench about 30 minutes before planned installation time;
- An ultrasonic test was performed on the test strip by Texel's QC technician;
- Three (3) samples for tensile resistance were taken from the test strip and tested by the Texel QC technician; and
- If all three (3) test strips tested had results above the minimum required 74 lb/in (13 kN/m) for ES2, the DRE approved liner placement.

The DRE observed the process of liner installation and qualification welding tests, seam welding, and ultrasonic tests along seams. The DRE also witnessed liner repairs and testing. Elements of the liner system were installed according to the requirements in the design documents and test results met specifications. The liner installation quality control report is presented in Appendix F.

5.0 INSTRUMENTATION

5.1 General

Ground Temperature Cables (GTCs) and survey monitoring points were installed in Dike D-CP5 for performance monitoring purposes. Horizontal Ground temperature Cables (HGTCs) were installed in the key trench and Vertical Ground Temperature Cables (VGTCs) were installed on the upstream and downstream sides of the key trench. Survey monitoring points were installed above the liner system along the dike crest. The location of the instruments are shown on the construction record drawings in Appendix B. The ground temperature cables and the survey monitoring points are discussed in the following sections.

5.2 Ground Temperature Cables

Two (2) HGTCs (HGTC-1 and HGTC-2) were installed above the first lift of Type C material, approximately 250 mm above the bottom liner along most of the key trench length. The cables were placed in 25 mm I.D. flush coupled threaded PVC pipes. The detail locations of the HGTCs are presented in the as-built drawing 65-685-230-220.

Three (3) VGTCs (VGTC-1, VGTC-2, and VGTC-3) were installed vertically on the upstream and downstream sides of the key trench. VGTC-1 and VGTC-2 are installed through the dike, upstream of the liner system and key trench, to monitor temperatures in the upstream portion of the dike and its foundation. VGTC-3 is installed through the dike, downstream of the liner system and key trench, to monitor temperatures in the downstream portion of the dike and its foundation.

Cable locations were carefully selected to avoid any damage to the liner system while drilling the holes to install VGTCs. The detail locations of the VGTCs are presented in the as-build drawing 65-685-230-221.

VGTC holes were drilled with a Hydra-Trac 400 RAB drill rig or Canadrill's drilll rig operated by McCaw South and Canadrill respectively. The holes were cased with a thick walled PVC pipe for about 1 m through the fill material to prevent the holes from caving in. A 25 mm I.D. flush coupled threaded PVC pipe was lowered down the cased boreholes and the GTCs installed inside the pipe. After cable installation, the holes were backfilled with sand.

Photos 23 to 26 show GTC installations. The GTC connectors were placed inside protective thick-walled 100 mm I.D. PVC pipe with an end cap as shown in Photo 26.

Manual ground temperature readings were taken before and immediately after installation to confirm that all the thermistor beads were working and several times later to allow the ground to equilibrate after drilling/backfilling. Tetra Tech's site personnel continued taking readings at least once a week during the remaining construction stage. Readings taken by Tetra Tech site representatives during the construction period and those taken by Agnico Eagle and sent to Tetra Tech prior to writing this report have been used to plot the ground temperature profiles presented in Appendix C. Readings from the GTCs indicate frozen ground conditions within the critical zones of the dike key trench and below it, as designed. The detail thermistor bead locations for each GTC are summarized in Appendix C.

5.3 Survey Monuments

Three (3) settlement survey monuments (M-1, M-2, and M-3) were installed in the central area of the dike located immediately above the liner crest to monitor any settlements of the liner crest. The survey monuments consist of a 1.4 m long, 25 mm diameter metal rod welded to a 500 mm square steel plate. A thick-walled 50 mm I.D. PVC pipe was placed around the metal rod as a protective casing. Photos 27 to 28 show the installation of M-2 and Photo 29 shows M-1 installed and protective casing inserted around it. The survey points are to be used in determining if dike settlement is occurring. A 16" pile was installed directly west of the south abutment in a hole drilled 1 m into bedrock and grouted in place to serve as a control point for the survey monuments. The detail locations of the survey monuments are presented in the as-build drawing 65-685-230-221.

6.0 QUALITY ASSURANCE AND QUALITY CONTROL

6.1 Dike Resident Engineer (DRE)

Agnico Eagle selected Tetra Tech to be responsible for QA activities during the construction of the dikes. Tetra Tech provided a DRE who was on site on a full time basis (day shift only) during the construction of the dikes.

The DRE's role on site is summarized as follows:

- Performed QA activities and examined dike construction issues first hand and refer to Design Engineer if needed;
- Oversaw and monitored QC activities, including field and laboratory testing;
- Approved or rejected the materials and construction done at critical stage gates;
- Tracked, reported, and followed up with any non-conformance reports;
- Observed and approved any QC activities (including both earthworks and liner);
- Reviewed, approved, or rejected QC testing results;
- Ensured the QC teams met calibration requirements for the testing facilities, equipment, and devices;
- Visually inspected materials hauled to the dike for conformance with contract or construction specifications;
- Compiled and maintained QA/QC results;

- Oversaw the installation of instrumentation;
- Prepared and distributed daily and weekly activity QA reports, documenting dike construction and QA/QC activities;
- Received and reviewed as-built survey data/drawings provided by the surveyor and ensured the as-built survey data/drawings met specified requirements; and
- Conducted other QA tasks related to dike construction, as directed by Agnico Eagle.

6.2 Quality Control

6.2.1 Earthworks Quality Control

Agnico Eagle selected Tetra Tech to perform earthworks QC services for dike construction. Tetra Tech provided field engineers and technologists who performed laboratory and field testing on construction materials and verified the key trench foundation conditions. The earthworks QC field personnel were onsite on a full time basis (day and night shifts) for the majority of the dike's construction duration. Earthworks QC engineers and technologists activities during dike construction are summarized as follows:

- Tested and confirmed the acceptance of the construction materials;
- Observed key trench excavation;
- Confirmed if key trench foundation depth met design requirements;
- Observed various fill material placement (lift thicknesses, segregation etc.) and compaction efforts;
- Completed in situ density testing using a nuclear densometer or the "modified" sand cone method;
- Conducted soil laboratory testing (sieve, moisture content, moisture-density relationship, jar test (for determining ice content), bentonite swell test);
- Ensured proper calibrations and use of laboratory and field testing equipment; and
- Prepared and distributed daily activity and earthworks QC reports.

6.2.2 Liner Quality Control

Liner QC work was conducted by a technician from Texel. The liner QC technician's activities during liner installation are summarized as follows:

- Checked liner panels and made sure they were free of punctures and wrinkles prior to installation;
- Observed the liner installation works and ensured the liner was installed according to the construction specifications and manufacturer's recommendation;
- Performed QC testing on installed liner as per the specifications and Texel's QC plan; and
- Prepared and distributed daily activity and liner QC testing reports.

6.3 Earthworks Quality Assurance and Quality Control Testing

6.3.1 Run-of-Mine Rockfill (600 mm minus)

The material was visually inspected by Tetra Tech's QC site representatives to verify that, in general, the particles adhered to the maximum particle size and that deleterious materials such as snow or till were not present. Additionally, Tetra Tech observed that the specified lift thickness was maintained during placement and that the material was compacted sufficiently.

No QA/QC testing was conducted on ROM Type A or Type A1 materials.

6.3.2 Transition Rockfill (150 mm minus) Material

6.3.2.1 Particle Size Analysis

Samples of transition material were taken after and during crushing operations. Samples that were taken after crushing were from the stockpiles crushed in September and October 2016 prior to QC personnel's arrival on site. Samples obtained from the crusher were taken off the jaw crusher discharge belt. Particle size analyses conducted on eleven (11) samples of transition material produced from September 2016 to April 2017 indicated that average particle size distribution was generally within the limits presented in the design specifications. Results of particle size analysis for the produced transition material are presented in Appendix E1.

6.3.2.2 Moisture content

The moisture contents of the samples used for particle size analyses were also determined. Results are reported in the particle size analyses reports presented in Appendix E1 and summarized in Table E1.1.

6.3.2.3 Compaction Monitoring

Transition material placement and compaction was observed and monitored by Tetra Tech's QC site representatives. They verified transition material was placed in lifts approximately 300 mm in thickness. The material was generally handled properly to avoid segregation and each lift subjected to at least six (6) passes with the smooth drum vibratory CAT CS56 or CS563E compactors. When it wasn't possible to use the 10 ton CAT compactors because of safety concerns, lift thicknesses were reduced to 200 mm maximum and the HAMM 3205 packer was used with a minimum of ten (10) passes made.

6.3.3 Granular Fill (Type C) Material

6.3.3.1 Particle Size Analysis

Particle size analyses were conducted on Type C (20 mm minus) material produced at the crusher and used for the dike construction to verify compliance with the design specifications. A total of fifty seven (57) tests were conducted in the site laboratory from October 2016 to May 2017 when the dike was constructed. Two (2) QA samples were tested in Tetra Tech's Edmonton laboratory in October and November 2016. Particle size analyses for Type C material indicated that the average gradation was within the specified limits. A detailed summary of the analyses is presented in Appendix E2.

6.3.3.2 Moisture Content

The moisture contents of the samples used for particle size analyses were also determined. Moisture contents of stockpiled materials were determined prior to their use when visually the material appeared to contain snow in it or a high fines content. Results are reported in the particle size analyses reports presented in Appendix E2 and summarized in Table E2.1

6.3.3.3 Moisture Density Testing

Moisture-Density relationship testing (ASTM 698) was performed on seven (7) samples in the site laboratory and two (2) samples in Tetra Tech's Edmonton laboratory.

The field single point frozen soil density test (single point density test) was conducted outside the laboratory under the ambient air temperature by using a frozen soil sample taken from either the stockpile or construction site and by following the standard moisture-density test (ASTM 698) procedure without thawing the soil or adding water. This test was performed because the aggregate temperatures were generally well below freezing during construction making it unrealistic to compare field densities with results from standard moisture-density tests to assess compaction. Using this approach effectively evaluated if the material had been compacted to near the maximum achievable density in the frozen state.

Nine (9) single point density tests were performed on material from Type C stockpiles during dikes construction. Moisture-Density relationship test results are presented in Appendix E2. Single point density test results for Type C material are summarized in Table E2.2.

Results from the moisture-density relationship and frozen single point density tests were used to assess the level of compaction of Type C material.

6.3.3.4 Field Density Testing

Type C material placement and compaction was monitored by Tetra Tech's QC site representatives. Density testing was carried out using a nuclear densometer and/or using a "modified" sand cone method. As aggregate temperatures were generally well below freezing and ambient temperatures at times as low as -35°C during construction from December 2016 to March 2017, the accuracy of field density values from the nuclear densometer were suspect. The "modified" sand cone method which involved the use of bentonite with a predetermined bulk density instead of sand was used to measure the in situ density during cold conditions. Results obtained from density tests were compared with the frozen single point density test results to estimate the compaction. From the test results and field observations, the best possible compaction under the field conditions for the available materials was generally achieved. Photo 30 shows density testing on a lift of Type C material. Test results are attached in Appendix E2.

Some of the field density tests indicated that some lifts of Type C placed in the key trench had relatively low density due to relatively high native ice content (moisture content) in the frozen material that was compacted in cold winter conditions.

6.3.4 Bentonite-Augmented Material (Type F)

6.3.4.1 Moisture Content

Moisture contents of six (6) samples of Type F material taken from the dike or the mixing station were determined. Results are summarized in Table E3.1.

6.3.4.2 Swell Test

Type F material production was monitored by Tetra Tech's QC site representatives (Photo 31). Regular visual swell assessment on samples of placed Type F material was performed (Photos 32) and the results proved the presence of bentonite in the material.

6.3.4.3 Moisture Density Testing

The presence of bentonite in this material made it not possible to do a normal standard moisture-density test on it. Seven (7) single frozen density tests were performed on the material during dikes construction. The single frozen density tests on Type F material under field conditions were performed without adding water. Test results were used in assessing field compaction. Test results for Type F material are summarized in Table E3.2.

6.3.4.4 Field Density Testing

Type F material placement and in situ density was monitored by Tetra Tech's QC site representatives. Density testing was carried out using a nuclear densometer and/or using a "modified" sand cone method. Results obtained from density tests were compared with frozen single point density test results to estimate the compaction. From the test results and field observations, the best possible compaction under field conditions for the available materials was generally achieved. Photo 33 shows density testing on a lift of Type F material. Test results are attached in Appendix E3.

6.3.5 Native Till at Bottom of Key Trench

Native till material from the base of the key trench was taken for jar tests (as described below) and moisture content to verify the ice content of the foundation. The criteria for base of key trench excavation was stipulated in Appendix A of the specifications and summarized as follows:

- Minimum excavation depth 1.4 m below existing ground; and
- Key trench is to be extended to greater than 1.4 m depth below existing ground surface, until a point where material at the base consists of "ice-saturated", but not "ice-rich" soil or approved bedrock. If the key trench was excavated to a depth of 2.8 m from the original ground surface and no icy soils were found at the bottom of the key trench, the key trench excavation was terminated at 2.8 m. The key trench was excavated to a maximum depth of 3.2 m.

Tetra Tech QC site representatives took samples for jar and moisture tests from the base of the key trench once a 1.4 m depth was attained and every approximately 0.5 m downwards. Samples were obtained using a concrete coring machine (Photo 34) or by ripping with an excavator.

The jar tests is a simple test performed on ice-rich frozen soil to estimate its volumetric ice content. The test was generally performed using an approximately 10 cm long frozen soil core placed in a graduated glass beaker and allowed to thaw. When it wasn't possible to take cores, disturbed samples were used. The thawed saturated soil was then thoroughly mixed and allowed to settle (Photos 35 and 36). Volumes of sediment and supernatant water are recorded to estimate excess ice content in percent of the sample. Following the criteria set in Appendix A of the specifications, key trench base material was classified as either:

- Ice-saturated – Having a minimum of 90% ice saturation (or a minimum of 82% of water saturation) and less than 10% free water by volume of thawed soil sample in the jar and acceptable as key trench base;
- Ice-rich – More than 10% but less than 30% free water by volume of thawed soil sample in jar and not acceptable as key trench base; and
- Icy–soil – More than 30% free water by volume of thawed soil sample in jar and not acceptable as key trench base.

Jar and moisture content tests results from the key trench base are attached in Appendix E4; as a summarized Table E4 and displayed on the chart in Figure E4.

6.4 Liner Quality Control Testing

Texel conducted QC testing during liner installation. The results of this program are presented in their Construction Report, which is presented in Appendix F. The DRE conducted visual inspections throughout liner construction and observed the qualification welding tests, seam welding, ultra-sonic tests on patches and on seams. Photographs were taken during some of the testing (Photos 37 and 38). Liner QC activities involved the following:

- An ultrasonic test for each roll (79 m of Coletanche ES2) of liner installed or one test per shift per welder when the liner is installed;

- An ultrasonic test on each patch;
- Trowel test and visual observations along the seams and repairs; and
- Final visual tests to check for punctures or wrinkles on the placed liner.

6.5 Liner Quality Assurance

Liner quality assurance was performed by the DRE. The DRE conducted visual inspections throughout liner construction and observed seam welding and non-destructive tests. The non-destructive tests included qualification welding tests, ultra-sonic tests on patches/repairs and on seams. Punctures were identified during some inspections. Texel was informed and repairs carried out following specifications.

Two samples (one from the top liner and one from the bottom liner) were taken for destructive testing along completed liner seams. Samples were taken by Texel from locations designated by the DRE. The samples were approximately 700 mm x 300 mm each. Destructive test sample locations were repaired and tested by Texel following specifications. Photo 39 shows a destructive sample location along seam between Liner Panels 35 and 36. The samples are currently stored on site and may be sent to an external laboratory for tensile shear strength and ultrasonic tests in the future.

7.0 VARIATIONS FROM DESIGN DOCUMENTS

7.1 Nearly Saturated Backfill (Type K)

Type K material which is basically saturated Type C material was designed to be used to backfill excavated zones of the key trench below 1.8 m from the existing ground surface. Excavations below 1.8 m from ground surface were required to remove ice-rich or icy soils following the criteria descried in Appendix A of the specifications.

In December 2016 and January 2017, MTKSL had several unsuccessful attempts at mixing water and Type C material to produce Type K material for dike D-CP1 construction. RFI No. 6515-C-230-007_018 was issued in January which resulted in the suspension of this material's use for the dike's construction. The alternative was to place a 0.15 m to 0.30 m thick layer of Type F material on the base of the key trench. The key trench excavation geometry had to be adjusted as described in Section 7.2 below. This change does not negatively affect the design intent, quality of the key trench, and the expected dike overall performance as a whole.

7.2 Key Trench Excavation Geometry and Volume Increase

The key trench excavation geometry had to be adjusted to meet design requirements based on the elimination of Type K material discussed in Section 7.1. Following the elimination of Type K material and consequently the lowering of the liner to depths in excess of 1.8 m below the existing ground surface, additional excavation in the key trench downstream side was required to comply with the design liner slope and width in the key trench base.

The depth of foundation preparation was greater than anticipated (>2.8 m) in the design in some sections of the key trench. This was because it was difficult to control ripping with the excavator rock hammer.

The as-built configuration meets the design intent of the dike. The consequences of these variations were an increase in excavation volume, additional liner required, and additional quantities of backfill material (Type B1, Type F (including bentonite), and Type C).

7.3 Shortage of Non-Saline Run-of-Mine Rockfill (Type A1)

Type A1 rockfill (clean ROM from the saline pond excavation) was intended to be used for the dike's downstream zone over the key trench. The design intent was to reduce the risk of potential salts that may be introduced in the

dikes critical zones if the Type A rockfill from underground operations was used. In December 2016, Agnico Eagle's Construction team and MTKSL noted that the volume of Type A1 material left in the stockpile would not be sufficient to complete the construction of Dikes D-CP1 and D-CP5 as designed. The shortfall was due to 15% to 40% of oversized boulders in the Type A1 stockpile that could not be used for the dike construction. As a result, Type A material was used to construct the uppermost section (~1.5 m to 2 m) of the downstream shell between approximately Stations 1+110 and 1+270 as per RFI No: 6515-C-230-007_014.

The consequence of using Type A material to construct a portion of the dike's downstream zone over the key trench is the potential for salts to be leached from the Type A material being introduced into the key trench and dike foundations. The salts would lower the freezing point depressions of the affected soils and impact their thermal performance. Since the Type A material was used in the less critical zones that were a distance away from the key trench, its potential effect on the dike overall performance is judged to be relatively low and tolerable.

7.4 Shortage of Non-Saline Transition Material (Type B1)

Dike D-CP5's design assumed that the non-saline ROM from the saline pond (Type A1) would be crushed to produce transition rockfill material (which was referred to in the design drawings and report as Type B1). Following the material increases resulting from the key trench changes discussed in Section 7.2 and the shortage of Type A1 as discussed in Section 7.3, a portion of the dike's crest material was crushed from Type A material (Type B). Based on Tetra Tech QA/QC personnel field notes and daily reports, the transition material produced from Type A material was placed above the top liner (from approximately Elevation 66.8 m to 67.8 m). This information was not provided in MTKSL as-built survey data. The change was authorized in RFI No: 6515-C-230-007_024.

As noted in the RFI, the option of using Type B material produced from Type A is not ideal. Type A material contains salts that would increase the pore water salinity of the dike fills. Since most of the Type B material was used in the less critical zones above the top liner, its potential effect on the dike overall performance is judged to be relatively low and tolerable.

7.5 Bottom Liner Depth from Original Ground Surface

Based on design specifications, the liner was designed to be installed at a maximum depth of ~1.8 m below original ground surface. To accommodate changes introduced by RFI_6515-C-230-007_018, the bottom liner had to be lowered below 1.8 m from the original ground surface in parts of the key trench where excavation was greater than 1.8 m from original ground surface. As indicated in the as-built drawings, the liner was installed deeper than 2 m in the sections between Stations 0+250 and 0+310.

The as-built liner depths meet or exceed the design intent and requirements of the dike. The consequence of this variation was an increase in the liner quantity required to complete the dike.

7.6 Top Liner Key-In at Crest

During a meeting attended by the members of the Dike Review Committee, the Dike Designer, and Agnico Eagle on October 28, 2016, it was suggested that changes be made to the designed top liner key-in at the crest to avoid sharp corners when anchoring the liner over the dike crest. These modifications were made by the Dike Designer and documented in ECN # 6515-C-235-007-ECN-002_RA.

As per the ECN, these changes were made during Construction and shown in the as-built drawings. This change is not expected to affect the dike's performance.

7.7 Seepage into Key Trench

7.7.1 Observations

Seepage problems started with water coming in from the upstream into the hinge point just prior to top liner installation. This necessitated the removal of portions of the saturated Type F under liner at the hinge point and replacement with unsaturated Type F, as shown on Photo 41.

Water ponding against the downstream dike toe between Stations 1+130 and 1+280 caused a bulge in the bottom of the top liner from Stations 1+150 to 1+210 on May 14, 2017. Pumps were set up to pump the downstream water to the upstream side of the dike into the CP5 basin. Ground temperature readings from within the key trench were taken and indicated near zero temperatures in some areas which meant the water was seeping into the key trench. Photos 40 to 45 taken from May 13, 2017 to May 18, 2017 show various observations made during the water ponding. Mitigation measures are discussed in Section 7.7.2.

7.7.2 Mitigation Measures

Pumping from the downstream side of D-CP5 continued for about a month. After a week, the seepage seemed to be under control; the water that was ponding against the downstream toe from Station 1+130 to 1+280 at D-CP5 was completely pumped to the upstream side. One pump was continuously pumping out any inflow. Water elevations on the upstream and downstream sides of the dike were being measured and reviewed on a daily basis during the period.

By the end of May 2017, areas within the key trench of D-CP5 that had warmed, showed a gradual freezing trend; previously unaffected areas generally showed an overall warming trend. This was an indication that water was no longer seeping into the key trench. As of August 17, 2017, the measured temperatures at the HGTC locations within the key trench are generally below -2°C.

7.8 Dike Dimensions

7.8.1 Observations

Comparison of the as-built drawings with the design indicates that some sections of the dike have as-built dimensions slightly less than designed. Table 7-1 summarizes the stations where the upstream crest widths, as shown in the as-built drawings, are less than designed. Table 7-2 summarizes the stations where the as-built thermal cover crest widths are less than designed. The deficiencies are not critical and therefore will not affect the dike overall stability and safety of the dike. Further discussions are presented in Section 7.8.2.

Table 7-1: Stations with Shorter As-Built Upstream Crest Widths

Station Shown in As-Built Drawings	As-Built Width (m)	Designed Width (m)	Difference (m)
1+130	11.1	11.4	-0.3
1+140	11.5	12.0	-0.5
1+230	11.8	12.0	-0.2
1+250	11.8	12.0	-0.2
1+260	11.8	12.0	-0.2

Table 7-2: Stations with Shorter As-Built Thermal Cover Crest Widths

Station Shown in As-Built Drawing	As-Built Width (m)	Designed Width (m)	Difference (m)
1+060	7.2	8.0	-0.8
1+070	7.0	8.0	-1.0
1+080	7.4	8.0	-0.6
1+090	7.4	8.0	-0.6
1+180	7.7	8.0	-0.3
1+190	7.7	8.0	-0.3
1+200	7.8	8.0	-0.2
1+210	7.8	8.0	-0.2
1+250	7.6	8.0	-0.4
1+260	7.5	8.0	-0.5
1+270	7.4	8.0	-0.6
1+290	7.7	8.0	-0.3
1+300	7.7	8.0	-0.3

The majority of the as-built liner crest elevations are equal to or higher than the design elevation of 66.8 m, with exception that the as-built liner crest elevations in the zones from Stations 1+058 to 1+0065, 1+180 to 1+1+185, 1+202 to 1+207, and 1+225 to 1+275 are slightly lower than designed. The as-built minimum liner crest elevation is approximately 66.72 m at the location around Station 1+260. This elevation is 0.08 m lower than the design elevation of 66.8 m.

The as-built drawings indicate that the thickness of the Type F material placed immediately between the base of the bottom key trench and the bottom liner in the key trench was less than the specified minimum thickness of 0.15 m around Stations 1+110, 1+200, 1+210, 1+260, and 1+280. The minimum Type F thickness at these stations appear near zero. The Type F layer below the liner at the hinge point appears to be missing around Stations 1+220 to 1+310. It is suspected that the minimal thickness shown on the drawings is a result of the limitations of the survey. The field observations do not support the survey data.

7.8.2 Mitigation Measures

The variations in dike widths are small and therefore will not affect the dike overall stability. Dike performance must be regularly monitored during its service life. Further mitigation measures can be established should dike inspection and monitoring observations indicate any concerns of the dike performance.

The design maximum water elevation under the inflow design flood (IDF) for D-CP5 is 66.3 m, which is 0.42 m lower than the as-built minimum liner crest elevation of 66.72 m, providing freeboard for the IDF. The dike is designed based on the assumption that the CP5 will contain little water throughout the year. The water level in CP5 will rise during freshet and during localized IDF events to the design level.

Dike crest settlement survey monitoring will confirm the final liner crest elevation after the expected dike settlement is completed during the first several years of dike operation. The dike operator should ensure that the dike upstream water elevation will maintain, with a safe margin, below the final minimum liner crest elevation. If future survey data indicate that the safe margin is greatly reduced after settlement, it would be recommended to raise the dike liner crest elevations in the affected zones.

7.9 Fill Material Density

7.9.1 Observations

Some of the Type C and Type F materials placed in the key trench below the liner during the winter had lower densities than designed. This was due to the frozen conditions of the fill materials with relatively higher than desired moisture (ice) contents.

7.9.2 Mitigation Measures

After the observation of the relatively low density of the Type C and Type F during the QC tests, the QC team closely monitored the moisture content of the Types C and F materials. The materials with excess moisture content were rejected.

The deficiencies will not affect the dike overall stability and safety. Dike performance will be regularly monitored during its service life. Further mitigation measures can be established should dike inspection and monitoring observations indicate any concerns of the dike performance.

7.10 Construction Schedule and Material Production

It was assumed in the dike design that key trench excavation and backfill would be completed from October to November 2016. This was not achieved. As a result, challenges were encountered when completion of the key trench excavation and backfill occurred under very cold winter conditions. In addition, some of the Type C material was produced from drill-blast frozen natural esker sourced materials during the winter construction period, instead of unfrozen summer-stockpiled materials that did not have excess moisture content. This increased the variability of the materials.

8.0 MATERIAL QUANTITIES

8.1 General

The material quantities used for Dike D-CP5 construction is presented in Table 8.1. The material quantities have been calculated from the as-built survey data. The design volumes presented in the design documents are also presented in Table 8-1 for comparative purpose.

Table 8-1: Summary of Construction Material Quantities

Material Type	Dike D-CP5 Design Quantity	Dike D-CP5 As-Built Quantity
Total Key Trench Excavation (m^3)	4,515	5,788
Total Run-of-Mine Rockfill – Type A (m^3)	9,890	10,029
Total Run-of-Mine Rockfill – Type A1 (m^3)	3,080	3,137
Total Transition Rockfill – Type B1/B (m^3)	3,580	3,971
Total Granular Fill – Type C (m^3)	3,100	4,096
Total Bentonite Augmented Material – Type F (m^3)	890 to 1,252	979
Total Geomembrane Liner – Coletanche ES2 (m^2)	3,955	4,437

8.2 Discussions on Quantities

Referencing Table 8-1, reasonable variations occurred in the Types A, A1, B/B1, C, and F materials volumes. The majority of the difference can be attributed to the additional volume required for the key trench excavation and backfill as discussed in Section 7.2.

9.0 LONG-TERM MONITORING

9.1 Purpose

Performance monitoring is an integral part of the operation of any water retention structure. The performance of Dike D-CP5 will need to be monitored throughout its operating life.

Permafrost exists beneath the footprint of D-CP5. The design intent is to maintain the original permafrost foundation beneath the liner in the key trench in a frozen condition over the life of the dike. Long-term monitoring of D-CP5 will include the following:

- Monitor thermal regime to confirm thermal prediction;
- Monitor settlement movements of the dike;
- Conduct routine visual inspection of the dike; and
- Satisfying regulatory requirements for dike performance monitoring.

9.2 Thermal Monitoring

Ground temperature cables installed in D-CP5 need to be read on a regular basis. Tetra Tech recommends that the cables be read twice per month during each June and July and on a monthly basis during the remaining months for the service life of the dike. The reading frequency can be adjusted as required. The data will be used to confirm the thermal predictions used to design the dike and identify any potential concerns in dike performance during its operation. The monitoring data should be sent to the Engineer of Record for assessment.

9.3 Survey Monitoring

The survey monitoring points installed in D-CP5 need to be surveyed on a regular basis. Tetra Tech recommends that a survey be performed on a monthly basis for the first two years and reduced to quarterly thereafter during the service life of the dike. The survey frequency can be adjusted when required. Each survey should note northings, eastings, and elevations. Elevation measurements must be performed with a total station with a high accuracy. In addition, the dike upstream and downstream water elevations should be surveyed at the same frequency and when changes in the water elevation are observed or impacted by pumping activities. When required, a complete survey of the dike external surface can be conducted. Monitoring data should be sent to the Engineer on Record for assessment.

9.4 Routine Dike Visual Inspection

Routine dike inspection by Agnico Eagle's site field engineer or technician should be undertaken to regularly monitor the dike conditions and performance. The frequency of the dike inspection should be at least once every two weeks during the open water seasons and monthly during the winter season. The inspection should include visual inspections for any signs of slope instability, seepage, settlements, cracks, sink holes, and lateral deformations. This inspection can be taken together with the thermal and survey monitoring activities for the dike. Any unusual observations or concerns during the routine dike inspections should be documented and sent to the Engineer of Record for further assessment.

9.5 Formal Annual Inspection

An annual site inspection is required to fulfil the Type “A” Water Licence (No. 2AM-MEL1631) requirements. The annual site inspection should be carried out by the design team to formally evaluate the performance of Dike D-CP5. An annual inspection report shall be produced following each inspection.

The inspection will typically take place at the end of summer when the maximum annual thaw has developed. The annual inspection will include the following, but not be limited to:

- Inspection of the upstream and downstream slopes for any signs of distress or instability;
- Inspection of the dike crest for any sign of transverse cracking or excess deformations;
- Inspection of the abutments and downstream toe for any evidence of seepage;
- Review of documents generated from routine dike visual inspections by Agnico Eagle’s on-site technical staff; and
- A review of GTCs and survey monument data collected.

10.0 CLOSURE.

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

Respectfully submitted,
Tetra Tech Canada Inc.

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PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date OCT. 19, 2017
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

REFERENCES

Tetra Tech EBA, 2016a. Design Report for Dike D-CP5, Meliadine Gold Project, NU. AEM Document Number: 6515-132-007-132-REP-004, Version 0, prepared by Tetra Tech EBA and submitted to Agnico Eagle Mines Ltd., August 15, 2016.

Tetra Tech EBA, 2016b. Geotechnical Specifications for Construction of Dike D-CP5, Meliadine Gold Project, NU. AEM Document Number: 6515-E-132-007-132-SPT-003 R1, Revision 1, prepared by Tetra Tech EBA and submitted to Agnico Eagle Mines Ltd., November 9, 2016.

Tetra Tech EBA, 2016c. Construction Quality Plan for Dikes D-CP1 and D-CP5, Meliadine Gold Project, NU. AEM Document Number: 6515-132-007-132-QQP-001, Version 0, prepared by Tetra Tech EBA and submitted to Agnico Eagle Mines Ltd., October 12, 2016.

FIGURES

Figure 1 General Project Location Plan
Figure 2 General Site Plan Showing Dike D-CP5 Location
Figure 3 General Section of Dike D-CP5 Design Concept
Figure 4 Organization Chart

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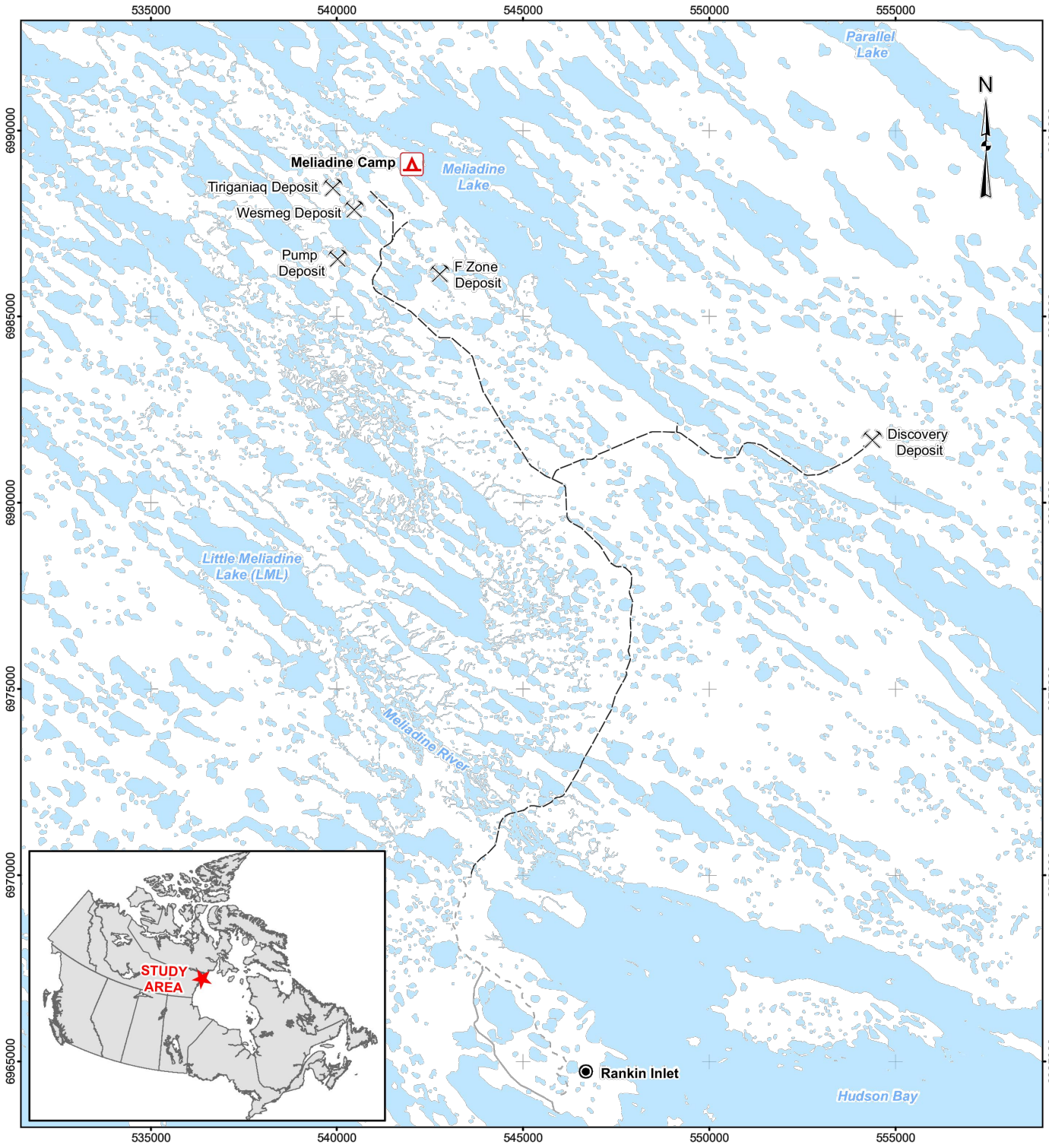

LEGEND

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

AGNICO EAGLE – MELIADINE DIVISION

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FIGURE 1 GENERAL PROJECT LOCATION PLAN

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DESSINÉ PAR / DRAWN BY	EL		FEUILLE/SHT 1 / 1
APPROUVÉ PAR / APPROVED BY	WTH		
NO. DESSIN / DRAWING NO.			REVISION A

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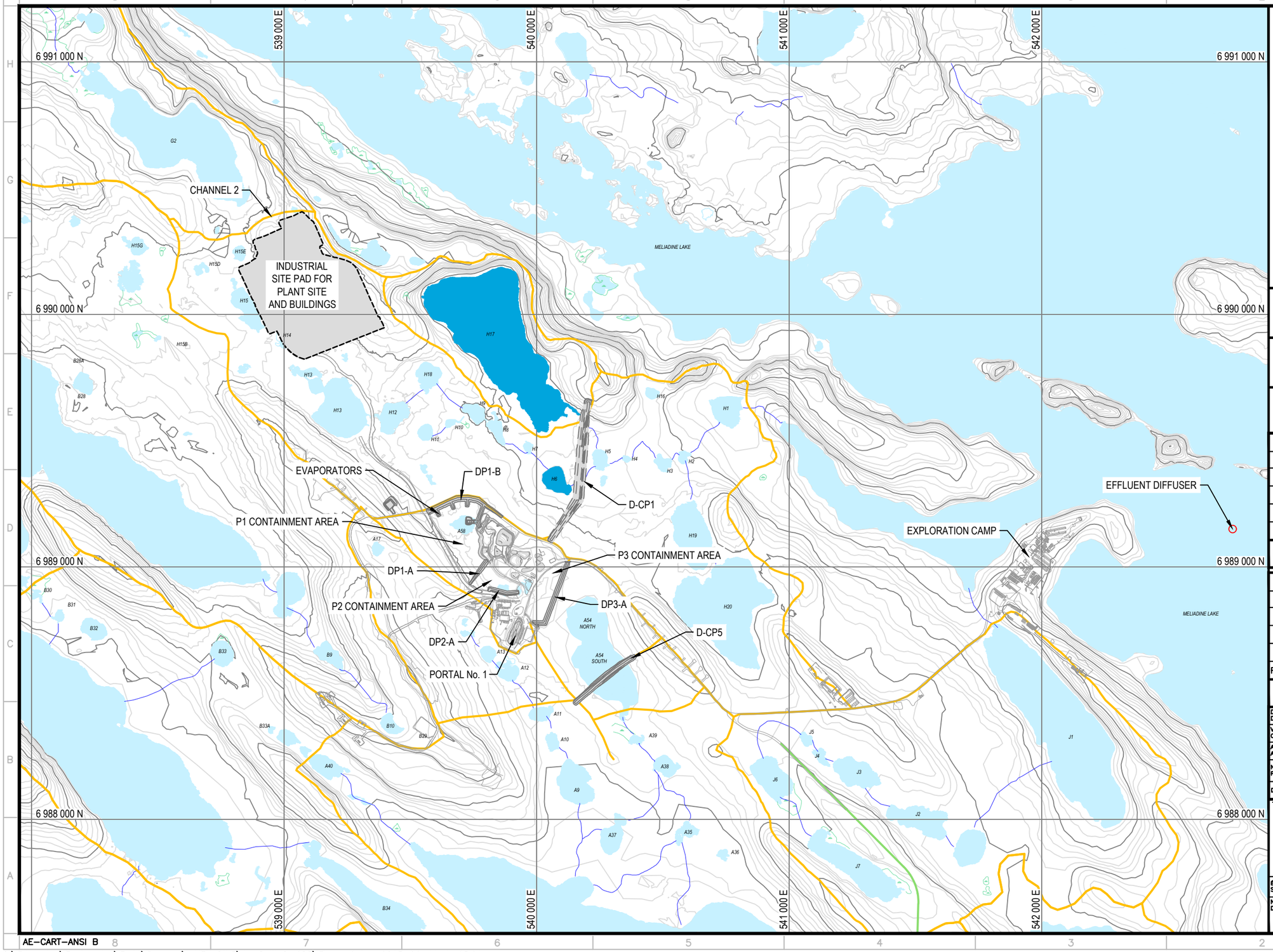

NOTES:

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No. PROJET / PROJECT NO.	6515	
DATE	2017–10–06	

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AGNICO EAGLE MELIADINE GOLD PROJECT

FIGURE 2
GENERAL SITE PLAN SHOWING
DIKE D–CP5 LOCATION

ÉCHELLE/ SCALE	FICHIER FILE A		
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AE–CART–ANSI B

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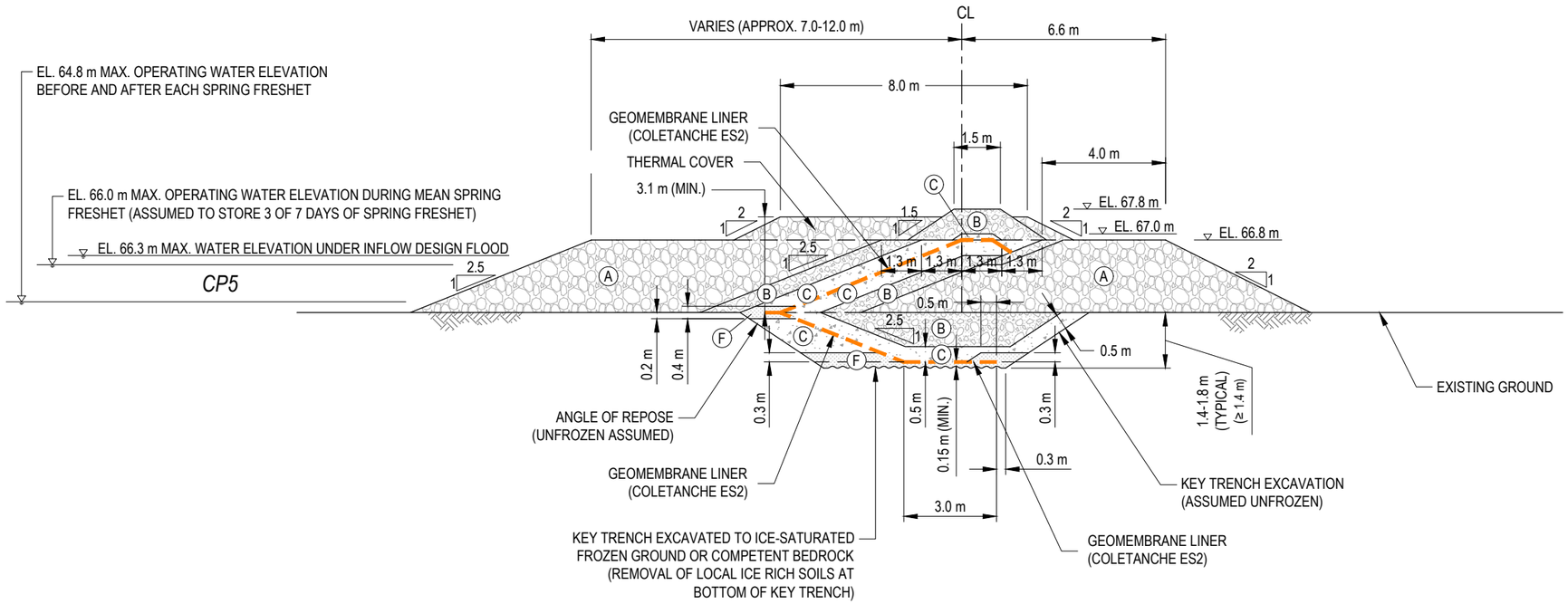
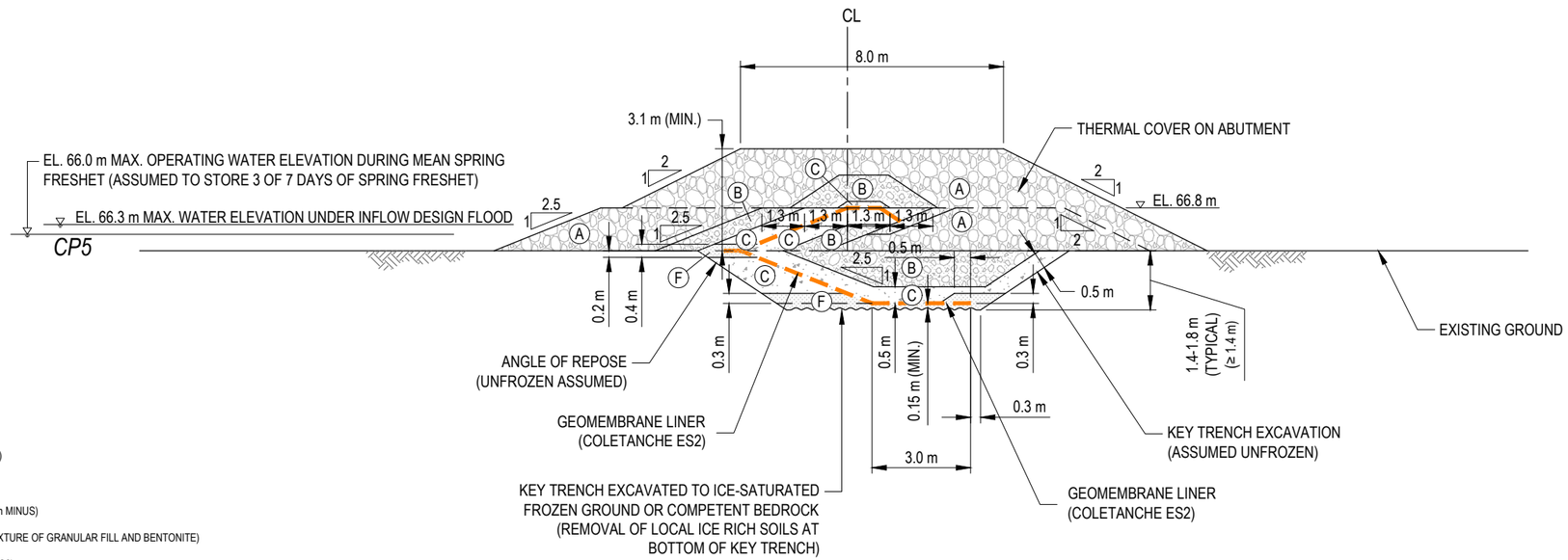


TYPICAL SECTION OF D-CP5



Ⓐ RUN-OF-MINE ROCKFILL (600 mm MINUS)
Ⓑ TRANSITION ROCKFILL (150 mm MINUS)
Ⓒ GRANULAR FILL OR ESKER SAND (20 mm MINUS)
Ⓕ BENTONITE-AUGMENTED MATERIAL (MIXTURE OF GRANULAR FILL AND BENTONITE)
GEOMEMBRANE LINER (COLETANCHE ES2)

TYPICAL SECTION OF D-CP5 NEAR ABUTMENT

- ASSUMED KEY TRENCH EXCAVATION AND BACKFILL TO BE CONSTRUCTED FROM SEPTEMBER 2016 TO NOVEMBER 2016.
- THE SELECTION AND USE OF THE COLETANCHE LINER TYPE FOR D–CP1 AND D–CP5 WERE MADE BY AGNICO EAGLE MINES LIMITED.

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No. PROJET / PROJECT NO.	6515	
DATE	2017–10–06	

TITRE / TITLE

AGNICO EAGLE MELIADINE GOLD PROJECT

GENERAL SECTION OF DIKE D–CP5 DESIGN CONCEPT

ÉCHELLE / SCALE | FICHIER / FILE

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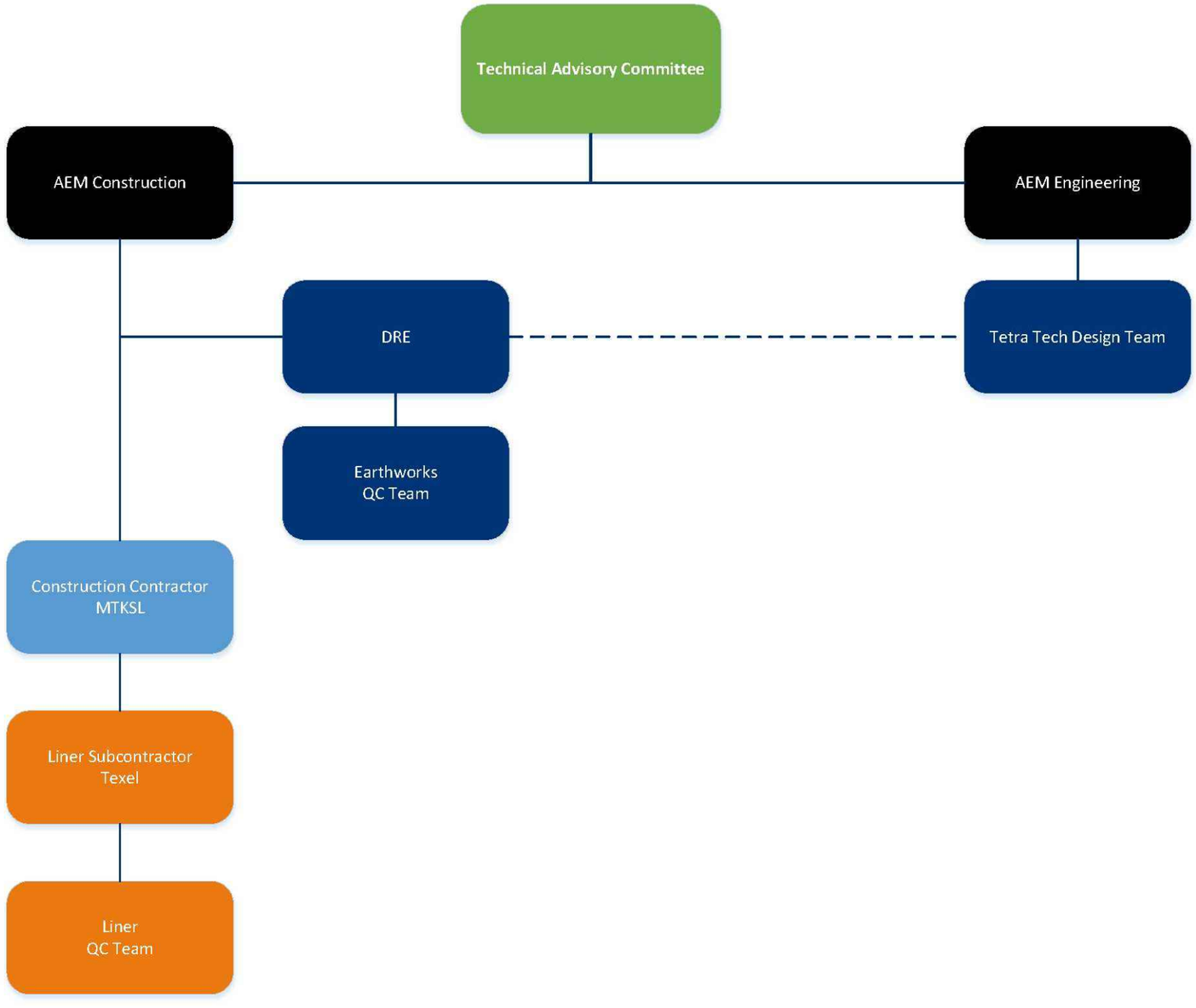

OPERATIONAL PARAMETERS FOR
D-CP1 AND D-CP5 DIKE CONSTRUCTION

ORGANIZATION CHART

CLIENT: AGNICO EAGLE

TETRA TECH

PROJECT NO.	DWN	CKD	REV
ENG.EARC03076-01	EL	GZ	A

OFFICE	DATE
EDMONTON	OCTOBER 12, 2017

FIGURE 4

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PHOTOGRAPHS

Photo 1	Pushing lake ice, snow, boulders, and cobbles to construct working platform
Photo 2	Placing first lift of Type A material (working platform) on the upstream side
Photo 3	Compaction of first lift of Type A material on the upstream working platform
Photo 4	Key trench excavation between Stations 0+210 and 0+290
Photo 5	Key trench sloping and hammering
Photo 6	Key trench – bedrock encountered at ~1.4 m depth below original ground surface
Photo 7	Final dental cleaning on key trench bottom prior to placing Type F material
Photo 8	Type F material placement
Photo 9	Type F material placement and compaction
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Photo 11	Compacting a lift of Type C upstream fillet
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Photo 32	Type F material swell test
Photo 33	Densometer and Sand Cone Tests on Type F fillet material around Station 0+095
Photo 34	Coring key trench base to take a jar test sample at depth of 2.3 m from OG at Station 0+245

Photo 35 Jar Test #26 – frozen sample
Photo 36 Jar Test #26 – thawed sample
Photo 37 Performing a tensile resistance test on a liner welding pre-qualification test strip
Photo 38 Performing an ultra-sonic test on a seam between two liner panels
Photo 39 Destructive test sample location between Panels 35 and 36
Photo 40 Water ponding downstream, afternoon of May 13, 2017, view from Station 1+200
Photo 41 Removal of saturated Type F under liner at hinge point, approximate Station 1+210
Photo 42 Area of water behind liner, Type F over liner at hinge point, Station 1+190
Photo 43 Ponding water downstream, morning of May 15, 2017, view from Station 1+090
Photo 44 Downstream toe on May 16, 2017 high water line down, Station 1+100
Photo 45 Downstream side of dike on May 18, 2018 showing low water level
Photo 46 D-CP5 overview of upstream side from Station 1+020 facing up chainage

Photo 1: Pushing Lake Ice, snow, boulders and cobbles from dike's footprint to construct working platform (first lifts of dike's shell)
View from Station 1+300 facing down chainage

Photo 2: Placing first lift of Type A material (working platform) on the upstream side
View from Station 1+280 facing up chainage

Photo 3: Compaction of first lift of Type A material on the upstream working platform
View from Station 1+090 facing up chainage

Photo 4: Key trench excavation between Stations 0+210 and 0+290

Photo 5: Key trench sloping and hammering
View from Station 0+190 facing up chainage

Photo 6: Key trench - bedrock encountered at ~1.4 m depth below original ground surface
Between Stations 0+040 and 0+060

Photo 7: Final dental cleaning on key trench bottom prior to placing Type F material
View from Station 0+30 facing up chainage

Photo 8: Type F material placement
View from Station 0+155 facing down chainage

Photo 9: Type F material placement and compaction
View from Station 0+180 facing up chainage

Photo 10: Placing first lift of upstream fillet Type F material
View from Station 0+100 facing down chainage

Photo 11: Compacting a lift of Type C upstream fillet
View from Station 0+285 facing down chainage

Photo 12: Placing downstream fillet Type F material
View from Station 0+135 facing up chainage

Photo 13: Excavator placing first lift of Type C over liner on upstream slope
Skid Steer placing second lift of Type C over liner on key trench base
View from Station 0+245 facing down chainage

Photo 14: Placing and spreading a lift of Type B material around Station 0+200
Excavator placing and D5 dozer spreading

Photo 15: Excavator placing Type C below liner bedding material on dike upstream slope
At Station 1+240

Photo 16: Placing and compacting Type B crest material
View from Station 1+260 facing down chainage

Photo 17: Placing Type A material
View from Station 1+040 facing down chainage

Photo 18: Placing Type A thermal cover around Station 1+320

Photo 19: Deploying a Phase 1 liner panel
View from Station 0+003 facing up chainage

Photo 20: Placed Phase 1 liner
View from Station 0+285 facing down chainage

Photo 21: Completed Phase 2 liner
View from 1+050 facing up chainage

Photo 22: Phase 2 liner placement
View from Station 1+100 facing down chainage

Photo 23: PVC Pipe housing HGTC-1 lying on first lift of Type C material over bottom liner View from Station 0+004 facing up chainage)

Photo 24: PVC pipe housing HGTC-2 lying on first lift of Type C material over bottom liner View from Station 0+298 facing down chainage

Photo 25: Drilling hole to install VGTC-3
View from Station 1+195 facing down chainage

Photo 26: Taking readings from HGTC-2

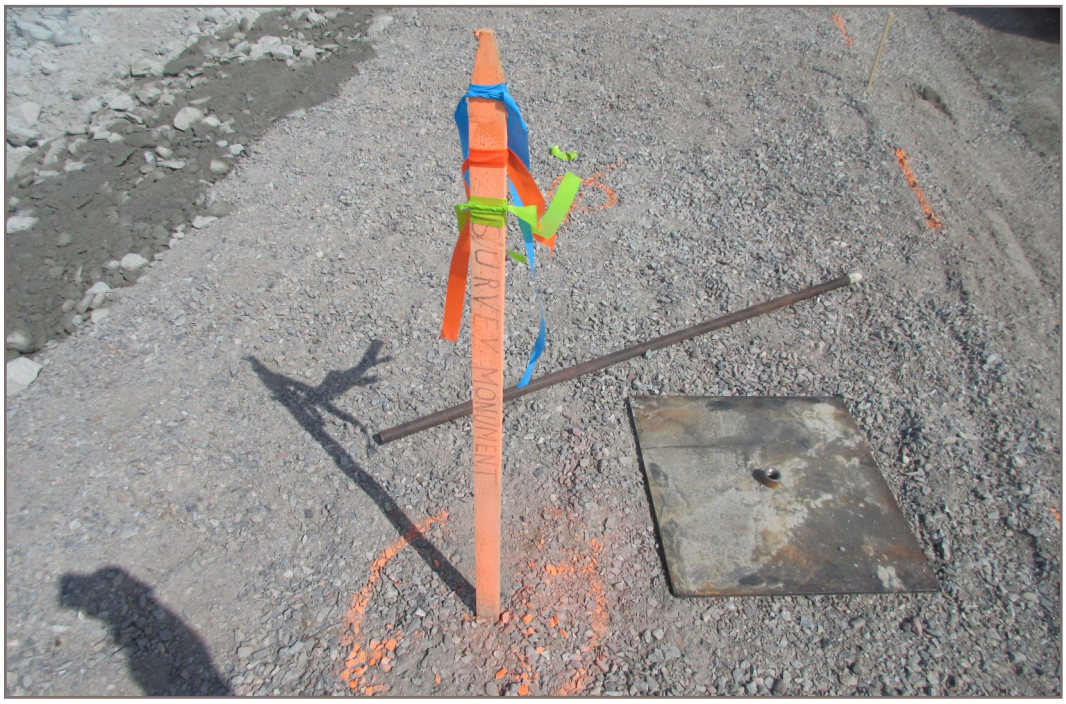

Photo 27: Survey Monument M2 to be installed

Photo 28: Survey Monument M2 installation

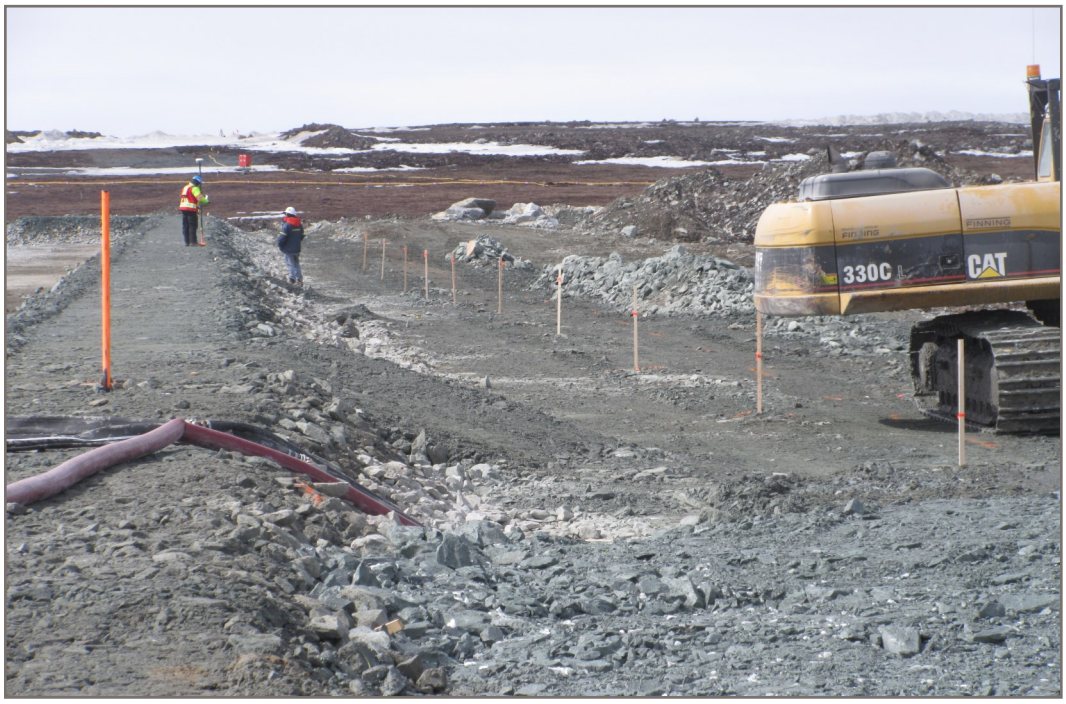

Photo 29: Looking at Survey Monument M1, protective casing painted orange
View from Station 1+180 facing down chainage

Photo 30: Densometer test on a lift of Type C fillet material around Station 0+025

Photo 31: QC monitoring the mixing of Bentonite-Augmented (Type F) material
Bentonite placed on Type C material waiting to be mixed by the IT62 CAT loader

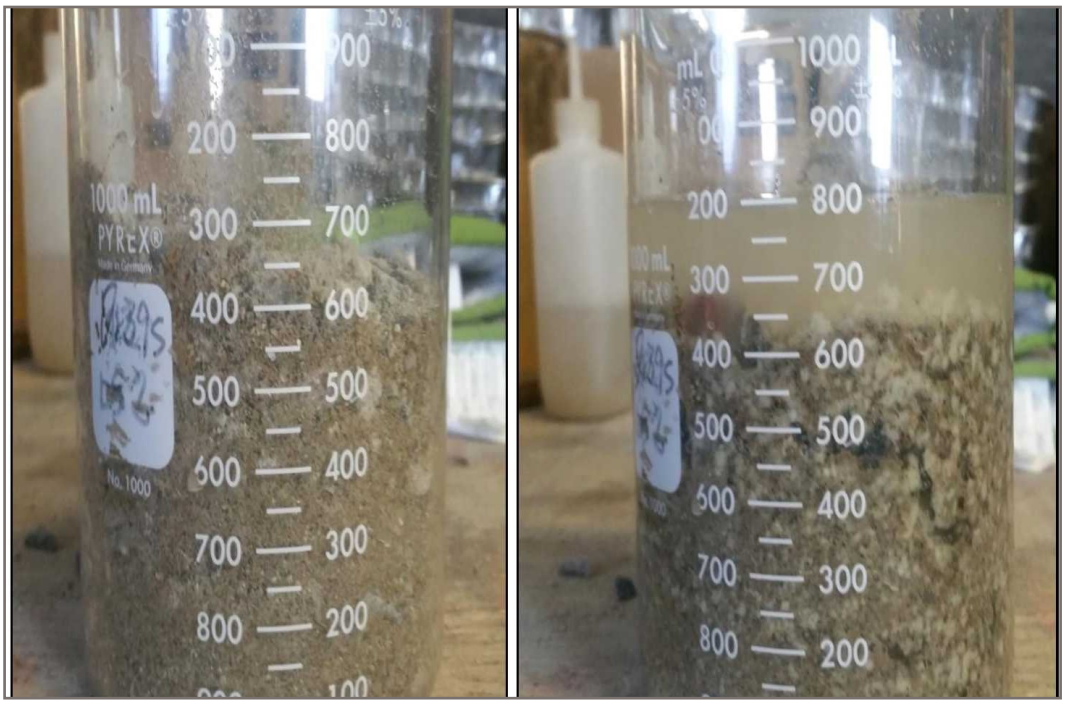

Photo 32: Type F material swell test
Beaker on left is before adding water and beaker on right is after adding water

Photo 33: Densometer and Sand Cone Tests on Type F material around Station 0+260

Photo 34: Coring key trench base to take a jar test sample at depth of 2.3 m from OG Station 0+245

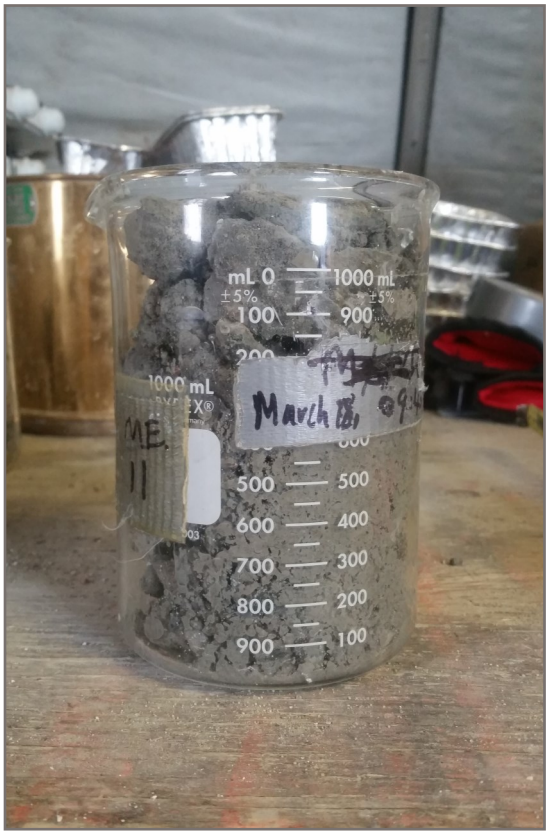

Photo 35: Jar Test #26 - frozen sample
A disturbed core from a 2.3 m deep key trench base at Station 0+242

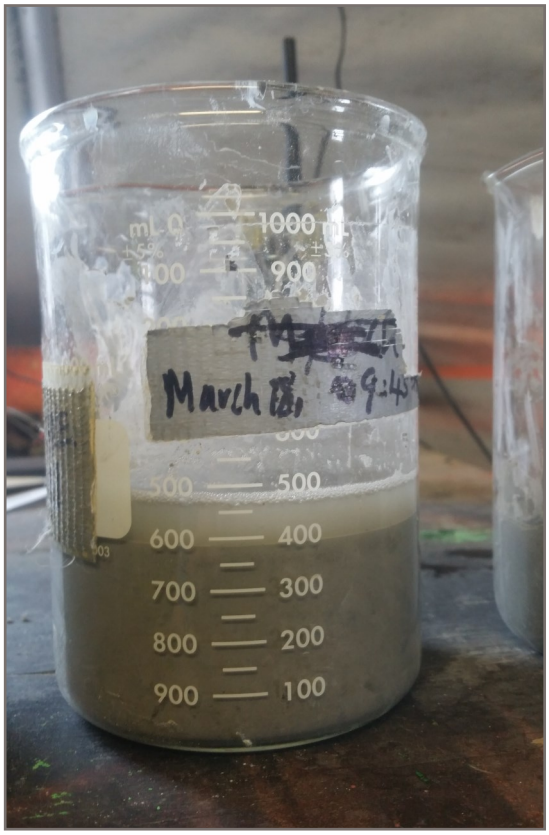

Photo 36: Jar Test #26 - thawed sample

Photo 37: Performing a tensile resistance test on a liner welding pre-qualification test strip

Photo 38: Performing an ultra-sonic test on a seam between two liner panels.

Photo 39: Destructive test sample location between Panels 35 and 36

Photo 40: Water ponding downstream, afternoon of May 13, 2017
View from Station 1+200 facing down chainage

Photo 41: Removal of saturated Type F under liner at hinge point
Approximate Station 1+210 facing up chainage

Photo 42: Area of water behind liner—granular material is Type F over liner at hinge point
Approximate Station 1+190

Photo 43: Ponding water downstream, morning of May 15, 2017
View from Station 1+090 facing up chainage

Photo 44: Downstream toe on May 16, 2017 with high water line down following pumping
View from Station 1+100 facing up chainage

Photo 45: Downstream side of dike on May 18, 2018 showing low water level

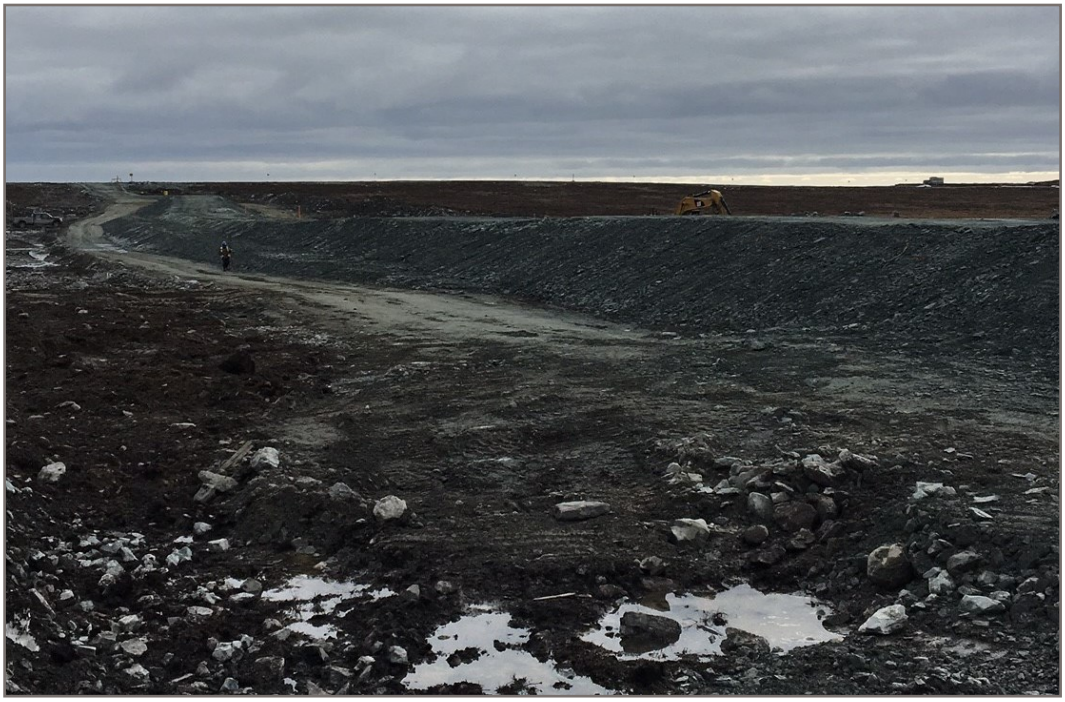

Photo 46: D-CP5 overview of upstream side from Station 1+020 facing up chainage

APPENDIX A

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOTECHNICAL

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of TETRA TECH's Client (the "Client") as specifically identified in the TETRA TECH Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). TETRA TECH does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by TETRA TECH.

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1.2 ALTERNATIVE DOCUMENT FORMAT

Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by persons other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary investigation and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 ENVIRONMENTAL AND REGULATORY ISSUES

Unless stipulated in the report, TETRA TECH has not been retained to investigate, address or consider and has not investigated, addressed or considered any environmental or regulatory issues associated with development on the subject site.

1.8 NATURE AND EXACTNESS OF SOIL AND ROCK DESCRIPTIONS

Classification and identification of soils and rocks are based upon commonly accepted systems and methods employed in professional geotechnical practice. This report contains descriptions of the systems and methods used. Where deviations from the system or method prevail, they are specifically mentioned.

Classification and identification of geological units are judgmental in nature as to both type and condition. TETRA TECH does not warrant conditions represented herein as exact, but infers accuracy only to the extent that is common in practice.

Where subsurface conditions encountered during development are different from those described in this report, qualified geotechnical personnel should revisit the site and review recommendations in light of the actual conditions encountered.

1.9 LOGS OF TESTHOLES

The testhole logs are a compilation of conditions and classification of soils and rocks as obtained from field observations and laboratory testing of selected samples. Soil and rock zones have been interpreted. Change from one geological zone to the other, indicated on the logs as a distinct line, can be, in fact, transitional. The extent of transition is interpretive. Any circumstance which requires precise definition of soil or rock zone transition elevations may require further investigation and review.

1.10 STRATIGRAPHIC AND GEOLOGICAL INFORMATION

The stratigraphic and geological information indicated on drawings contained in this report are inferred from logs of test holes and/or soil/rock exposures. Stratigraphy is known only at the locations of the test hole or exposure. Actual geology and stratigraphy between test holes and/or exposures may vary from that shown on these drawings. Natural variations in geological conditions are inherent and are a function of the historic environment. TETRA TECH does not represent the conditions illustrated as exact but recognizes that variations will exist. Where knowledge of more precise locations of geological units is necessary, additional investigation and review may be necessary.

1.11 PROTECTION OF EXPOSED GROUND

Excavation and construction operations expose geological materials to climatic elements (freeze/thaw, wet/dry) and/or mechanical disturbance which can cause severe deterioration. Unless otherwise specifically indicated in this report, the walls and floors of excavations must be protected from the elements, particularly moisture, desiccation, frost action and construction traffic.

1.12 SUPPORT OF ADJACENT GROUND AND STRUCTURES

Unless otherwise specifically advised, support of ground and structures adjacent to the anticipated construction and preservation of adjacent ground and structures from the adverse impact of construction activity is required.

1.13 INFLUENCE OF CONSTRUCTION ACTIVITY

There is a direct correlation between construction activity and structural performance of adjacent buildings and other installations. The influence of all anticipated construction activities should be considered by the contractor, owner, architect and prime engineer in consultation with a geotechnical engineer when the final design and construction techniques are known.

1.14 OBSERVATIONS DURING CONSTRUCTION

Because of the nature of geological deposits, the judgmental nature of geotechnical engineering, as well as the potential of adverse circumstances arising from construction activity, observations during site preparation, excavation and construction should be carried out by a geotechnical engineer. These observations may then serve as the basis for confirmation and/or alteration of geotechnical recommendations or design guidelines presented herein.

1.15 DRAINAGE SYSTEMS

Where temporary or permanent drainage systems are installed within or around a structure, the systems which will be installed must protect the structure from loss of ground due to internal erosion and must be designed so as to assure continued performance of the drains. Specific design detail of such systems should be developed or reviewed by the geotechnical engineer. Unless otherwise specified, it is a condition of this report that effective temporary and permanent drainage systems are required and that they must be considered in relation to project purpose and function.

1.16 BEARING CAPACITY

Design bearing capacities, loads and allowable stresses quoted in this report relate to a specific soil or rock type and condition. Construction activity and environmental circumstances can materially change the condition of soil or rock. The elevation at which a soil or rock type occurs is variable. It is a requirement of this report that structural elements be founded in and/or upon geological materials of the type and in the condition assumed. Sufficient observations should be made by qualified geotechnical personnel during construction to assure that the soil and/or rock conditions assumed in this report in fact exist at the site.

1.17 SAMPLES

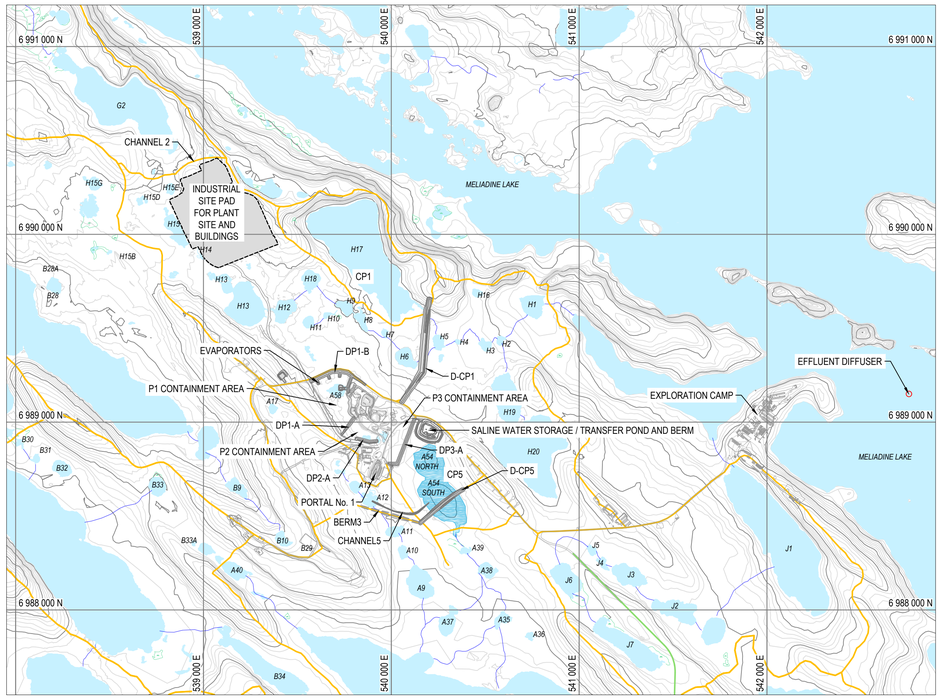
TETRA TECH will retain all soil and rock samples for 30 days after this report is issued. Further storage or transfer of samples can be made at the Client's expense upon written request, otherwise samples will be discarded.

APPENDIX B

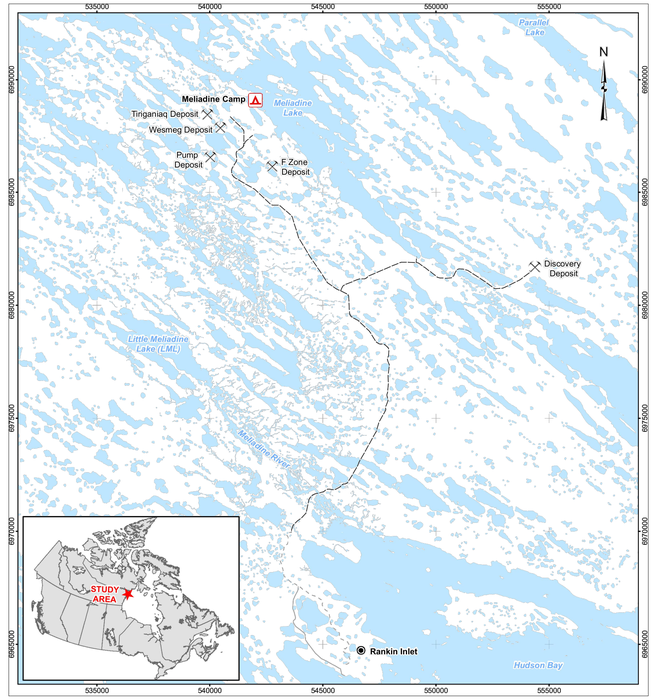
CONSTRUCTION RECORD DRAWINGS

NO. DESSIN
DRAWING NO. 65-685-230-214_R1

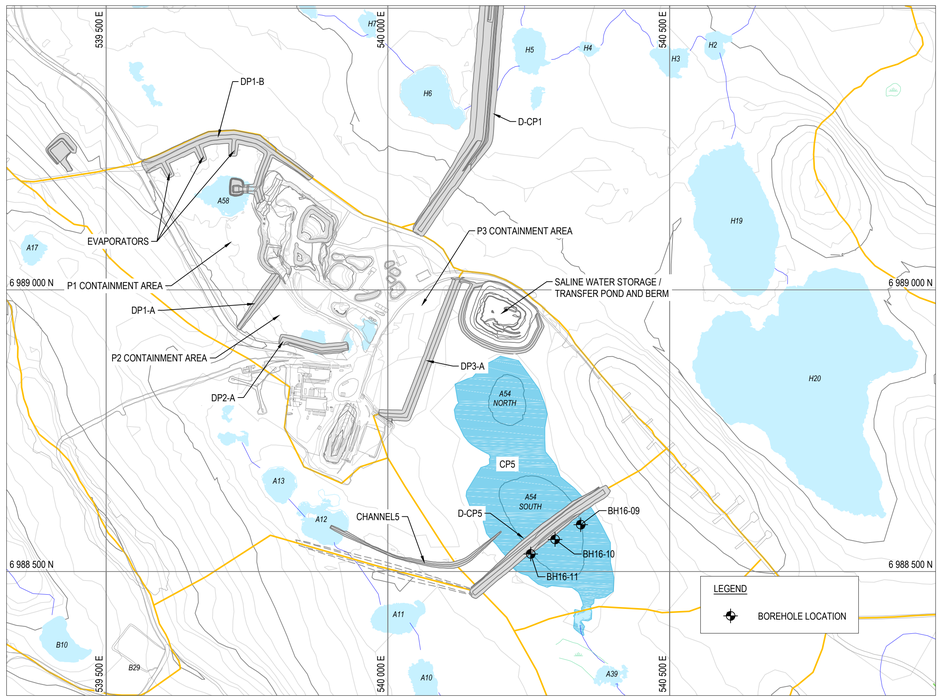
FORMAT ARCHD



GENERAL SITE LOCATION
SCALE: 1:15,000



LOCATION MAP
SCALE: N.T.S.



D-CP5 SITE LOCATION
SCALE: 1:5,000

D-CP5 AS-BUILT DRAWING INDEX

DRAWING NUMBER	DRAWING TITLE
65-685-230-214	D-CP5 AS-BUILT GENERAL LOCATION PLAN
65-685-230-215	D-CP5 AS-BUILT KEY TRENCH AND DIKE LAYOUT PLAN
65-685-230-216	D-CP5 AS-BUILT PROFILES
65-685-230-217	D-CP5 AS-BUILT THERMAL COVER LAYOUT PLAN AND PROFILES
65-685-230-218	D-CP5 AS-BUILT TYPICAL SECTIONS AND QUANTITIES
65-685-230-219-001	D-CP5 AS-BUILT SECTIONS STATION 0+030 TO 0+170
65-685-230-219-002	D-CP5 AS-BUILT SECTIONS STATION 0+180 TO 0+310
65-685-230-220	D-CP5 AS-BUILT INSTRUMENTATION PLAN AND DETAILS FOR GROUND TEMPERATURE CABLES
65-685-230-221	D-CP5 AS-BUILT INSTRUMENTATION PLAN AND DETAILS FOR GROUND TEMPERATURE CABLES AND SETTLEMENT SURVEY MONUMENT POINTS

TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

- LAKE A54 WAS PARTIALLY DEWATERED PRIOR TO D-CP5 CONSTRUCTION

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date Oct 19, 2017
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE DATE : 2017-10-19

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DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2017-10-19	ISSUED FOR RECORD	WTH	NG	
0	2016-08-15	ISSUED FOR CONSTRUCTION	GZ	KJ	
A	2016-08-10	ISSUED FOR REVIEW	GZ	KJ	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER W.T. HORNE LICENSEE N.W.T. — REGISTERED PROFESSIONAL ENGINEER G. ZHANG LICENSEE NWT/NU

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

D-CP5 AS-BUILT
GENERAL LOCATION PLAN

DESSINÉ PAR / DRAWN BY	EL	DATE	2016-08-15
VÉRIFIÉ PAR / CHECKED BY	GZ		2016-08-15
APPROUVÉ PAR / APPROVED BY	GZ		2016-08-15
ÉCHELLE / SCALE	AS SHOWN	DATE	2016-08-15
NO. DESSIN / DRAWING NO.	65-685-230-214		
NO. PROJET / PROJECT NO.	6515	REVISION	1
		FEUILLE / SHT	1 / 9

AE-CART-ARCH D

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FILE NO. 65-685-230-214_R1.dwg

NO. DESSIN
DRAWING NO. 65-685-230-215_R1

FORMAT ARCHD

D-CP5 KEY TRENCH AS-BUILT LAYOUT POINTS

STATION	EASTING	NORTHING	ELEVATION
• 0+000	540152.41	6988468.48	66.69
• 0+010	540160.26	6988474.61	66.08
• 0+020	540167.66	6988481.19	65.91
• 0+030	540175.32	6988487.39	65.69
• 0+040	540182.41	6988493.69	66.07
• 0+050	540190.12	6988500.01	66.19
• 0+060	540197.98	6988506.00	65.74
• 0+070	540205.51	6988512.51	65.74
• 0+080	540213.19	6988518.91	65.39
• 0+090	540220.66	6988525.03	64.81
• 0+100	540227.57	6988531.97	65.14
• 0+110	540235.19	6988538.42	64.97
• 0+120	540242.72	6988544.99	64.89
• 0+130	540249.97	6988551.86	64.72
• 0+140	540257.73	6988557.68	64.62
• 0+150	540265.46	6988564.00	64.72
• 0+160	540273.47	6988569.96	64.40
• 0+170	540281.53	6988575.67	63.43
• 0+180	540288.33	6988582.45	64.52
• 0+190	540296.50	6988588.18	64.75
• 0+200	540304.66	6988593.90	64.77
• 0+210	540312.70	6988599.84	64.59
• 0+220	540320.86	6988605.59	64.89
• 0+230	540328.95	6988611.45	64.97
• 0+240	540336.85	6988617.58	65.15
• 0+250	540344.99	6988623.36	65.40
• 0+260	540353.35	6988628.85	65.58
• 0+270	540361.63	6988634.44	65.86
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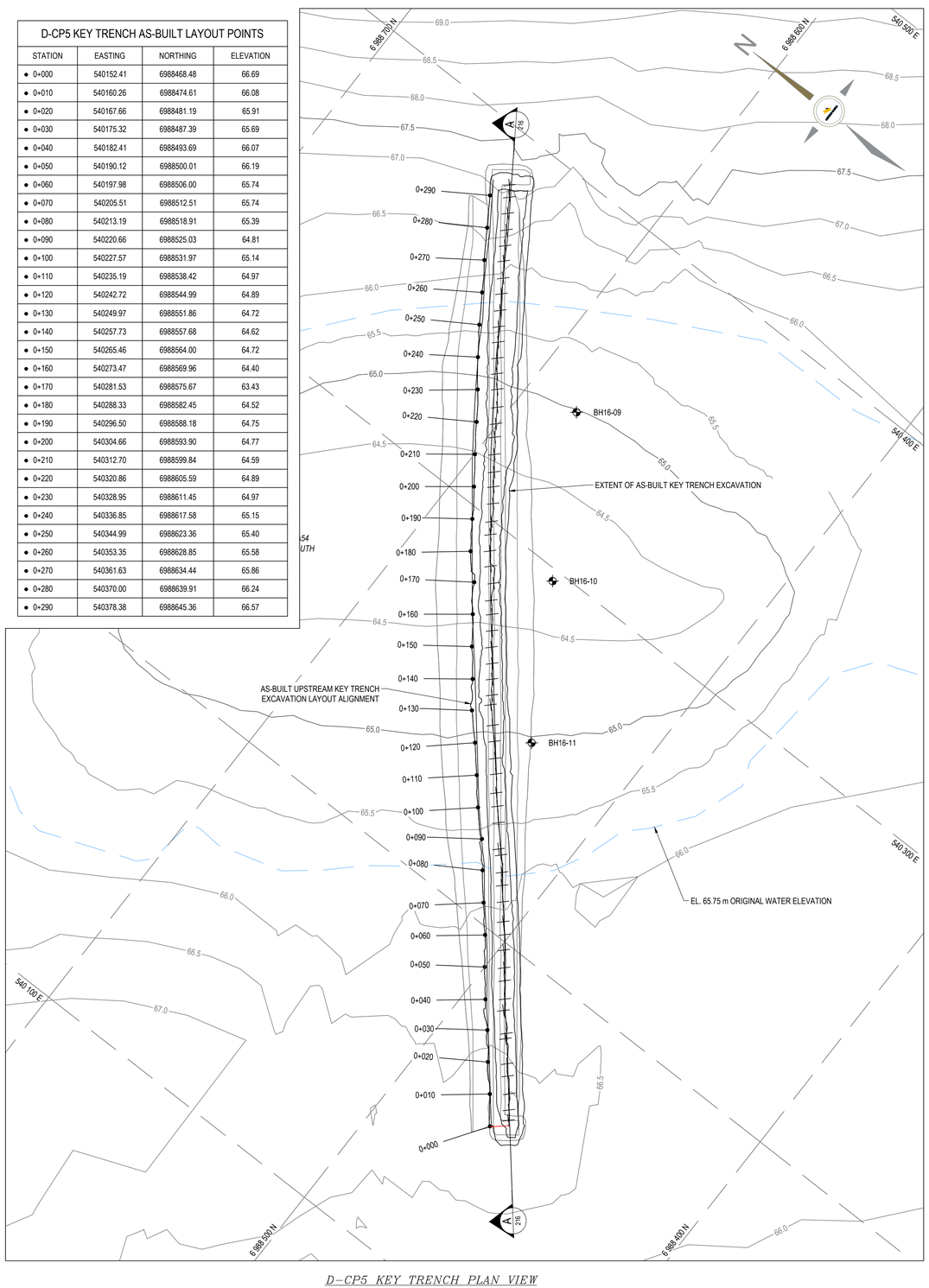
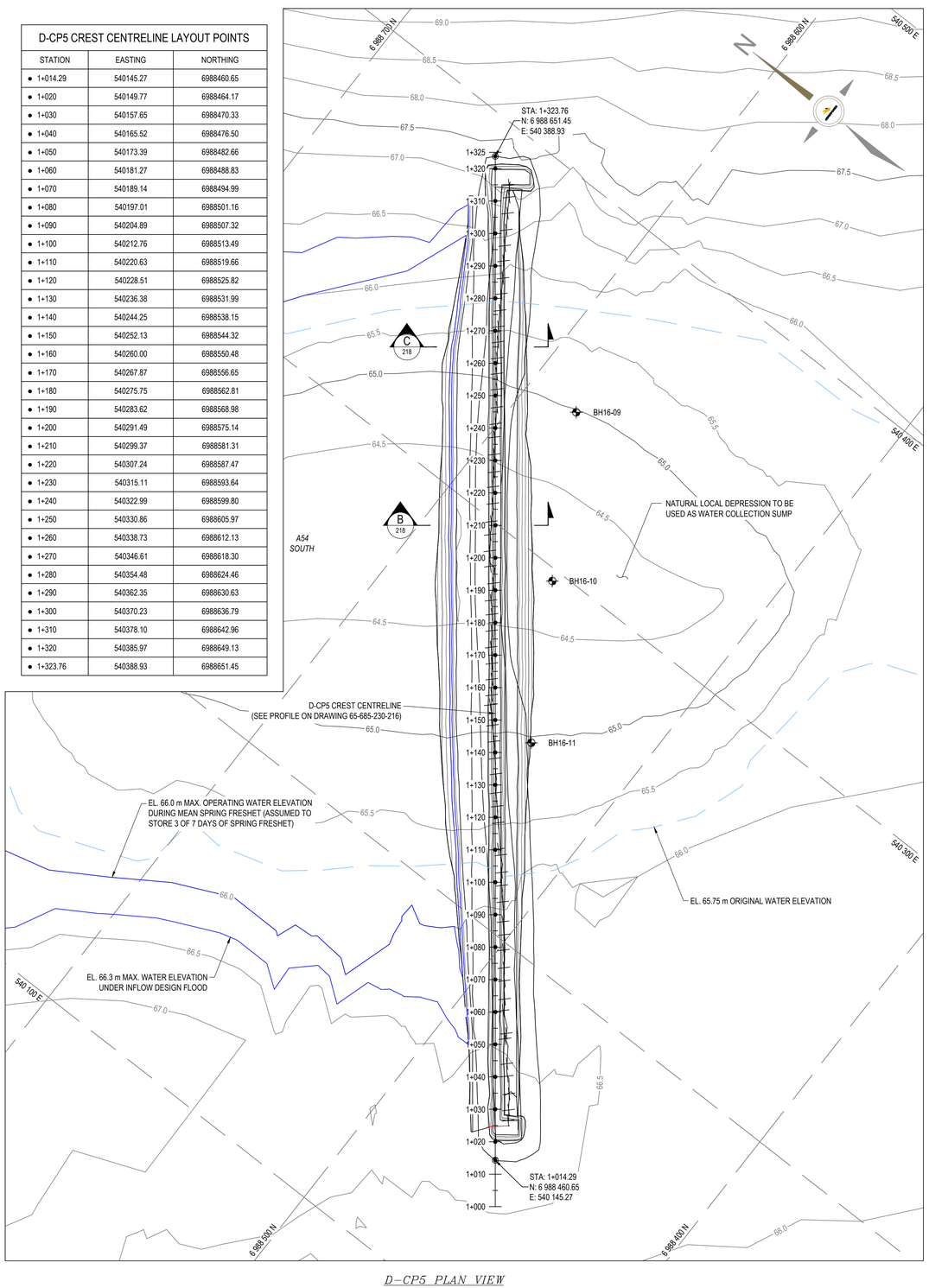
• 0+290	540378.38	6988645.36	66.57



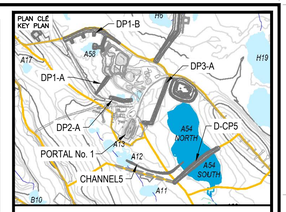
D-CP5 KEY TRENCH PLAN VIEW
SCALE: 1:750

D-CP5 CREST CENTRELINE LAYOUT POINTS

STATION	EASTING	NORTHING
• 1+014.29	540145.27	6988460.65
• 1+020	540149.77	6988464.17
• 1+030	540157.65	6988470.33
• 1+040	540165.52	6988476.50
• 1+050	540173.39	6988482.66
• 1+060	540181.27	6988488.83
• 1+070	540189.14	6988494.99
• 1+080	540197.01	6988501.16
• 1+090	540204.89	6988507.32
• 1+100	540212.76	6988513.49
• 1+110	540220.63	6988519.66
• 1+120	540228.51	6988525.82
• 1+130	540236.38	6988531.99
• 1+140	540244.25	6988538.15
• 1+150	540252.13	6988544.32
• 1+160	540260.00	6988550.48
• 1+170	540267.87	6988556.65
• 1+180	540275.75	6988562.81
• 1+190	540283.62	6988568.98
• 1+200	540291.49	6988575.14
• 1+210	540299.37	6988581.31
• 1+220	540307.24	6988587.47
• 1+230	540315.11	6988593.64
• 1+240	540322.99	6988599.80
• 1+250	540330.86	6988605.97
• 1+260	540338.73	6988612.13
• 1+270	540346.61	6988618.30
• 1+280	540354.48	6988624.46
• 1+290	540362.35	6988630.63
• 1+300	540370.23	6988636.79
• 1+310	540378.10	6988642.96
• 1+320	540385.97	6988649.13
• 1+323.76	540388.93	6988651.45



D-CP5 PLAN VIEW
SCALE: 1:750



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

LEGEND

BOREHOLE

0 25m
Scale: 1:750

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date Oct 19, 2017
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2017-10-19

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TITRE / TITLE	# DWG
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A	2016-08-10	ISSUED FOR REVIEW	GZ	KJ	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER — W.T. HORNE — LICENSEE — N.W.T. — Oct 19 '17
REGISTERED PROFESSIONAL ENGINEER — G. ZHANG — LICENSEE — NWT/NU — Oct 19 '17

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

D-CP5 AS-BUILT
KEY TRENCH AND DIKE LAYOUT PLAN

DESSINÉ PAR / DRAWN BY	EL		DATE 2016-08-15
VÉRIFIÉ PAR / CHECKED BY	GZ		2016-08-15
APPROUVÉ PAR / APPROVED BY	GZ		2016-08-15
ÉCHELLE / SCALE	1:750	DATE	2016-08-15
NO. DESSIN / DRAWING NO.	65-685-230-215		
NO. PROJET / PROJECT NO.	6515	REVISION	1
		FEUILLE / SHT	2 / 9

AE-CART-ARCH D

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FILE NO. 65-685-230-215_R1.dwg

NO. DESSIN
DRAWING NO. 65-685-230-216_R1

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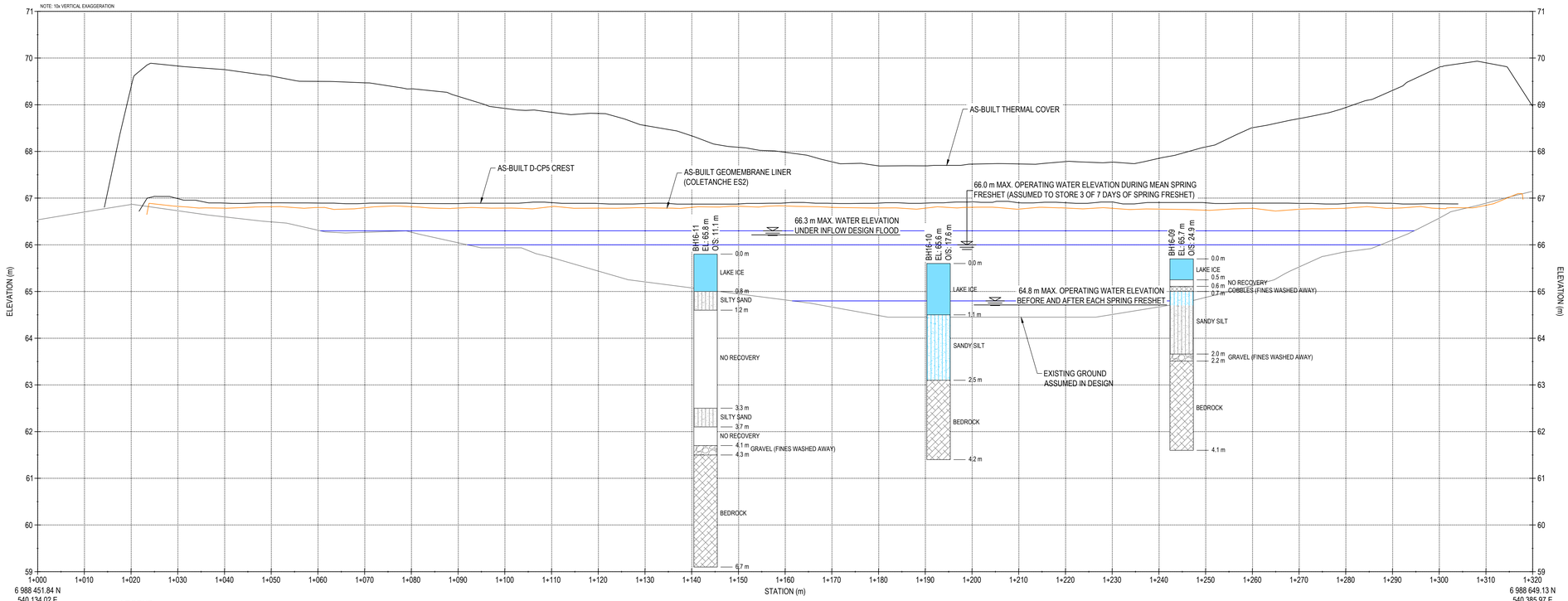
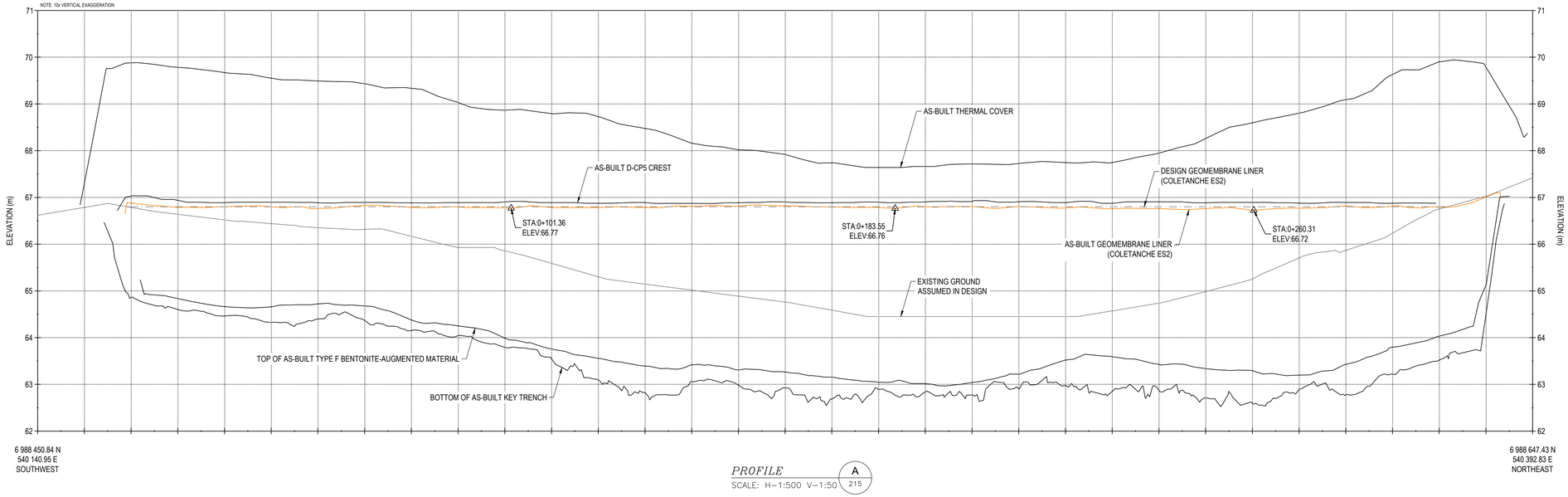


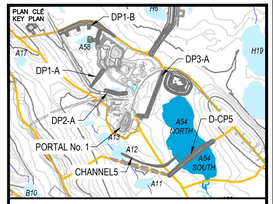
LEGEND

LAKE ICE
PEAT
SAND / ICE RICH SAND
GRAVEL AND SAND
GRAVEL
SILT / ICE RICH SILT
COBBLES
BOULDERS
BEDROCK
NO RECOVERY

D-CP5 PROFILE
SCALE: H-1:500 V-1:50



PROFILE A 215
SCALE: H-1:500 V-1:50



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date Oct 19, 2017
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2017-10-19

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DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2017-10-19	ISSUED FOR RECORD	WTH	NG	
0	2016-08-15	ISSUED FOR CONSTRUCTION	GZ	KJ	
A	2016-08-10	ISSUED FOR REVIEW	GZ	KJ	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER W.T. HORNE LICENSEE N.W.T. 2017
REGISTERED PROFESSIONAL ENGINEER G. ZHANG LICENSEE NWT/NU 2017

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

D-CP5 AS-BUILT
PROFILES

DESSINÉ PAR / DRAWN BY	EL	DATE 2016-08-15
VERIFIÉ PAR / CHECKED BY	GZ	2016-08-15
APPROUVÉ PAR / APPROVED BY	GZ	2016-08-15
ÉCHELLE / SCALE	1:500	DATE 2016-08-15

NO. DESSIN / DRAWING NO. 65-685-230-216

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6515	1	3 / 9

AE-CART-ARCH D

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FILE NO. 65-685-230-216_R1.dwg

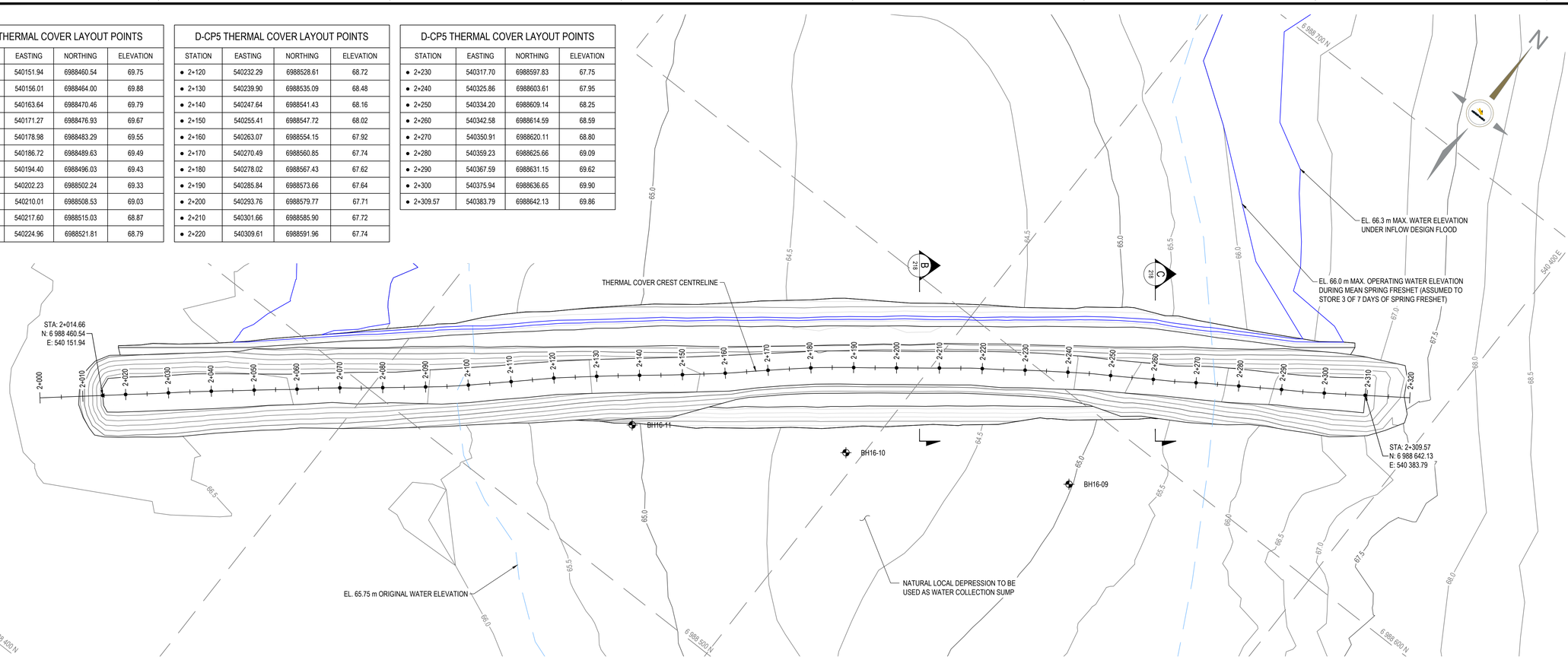
NO. DESSIN
DRAWING NO. 65-685-230-217_R1

FORMAT ARCHD

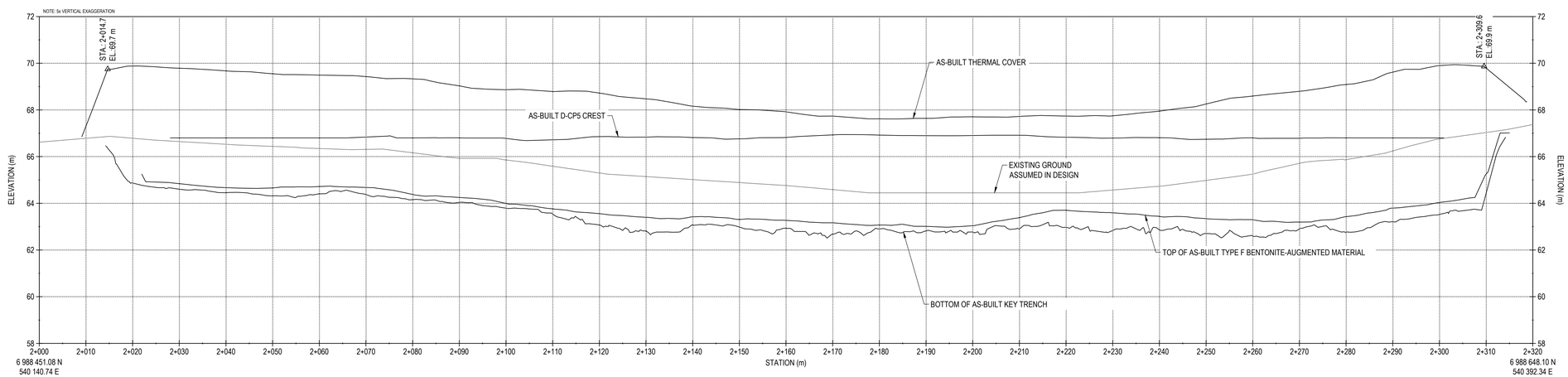
D-CP5 THERMAL COVER LAYOUT POINTS			
STATION	EASTING	NORTHING	ELEVATION
• 2+014.66	540151.94	6988460.54	69.75
• 2+020	540156.01	6988464.00	69.88
• 2+030	540163.64	6988470.46	69.79
• 2+040	540171.27	6988476.93	69.67
• 2+050	540178.98	6988483.29	69.55
• 2+060	540186.72	6988489.63	69.49
• 2+070	540194.40	6988496.03	69.43
• 2+080	540202.23	6988502.24	69.33
• 2+090	540210.01	6988508.53	69.03
• 2+100	540217.60	6988515.03	68.87
• 2+110	540224.96	6988521.81	68.79

D-CP5 THERMAL COVER LAYOUT POINTS			
STATION	EASTING	NORTHING	ELEVATION
• 2+120	540232.29	6988528.61	68.72
• 2+130	540239.90	6988535.09	68.48
• 2+140	540247.64	6988541.43	68.16
• 2+150	540255.41	6988547.72	68.02
• 2+160	540263.07	6988554.15	67.92
• 2+170	540270.49	6988560.85	67.74
• 2+180	540278.02	6988567.43	67.62
• 2+190	540285.84	6988573.66	67.64
• 2+200	540293.76	6988579.77	67.71
• 2+210	540301.66	6988585.90	67.72
• 2+220	540309.61	6988591.96	67.74

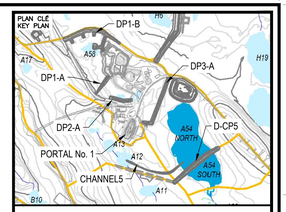
D-CP5 THERMAL COVER LAYOUT POINTS			
STATION	EASTING	NORTHING	ELEVATION
• 2+230	540317.70	6988597.83	67.75
• 2+240	540325.86	6988603.61	67.95
• 2+250	540334.20	6988609.14	68.25
• 2+260	540342.58	6988614.59	68.59
• 2+270	540350.91	6988620.11	68.80
• 2+280	540359.23	6988625.66	69.09
• 2+290	540367.59	6988631.15	69.62
• 2+300	540375.94	6988636.65	69.90
• 2+309.57	540383.79	6988642.13	69.86



D-CP5 THERMAL COVER PLAN
SCALE: H-1:500



D-CP5 THERMAL COVER PROFILE
SCALE: H-1:500 V-1:100



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

LEGEND

BOREHOLE

0 25m
Scale: 1:500

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date Oct 19, 2017
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2017-10-19

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DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2017-10-19	ISSUED FOR RECORD	WTH	NG	
0	2016-08-15	ISSUED FOR CONSTRUCTION	GZ	KJ	
A	2016-08-10	ISSUED FOR REVIEW	GZ	KJ	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER — W.T. HORNE — LICENSEE — N.W.T. — Oct 19, 17
REGISTERED PROFESSIONAL ENGINEER — G. ZHANG — LICENSEE — NWT/NU — Oct 19, 17

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

D-CP5 AS-BUILT THERMAL COVER
LAYOUT PLAN AND PROFILES

DESSINÉ PAR / DRAWN BY	EL	DATE 2016-08-15
VÉRIFIÉ PAR / CHECKED BY	GZ	2016-08-15
APPROUVÉ PAR / APPROVED BY	GZ	2016-08-15
ÉCHELLE / SCALE	1:500	DATE 2016-08-15

NO. DESSIN / DRAWING NO. 65-685-230-217

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6515	1	4 / 9

AE-CART-ARCH D

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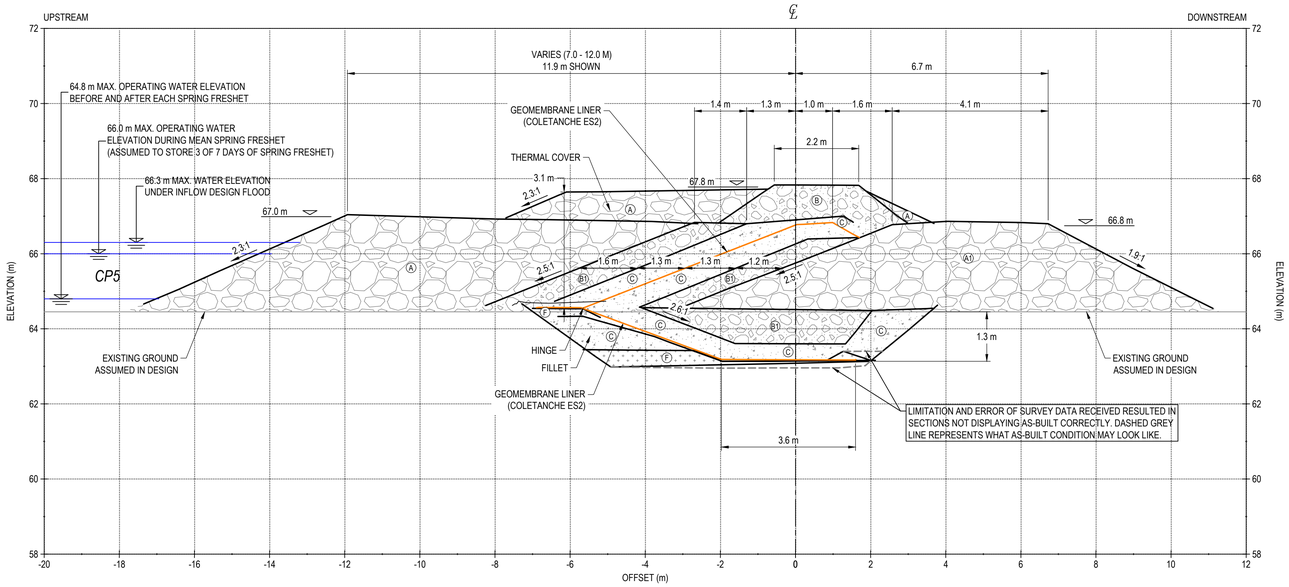
FILE NO. 65-685-230-217_R1.dwg

NO. DESSIN
DRAWING NO. 65-685-230-218_R1

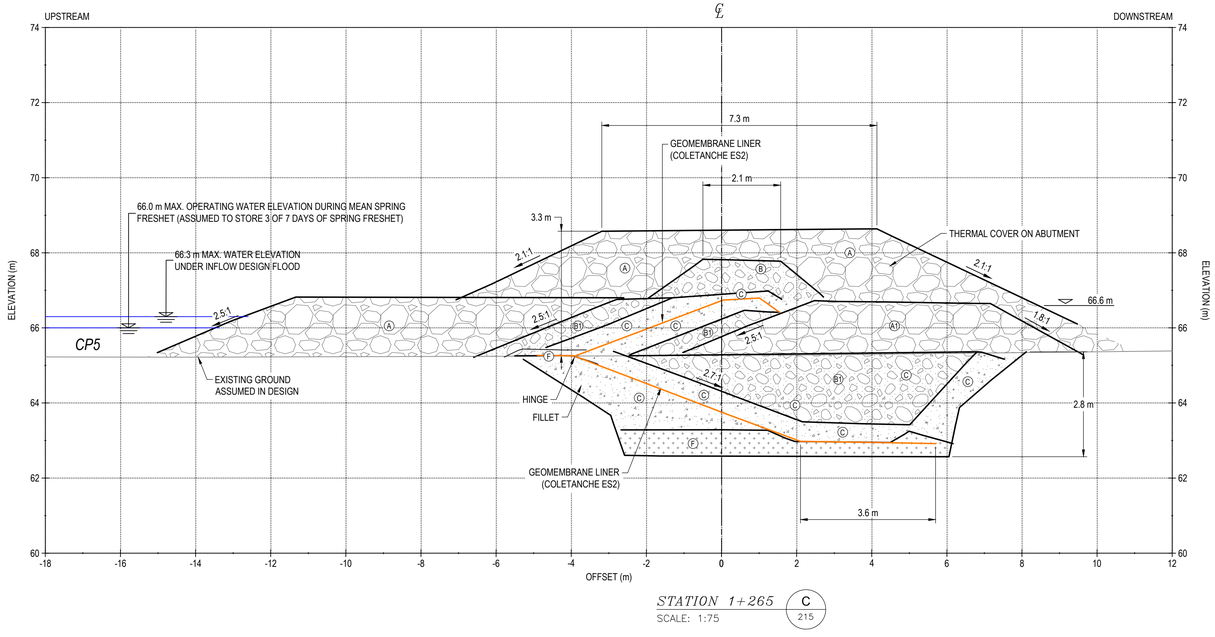
FORMAT ARCHD



STATION 1+210 (B / 215)
SCALE: 1:75

ESTIMATED IN-PLACE MATERIAL QUANTITIES FOR CONSTRUCTION OF D-CP5			
	ITEM	UNIT	AS-BUILT QUANTITY [a]
(A)	RUN-OF-MINE ROCKFILL (600 mm MINUS) IN DIKE UPSTREAM AND FOR THERMAL COVER	m³	10,029
(A1)	RUN-OF-MINE ROCKFILL (600 mm MINUS) IN DIKE DOWNSTREAM	m³	3,137
(B)/(B1)	TRANSITION ROCKFILL (150 mm MINUS)	m³	3,971
(C)	GRANULAR FILL OR ESKER SAND (20 mm MINUS)	m³	4,096
(F)	BENTONITE-AUGMENTED MATERIAL	m³	979
	GEOMEMBRANE LINER (COLETANCHE ES2)	m²	4437
	KEY TRENCH EXCAVATION	m³	5788

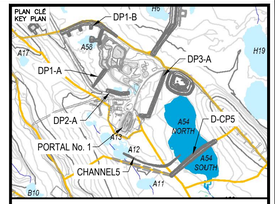
[a] MATERIAL QUANTITIES WERE BASED ON SURVEY DATA PROVIDED BY AGNICO EAGLE ON AUGUST 2017



STATION 1+265 (C / 215)
SCALE: 1:75

NOTE

THE DESIGN MINIMUM LINER CREST ELEVATION WAS 66.80 m.
THE DESIGN MINIMUM LINER CREST ELEVATION IS 66.72 m.



TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date Oct 19, 2017
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

TEL QUE CONSTRUIT
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AGNICO EAGLE
DATE : 2017-10-19

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DESSINS EN RÉFÉRENCE / REFERENCE DRAWINGS

TITRE / TITLE	# DWG
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AGNICO EAGLE

REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2017-10-19	ISSUED FOR RECORD	WTH	NG	
0	2016-08-15	ISSUED FOR CONSTRUCTION	GZ	KJ	
A	2016-08-10	ISSUED FOR REVIEW	GZ	KJ	

REVISIONS

PROFESSIONAL ENGINEER — W. T. HORNE — LICENSEE — N.W.T. — 2017
PROFESSIONAL ENGINEER — G. ZHANG — LICENSEE — NWT/NU — 2017

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

D-CP5 AS-BUILT
TYPICAL SECTIONS AND QUANTITIES

DESSINÉ PAR / DRAWN BY	EL	DATE 2016-08-15
VÉRIFIÉ PAR / CHECKED BY	GZ	2016-08-15
APPROUVÉ PAR / APPROVED BY	GZ	2016-08-15
ÉCHELLE / SCALE	1:75	DATE 2016-08-15
NO. DESSIN / DRAWING NO.	65-685-230-218	
NO. PROJET / PROJECT NO.	6515	REVISION 1
		FEUILLE / SHT 5 / 9

AE-CART-ARCH D

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FILE NO. 65-685-230-218_R1.dwg

NO. DESSIN
DRAWING NO. 65-685-230-219_R1

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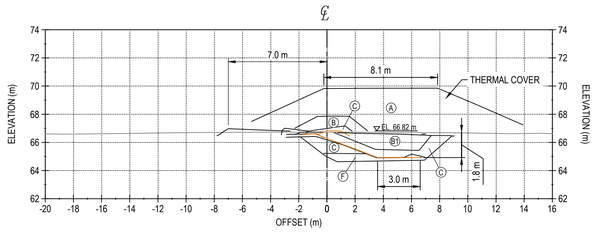

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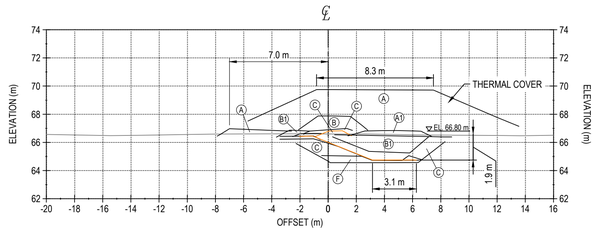

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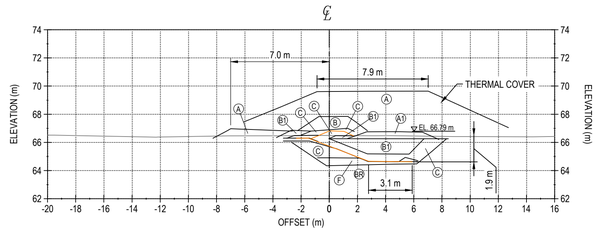

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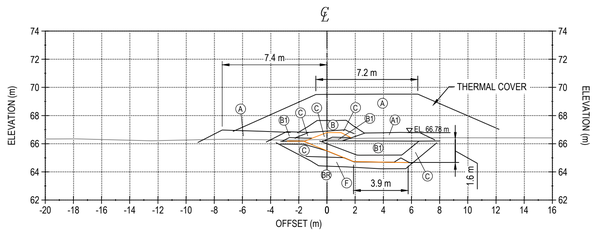

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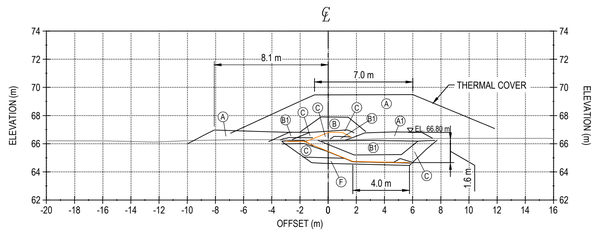

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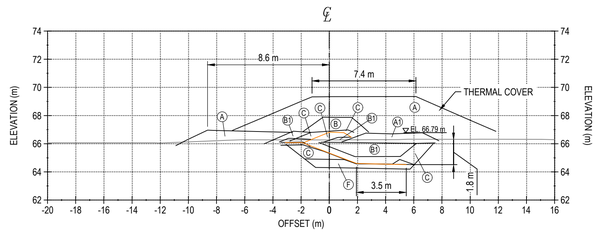

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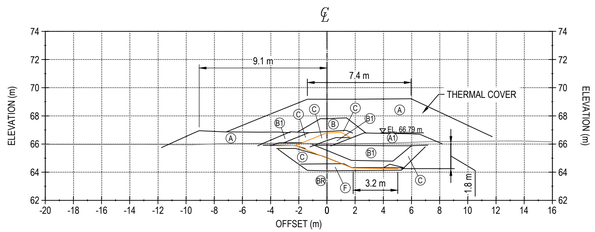

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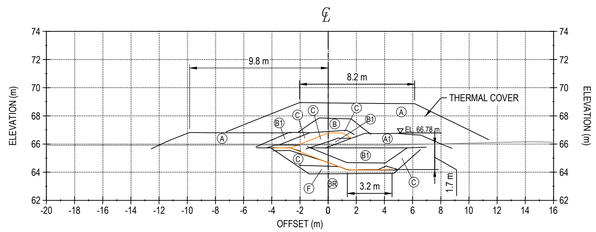

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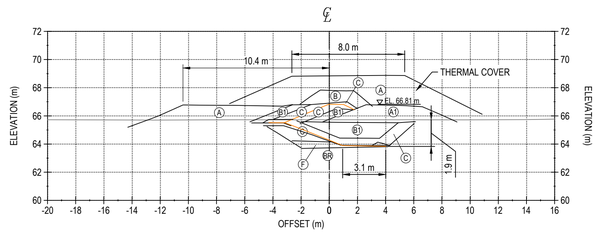

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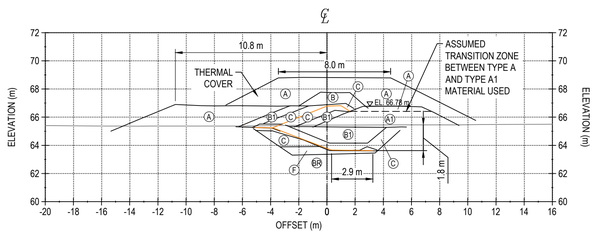

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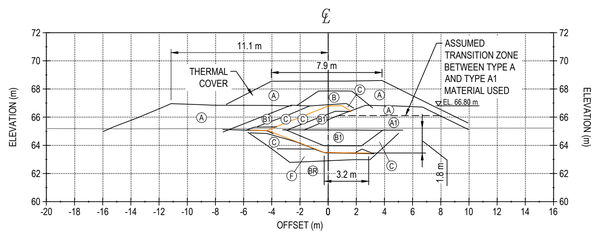

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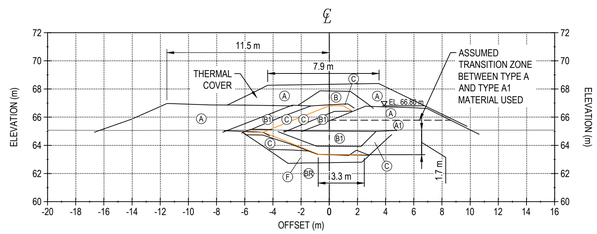

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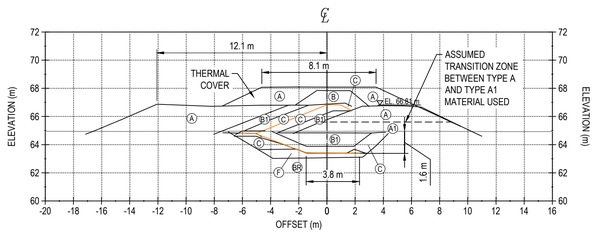

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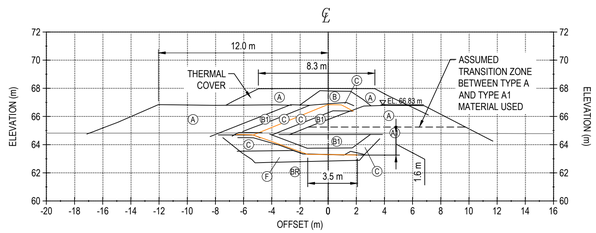

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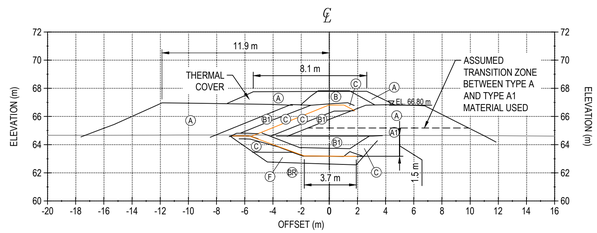

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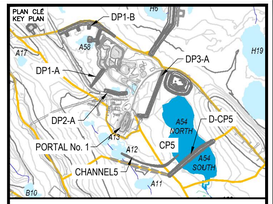

TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

LEGEND

- (A) RUN-OF-MINE ROCKFILL (600 mm MINUS) IN DIKE UPSTREAM AND FOR THERMAL COVER
- (A1) RUN-OF-MINE ROCKFILL (600 mm MINUS) IN DIKE DOWNSTREAM
- (B) TRANSITION ROCKFILL (150 mm MINUS)
- (B1) TRANSITION ROCKFILL (150 mm MINUS)
- (C) GRANULAR FILL OR ESKER SAND (20 mm MINUS)
- (F) BENTONITE-AUGMENTED MATERIAL (MIXTURE OF BENTONITE AND TYPE C MATERIAL)

  DASHED LINES REFER TO NO AS-BUILT DATA BUT ESTIMATED BASED ON FIELD VISUAL OBSERVATION
- (BR) BEDROCK

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date OCT 19, 2017
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

TEL QUE CONSTRUIT
AS BUILT
AGNICO EAGLE
DATE : 2017-10-19

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REV.	DATE	DESCRIPTION	PAR/BY	APP.	CLIENT
1	2017-10-19	ISSUED FOR RECORD	WTH	NG	
0	2016-08-15	ISSUED FOR CONSTRUCTION	GZ	KJ	
A	2016-08-10	ISSUED FOR REVIEW	GZ	KJ	

REVISIONS

REGISTERED PROFESSIONAL ENGINEER — W.T. HORNE — LICENSEE — N.W.T. — Oct 19/17

REGISTERED PROFESSIONAL ENGINEER — G. ZHANG — LICENSEE — NWT/NU — Oct 19/17

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

D-CP5 AS-BUILT SECTIONS
STATION 1+030 TO 1+170

DESSINÉ PAR / DRAWN BY	EL	DATE	2016-08-15
VERIFIÉ PAR / CHECKED BY	GZ		2016-08-15
APPROUVÉ PAR / APPROVED BY	GZ		2016-08-15
ÉCHELLE / SCALE	1:200	DATE	2016-08-15

NO. DESSIN / DRAWING NO. 65-685-230-219-001

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6515	1	6 / 9

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FILE NO. 65-685-230-219_R1.dwg

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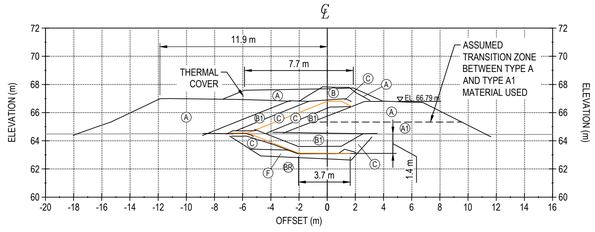

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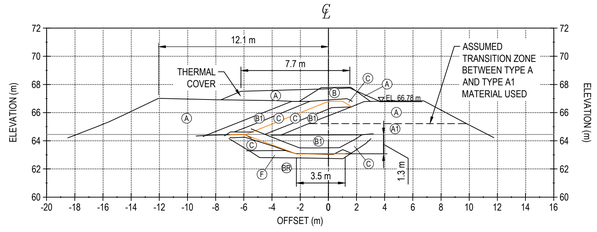

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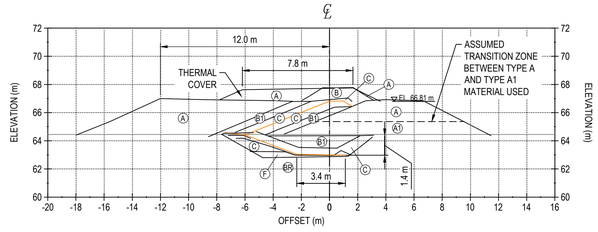

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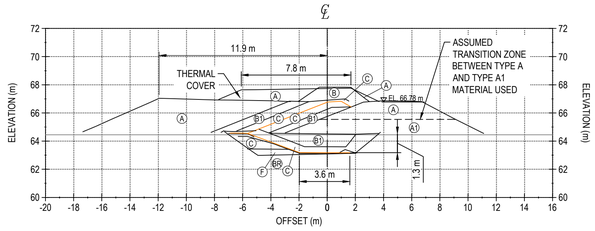

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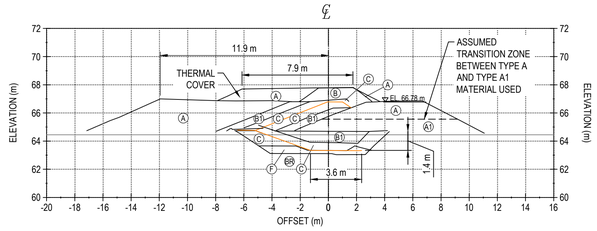

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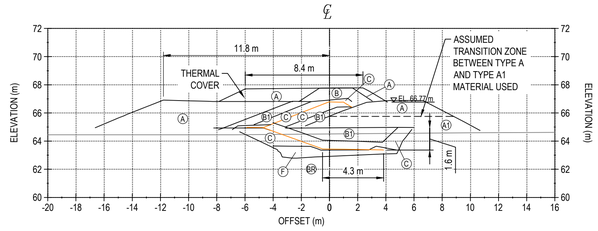

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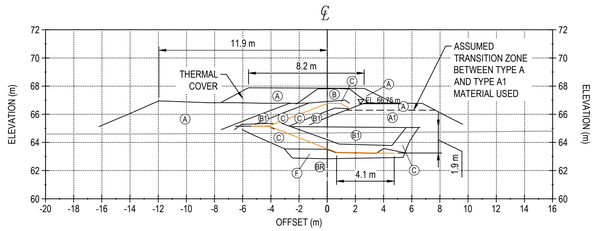

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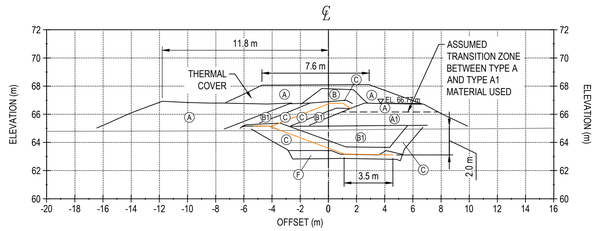

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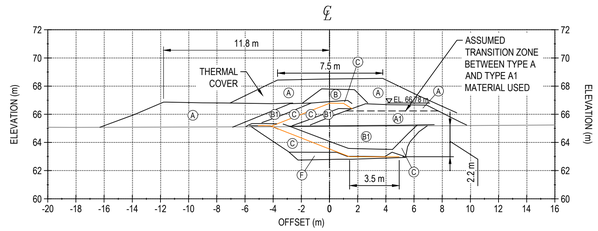

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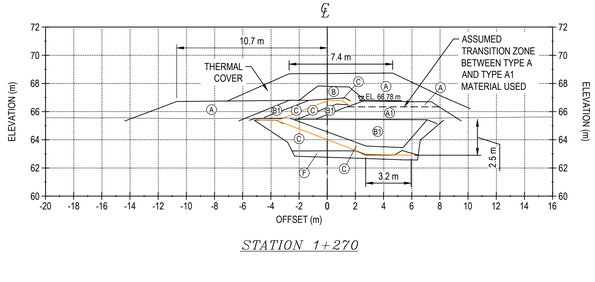

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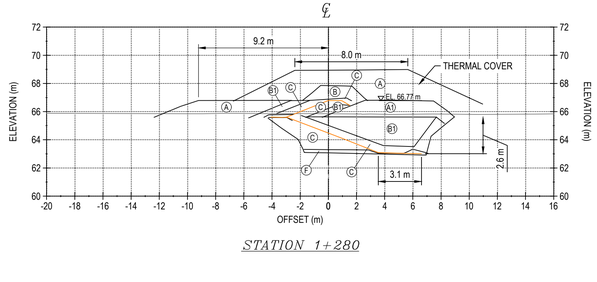

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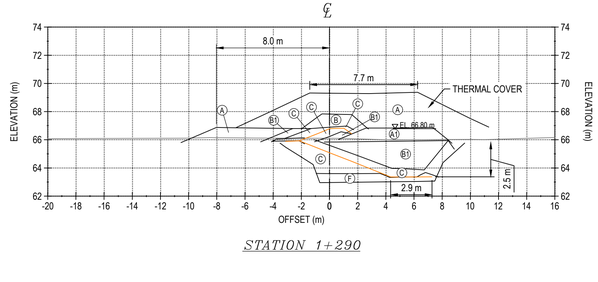

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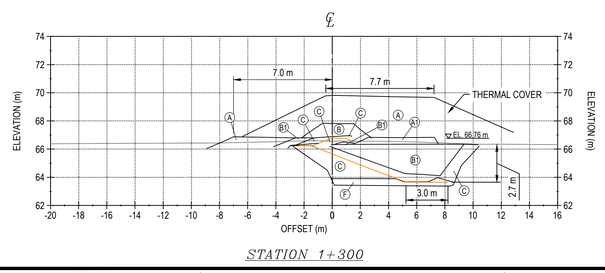

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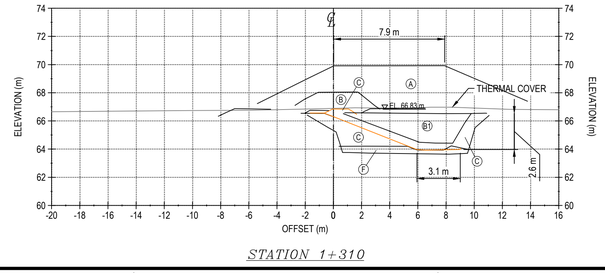

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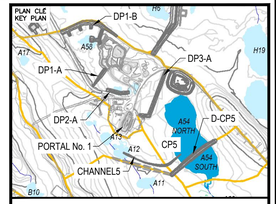

TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

LEGEND

- (A) RUN-OF-MINE ROCKFILL (600 mm MINUS) IN DIKE UPSTREAM AND FOR THERMAL COVER
- (A1) RUN-OF-MINE ROCKFILL (600 mm MINUS) IN DIKE DOWNSTREAM
- (B) TRANSITION ROCKFILL (150 mm MINUS)
- (B1) TRANSITION ROCKFILL (150 mm MINUS)
- (C) GRANULAR FILL OR ESKER SAND (20 mm MINUS)
- (F) BENTONITE-AUGMENTED MATERIAL (MIXTURE OF BENTONITE AND TYPE C MATERIAL)

  DASHED LINES REFER TO NO AS-BUILT DATA BUT ESTIMATED BASED ON FIELD VISUAL OBSERVATION
- (BR) BEDROCK

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
Signature
Date OCT 19, 2017
PERMIT NUMBER: P 018
NT/NU Association of Professional Engineers and Geoscientists

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AGNICO EAGLE
DATE : 2017-10-19

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REVISIONS

REGISTERED PROFESSIONAL ENGINEER W.T. HORNE LICENSEE N.W.T. — OCT 19 2017
REGISTERED PROFESSIONAL ENGINEER G. ZHANG LICENSEE NWT/NU — OCT 19 2017

TITRE / TITLE

AGNICO EAGLE MELIADINE GOLD PROJECT

D-CP5 AS-BUILT SECTIONS
STATION 1+180 TO 1+310

DESSINÉ PAR / DRAWN BY	EL	DATE	2016-08-15
VÉRIFIÉ PAR / CHECKED BY	GZ		2016-08-15
APPROUVÉ PAR / APPROVED BY	GZ		2016-08-15
ÉCHELLE / SCALE	1:200	DATE	2016-08-15

NO. DESSIN / DRAWING NO. 65-685-230-219-002

NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6515	1	7 / 9

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FILE NO. 65-685-230-219_R1.dwg

NO. DESSIN
DRAWING NO. 65-685-230-220_R1

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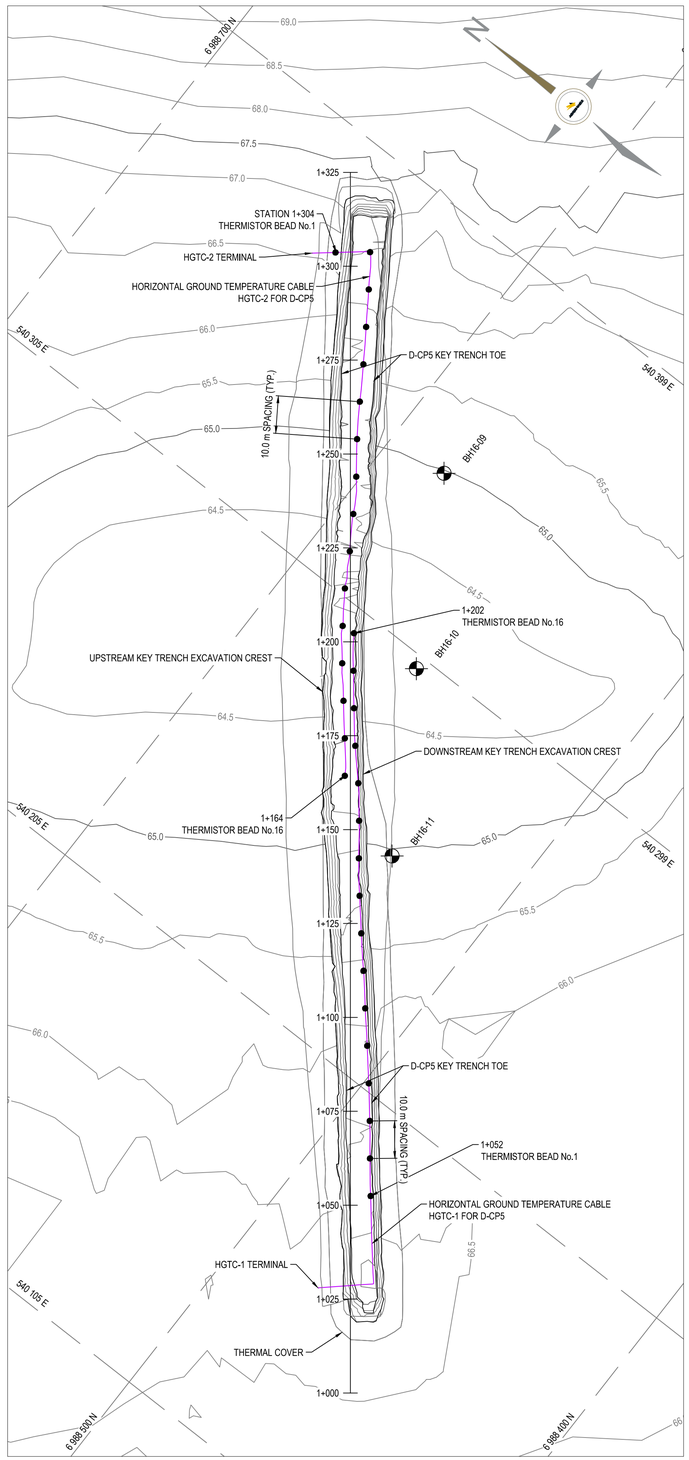
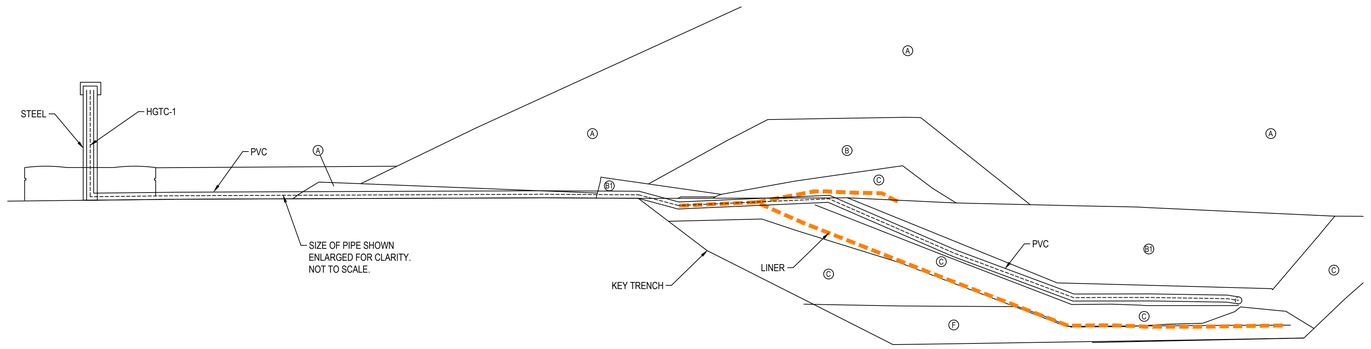


D-CP5 AS-BUILT HORIZONTAL GROUND TEMPERATURE CABLE LAYOUT
SCALE: 1:750



D-CP5 AS-BUILT HORIZONTAL GROUND TEMPERATURE CABLE - SOUTH TERMINAL SECTION THROUGH STATION 1+028
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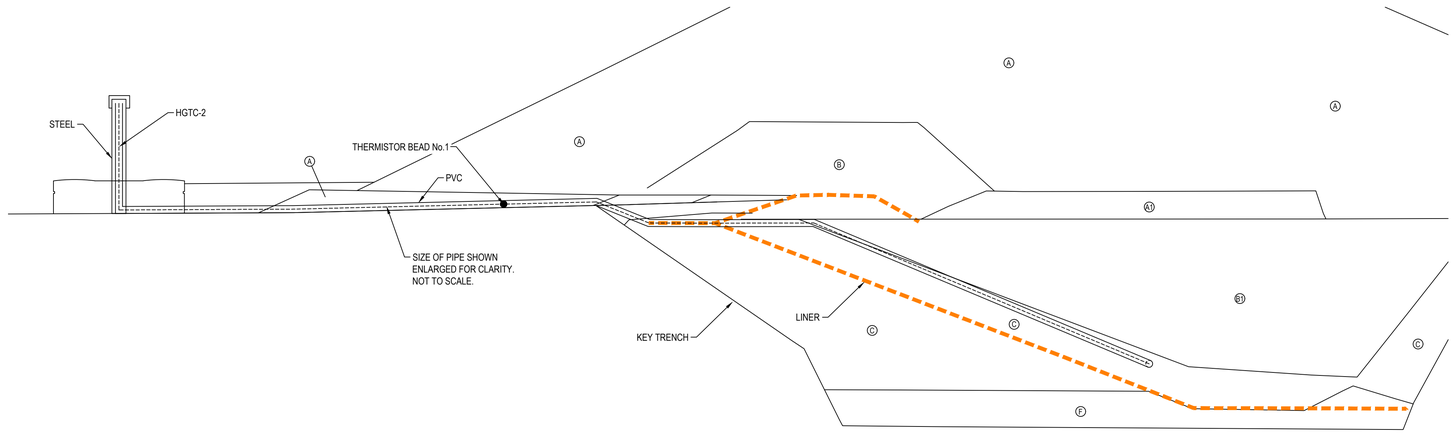

D-CP5 AS-BUILT HORIZONTAL GROUND TEMPERATURE CABLE - NORTH TERMINAL SECTION THROUGH STATION 1+304
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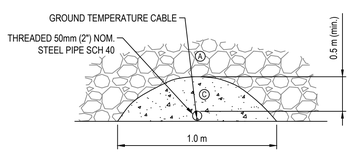

TEMPERATURE CABLE - PROTECTIVE COVER SECTION
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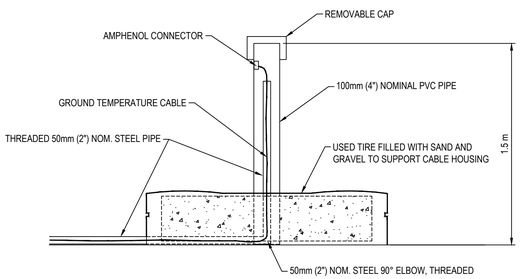

TEMPERATURE CABLE - TERMINAL SUPPORT DETAIL
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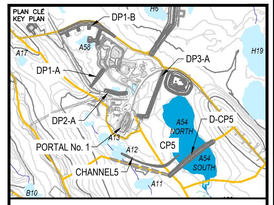

TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

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TETRA TECH CANADA INC.
Signature
Date Oct 19, 2017
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NT/NU Association of Professional Engineers and Geoscientists

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AGNICO EAGLE
DATE : 2017-10-19

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REVISIONS

REGISTERED PROFESSIONAL ENGINEER W.T. HORNE LICENSEE 14-19 N.W.T. 2017
REGISTERED PROFESSIONAL ENGINEER G. ZHANG LICENSEE 14-19 NWT/NU 2017

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

D-CP5 AS-BUILT
INSTRUMENTATION PLAN AND DETAILS
FOR GROUND TEMPERATURE CABLES

DESSINÉ PAR / DRAWN BY	DRG	DATE 2016-08-08
VÉRIFIÉ PAR / CHECKED BY	GZ	2016-08-15
APPROUVÉ PAR / APPROVED BY	KJ	2016-08-15
ÉCHELLE / SCALE	AS SHOWN	DATE 2016-08-08

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NO. PROJET / PROJECT NO.	REVISION	FEUILLE / SHT
6515	1	8 / 9

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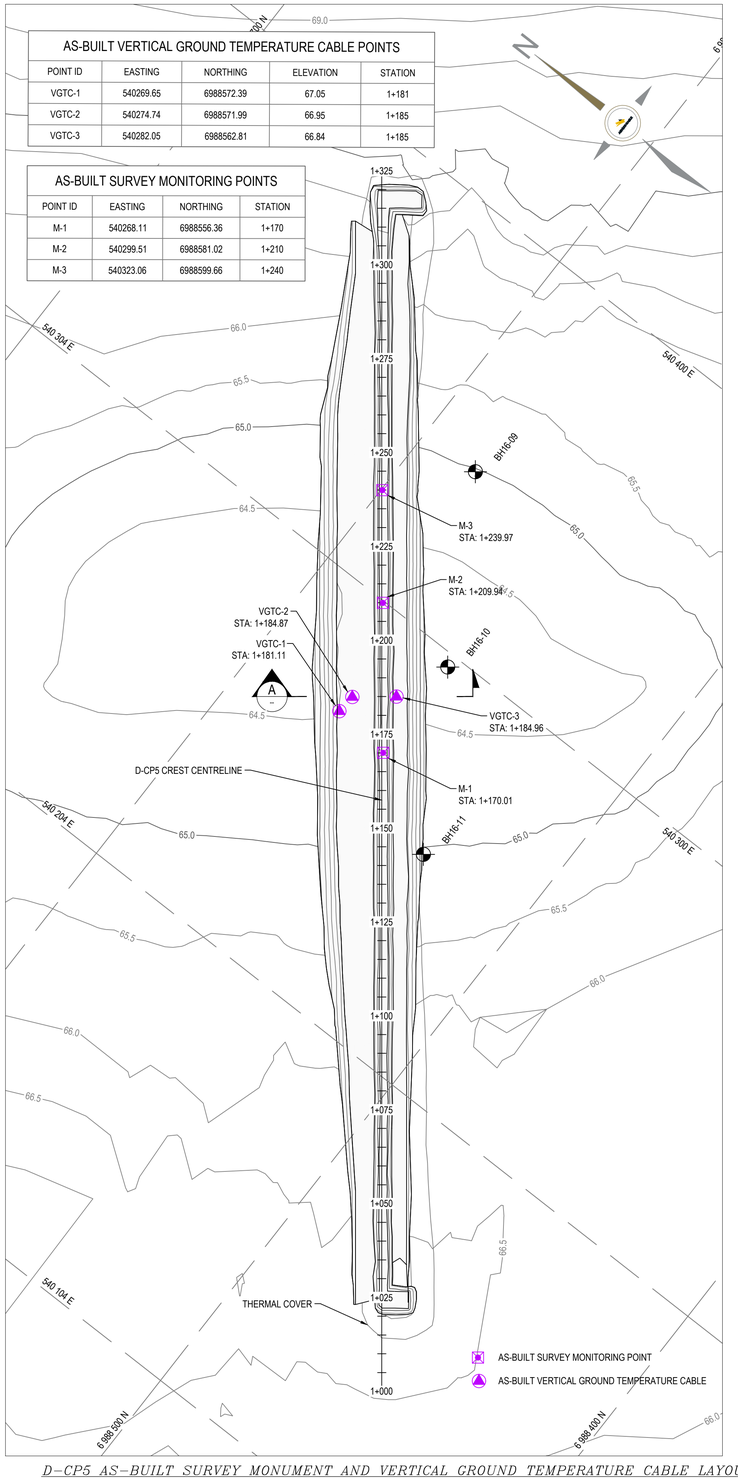
FILE NO. 65-685-230-220_R1.dwg

NO. DESSIN DRAWING NO. 65-685-230-221_R1

FORMAT ARCHD

AS-BUILT VERTICAL GROUND TEMPERATURE CABLE POINTS				
POINT ID	EASTING	NORTHING	ELEVATION	STATION
VGTC-1	540269.65	6988572.39	67.05	1+181
VGTC-2	540274.74	6988571.99	66.95	1+185
VGTC-3	540282.05	6988562.81	66.84	1+185

AS-BUILT SURVEY MONITORING POINTS			
POINT ID	EASTING	NORTHING	STATION
M-1	540268.11	6988556.36	1+170
M-2	540299.51	6988581.02	1+210
M-3	540323.06	6988599.66	1+240



D-CP5 AS-BUILT SURVEY MONUMENT AND VERTICAL GROUND TEMPERATURE CABLE LAYOUT
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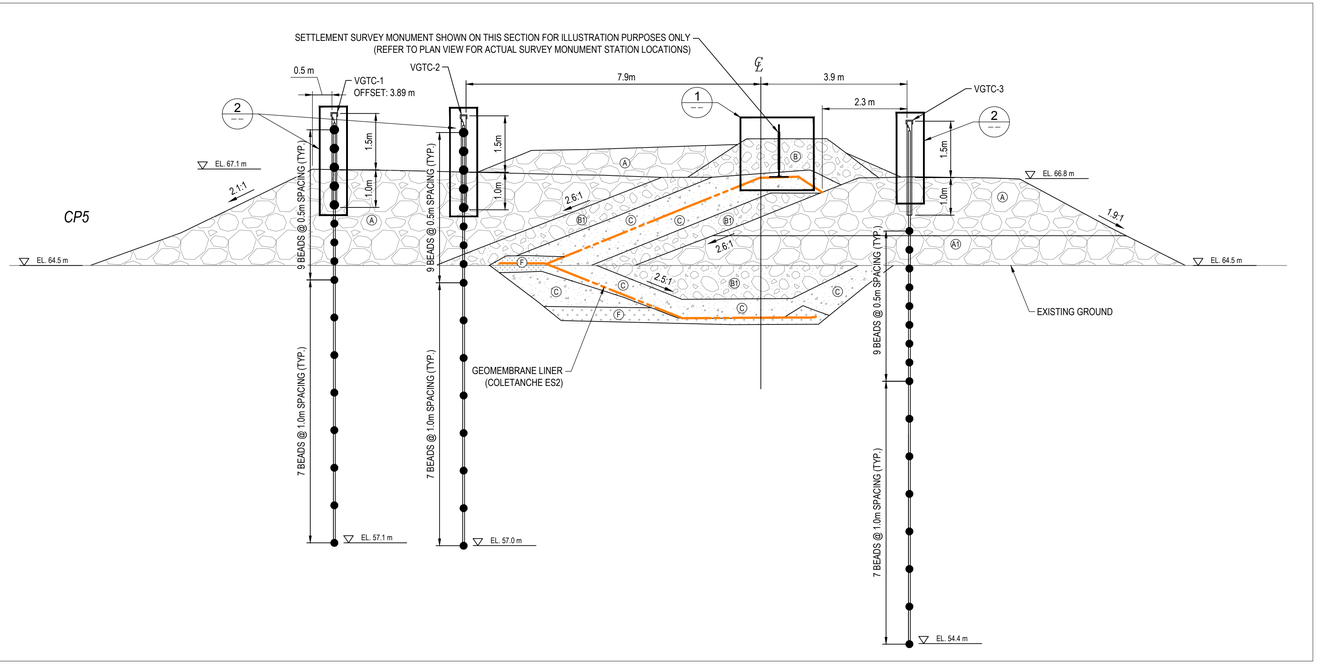
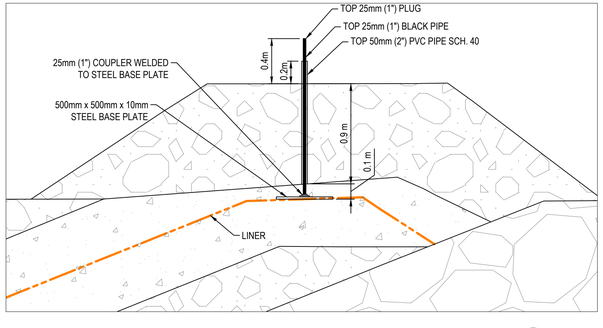


D-CP5 AS-BUILT SECTION A - VERTICAL GROUND TEMPERATURE CABLE - STATION 1+185
SCALE: 1:75



D-CP1 TYPICAL SETTLEMENT SURVEY MONUMENT DETAIL (1)
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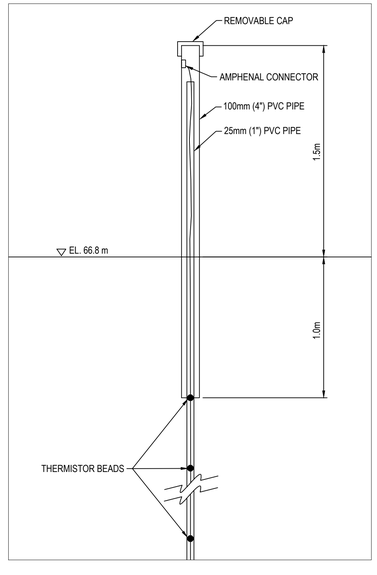

D-CP1 TYPICAL VERTICAL GROUND TEMPERATURE CABLE TERMINAL DETAIL (2)
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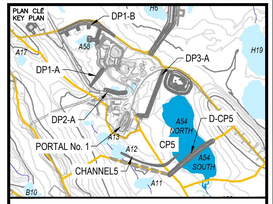

TETRA TECH

NOTES GÉNÉRALES / GENERAL NOTES

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Date Oct 19, 2017
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NT/NU Association of Professional Engineers and Geoscientists

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DATE : 2017-10-19

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REVISIONS

PROFESSIONAL ENGINEER W.T. HORNE LICENSEE NWT/NU — PROFESSIONAL ENGINEER G. ZHANG LICENSEE NWT/NU

TITRE / TITLE
AGNICO EAGLE MELIADINE GOLD PROJECT

D-CP5 AS-BUILT - INSTRUMENTATION PLAN AND DETAILS FOR GROUND TEMPERATURE CABLES AND SETTLEMENT SURVEY MONUMENT POINTS

DESSINÉ PAR DRAWN BY	DRG	DATE 2016-08-08
VERIFIÉ PAR CHECKED BY	GZ	2016-08-15
APPROUVÉ PAR APPROVED BY	KJ	2016-08-15
ÉCHELLE SCALE	AS SHOWN	DATE 2016-08-08

NO. DESSIN DRAWING NO. 65-685-230-221

NO. PROJET PROJECT NO.	REVISION	FEUILLE / SHT
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FILE NO. 65-685-230-221_R1.dwg

APPENDIX C

GROUND TEMPERATURE PROFILES

Table 4: DCP-5 Horizontal Ground Temperature Cables (HGTCs) Bead Locations

Point ID	Bead Number	Easting (m)	Northing (m)	Point Elevation (m)	Station
HGTC1-1	1	540178.64	6988479.94	65.01	1+052
HGTC1-2	2	540186.40	6988486.24	65.05	1+062
HGTC1-3	3	540194.24	6988492.45	65.06	1+072
HGTC1-4	4	540201.95	6988498.81	64.86	1+082
HGTC1-5	5	540209.55	6988505.30	64.62	1+092
HGTC1-6	6	540217.09	6988511.87	64.41	1+102
HGTC1-7	7	540224.67	6988518.38	64.21	1+112
HGTC1-8	8	540232.16	6988525.00	63.97	1+122
HGTC1-9	9	540239.75	6988531.51	63.81	1+132
HGTC1-10	10	540247.49	6988537.84	63.79	1+142
HGTC1-11	11	540255.41	6988543.94	63.72	1+152
HGTC1-12	12	540263.12	6988550.29	63.64	1+162
HGTC1-13	13	540270.48	6988557.06	63.56	1+172
HGTC1-14	14	540278.14	6988563.48	63.42	1+182
HGTC1-15	14	540285.93	6988569.76	63.41	1+192
HGTC1-16	14	540293.87	6988575.81	63.33	1+202
HGTC-2-1	1	540370.67	6988642.18	68.14	1+304
HGTC-2-2	2	540376.40	6988635.00	64.29	1+304
HGTC-2-3	3	540368.36	6988629.14	63.86	1+294
HGTC-2-4	4	540360.08	6988623.54	63.49	1+284
HGTC-2-5	5	540351.78	6988617.98	63.34	1+274
HGTC-2-6	6	540343.36	6988612.59	63.30	1+264
HGTC-2-7	7	540335.06	6988607.01	63.43	1+254
HGTC-2-8	8	540327.06	6988601.02	63.53	1+244
HGTC-2-9	9	540318.75	6988595.52	63.68	1+234
HGTC-2-10	10	540310.34	6988590.12	63.72	1+224
HGTC-2-11	11	540301.77	6988585.06	63.54	1+214
HGTC-2-12	12	540293.55	6988579.38	63.38	1+204
HGTC-2-13	13	540285.63	6988573.34	63.38	1+194
HGTC-2-14	14	540277.99	6988566.91	63.38	1+184
HGTC-2-15	15	540270.33	6988560.48	63.45	1+174
HGTC-2-16	16	540262.47	6988554.34	63.56	1+164

Table 5: DCP-5 Vertical Ground Temperature Cables (VGTCs) Bead Locations

Cable :	VGTC1
Easting:	540269.65
Northing:	6988572.39
Station:	1+181

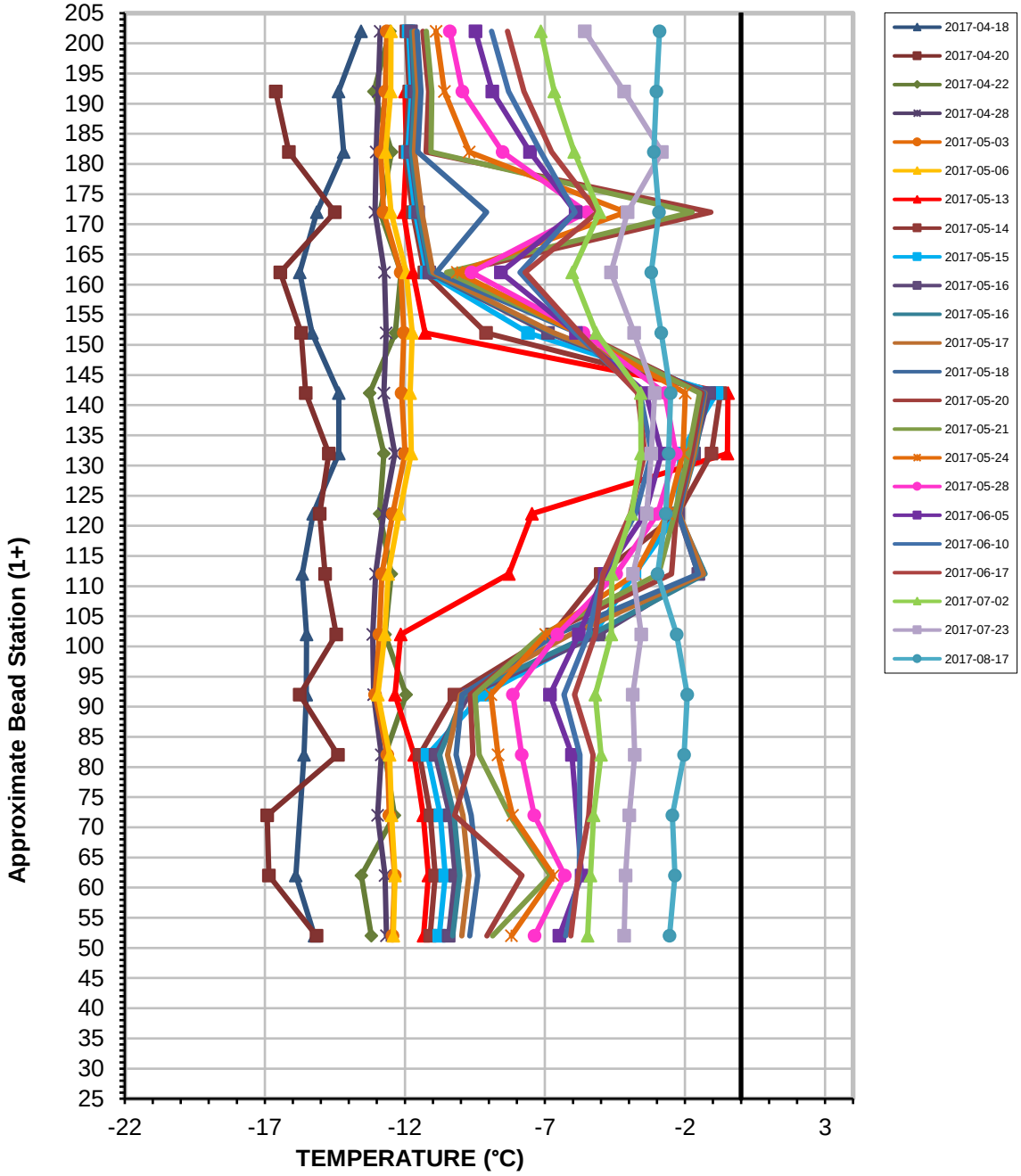
Bead Number	Point Elevation (m)
1	68.10
2	67.60
3	67.10
4	66.60
5	66.10
6	65.60
7	65.10
8	64.60
9	64.10
10	63.10
11	62.10
12	61.10
13	60.10
14	59.10
15	58.10
16	57.10

Cable :	VGTC2
Easting:	540274.74
Northing:	6988571.99
Station:	1+185

Bead Number	Point Elevation (m)
1	68.00
2	67.50
3	67.00
4	66.50
5	66.00
6	65.50
7	65.00
8	64.50
9	64.00
10	63.00
11	62.00
12	61.00
13	60.00
14	59.00
15	58.00
16	57.00

Cable :	VGTC3
Easting:	540282.05
Northing:	6988562.81
Station:	1+185

Bead Number	Point Elevation (m)
1	65.40
2	64.90
3	64.40
4	63.90
5	63.40
6	62.90
7	62.40
8	61.90
9	61.40
10	60.40
11	59.40
12	58.40
13	57.40
14	56.40
15	55.40
16	54.40

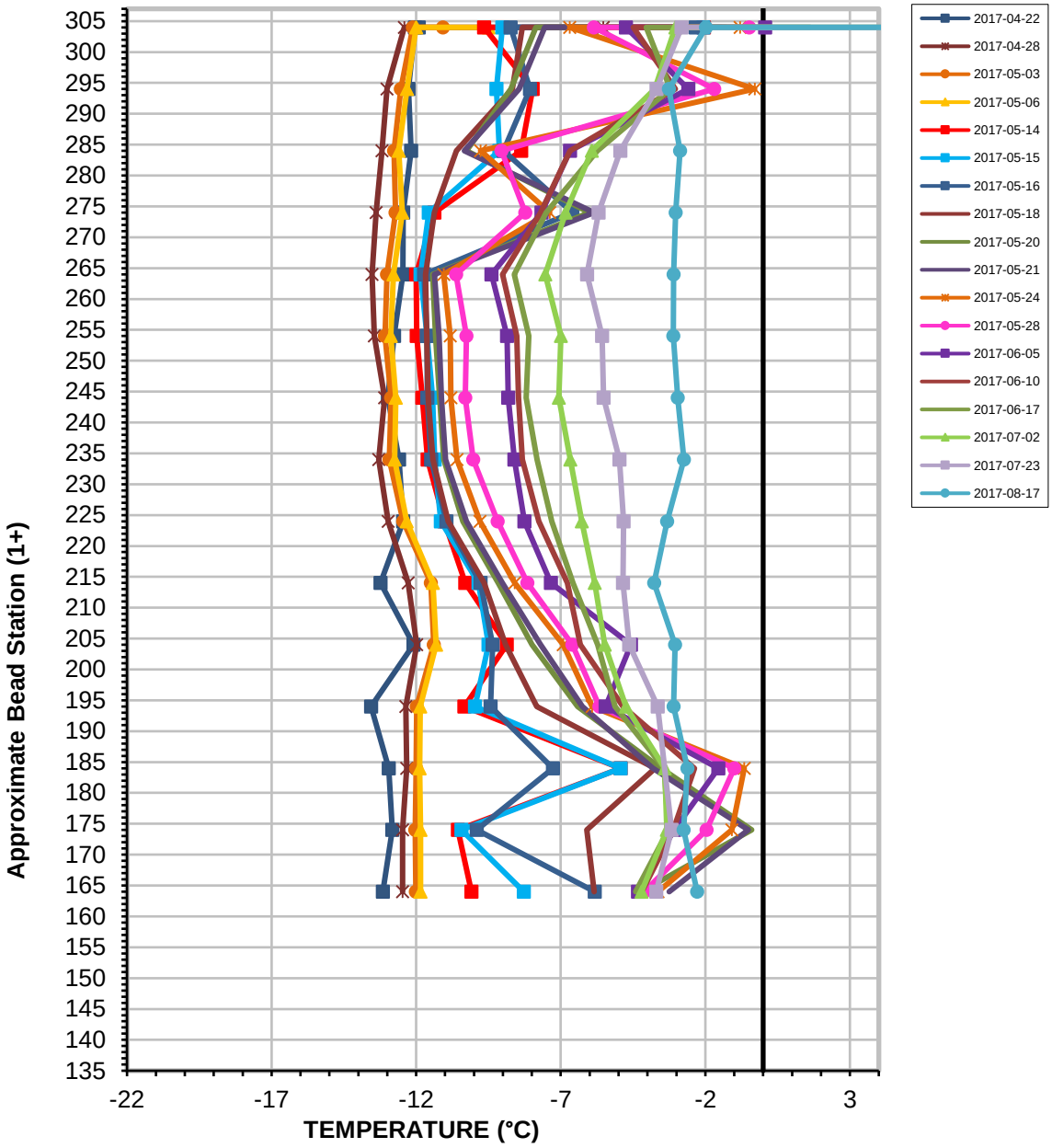


Serial No.: 2600
Date Installed: April 15, 2017

EBA File No:
E14103230.01-023

Horizontal Ground Temperature Profile for Cable #1 (HGTC-01)
Dike D-CP5

TETRA TECH

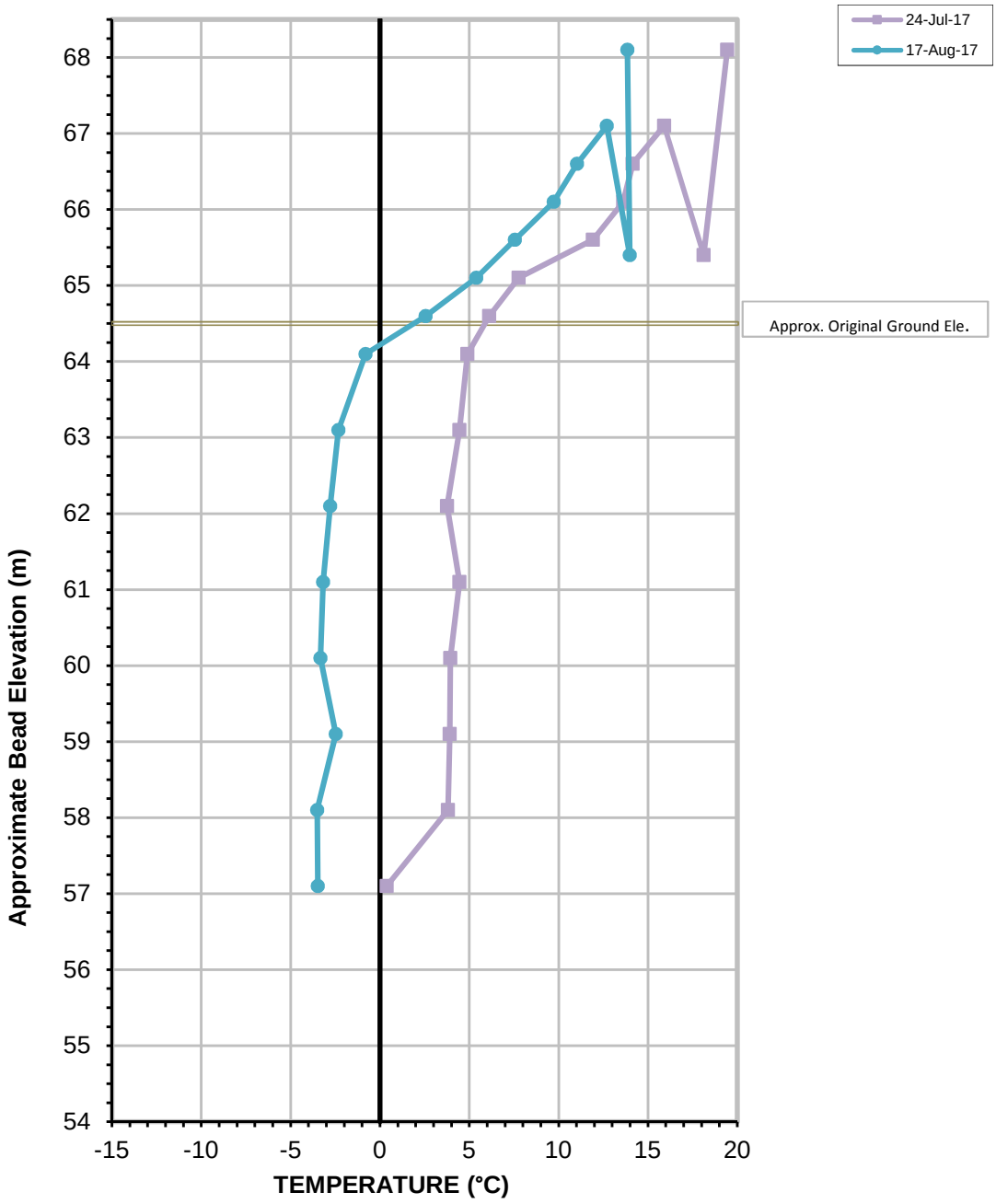


Serial No.: 2601
Date Installed: April 20, 2017

EBA File No:
E14103230.01-023

Horizontal Ground Temperature Profile for Cable #2 (HGTC-02)
Dike D-CP5

TETRA TECH

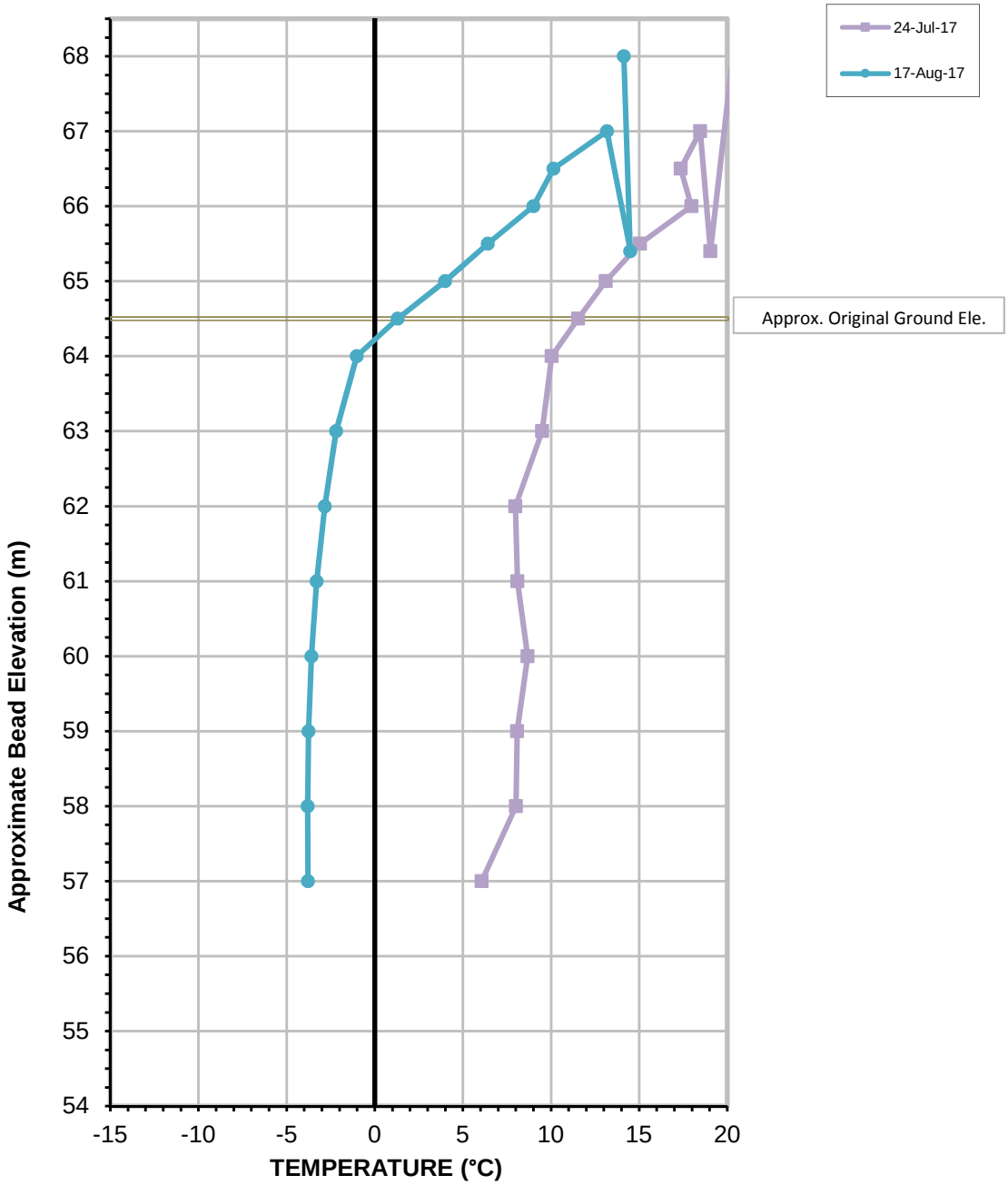


Serial No.: 2631
Date Installed: July 24, 2017

EBA File No: E14103230.01-023

Vertical Ground Temperature Profile for Cable VGTC-01
Dike D-CP5

TETRA TECH

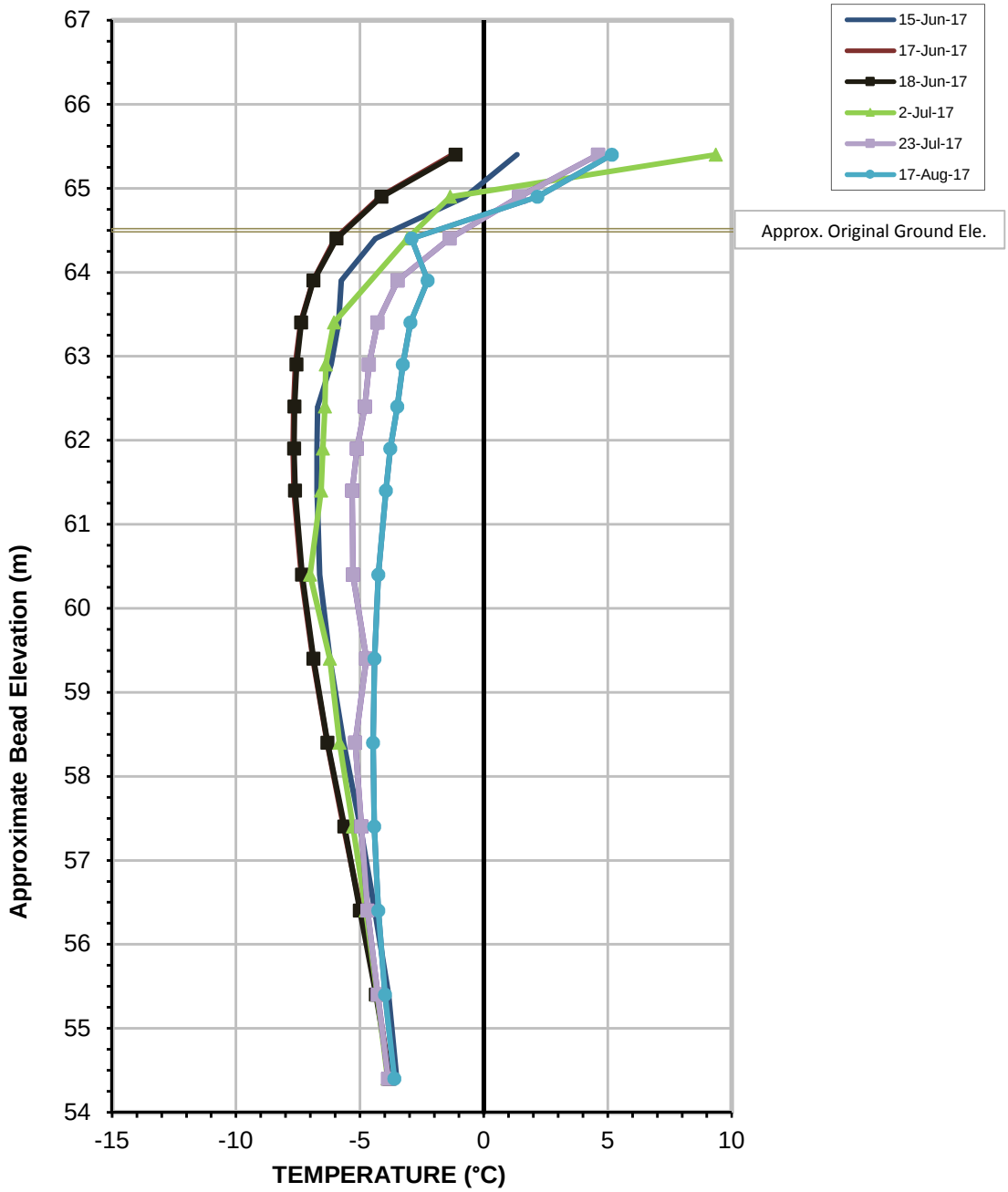


Serial No.: 2632
Date Installed: July 24, 2017

EBA File No: E14103230.01-023

Vertical Ground Temperature Profile for Cable VGTC-02
Dike D-CP5

TETRA TECH



Serial No.: 2633
Date Installed: June 15, 2017

EBA File No: E14103230.01-023

Vertical Ground Temperature Profile for Cable VGTC-03
Dike D-CP5

TETRA TECH

APPENDIX D1

REQUEST FOR INFORMATION (RFI)

AGNICO EAGLE

Request For Information

Project No: 6515 Contract No: C-007 RFI No: 6515-C-230-007_004 Rev: 0
Meliadine Project

Site RFI Initiator: Matt Gallant Date: 2016-10-11

1. REFERENCE DOCUMENTS :

Title(s):	*Number:*	*Revision:*
		0

2. DESCRIPTION , JUSTIFICATION OF THE RFI AND CONTRACTOR'S PROPOSED SOLUTION :

Please Specify the horizontal tolerances that will be acceptable for lift placement.

Prepared by: Matt Gallant Signature: Matt Gallant Date: 2016-10-11

3. TECHNICAL RESPONSE FROM ENGINEERING AND/OR VALIDATION OF PROPOSED SOLUTION :

In general, the acceptable horizontal tolerances are from -0.1 m to +0.1 m for fill lift placement during dike construction. However, the compacted liner bedding layer that is immediately below the liner should have smooth surface without sudden slope changes.

Engineering : Gordon Zhang Signature: Date: October 12, 2016

4. IF NOT TECHNICAL RFI VALIDATION OF PROPOSED SOLUTION BY SITE SUPERVISION

Deviation Request: ☐ No ☐ Yes

	Name	Signature	Date
Superintendent:			
c.c. Contract Administrator:			

Ndofor, Fai

From: Zhang, Guangwen (Gordon)
Sent: Monday, October 17, 2016 12:01 PM
To: 'Duy Nguyen'
Cc: Jack Dutil; Pyliuk, Jennifer; Ndofor, Fai; Construction Regional; EBA.Tt.Meliadine.Block007
Subject: Responses - RE: 6515-C-230-007-RFI-005_materiel

Importance: High

Hi Duy,

Our responses to 6515-C-230-007-RFI-005 are summarized below:

1) **3D models to show all crests and surfaces**: Tetra Tech originally developed the dike drawings based on Civil3D modelling. However, based on AEM's drawing procedures, the CAD drawings to AEM should be in CAD format but not Civil3D format. To meet AEM's drawing procedures, we purposely exploded the Civil3D modelling in generating the CAD drawings submitted to AEM. As a result, all the Civil 3D features were gone after these modifications. Therefore, the CAD drawings that the Contractor received from AEM are not the right format for the Contractor to generate 3D drawings. We plan to send a complete set of dike drawings in Civil3D format to the Contractor so that they can have all 3D features including all crest lines and 3D surfaces. Before I send the drawings to you and the Contractor through our large file transfer system, could you please send me a distribution list of emails for the Civil3D drawing?
2) **Key Trench Excavation and Liner**: First of all, I do not fully understand what the Contractor is planning to do. Do they plan to over-excavate the key trench to a further 30 m wide beyond the design key trench? If this is the case. This is absolutely NO. I need to know exactly the Contractor is planning to do and need drawings or detail plans to show their proposed key trench excavation for my approval. Before the start of the key trench excavation with any changes proposed by the Contractor, I need to review their plan and make decision (approval or rejection) thereafter. I believe that the Contractor will have a better understanding on the design details of the key trench and liner installation after they receive and review our Civil3D drawings.

Regards

Gordon

Guangwen (Gordon) Zhang, Ph.D., P.Eng. | Principal Specialist, Arctic Region
Direct **+1 (780) 451-2130 x501** | Business **+1 (780) 451-2121** | Mobile **+1 (587) 985-2371** | GuangwenGordon.Zhang@tetratech.com

Tetra Tech EBA
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From: Duy Nguyen [mailto:duy.nguyen@agnicoeagle.com]
Sent: Sunday, October 16, 2016 7:08 PM
To: Zhang, Guangwen (Gordon) <GuangwenGordon.Zhang@tetratech.com>
Cc: Jack Dutil <jack.dutil@agnicoeagle.com>; Pyliuk, Jennifer <Jennifer.Pyliuk@tetratech.com>
Subject: FW: 6515-C-230-007-RFI-005_materiel

Hi Gord,

Could you provide these answer for MT KSL,

Thank you

Duy Nguyen

From: Yan Bergeron [mailto:Yanb@nunalogistics.com]
Sent: Friday, October 14, 2016 2:23 PM
To: Duy Nguyen
Subject: RE: 6515-C-230-007-RFI-005_materiel

For example
I need the crest of type h materiel because I don't know where it start it's between cross section 1+050 and 1+075. And I don't know where the direction change for the crest, we don't have the line for each materiel on the plan view, we just have the final slope of the dyke and the key trench.
It's the same for each materiel. For the type B I need to have crest point because I don<t have the information where to adjust, because I always start from the alignment.
I know that we are going to adjust the liner in the field to have the liner to be the most straight at possible, because we can't have it moving to mush to make the welding possible.
We plane to excavate may be 30 m further to correct the slope before install the liner.

You can call me at 3973 and we can discuss with the pdf.

Yan Bergeron
Project coordinator
Meliadine
Site 819-759-3555 ext 3973

Kivalliq Services Ltd.
19– 41 Street South, PO Box 809
NUNA LOGISTICS LIMITED
9839 – 31 Avenue, Edmonton, AB. T6N 1C5
MeliadineSurvey@nunalogistics.com
www.nunalogistics.com
www.Kivalliqservices.com

From: Duy Nguyen [mailto:duy.nguyen@agnicoeagle.com]
Sent: Friday, October 14, 2016 12:58 PM
To: Yan Bergeron <Yanb@nunalogistics.com>
Subject: RE: 6515-C-230-007-RFI-005_materiel

Could you send me a pdf what you want to build so I can help

Duy Nguyen, MPM, MBA, Eng.
Concrete, Civil and Structural Lead
C: 819 355 0425
T: 819.759.3555 Ext 8067
Agnico Eagle Mines Limited
1075, 3e Avenue Est

Val D'Or, Québec, Canada
J9P 0J7

AGNICO EAGLE

From: Yan Bergeron [mailto:Yanb@nunalogistics.com]
Sent: Friday, October 14, 2016 1:39 PM
To: Duy Nguyen
Cc: Mike Price; Boyd Barstad; Jack Dutil; Mark Long; Gramoz Rexhepi; Michael Love; Larry Chabot; Sylvain Chartier; Greg Smith; Daniel Seguin; Matt Gallant
Subject: RE: 6515-C-230-007-RFI-005_materiel

Hi Duy

I forgot to send you the explanation

I try to build 3d model with the cross section and I have not enough information on the plan to do it, and the cross section are at each 25 m, so I can just made straight line between each cross section

Yan Bergeron
Project coordinator
Meliadine
Site 819-759-3555 ext 3973

Kivalliq Services Ltd.
19– 41 Street South, PO Box 809
NUNA LOGISTICS LIMITED
9839 – 31 Avenue, Edmonton, AB. T6N 1C5
MeliadineSurvey@nunalogistics.com
www.nunalogistics.com
www.Kivalliqservices.com

From: Yan Bergeron
Sent: Friday, October 14, 2016 12:16 PM
To: 'Duy Nguyen' <duy.nguyen@agnicoeagle.com>
Cc: Mike Price <mikepr@nunalogistics.com>; Boyd Barstad <boydb@nunalogistics.com>; 'Jack Dutil' <jack.dutil@agnicoeagle.com>; 'Mark Long' <mark.long@agnicoeagle.com>; Gramoz Rexhepi <GramozR@nunalogistics.com>; Michael Love <MichaelLove@nunalogistics.com>; 'Larry Chabot' <larry.chabot@agnicoeagle.com>; 'Sylvain Chartier' <sylvain.chartier@agnicoeagle.com>; Greg Smith <GregS@nunalogistics.com>; 'Daniel Seguin' <daniel.seguin@agnicoeagle.com>; Matt Gallant <mattg@nunalogistics.com>
Subject: 6515-C-230-007-RFI-005_materiel

Hi Duy,
See attached RFI.

Yan Bergeron
Project coordinator
Meliadine
Site 819-759-3555 ext 3973

Kivalliq Services Ltd.
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NUNA LOGISTICS LIMITED
9839 – 31 Avenue, Edmonton, AB. T6N 1C5
MeliadineSurvey@nunalogistics.com
www.nunalogistics.com
www.Kivalliqservices.com

AGNICO EAGLE

Request For Information

Project No: 6515 Contract No: C-007 RFI No: 6515-C-230-007_006 Rev: 0
Meliadine Project

Site RFI Initiator: Mike Price Date: 2016-10-24

1. REFERENCE DOCUMENTS :

Title(s):	*Number:*	*Revision:*
Geotechnical Specifications for Construction of Dike D-CP1	6515-E-132-SPT-002	0

2. DESCRIPTION , JUSTIFICATION OF THE RFI AND CONTRACTOR'S PROPOSED SOLUTION :

The specifications for Nearly –Saturated Backfill (Type –C) call for 85% - 95% saturation after its placement and compaction. MTKSL has concern that the Type C material properties will not allow for the level of saturation specified to be achieved following placement and compaction.

Please confirm / advise;

- Has the mix design been validated to ensure that the saturation level of sandy material (0.20mm) can be maintained during placement and compaction as per multi-lift construction methods?
- Has testing been conducted on the Type C material to verify that this is achievable?
- If the properties of the Type C material do not allow for the level of saturation to be achieved is it foresee that blending of materials or an alternate material will be required?

Prepared by: Mike Price Signature: Mike Price Date: 2016-10-24

3. TECHNICAL RESPONSE FROM ENGINEERING AND/OR VALIDATION OF PROPOSED SOLUTION :

So far no confirmation or validation testing has been conducted on the Nearly-Saturated Backfill. This confirmation or validation testing is better to be conducted in the field conditions by the Contractor, before starting the backfilling operation using the Nearly-Saturated Backfill in the key trench. Nevertheless, 20 mm minus materials with similar specified gradation limits of Type C material had been successfully used in the past for construction of nearly-saturated cores of frozen core dikes/dams in the Arctic. Therefore, if Type C meets the specified gradation and placed in relatively thin, horizontal lifts over relatively level surfaces, the required saturation after compaction is likely achievable.

It is strongly recommended that trial mixing (Type C material and hot water), placing and compacting testing of the Nearly-Saturated Backfill be conducted in the field by the Contractor to confirm whether the required saturation can be maintained after its placement and compaction. This trial program should be done well ahead of the backfilling operation.

If the field trial testing indicates that the required saturation cannot be maintained after the placement and compaction of the Nearly-Saturated Backfill, one of the following alternative source materials can then be used to produce the Nearly-Saturated Backfill, instead of using the originally specified Type C material with 4% to 10% of a fines content:

1) Option 1: using rejected Type C (20 mm minus) that has a higher fines (<0.075 mm) content of 15% to 30%;
2) Option 2: using rejected natural esker sand and gravel with higher fines content (15% to 30%) as a source for crusher feed to produce the 20 mm minus material having a final fines content of 15% to 30%; or
3) Option3: using selected natural till material (with a fines content of 20% to 50%) as a source for crusher feed to produce the 20 mm minus till, and then blending it with the originally specified Type C to produce a targeted material having a final fines content of 15% to 30%.

We are updating the construction specifications for D-CP1 and D-CP5 to include additional sections for the Nearly-Saturated Backfill. The updated construction specifications will be available this week.

Engineering : Gordon Zhang Signature: _____ Date: November 7, 2016

4. IF NOT TECHNICAL RFI VALIDATION OF PROPOSED SOLUTION BY SITE SUPERVISION

Deviation Request: ☐ No ☐ Yes

	Name	Signature	Date
Superintendent:			
c.c. Contract Administrator:			

AGNICO EAGLE

Request For Information

Project No: 6515 Contract No: C-007 RFI No: 6515-C-230-007_007 Rev: 0
Meliadine Project

Site RFI Initiator: Gramoz Rexhepi Date: 2016-10-26

1. REFERENCE DOCUMENTS :

Title(s):	*Number:*	*Revision:*
D-CP5 Profiles	65-685-230-216	0
D-CP5 Thermal Cover Layout Plan and Profiles	65-685-230-217	0
Geotechnical Specifications for Construction of Dike D-CP5	6515-E-132-SPT-002	0

2. DESCRIPTION , JUSTIFICATION OF THE RFI AND CONTRACTOR'S PROPOSED SOLUTION :

Regarding initial rock placement into the footprint of DCP-5, the maximum fill thickness for Type A and Type A1 is 900mm. The current water elevation is 65.41masl which equates to approximately 900mm above current OG at the deepest points. This will prevent us from placing the first lift as per the designed fill thickness.

MTKSL proposes to exceed the maximum thickness in areas were 900mm cannot be maintained above current water elevation. In addition, clarity on how to compact the first lift once the material has been placed in the water is required.

Furthermore, we are looking for clarity on how to manage the water within the footprint of DCP5. MTKSL proposes the upstream and downstream platforms are placed and then water can be pumped upstream of the working platform to drain the key trench area between the two platforms.

Prepared by: Gramoz Rexhepi Signature: Gramoz Rexhepi Date: 2016-10-26

3. TECHNICAL RESPONSE FROM ENGINEERING AND/OR VALIDATION OF PROPOSED SOLUTION :

The D-CP5 design had based on the assumption of completely dewatering Lake A54 (South A54 only where D-CP5 will be constructed) before the dike construction. Therefore, underwater construction is not planned and not allowed, even for placing initial lift of Type A or Type A1 materials. Without completely dewatering A54, using the waste rock (Type A Material) to control water from flowing into the key trench is questionable and is expected to be not working. It is strongly recommended to completely dewatering A54 before the start of D-CP5 construction.

The water management during construction may include pumping the water in A54 to H17, as originally planned. However, any water management plan during construction should be approved by Agnico Eagle.

Alternatively the construction will need to be delayed until the water turning into ice and the contractor can excavate out the ice within the footprint of D-CP5, before placing any fills and key trench excavation. However, this will introduce more issues for dike construction, including drill/blast operation for key trench excavation (especially over dike abutment areas where the active layer will freeze back into frozen ground due to construction delay), more fills for backfilling key trench due to over-blasting, and additional foundation preparation due to uneven surfaces.

Engineering : Gordon Zhang Signature: Date: October 26, 2016

4. IF NOT TECHNICAL RFI VALIDATION OF PROPOSED SOLUTION BY SITE SUPERVISION

AGNICO EAGLE

Request For Information

		Deviation Request: ☐ No ☐ Yes	
	Name	Signature	Date
Superintendent:			
c.c. Contract Administrator:			

AGNICO EAGLE

Request For Information

Project No: 6515 Contract No: C-007 RFI No: 6515-C-230-007_009 Rev: 0
Meliadine Project

Site RFI Initiator: David Morley Date: 2016-11-01

1. REFERENCE DOCUMENTS :

Title(s):	*Number:*	*Revision:*
Geotechnical Specifications for Construction of Dike D-CP1, Meliadine Gold Project, NU, September 28,2016	AEM Document Number: 6515-E-132-SPT-002	0

2. DESCRIPTION , JUSTIFICATION OF THE RFI AND CONTRACTOR'S PROPOSED SOLUTION :

Section 1006: General Fill Placement
1.1.7 reads:

"All fills shall be placed and compacted in horizontal lifts from the bottom up over the slope."

The contractor proposes to modify this section to read as follows:
"All fills shall be placed and compacted in horizontal lifts from the bottom up over the slope, with the exception of the Type B and Type C material under the Geomembrane Liner, and the Type C material over the Geomembrane liner, which may be placed parallel to the Geomembrane Liner as shown in the attached sketches."

Please see attached sketches.

Prepared by: David Morley Signature: David Morley Date: 2016-11-01

3. TECHNICAL RESPONSE FROM ENGINEERING AND/OR VALIDATION OF PROPOSED SOLUTION :

If the Contractor can properly place the Type C and Type B materials under the geomembrane liner from bottom up over the 2.5:1 slope for each lift without material segregation, and compact each lift of the materials to meet the required density, it is OK to construct the Type C and Type B materials under the geomembrane liner in lifts that are parallel to the 2.5:1 slope, as proposed by the Contractor. However, for each lift, the Type C or Type B material should be placed from bottom up. The materials should not be dumped on the top and pushed down over the slope.

We do NOT agree with the construction method proposed by the Contractor for the Type C layer above the geomembrane liner (Dike Construction Part2 – Place Type C in parallel lifts to the Coletanche). To protect the geomembrane liner from damage during construction, no direct mechanical compaction of the Type C layer above the liner is required. The Type C should be placed from bottom up and in horizontal lifts slightly ahead of the placement of the upstream Type H and Type A lifts. The Type C material will be indirectly compacted when the nearby Type H lifts are compacted.

In summary, we agree ""All fills shall be placed and compacted in horizontal lifts from the bottom up over the slope, with the exception of the Type B and Type C material under the Geomembrane Liner, which may be placed from bottom up in each lift that can be parallel to the slope, as long as the materials meet the specifications after placement and compaction."

AGNICO EAGLE

Request For Information

Engineering : Gordon Zhang	Signature:	Date: November 2, 2016

4. IF NOT TECHNICAL RFI VALIDATION OF PROPOSED SOLUTION BY SITE SUPERVISION

	Deviation Request: ☐ No ☐ Yes

	Name	Signature	Date
Superintendent:			
c.c. Contract Administrator:			

AGNICO EAGLE

Request For Information

Project No: 6515 Contract No: C-007 RFI No: 6515-C-230-007_010 Rev: 0
Meliadine Project

Site RFI Initiator: David Morley Date: 2016-11-01

1. REFERENCE DOCUMENTS :

Title(s):	*Number:*	*Revision:*
Definitions for D-CP1 and D-CP5 Construction	"To AEM_Definitions and Key Trench Excavation Details for D-CP1 and D-CP5 Construction_Sep07_2016.pdf"	0

2. DESCRIPTION , JUSTIFICATION OF THE RFI AND CONTRACTOR'S PROPOSED SOLUTION :

MTKSL is requesting further clarification on Scenario 3B & 3C: Key Trench Excavation (2.8m, Ice Rich Soil)

Proposed Solution:

In areas where excavation depth greater than 1.8 m is required, MTKSL is proposing to sub-excavate to the required depth with vertical walls from the design 1.8m trench toes (see attached sketch).

Please confirm that this approach for sub-excavation is acceptable.

Prepared by: Matt Gallant Signature: Matt Gallant Date: 2016-11-04

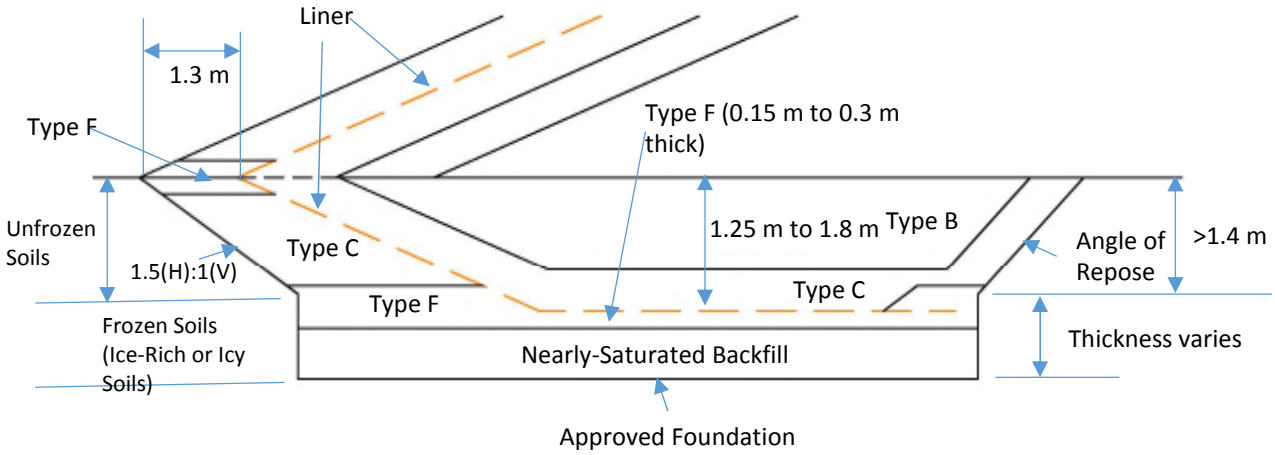
3. TECHNICAL RESPONSE FROM ENGINEERING AND/OR VALIDATION OF PROPOSED SOLUTION :

We do NOT agree with the upstream side slope of 2.5(H):1(V) for the key trench that was proposed by the Contractor. This slope is too flat and is not consistent with the design intent.

The designed key trench side slopes (both upstream and downstream) were "angle of repose". In the construction drawings, the key trench side slopes with "angle of repose" were assumed to be 1.5(H):1(V). Based on the current field conditions, the actual "angle of repose" is steeper than 1.5(H):1(V). To reduce overall key trench excavation and backfill, we propose the following:

1) 1.5(H):1(V) for upstream key trench side slope, which is the same as shown in the construction drawings; it is also acceptable if the upstream key trench side slope is slightly steeper than 1.5(H):1(V).
2) The actual "angle of repose" for the downstream key trench side slope, which is steeper than 1.5(H):1(V), as proposed by the Contractor.
3) Nearly vertical wall excavation below the toes of the upstream and downstream key trench slopes within the unfrozen active layer zone (1.4 to 1.8 m). This is generally consistent with the plan proposed by the Contractor.

The sketch below presents the general key trench excavation and backfill concept for D-CP1 and D-CP5:



Please see other details (liner, liner bedding, Type F, etc.) in the construction drawings and specifications.

Engineering : Gordon Zhang Signature: Date: November 8, 2016

4. IF NOT TECHNICAL RFI VALIDATION OF PROPOSED SOLUTION BY SITE SUPERVISION

Deviation Request: ☐ No ☐ Yes

	Name	Signature	Date
Superintendent:			
c.c. Contract Administrator:			

AGNICO EAGLE

Request For Information

Project No: 6515 Contract No: C-007 RFI No: 6515-C-230-007_011 Rev: 0
Meliadine Project

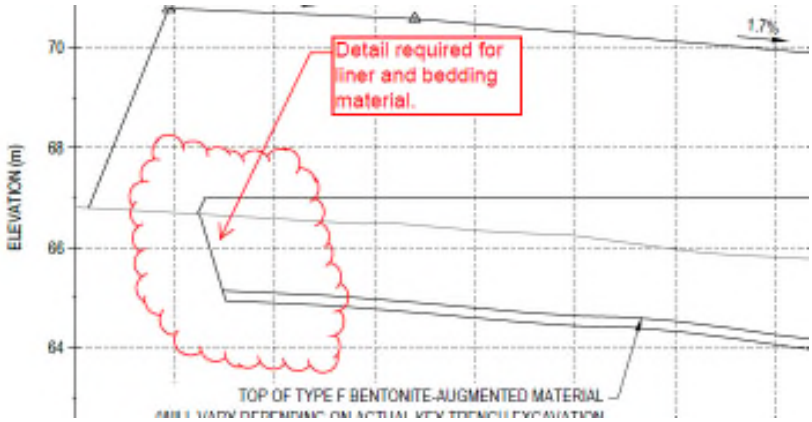
Site RFI Initiator: Mike Price Date: 2016-11-16

1. Reference Documents :

Title(s):	*Number:*	*Revision:*
D-CP1 and D-CP5 IFC Drawings Package		

2. Description , Justification of the RFI and Contractor's Proposed Solution :

MTKSL is requesting tie in details for the termination points at either end of the key trench for DCP 1 and 5, more specifically related to requirements for the liner and bedding material in the area.



Prepared by: Mike Price Signature: Mike Price Date: 2016-11-016

3. Technical Response from Engineering and/or Validation of Proposed Solution :

For either end of the key trench for D-CP1 and D-CP5, the following construction details should be followed:

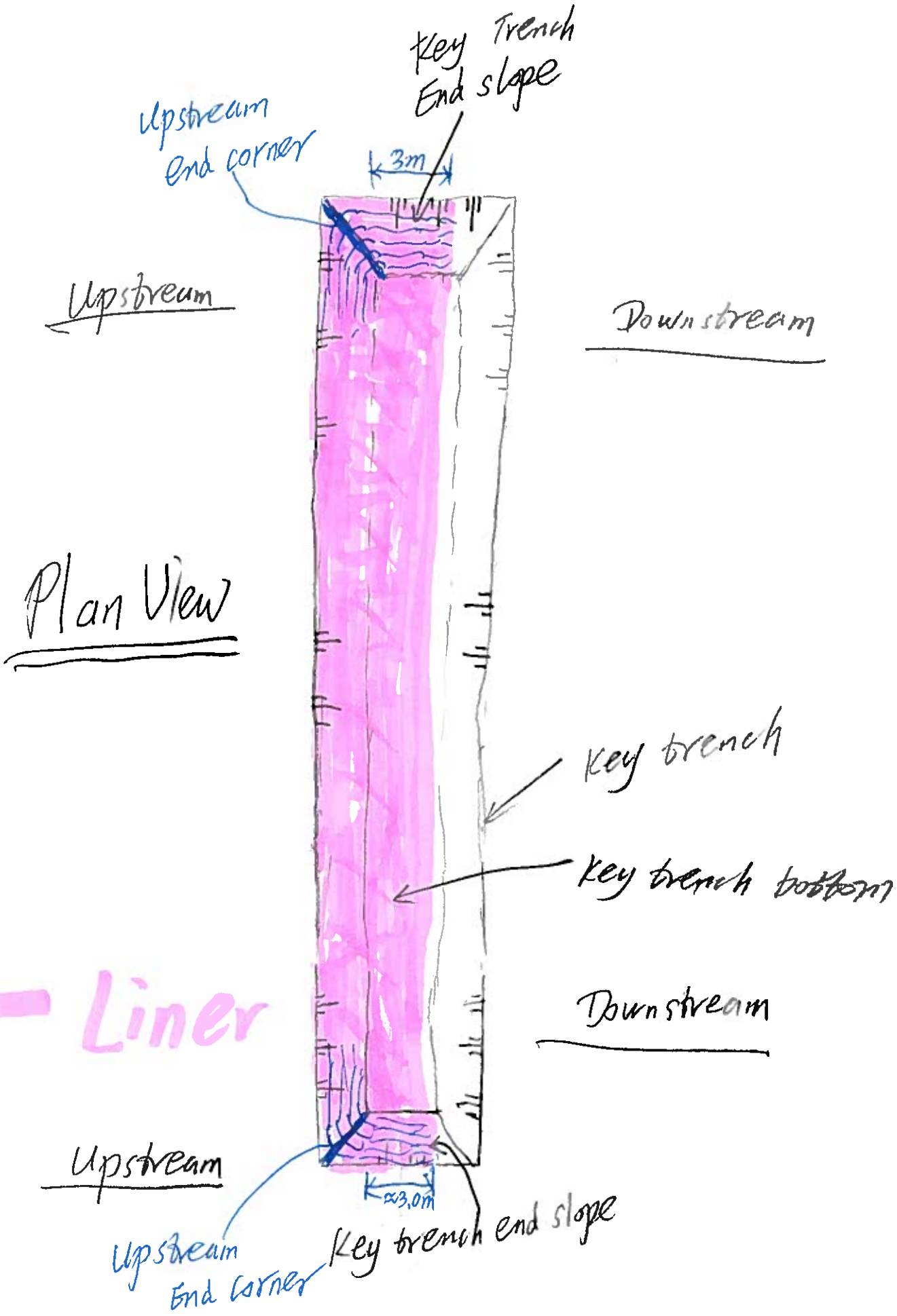
1) Place a liner bedding layer of Type F (mixture of Type C and bentonite) over the entire excavated slope at the end of the key trench and compact the Type F layer to form a smooth surface for liner installation over the end slope. The minimum thickness of the compacted Type F over the key trench end slope would be 0.2 m;
2) Place and compact extra Type F over the key trench (upstream side) end corner to form a rounded corner for liner installation;
3) Extend the typical liner in the key trench towards the key trench (upstream side) end corner, curve (wrap) over the key trench (upstream side) end corner, and then further extend a minimum of 3 m downstream over the compacted Type F layer on the end slope of the key trench. The liner over the key trench end slope should be welded together with the liner at the key trench bottom;
4) Place a layer of Type C as an upper bedding over the completed liner area at the end of the key trench. The thickness (perpendicular to the slope) of Type C should be about 0.5 m. No mechanical compaction is required for the Type C layer immediately over the liner; and
5) Backfill the remaining key trench end area with Type B, similar to the typical section.

A hand sketch is attached for information.

Engineering : Gordon Zhang Signature: Date: November 17, 2016

4. IF NOT TECHNICAL RFI VALIDATION OF PROPOSED SOLUTION BY SITE SUPERVISION

		Deviation Request: ☐ No ☐ Yes	
	Name	Signature	Date
Superintendent:			
c.c. Contract Administrator:			


Key Trench End slope
Upstream End corner
3m
Upstream
Downstream
Plan View
Key trench
Key trench bottom
Liner
Downstream
Upstream
≈3,0m
Upstream End corner
Key trench end slope

AGNICO EAGLE

Request For Information

Project No: 6515 Contract No: C-007 RFI No: 6515-C-230-007_012 Rev: 0
Meliadine Project

Site RFI Initiator: Matt Gallant Date: 2016-11-29

1. REFERENCE DOCUMENTS :

Title(s):	*Number:*	*Revision:*
D-CP1 and D-CP5 Material Specifications		

2. DESCRIPTION , JUSTIFICATION OF THE RFI AND CONTRACTOR'S PROPOSED SOLUTION :

MTKSL is requesting Confirmation of Material Acceptance for all the materials produced to date from contract 6515-C-235-003 for the Water Management Dikes will be suitable for construction of the D-CP1 and D-CP5.

Specifically:

- Type B1: Transition Rockfill (150mm Minus) produced by processing material obtained from the saline pond excavation.
- Type C: Granular Fill or Esker Sand (20mm Minus) produced by processing material obtained from the esker borrow sources
- Type H: Esker Sand and Gravel (75mm Minus) produced by processing material obtained from the esker borrow sources.

Prepared by: Matt Gallant Signature: Matt Gallant Date: 2016-11-29

3. TECHNICAL RESPONSE FROM ENGINEERING AND/OR VALIDATION OF PROPOSED SOLUTION :

Type B1: a total of 4 sieve tests were conducted by the dike earthwork QC team during the period of November 9 to 13, 2016. The results (a summary table and a chart) are attached with this file. The average gradation of Type B1 produced so far generally meets the requirements. The percentages passing a sieve size of 5 mm for the last three tests slightly exceed the specifications but is tolerable.

Type C: a total of 40 sieve tests were conducted by the dike earthwork QC team during the period of October 22 to December 5, 2016. The results (a summary table and a chart) are attached with this file. The average gradation of Type C produced so far generally meets the requirements, except for 6 samples that were significantly outside of the specifications. The 6 out-of-spec samples included three samples with higher fines content (<0.08 mm) of 18% to 23% and three samples with higher percentage passing 0.63 mm sieve (48% to 77%). After the tests, the dike QA/QC team had instructed the Contractor to stockpile the rejected Type C in a separate area for other site uses. It is also noted that the recently produced Type C had high natural moisture content of up to 14.4% because the esker source reached the permafrost table. This is not acceptable. The source esker should be excavated well above the permafrost table to have a relatively low natural moisture content. It is understand that more Type C will be produced for the dike construction. It is strongly recommended that the esker source for Type C should be excavated in shallow depths well above the permafrost table to have a relatively low natural moisture content.

Type H: a total of 5 sieve tests were conducted by the dike earthwork QC team during the period of October 22 to December 1, 2016. The results (a summary table and a chart) are attached with this file. The average gradation of Type H produced so far generally meets the requirements. . It is understand that very limited quantity of Type H has been produced so far and a significant volume of Type H is to be produced for the dike construction. It is strongly recommended that the esker source for Type H should be excavated in shallow depths well above the permafrost table to have a relatively low natural moisture content.

Engineering : Gordon Zhang Signature: Date: December 9, 2016

4. IF NOT TECHNICAL RFI VALIDATION OF PROPOSED SOLUTION BY SITE SUPERVISION

Deviation Request: ☐ No ☐ Yes

	Name	Signature	Date
Superintendent:			
c.c. Contract Administrator:			

AGNICO EAGLE

Request For Information

Project No: 6515 Contract No: C-007 RFI No: 6515-C-230-007_014 Rev: 0
Meliadine Project

Site RFI Initiator: Jennifer Pyliuk Date: 2016-12-09

1. REFERENCE DOCUMENTS :

Title(s):	*Number:*	*Revision:*
D-CP1 Typical Section and Quantities	65-685-230-208	1
D-CP5 Typical Section and Quantities	65-685-230-218	1
Geotechnical Specifications for Construction of DCP-1 (Tetra Tech EBA, Issued for Use November 9, 2016)	6515-E-132-007-132-SPT-002	1
Geotechnical Specifications for Construction of DCP-5 (Tetra Tech EBA, Issued for Use November 9, 2016)	6515-E-132-007-SPT-003	1

2. DESCRIPTION , JUSTIFICATION OF THE RFI AND PROPOSED SOLUTION :

The estimated material quantities of Type A1 (sourced from Saline Water Pond) required to complete construction of both dikes (in place plus the recommended 25% to account for material wasting, overbuild, bulking factor and potential foundation settlement) are 27,044 m3 (D-CP1) and 3,850 m3 (D-CP5), for a total of 30,894 m3.

Current placed quantities of Type A1 material are 4,985 m3 (D-CP1) and 1,071 m3 (D-CP5), for a total of 6,056 m3. When the placed quantities are subtracted from the estimated required amounts, the remaining quantities are 22,059 m3 (D-CP1) and 2,779 m3 (D-CP5), for a total of 24,838 m3.

The latest stockpile survey of Type A1 material (conducted November 13) by Hamel Arpentage calculated volume of 28,550 m3. However, this volume does not account for the presence of oversize material within the stockpile, believed to be in the range of 15% to 40%. The total remaining volume of Type A1 material is expected to be in the range of 24,268 m3 (15% oversize in pile) to 17,130 m3 (40% oversize). It is therefore highly probable that there will not be sufficient quantities of Type A1 material to complete the construction of both dikes to design.

Possible design solutions to optimize the remaining quantities of Type A1 material are proposed to include elimination of further Type A1 material at D-CP5; placement of only two lifts (1.8 m) of Type A1 at D-CP1 and strategic placement of remaining Type A1 around most critical key trench locations of D-CP-1 based on encountered ground conditions within the key trench (ie. where no bedrock encountered). An examination of the design placement of the Type A1 material is requested in order to appropriately use the expected remaining quantities.

Prepared by: Jennifer Pyliuk Signature: _____ Date: 2016-12-09

3. TECHNICAL RESPONSE FROM ENGINEERING AND/OR VALIDATION OF PROPOSED SOLUTION :

Instead of using Type A rockfill (waste rock from underground operation), Type A1 rockfill (clean rockfill from saline pond excavation) was designed to be used in the dike downstream zone over the key trench area for each of D-CP1 and D-CP5. The design intent was to reduce the risk of potential salts from the Type A rockfill to get into the key trench and increase the pore water salinity of the soils in the key trench and underneath foundations.

If all of the rock (without oversize issue) from the saline pond excavation could be used for the dike construction, the rock quantity would be adequate for the Type A1 rockfill to be used for both D-CP1 and D-CP5 construction. Unfortunately, poor blasting operation during the saline pond excavation generated 15% to 40% of oversized boulders that cannot be used as Type A1 rockfill.

At this stage of dike construction, opening a new quarry to obtain additional clean rockfill is not feasible, which leaves one practical option – using the Type A rockfill to balance the material quantity for the dike construction. Of course, this will increase the risk of the potential salts from the Type A rockfill to get into the key trench and underneath foundations. The potential consequence would be that the risk of the seepage through the dike foundation soils could be increased.

To minimize the risk, the Type A rockfill can be used in the less critical dike (D-CP5) and less sensitive zone (higher elevation away from the key trench) in the dikes. Table below presents the overall plan, depending on the percentage of the oversize boulders in the Type A1 stockpile:

Type A1 Stockpile Volume (m3)	Percentage of Oversize Boulders (%)	Useable Type A1 for Dike Construction (m3)	Balance of Type A1 to be Used for D-CP1 (m3)	Balance of Type A1 to be Used for D-CP5 (m3)	Additional Type A to be Used for D-CP1 (m3)	Additional Type A to be Used for D-CP5 (m3)
28,550	15%	24,268	22,059	2,209	0	571
28,550	20%	22,840	22,059	781	0	1,998
28,550	25%	21,413	21,413	0	647	2,779
28,550	30%	19,985	19,985	0	2,074	2,779
28,550	35%	18,558	18,558	0	3,502	2,779
28,550	40%	17,130	17,130	0	4,929	2,779

The overall plan is to place as much as possible of Type A1 in the bottom zone of D-CP1 (high priority) or D-CP5 until no more useable Type A1 is available; and then place the balance of the required Type A in the upper zone over the placed Type A1, if applicable. This plan is easy for construction.

For example, for the 30% oversize case, the Type A1 rockfiil can be placed to an estimated top elevation of 66.2 m for the entire dike length in the design Type A1 zone of D-CP1. After that only a final lift of Type A material can be placed in the upper zone from 66.2 m to 67.0 elevations over the placed Type A1 zone. Similarly, for the extreme 40% oversize case, the Type A1 rockfill can be placed to an estimated elevation of 65.5 m for the entire dike length in the design Type A1 zone of D-CP1. The remaining upper zone from 65.5 m to 67.0 m can be placed using Type A material.

Engineering : Gordon Zhang Signature: Date: December 22, 2016

4. IF NOT TECHNICAL RFI VALIDATION OF PROPOSED SOLUTION BY SITE SUPERVISION

Deviation Request: ☐ No ☐ Yes

Name | Signature | Date

Superintendent:			
c.c. Contract Administrator:			

AGNICO EAGLE

Request For Information

Project No: 6515 Meliadine Project	Contract No: C-007	RFI No: 6515-C-230-007_016	Rev: 0
Site RFI Initiator: Michael Love		Date: Jan 5, 2017	

1. REFERENCE DOCUMENTS :

Title(s):	*Number:*	*Revision:*
Geotechnical Specifications for Construction of DCP-1 (Tetra Tech EBA, Issued for Use November 9, 2016)	6515-E-132-007-132-SPT-002	R1

2. DESCRIPTION , JUSTIFICATION OF THE RFI AND PROPOSED SOLUTION :

On Dec 20, 2016 Type C was mixed with heated water from Orbit's water heating system in a mixing pit at the south end of DCP-1 to produce Type K. Due to the winter conditions the material was frozen before it reached the key trench excavation of DCP-1 (3 loads of Type K mixed using this method were placed at DCP-1 and had to be removed).

This demonstrates our current methodology for producing Type K is insufficient in temperatures at -36C and below. Type K was previously manufactured using this methodology successfully in temperatures ranging from -2C to -15C from Nov 26, 2016 to Dec 5, 2016 (with an average temperature of -6C). Forecasted temperatures are approximately -30C over the next 14 days and MTKSL do not believe our current methodology will achieve acceptable results in those temperatures.

During preliminary discussions on site with AEM and Tetra Tech between Dec 20 and 23 mention was made of heating the aggregate. MTKSL do not believe the infrastructure is available to support this method of producing Type K in a manner which supports productive placement.

We suggest placing the Type C in specified lift thicknesses, adding the required amount of heated water to achieve "Nearly Saturated Backfill" and compacting the "Nearly Saturated Backfill" immediately after the heated water is applied. Similar material was placed successfully using this method in similar temperatures last March - during construction of the P1 Dikes at Meliadine. This would require a variance to the specification as Section 1005 1.4.7.b states:

"The Type K material shall be pre-mixed with water and Type C material or other approved material (20 mm minus) before being placed and compacted. It is preferred that pre-mixing be done in a pug mill. If not available, pre-mixing in a dedicated pit or container close to the construction site can be done after approval from the Engineer. It is not allowed that in situ mixing of the Type K material is done in the area where the material is to be placed."

Be advised Type K placement is presently our only available work front and until a plan is in place – or other work fronts become available – we will not be remobilizing our dike construction crews to site.

Prepared by: Michael Love Signature: Michael Love Date: Jan 5, 2017

3. TECHNICAL RESPONSE FROM ENGINEERING AND/OR VALIDATION OF PROPOSED SOLUTION :

Unsuccessful Past Experience for In-situ Mixing to Produce Nearly-saturated Backfill

As I know, our Edmonton Arctic Group has involved in the design and construction QA/QC for the majority (if not all) of the frozen core dikes/dams that have been constructed in Northern Canada. Similar to the Type K material (nearly-saturated backfill) for the dike (D-CP1) construction at the Meliadine site, unfrozen nearly-saturated backfill was used to construct the frozen cores of these dikes/dams in cold winter conditions. During the early stage of construction for some of the frozen cores, trials with in-situ mixing to produce nearly-saturated backfill proved to be unsuccessful. As a result, the in-situ mixing method was not adopted in construction of these frozen cores. The major issues with the in-situ mixing include the following:

- Water ponding on the lift surface and not being able to penetrate down to the bottom of the lift before the water froze; as a result, ice layers formed on the surface and the under-saturated bottom lift had low ice/water saturation;
- Difficulty in controlling final water content of the material; tending to generate either ice-rich or under-saturated material with various saturation conditions, which does not meet the design intent and requirements;
- Under cold air temperatures, sprayed water tended to freeze quickly before mixing and compaction.

Based on this past experience, we specified in the D-CP1 Construction Specifications that in-situ mixing method should be avoided for mixing the Type K Material.

Regarding the "frozen core" construction of the P1 Area temporary dikes (DP1-A, DP1-B, DP2-A and DP3-A) at the Meliadine site, the "frozen core" construction of the P1 Area temporary dikes cannot be referred to justify using the in-situ mixing method for the D-CP1 dike Type K material for the following reasons:

- The P1 Area dikes were constructed to temporarily control the water in the P1 area during the 2016 spring freshet and had much less stringent engineering requirements than those for the permanent dikes (D-CP1 and D-CP5);
- Many unsuccessful trials using the in-situ mixing method were made during the early stage of the "frozen core" construction, which resulted in loss of some valuable construction time and partially led to final cancellation of using nearly-saturated fill as construction material for the dike cores. In the end, only several lifts of the bottom cores in DP1-A and DP3-A were constructed using the nearly-saturated backfill. The remaining majority of the cores in DP1-A and DP3-A were constructed using the 0 – 30 mm material only – no mixing with water. The entire cores for DP1-B and DP2-A were constructed using the 0 – 30 mm material only – no mixing with water. Therefore, the P1 Area temporary dikes are not "frozen core" dikes.
- The core construction for the P1 Area dikes started on March 26, 2016 when the air temperatures ranged from -10°C to -25°C. Under these relatively mild temperatures, I would say that pre-mixing in a pit may achieve a better result.
- The core material for the P1 Area dikes was the crushed 0-30 mm rockfill, which had low natural ice/water content (about 3%), which is different from the Type C (0-20mm) used for the D-CP1 construction. The latter (Type C) has a high natural moisture content of 7% to 14%, which would need more heat to thaw the existing ice during mixing.

Construction Schedule and Plan

As noted in Construction Drawing 65-685-230-208 for Dike D-CP1, it was assumed during the design that the key trench excavation and backfill would be conducted from late September to November 2016 for D-CP1 to avoid the extreme cold temperatures in December to February. Unfortunately, this was not achieved due to the late start of the D-CP1 construction and slow progress in construction.

It is understood that the Contractor together with AEM is responsible for developing proper construction schedules/plans and adopting relevant construction techniques and methodology to meet the design intent and final completion schedule of D-CP1 and D-CP5.

The following preliminary construction plan is provided for further consideration and discussion:

- Focus on excavation of the key trenches for D-CP1 and D-CP5 during the extreme cold weather period;
- Temporarily suspend the Type K material placement during the extreme cold weather period;
- Further re-adjust the current in-pit mixing method to produce unfrozen Type K material under cold weather conditions; consideration can be given to increasing the water temperature for mixing, selecting the Type C material with less natural moisture content as the source for mixing, pre-heating the Type C material before mixing, stockpiling the selected Type C in a warming tent, pre-heating the mixing pit, or covering the mixing pit with a heated tent, etc.

Based on the discussions mentioned earlier, it is not recommended to adopt the in-situ mixing method that was proposed by the Contractor. Nevertheless, if the Contractor together with AEM would like to take time and effort to investigate the in-situ mixing method, they can first conduct a trial mixing/placement in a test strip at a selected site away from the dike key trench:

- Remove snow/ice and other non-suitable surface material to form a relatively level base for the trial mixing;
- Place the Type C in a loose lift (no compaction) with a maximum lift thickness of 75 mm or 100 mm;
- Spray hot water uniformly over the lift surface to target the desired water saturation after compaction;
- Compact the Type C before the water freezing;
- Take several core samples from the test strip to determine the water saturation and its variation over depth.

If the trail mixing and test results suggest that the in-situ mixing is working, the Contractor may conduct more trials to develop final procedures to be used for mixing and placing the Type K material for the dike construction:

- Follow the procedures developed during the trial mixing;
- Take core samples after compaction to verify the water saturation and its variation over depth for each lift;
- If the placed Type K does not meet the design requirements, the lift should be removed.

Engineering : Gordon Zhang Signature: Date: January 9, 2017

4. IF NOT TECHNICAL RFI VALIDATION OF PROPOSED SOLUTION BY SITE SUPERVISION

Deviation Request: ☐ No ☐ Yes

	Name	Signature	Date
Superintendent:			
c.c. Contract Administrator:			

AGNICO EAGLE

Request For Information

Project No: 6515 Contract No: C-007 RFI No: 6515-C-230-007_018 Rev: 0
Meliadine Project

Site RFI Initiator: Fai Ndofor Date: 2017-01-19

1. REFERENCE DOCUMENTS :

Title(s):	*Number:*	*Revision:*
D-CP1 Typical Section and Quantities	65-685-230-208	1
Geotechnical Specifications for Construction of DCP-1 (Tetra Tech EBA, Issued for Use November 9, 2016)	6515-E-132-007-132-SPT-002	1

2. DESCRIPTION , JUSTIFICATION OF THE RFI AND PROPOSED SOLUTION :

Since the unsuccessful attempt at mixing/placing Type K material occurred on December 20, 2016, two further attempts to mix/place Type K within the key trench at D-CP1 have been made. A summary of the QA/QC observations from these attempts is as follows:

1. January 17: Ambient temperature = -12°C; Mix water temperature = ~40°C; Aggregate temperature = -35°C; Temperature of Type K after mixing = -6°C to -8°C; Amount of aggregate = 6 level 345 buckets; Amount of added water = 13 minutes (approximately 2,200 L); Mix time = 5 minutes. The mix moisture content was 14.2%, it was observed as dry and frozen and was not placed within the key trench.
2. January 18:

- Mix water temperatures = ~63°C; Aggregate temperature = -24°C; Temperature of Type K after mixing = -7°C to -8°C; Amount of aggregate = 6 level 345 buckets; Amount of added water = 19 minutes (approximately 3,150 L); Mix time = 5 minutes. The mix moisture content was 17.5%, it was observed as damp, frozen and was not placed within the key trench. The mix was spread in a 200 mm thick lift close to the mix station and compacted (2 static and 5 vibrating passes) with the 10 ton compactor. Cracks and loose material were observed on most of the compacted surface indicating non-saturated and frozen material.
- Heating aggregate will not be possible until mid-February at the earliest using the on-site batch plant facilities.
- Recommend placing 0.15 to 0.30 m thick Type F directly on base of key trench at the approved depths (approximately 2.8 m) and lowering the liner for remainder of D-CP1 from Stations 0+310 to 0+580 – all other overliner design elements will remain.
- This will increase liner, Type B, Type F (bentonite mix) and Type C materials quantities. The changes in materials quantities have not been quantified to date.

Prepared by: Fai Ndofor Signature: Fai Ndofor Date: 2017-01-19

3. TECHNICAL RESPONSE FROM ENGINEERING AND/OR VALIDATION OF PROPOSED SOLUTION :

It is understood that the Contractor could not produce the Type K material (nearly-saturated backfill by mixing the Type C with hot water) that meets the required specifications under the current climate conditions and available facilities at the site:

1) The maximum water temperature for mixing is limited to about 60 C and could not be higher due to limitation of the available water heating facility;
2) Cold temperature (as cold as -35 C) of the Type C material for mixing;
3) Relatively high natural ice content in the Type C material for mixing;
4) No facility or equipment is available to pre-heat the Type C for mixing;
5) Cold air temperatures in January; and
6) Mixing in a cold pit in the natural ground that is open to cold ambient air temperatures.

The option to lower the liner bottom elevation in the key trench is a technically feasible solution to eliminate the use of the Type K material in the remaining portion of the D-CP1 key trench. This option will result in the following changes and associated construction cost increases:

a) Additional liner is required and may need to be shipped in by air;
b) Additional excavation in the key trench downstream side is required to meet the design liner bottom length in the key trench; and
c) More backfill materials (Type B, Type F (including bentonite), and Type C) are required.

Sketches to compare the original design and the option are attached with this file.

Based on the sketches (typical sections with 2.8 m key trench depth), the material quantity changes are roughly estimated for planning, assuming the changes for the option will be applied to Stations 0+310 to 0+580 (about 270 m):

Estimated in-place quantity changes:

Type B: 2,940 m3 (increase);
Type C: 1,690 m3 (increase);
Type F: 210 m3 (increase); therefore, bentonite increase: approximately 42 tonnes
Type K: -2,170 m3 (decrease); therefore, the total Type C will slightly decrease (1690+210-2170 = -270 m3);
Liner (ES3): 909 m2 (increase), including overlapping; and
Key trench excavation: 2,670 m3 (increase).

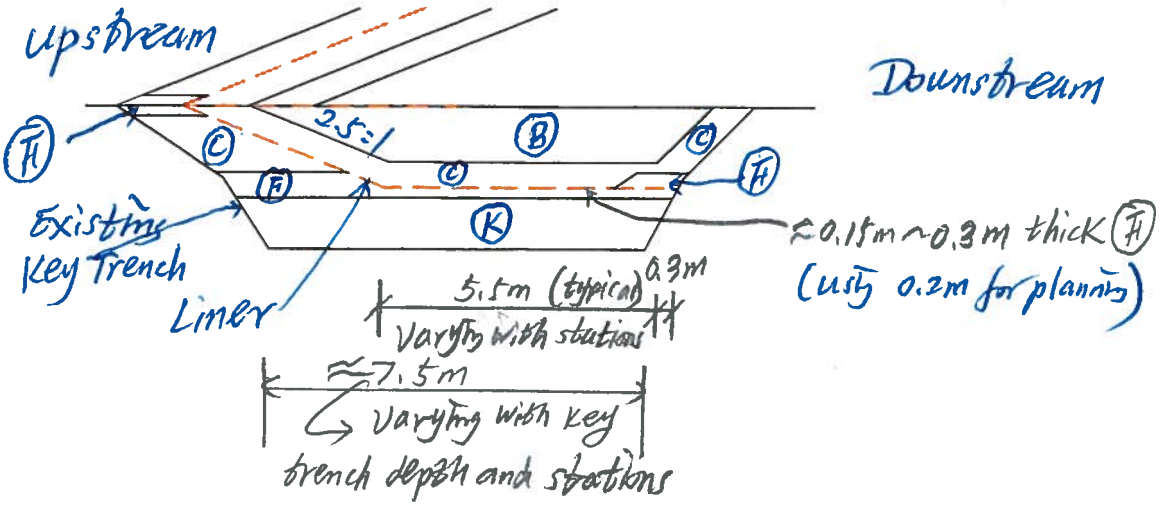
The estimated quantity changes are provided for AEM's planning and decision making. The actual quantities will depend on the actual construction details and could be different.

Prepared by:	Gordon Zhang	Signature:		Date:	January 20, 2017

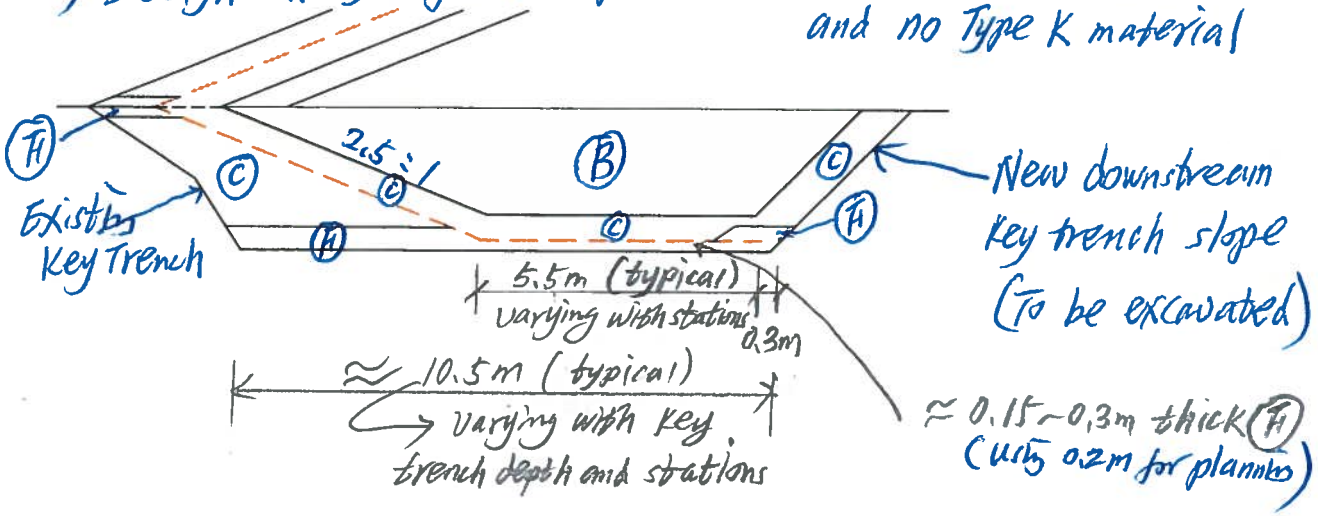
4. IF NOT TECHNICAL RFI VALIDATION OF PROPOSED SOLUTION BY SITE SUPERVISION

		Deviation Request: ☐ No ☐ Yes	
	Name	Signature	Date
Superintendent:			
c.c. Contract Administrator:			

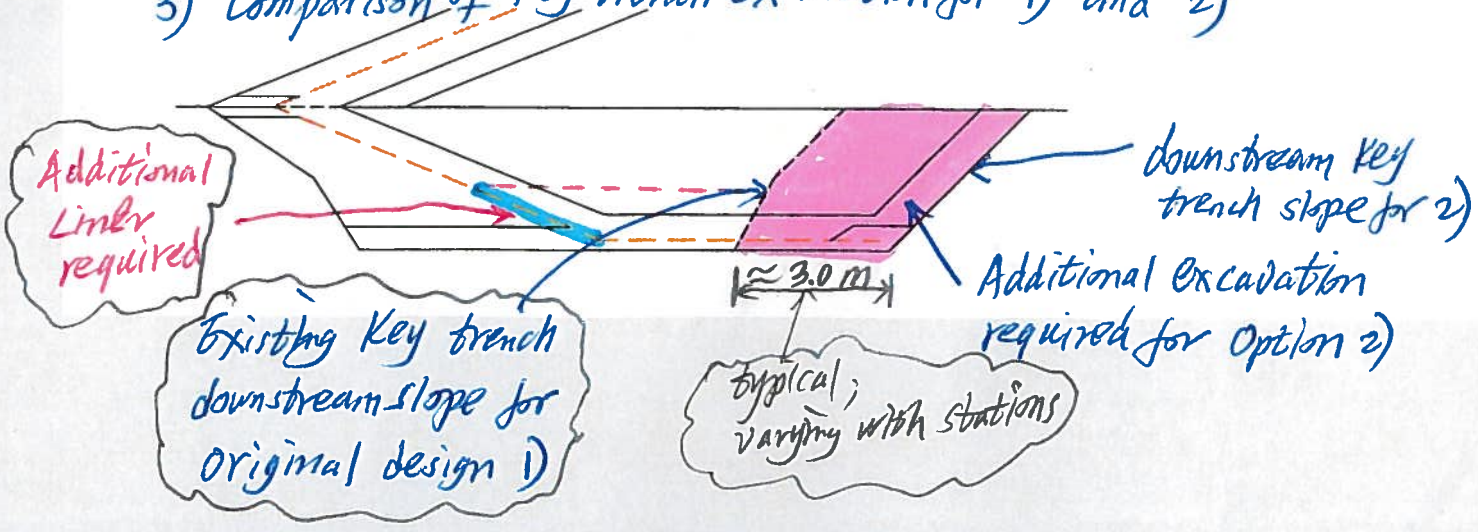
1) Original Design in Dike Key Trench for D-CP1



2) Design Changes for the option with lower Liner bottom elevation and no Type K material



3) Comparison of Key trench excavation for 1) and 2)



AGNICO EAGLE

Request For Information

Project No: 6515 Contract No: C-007 RFI No: 6515-C-230-007_019 Rev: 0
Meliadine Project
Site RFI Initiator: Michael Price Date: Jan 22, 2017

1. REFERENCE DOCUMENTS :

Title(s):	*Number:*	*Revision:*
RFI No: 6515-C-230-007_018		

2. DESCRIPTION , JUSTIFICATION OF THE RFI AND PROPOSED SOLUTION :

The original volume MTKSL calculated and provided for the additional excavation required to incorporate lowering the liner at DCP01 was based on the assumption that the vertical box cut would be held from -2.8 to -1.8m and the 1:1 slope would begin from that point. Upon review of RFI 018 response the details appear to have a 1:1 slope projected back from the new toe location. The attached detail outlines the additional volumes associated with the different slope options, proceeding with the 1:1 slope from the new toe location would result in an increase of approximately 550m^3 and 4 days of duration to the excavation activity.

Please confirm the required slope for the DS face of the additional excavation.

- Option 1 = 1:1 slope down to -1.8m transition to box cut down to final toe.
- Option 2 = 1:1 Slope beginning at the new toe location.

Prepared by: Michael Price Signature: Mike Price Date: Jan 22, 2017

3. TECHNICAL RESPONSE FROM ENGINEERING AND/OR VALIDATION OF PROPOSED SOLUTION :

The Option 2 (downstream slope beginning at the new toe location) was shown in the sketch in the responses to the RFI 018 to illustrate the general concept of lowering the liner in the key trench of D-CP1. This is just a preferred option that has a uniform downstream slope. Nevertheless, other excavation options, such as Option 1 proposed by MTKSL, can be considered.

Instead of a uniform sloping wall, Option 1 adopts a vertical downstream side wall in the lower portion (from -1.8 m to the final bottom) of the downstream key trench, which would result in less key trench excavation/backfill. Since Option 1 would result in lower dike construction cost and still meet the overall dike design intent, this option is acceptable.

Engineering : Gordon Zhang Signature: Date: January 22, 2017

4. IF NOT TECHNICAL RFI VALIDATION OF PROPOSED SOLUTION BY SITE SUPERVISION

Deviation Request: ☐ No ☐ Yes

	Name	Signature	Date
Superintendent:			
c.c. Contract Administrator:			

AGNICO EAGLE

Request For Information

Project No: 6515 Contract No: C-007 RFI No: 6515-C-230-007_020 Rev: 0
Meliadine Project
Site RFI Initiator: Michael Love Date: Jan 23, 2017

1. REFERENCE DOCUMENTS :

Title(s):	*Number:*	*Revision:*
RFI No: 6515-C-230-007_018 RFI No: 6515-C-230-007_019		

2. DESCRIPTION , JUSTIFICATION OF THE RFI AND PROPOSED SOLUTION :

Does RFI 18 and the pending response to RFI 19 apply to DCP-5 also?

Prepared by: Michael Love Signature: Michael Love Date: Jan 23, 2017

3. TECHNICAL RESPONSE FROM ENGINEERING AND/OR VALIDATION OF PROPOSED SOLUTION :

Engineering : _____ Signature: _____ Date: _____

4. IF NOT TECHNICAL RFI VALIDATION OF PROPOSED SOLUTION BY SITE SUPERVISION

Deviation Request: ☐ No ☐ Yes

	Name	Signature	Date
Superintendent:			
c.c. Contract Administrator:			

AGNICO EAGLE

Request For Information

Project No: 6515 Contract No: C-007 RFI No: 6515-C-230-007_022 Rev: 0
Meliadine Project

Site RFI Initiator: Michael Price Date: Jan 27, 2017

1. REFERENCE DOCUMENTS :

Title(s):	*Number:*	*Revision:*

2. DESCRIPTION , JUSTIFICATION OF THE RFI AND PROPOSED SOLUTION :

For areas of D-CP05 where the excavation is required to extend down to -2.8m, please confirm that the upstream slope will continue at the slope of 1.5:1.

As an alternate option to reduce the excavation and Type F quantity MTKSL is proposing to use the existing minimum cover and slope parameters from the IFC design to create a step in the slope at the 1.8m elevation where the design key trench floor was planned to be encountered. (per attached detail) potential saving = 1.1m3/Ln.m of excavation and 0.5 m3/Ln.m Type F.

Please confirm approved up stream slope detail for D-CP05.

Prepared by: Michael Price Signature: Mike Price Date: Jan 26, 2017

3. TECHNICAL RESPONSE FROM ENGINEERING AND/OR VALIDATION OF PROPOSED SOLUTION :

First of all, none of the final key trench depths for the stations excavated so far at D-CP5 has reached 2.8 m from the original ground surface. Actually, almost all of the final key trench depths that have been approved by the QA/QC team are around 1.8 m or less:

Stations 0+000 to 0+020: final depth around 1.8 m (see daily report on January 24);

Stations 0+140 to 0+200: bedrock encountered at 1.3 m to 1.8m (see daily report on January 24);

Stations 0+070 to 0+080: positive results from jar test results at 1.8 m; may be approved after the QA inspection today.

Based on the two boreholes drilled in the 2016 geotechnical site investigation, shallow bedrock (about 1.5 m from ground surface) was encountered in areas around Station 0+170 and Station 0+220. Note that the D-CP5 is shorter and key trench is about 290 m (0+000 to 0+0290).

In summary, with possibly no or limited length of the D-CP5 key trench that needs to be excavated beyond a depth of 1.8 m, the potential saving of excavation for the scheme proposed by MTKSL is limited.

Technically, we do not recommend the key trench excavation option that was proposed by MTKSL in this RFI for the following reasons:

1) If the key trench needs to be excavated below 1.8 m to up to 2.8 m, that means the foundation soils below the 1.8 m depth must be either ice-rich or icy soils. If these soils are thawed, potential thaw induced settlements would be relatively great.
2) To reduce the potential risk of detrimental thaw settlement below the critical portion of the line, the ice-rich or icy soils below the critical portion of the liner system should be removed and replaced with thaw-stable backfill.

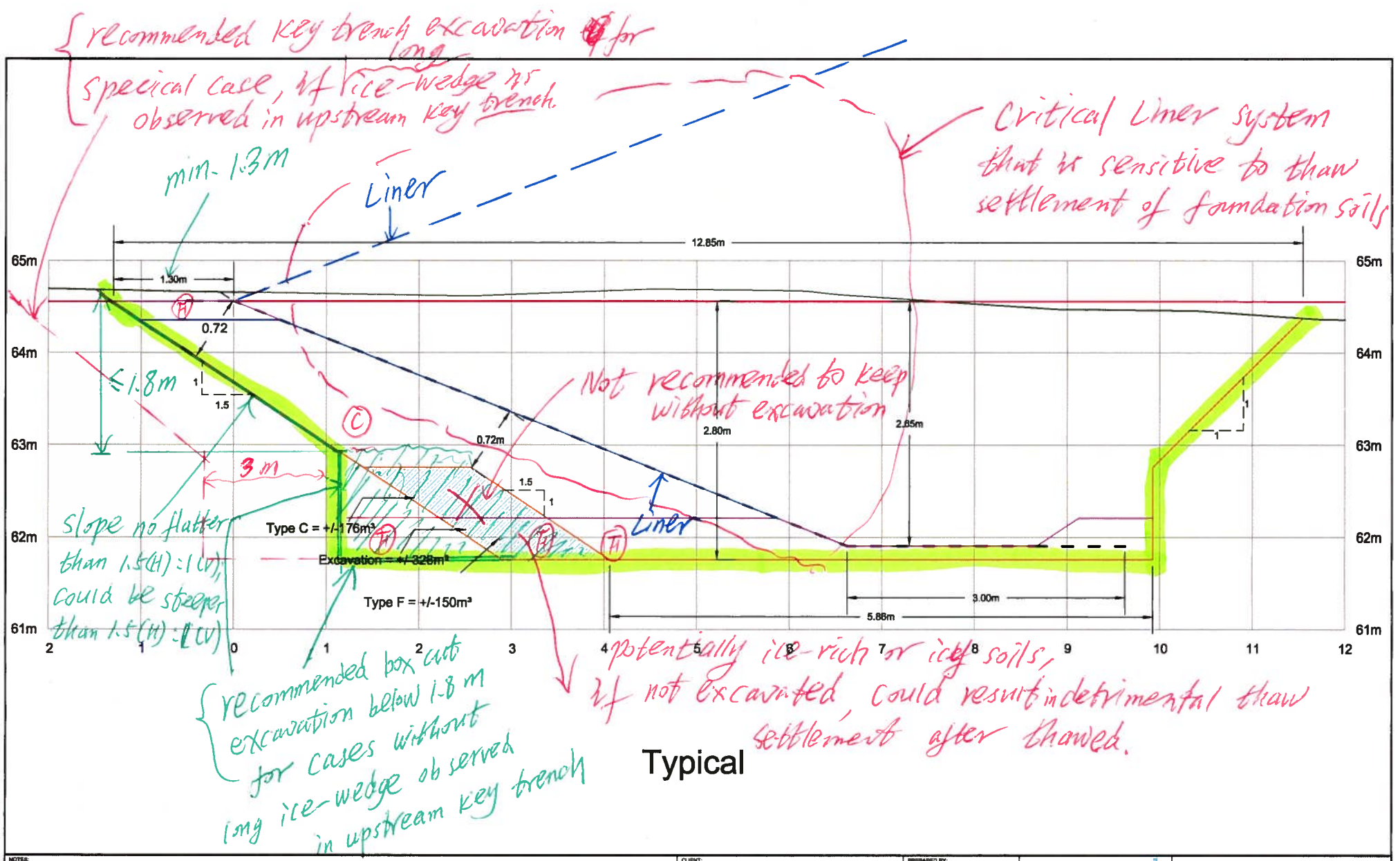
Based on MTKSL's original sketch, notes are made in the attached sketch to show the recommended excavation plan for the case with a required key trench depth of up to 2.8 m.

Engineering : Gordon Zhang	Signature:	Date: January 27, 2017

4. IF NOT TECHNICAL RFI VALIDATION OF PROPOSED SOLUTION BY SITE SUPERVISION

	Deviation Request: ☐ No ☐ Yes

	Name	Signature	Date
Superintendent:			
c.c. Contract Administrator:			



NOTES:

Type F — Original Ground
Type C — Hinge Point Elevation
Excavation — Liner

CLIENT: AGNICO EAGLE Meliadine Gold Project

PROJECT: Agnico Eagle Meliadine Civil Works Dike Construction 2016-2017

PREPARED BY: MTKSL Contracting Joint Venture 19-41 Street South PO Box 809 Rankin Inlet, Nunavut X0C 0G0

MTKSL CONTRACTING JOINT VENTURE

DRAWN BY: JLR | SCALE: NTS | DATE: Jan 23 2017

Work Area

DRAWING TITLE: DCP 5 Excavation Proposal 2

DRAWING NAME (YYMMDD): CA 170121 D5 KT Excavation.dwg

AGNICO EAGLE

Request For Information

Project No: 6515	Contract No: C-007	RFI No: 6515-C-230-007_024	Rev: 0
Meliadine Project			
Site RFI Initiator: Michael Price		Date: Feb 20, 2017	

1. REFERENCE DOCUMENTS :

Title(s):	*Number:*	*Revision:*
Geotechnical Specifications for Construction of D-CP1 (Tetra Tech EBA, Issued for Use November 9, 2016)	6515-E-132-007-132-SPT-002	1

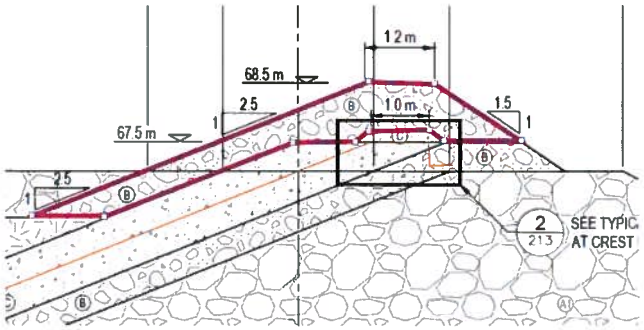
2. DESCRIPTION , JUSTIFICATION OF THE RFI AND PROPOSED SOLUTION :

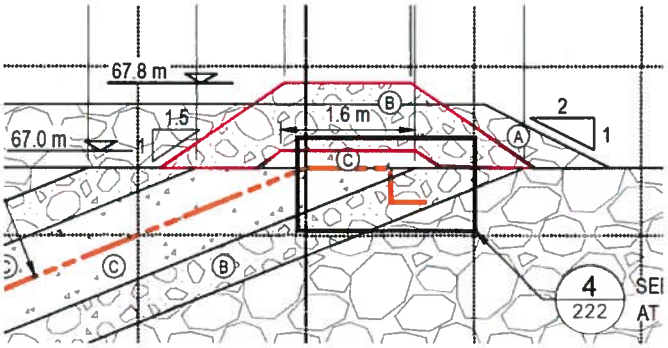
Based on survey data and approved design changes MTKSL has calculated the neat line volume of Type B to be 16,191 m^3. This volume considers D-CP1 to be constructed with no substitutions where Type B is required (including the additional excavation) and D-CP5 to maintain Type B as per design above OG and a minimum thickness of 300mm from OG down within the Key Trench. The remainder of D-CP5 Key Trench Type B will be substituted with Type H.

The current stockpile of Type B = 15,100 m^3 leaving us short of material which would require the substitution of Type H within the D-CP01 Key Trench. The current supply of Type H material on hand is not acceptable for the key due to high moister content and the production of additional Type H is delayed pending a blasting program to produce the feed material as ripping will not produce material in the time frame required.

In an effort to prevent any delay MTKSL is proposing / requesting one of 3 options;

1. Replace the Type B material within the very top cover portion of the Dikes with Type B material produced from UG ROM as this location is already adjacent to Type A material. (see below)
2. Replace the Type B material within the very top cover portion of the Dikes with the 0-125mm Type H (see below)
3. Produce an additional quantity of clean Type B from the A1 supply which is not ideal as the quantities are already tight for this material.





Prepared by: Michael Price Signature: Mike Price Date: Feb 20, 2017

3. TECHNICAL RESPONSE FROM ENGINEERING AND/OR VALIDATION OF PROPOSED SOLUTION :

As indicated by MTKSL, Option 3 to produce Type B from Type A1 (ROM from the saline pond excavation) is not practical because of a shortage of qualified Type A1 due to a large percentage of oversized boulders produced during the saline pond excavation. Depending on the percentage of oversized boulders in the Type A1 ROM, the estimated quantity of the actual Type A1 (after removing oversized boulders) that is currently available at the site may not be adequate for the required quantity of Type A1 for construction of D-CP1 and D-CP5. Therefore, Option 3 is not feasible.

Option 2 to replace Type B with Type H (esker sand and gravel) has two issues. The esker sand and gravel (Type H) is susceptible to surface erosion and therefore, is not a suitable material to be placed over the dike crest. Secondly, the majority of Type H required for construction of D-CP1 has not been produced at this stage. The availability of additional, qualified Type H is uncertain.

Option 1 to use the UG ROM to produce an alternative of Type B is not ideal but is a practical option. The UG ROM contains salts that would increase the pore water salinity of the dike fills. Nevertheless, since the material will be placed over the dike crest (as shown within the red lines in MTKSL's sketches above) that is relatively away from the critical component (key trench) of the dikes, the potential risk of the salt impacts to the dike's overall performance is manageable. Option 1 is a practical solution since the UG ROM quantity is adequate and readily available at site.

In summary, Option 1 is the most practical option among the three options proposed by MTKSL. At this stage and tight construction schedule, we have no other practical alternatives but to adopt Option 1.

It should be emphasized that the Type B using the UG ROM as a source should be only placed within the dike crest zones as shown within the red lines in MTKSL's sketches above. The Type B in other dike zones should use the rockfill without salts (from the saline pond excavation).

Engineering : Gordon Zhang	Signature: Gordon Zhang	Date:	February 21, 2017

4. IF NOT TECHNICAL RFI VALIDATION OF PROPOSED SOLUTION BY SITE SUPERVISION

	Deviation Request: ☐ No ☐ Yes

	Name	Signature	Date
Superintendent:			
c.c. Contract Administrator:			

APPENDIX D2

ENGINEERING CHANGE NOTICES (ECNS)

AGNICO EAGLE

MELIADINE GOLD MINE PROJECT

ENGINEERING CHANGE NOTICE

Contract No: OL-459893-L Contract Title: Block 007 - Water Management Infrastructure

Contractor: Tetra Tech EBA Inc. Date: 10-Nov-16

ECN No: 6515-C-235-007-ECN-001_RA ECN Title: Revision 1 for Construction Specifications of D-CP1 and D-CP5

ECN Description:

We have updated the construction specifications (from Revision 0 into Revision 1) for D-CP1 and D-CP5 to include additional information for clarification:

1) Add a new section for dike instrumentation installation
2) Add additional details for material preparation and placement for Nearly-Saturated Backfill
3) Add additional details for liner QC/QA testing and reporting for the liner installation

Justification:

To add more details and increase clarifications for construction specifications of D-CP1 and D-CP5

List of Deleted, Revised or Added Documents (*Add a page to list more if needed*)

Item	Document Number	Rev
1	6515-E-132-007-132-SPT-002	R1
1	6515-E-132-007-132-SPT-003	R1

Item	Document Number	Rev

Potential Impacts:

On Schedule: Yes ☑ No ☐ On Cost: Yes ☑ No ☐

Action Record	TITLE	NAME	Signature	Date
Prepared by:	Package Engineer			
Reviewed by:	Lead Discipline	Duy Nguyen		
Accepted by:	Engineering Manager	Daniel Seguin		
Accepted by:	Project Manager	Jean Routhier		

Notes:

1	Contractor has 10 days to return the Impact on Cost (on the attached Price Breakdown) and Schedule			
2	Contractor is not to proceed with any work until authorized to do so			
Contractor Acknowledment				
Received by:	Contractor Repres.			

Attachments Forming Part of This Specification:

Section	Rev.	Title of Section
General Specification Section		
6515-C-235-007-230-MTX-001	R2	Documents and Drawings Index
6515-C-235-007-230-SOW-001	R2	Summary of Work
6515-E-132-007-132-SPT-002	R1	Specifications for Dike D-CP1
6515-E-132-007-132-SPT-003	R1	Specifications for Dike D-CP5
6515-C-235-007-230-VDT-001	R1	Vendor Data Requirements Table
Standard Datasheet Section		
N/A		
Standard Specification Section		
Drawing No.	**Rev.**	**Title**
6515-GGD-03	R0	Site Information and Design Coefficients
6515-000-133-VDR-001	R0	Vendor Data Requirements

Drawings Forming Part of This Specification:

Drawing No.	Rev.	Title
65-685-230-204	R1	D-CP1 GENERAL LOCATION PLAN
65-685-230-205	R1	D-CP1 KEY TRENCH AND DIKE LAYOUT PLAN
65-685-230-206	R1	D-CP1 PROFILES
65-685-230-207	R1	D-CP1 THERMAL COVER LAYOUT PLAN AND PROFILES
65-685-230-208	R1	D-CP1 TYPICAL SECTIONS AND QUANTITIES
65-685-230-209-01	R1	D-CP1 SECTIONS STATION 0+025 TO 0+200
65-685-230-209-02	R1	D-CP1 SECTIONS STATION 0+225 TO 0+400
65-685-230-209-03	R1	D-CP1 SECTIONS STATION 0+400 TO 0+575
65-685-230-210	R1	D-CP1 DOWNSTREAM WATER COLLECTION CHANNEL AND SUMP LAYOUT PLAN AND PROFILES
65-685-230-211	R1	D-CP1 INSTRUMENTATION PLAN AND DETAILS FOR GROUND TEMPERATURE CABLES
65-685-230-212	R1	D-CP1 INSTRUMENTATION PLAN AND DETAILS FOR GROUND TEMPERATURE CABLES AND SETTLEMENT SURVEY MONUMENT POINTS
65-685-230-213	R1	D-CP1 TYPICAL DETAILS
65-685-230-214	R0	D-CP5 GENERAL LOCATION PLAN
65-685-230-215	R0	D-CP5 KEY TRENCH AND DIKE LAYOUT PLAN

65-685-230-216	R0	D-CP5 PROFILES
65-685-230-217	R0	D-CP5 THERMAL COVER LAYOUT PLAN AND PROFILES
65-685-230-218	R0	D-CP1 TYPICAL SECTIONS AND QUANTITIES
65-685-230-219-01	R0	D-CP5 SECTIONS STATION 0+030 TO 0+170
65-685-230-219-02	R0	D-CP5 SECTIONS STATION 0+170 TO 0+310
65-685-230-220	R0	D-CP5 INSTRUMENTATION PLAN AND DETAILS FOR GROUND TEMPERATURE CABLES
65-685-230-221	R0	D-CP5 INSTRUMENTATION PLAN AND DETAILS FOR GROUND TEMPERATURE CABLES AND SETTLEMENT SURVEY MONUMENT POINTS
65-685-230-222	R0	D-CP5 TYPICAL DETAILS
65-000-230-212	R3	CIVIL WORKS 2016 – PLAN VIEW
65-417-230-207	RA	JETTY CP1 – PLAN / CROSS SECTION
65-417-230-208	RA	JETTY CP5 – PLAN / CROSS SECTION
65-695-265-200	R4	PUMPING STATION CP1 – PLAN, ELEVATION, DETAILS
65-695-265-203	R4	PUMPING STATION CP5 – PLAN, ELEVATION, DETAILS

2016-11-10	2	For review	G. Zhang	G. Zhang	G. Zhang	
2016-08-26	1	For Review	M. Ricard	G. Zhang	G. Zhang	D. Nguyen
2016-06-13	0	For Tender	M. Ricard	G. Zhang	G. Zhang	S. Guay
Date	**Rev.**	**Status**	**Prepared By**	**Checked By**	**Approved By**	**Approved By**
						Client

END OF SECTION

AGNICO EAGLE

MELIADINE GOLD MINE PROJECT

ENGINEERING CHANGE NOTICE

Contract No: OL-459893-L
Contract Title: Block 007 - Water Management Infrastructure
Contractor: Tetra Tech EBA Inc.
Date: 10-Nov-16

ECN No: 6515-C-235-007-ECN-002_RA
ECN Title: Design Change of Dike Liner Key-in Detail at Crest for D-CP1 and D-CP5

ECN Description:

In the meeting with Luciano and Duy on October 28, 2016, Luciano suggested some changes to avoid sharp corners of the liner in anchoring the liner over the dike crest. As directed, we have prepared two drawings (see attached) to show the proposed design changes for your review:

1) Proposed dike crest design change No.1 for D-CP1.
2) Proposed dike crest design change No.1 For D-CP5.

Justification:

As suggested by the extremal reviewer (Luciano), minor changes to the dike liner key-in at crest were made to avoid sharp corners of the liner in anchoring the liner over the dike crest.

List of Deleted, Revised or Added Documents (*Add a page to list more if needed*)

Item	Document Number	Rev
1	Proposed Design Change No1 for D-CP1	RA
1	Proposed Design Change No1 for D-CP5	RA

Item	Document Number	Rev

Potential Impacts:

On Schedule: Yes ☑ No ☐ On Cost: Yes ☑ No ☐

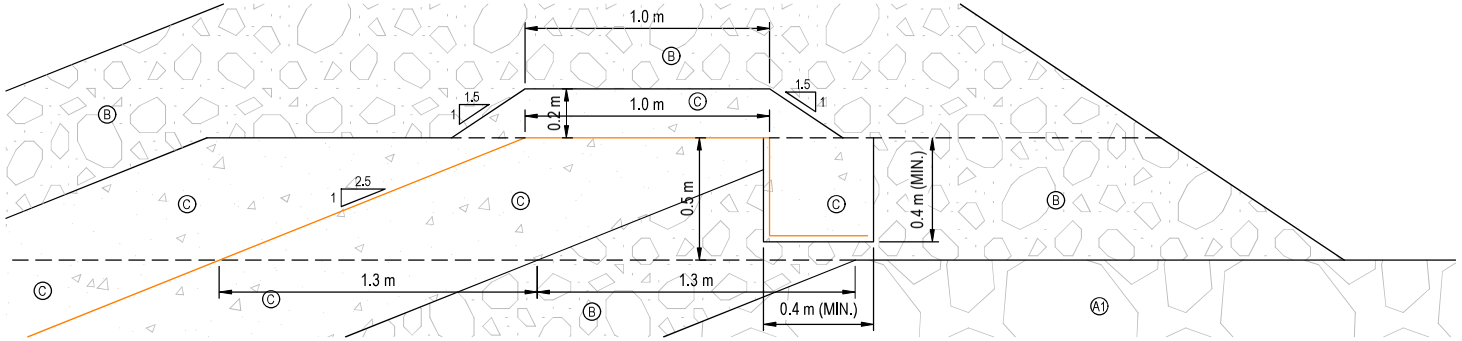
Action Record	TITLE	NAME	Signature	Date
Prepared by:	Package Engineer	Gordon Zhang	Gordon Zhang	NOV. 14/2016
Reviewed by:	Lead Discipline	Duy Nguyen	Duy Nguyen	
Accepted by:	Engineering Manager	Daniel Seguin		
Accepted by:	Project Manager	Marcel Beaudoin		

Notes:

1	Contractor has 10 days to return the Impact on Cost (on the attached Price Breakdown) and Schedule				
2	Contractor is not to proceed with any work until authorized to do so				
Contractor Acknowledgment					
Received by:	Contractor Repres.				

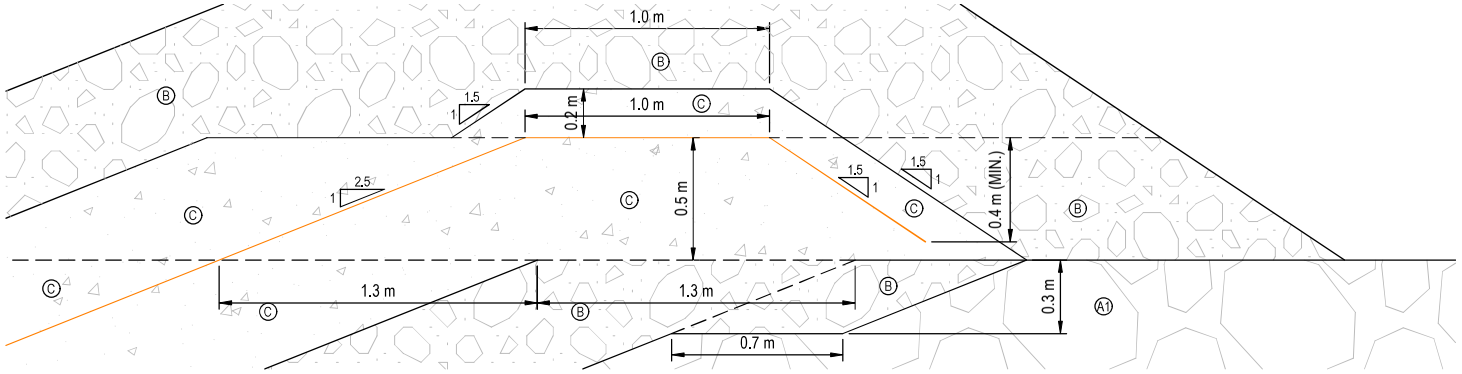
NO. DESSIN
DRAWING NO.

FORMAT ANSI B–11x17



TYPICAL LINER KEY–IN AT CREST – PREVIOUS DESIGN 2/208 (65–685–230–213 R1)

NOT TO SCALE



TYPICAL LINER KEY–IN AT CREST – REVISED DESIGN 2/208

NOT TO SCALE

NOTE:
ADDITIONAL MATERIAL 'C' CROSS-SECTIONAL AREA = 0.335 m²
ADDITIONAL MATERIAL 'B' CROSS-SECTIONAL AREA = 0.210 m²

NE PAS UTILISER POUR CONSTRUCTION
NOT FOR CONSTRUCTION
DATE : 2016–10–28

LEGEND

- (A) RUN-OF-MINE ROCKFILL (600 mm MINUS) IN DIKE UPSTREAM AND FOR THERMAL COVER
- (A1) RUN-OF-MINE ROCKFILL (600 mm MINUS) IN DIKE DOWNSTREAM
- (B) TRANSITION ROCKFILL (150 mm MINUS)
- (C) GRANULAR FILL OR ESKER SAND (20 mm MINUS)
- (F) BENTONITE-AUGMENTED MATERIAL (MIXTURE OF BENTONITE AND TYPE C MATERIAL)

AGNICO EAGLE

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TITRE / TITLE	# DWG

DESSINS EN RÉFÉRENCE/REFERENCE DRAWINGS

REV	DESCRIPTION	DATE	PAR BY

REVISIONS

DESSINÉ PAR DRAWN BY	DATE
VÉRIFIÉ PAR CHECKED BY	
APPROUVÉ PAR APPROVED BY	
No. PROJET PROJECT NO.	
DATE	

TITRE / TITLE

AGNICO EAGLE – DIVISION

PROPOSED DESIGN CHANGE No.1 FOR D–CP1

ÉCHELLE/ SCALE	FICHIER FILE .DWG		
No. DESSIN/ DRAWING NO.		REVISION	FEUILLE/SHT
X		X	1 / 1

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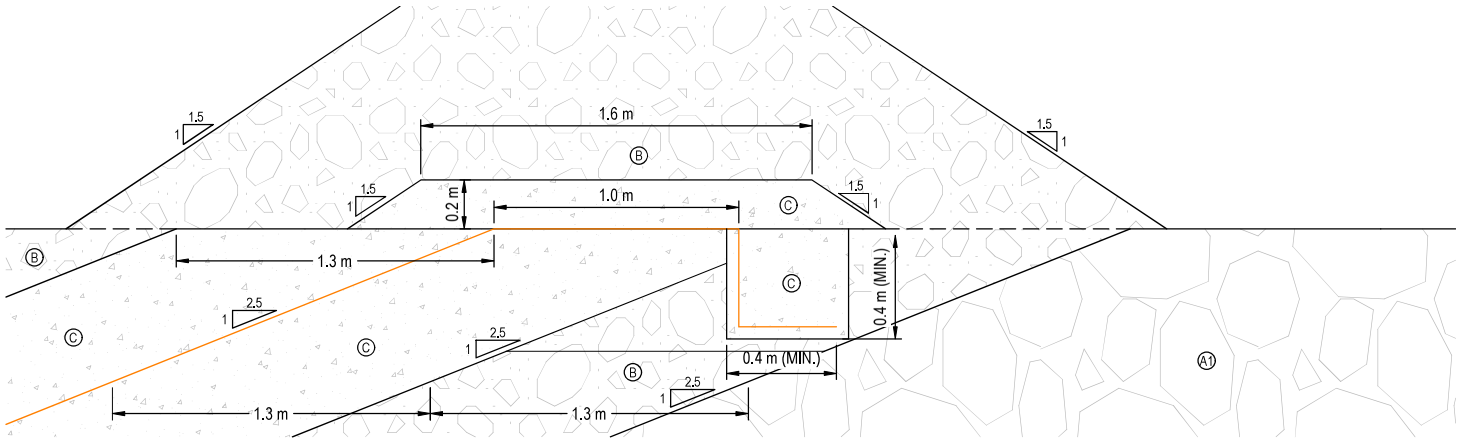
FORMAT ANSI B–11x17



TYPICAL LINER KEY–IN AT CREST – PREVIOUS DESIGN

NOT TO SCALE

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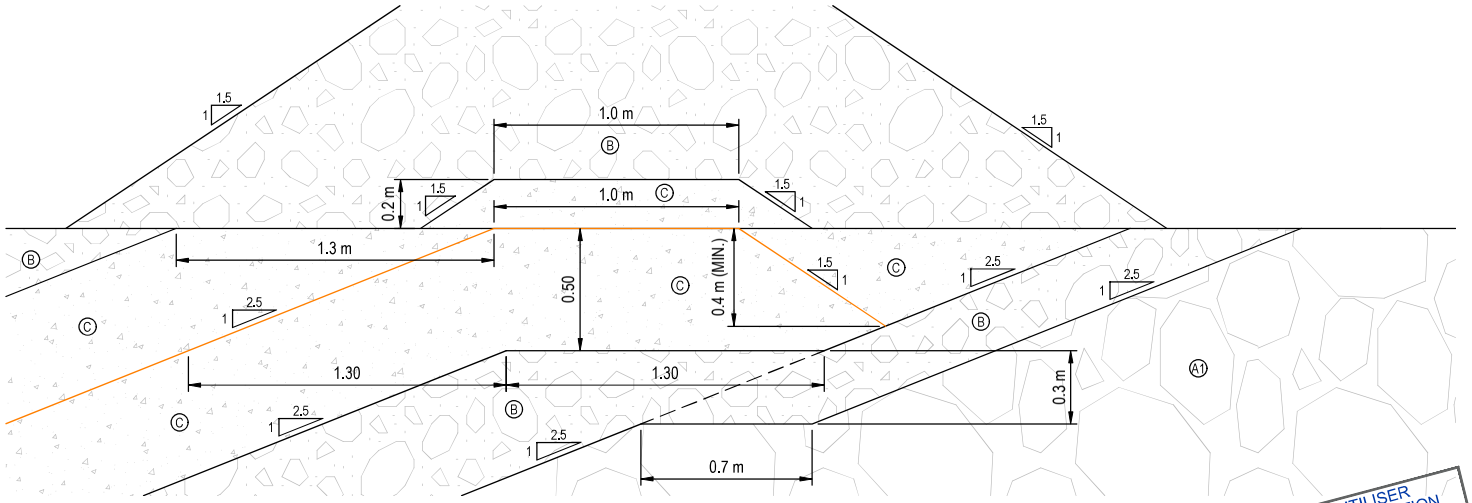
218

(65–685–230–222 R0)



TYPICAL LINER KEY–IN AT CREST – REVISED DESIGN

NOT TO SCALE

4
218

NOTE:
ADDITIONAL MATERIAL 'C' CROSS-SECTIONAL AREA = 0.330 m²
ADDITIONAL MATERIAL 'B' CROSS-SECTIONAL AREA = 0.110 m²

NE PAS UTILISER POUR CONSTRUCTION
NOT FOR CONSTRUCTION
DATE : 2016-10-28

LEGEND

- (A) RUN-OF-MINE ROCKFILL (600 mm MINUS) IN DIKE UPSTREAM AND FOR THERMAL COVER
- (A1) RUN-OF-MINE ROCKFILL (600 mm MINUS) IN DIKE DOWNSTREAM
- (B) TRANSITION ROCKFILL (150 mm MINUS)
- (C) GRANULAR FILL OR ESKER SAND (20 mm MINUS)
- (F) BENTONITE-AUGMENTED MATERIAL (MIXTURE OF BENTONITE AND TYPE C MATERIAL)

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TITRE / TITLE	# DWG

DESSINS EN RÉFÉRENCE/REFERENCE DRAWINGS

REV	DESCRIPTION	DATE	PAR BY

REVISIONS

DESSINÉ PAR DRAWN BY	DATE
VÉRIFIÉ PAR CHECKED BY	
APPROUVÉ PAR APPROVED BY	
No. PROJET PROJECT NO.	
DATE	

TITRE / TITLE

AGNICO EAGLE – DIVISION

PROPOSED DESIGN CHANGE No.1 FOR D–CP5

ÉCHELLE/ SCALE	FICHIER FILE .DWG		
No. DESSIN/ DRAWING NO.	X	REVISION X	FEUILLE/SHT 1 / 1

AE–CART–ANSI B

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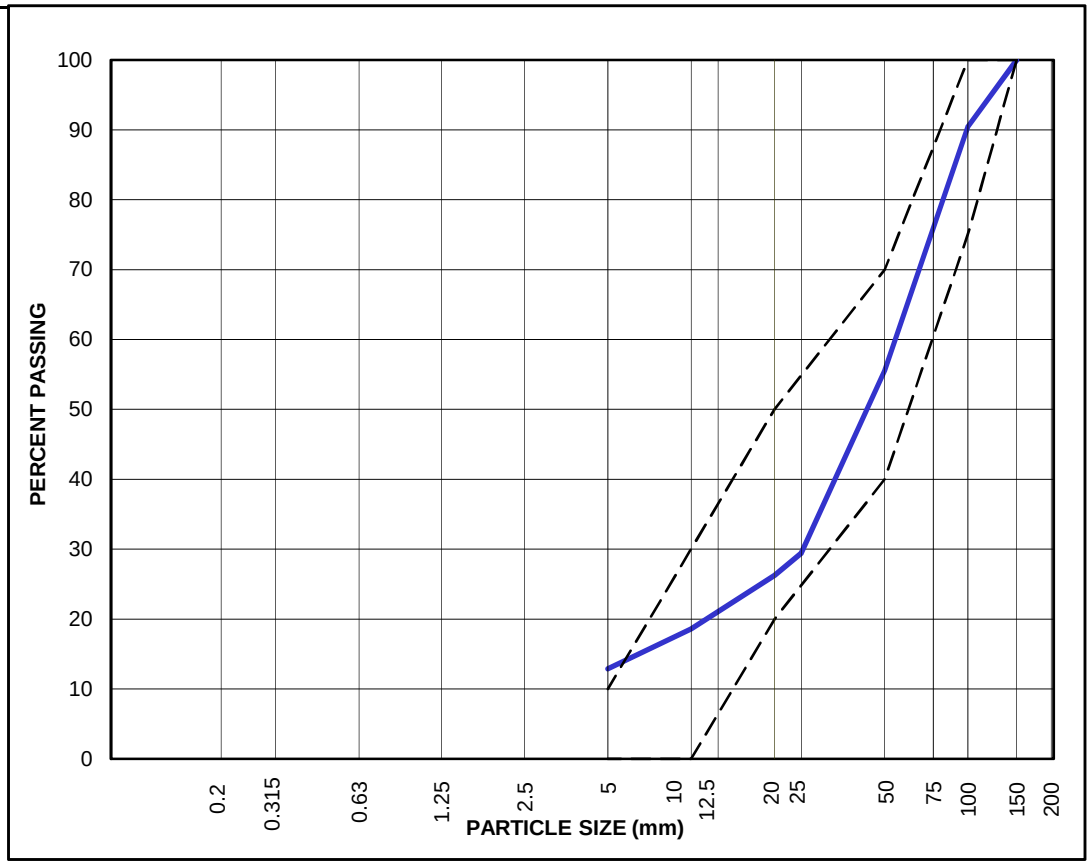
APPENDIX E1

TRANSITION MATERIAL PARTICLE SIZE ANALYSIS RESULTS

PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA01
		SAMPLE DESCRIPTION:	150 mm minus from stockpile
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	5.2%
DATE SAMPLED:	Nov 09/16 **By:** TW		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
150	100
20	26
10	19
5	13



Remarks:

Reviewed by: _____ P.Eng.

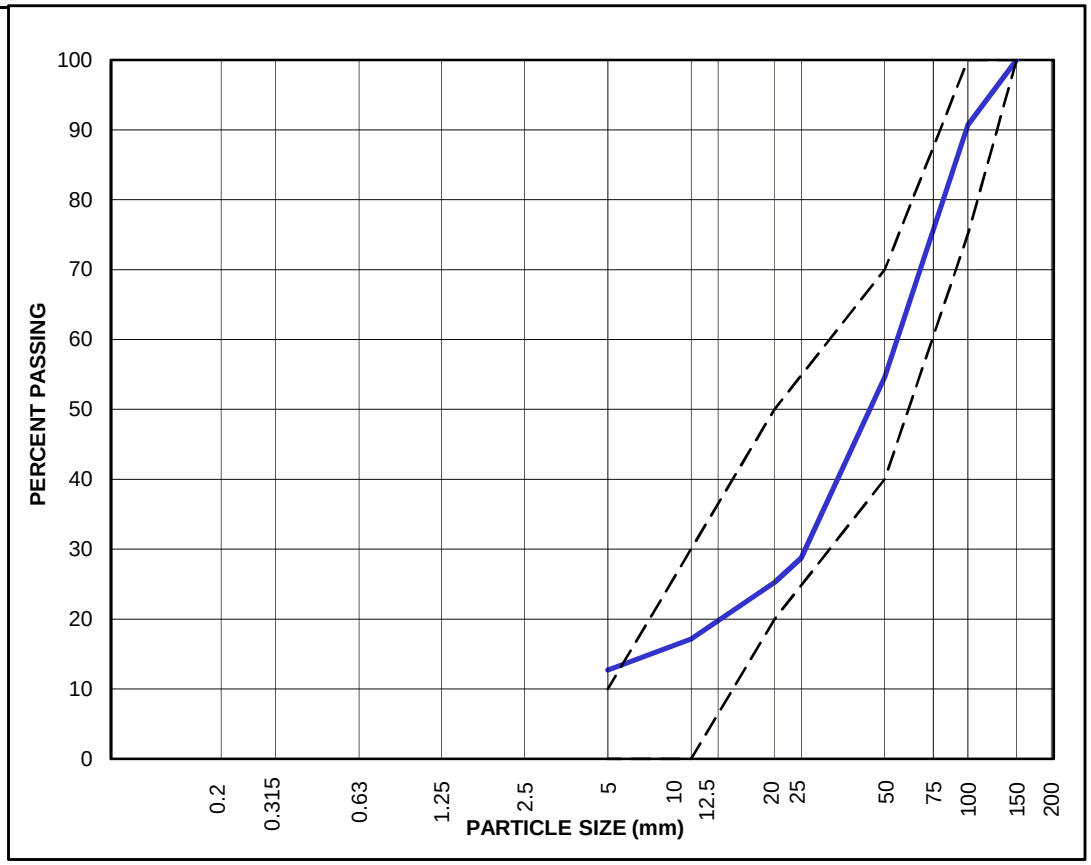
Data presented hereon is for the sole use of the stipulated client. Tetra Tech EBA is not responsible, nor can be held liable, for use made of this report by any other party, with or without the knowledge of Tetra Tech EBA.

The testing services reported herein have been performed by an Tetra Tech EBA technician to recognized industry standards, unless otherwise noted. No other warranty is made. These data do not include or represent any interpretation or opinion of specification compliance or material suitability. Should engineering interpretation be required, Tetra Tech EBA will provide it upon written request.

PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA02
		SAMPLE DESCRIPTION:	150 mm minus from stockpile
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	4.3%
DATE SAMPLED:	Nov 09/16 **By:** TW		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
150	100
20	25
10	17
5	13



Remarks:

Reviewed by: _____ P.Eng.

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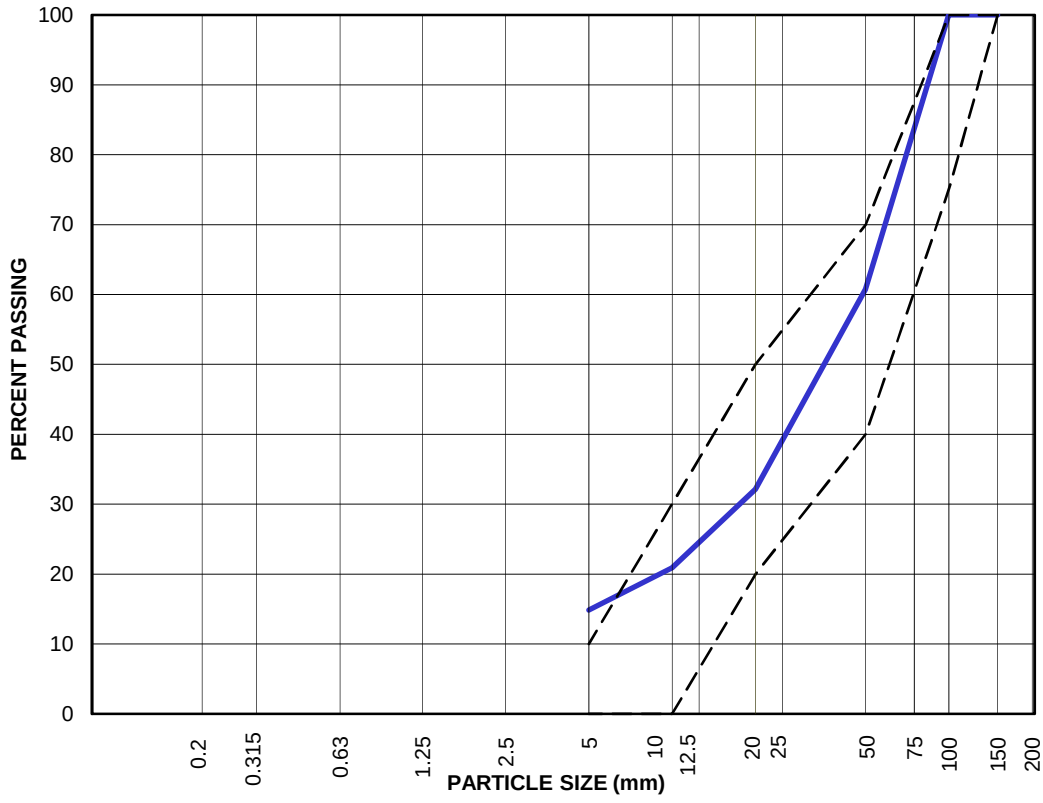
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA03
		SAMPLE DESCRIPTION:	Type B - 150 mm Minus Transition Rock
ADDRESS:	Meliadine Gold Project, NU.		Sampled From Stockpile
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	1.3%
DATE SAMPLED:	Nov 11/16 By: IM		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
150	100
100	100
50	61
20	32
10	21
5	15



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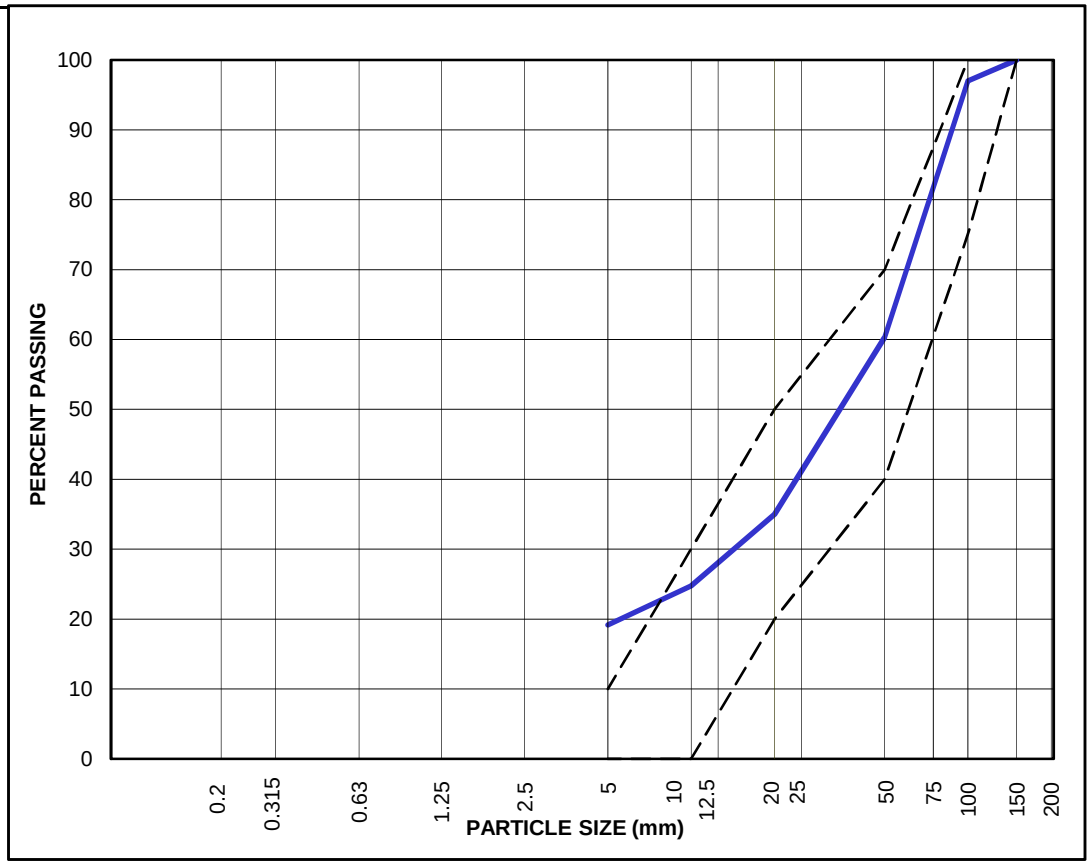
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA04
		SAMPLE DESCRIPTION:	Type B - 150 mm Minus Transition Rock
ADDRESS:	Meliadine Gold Project, NU.		Sampled From Stockpile
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	2.8%
DATE SAMPLED:	Nov 13/16 **By:** IM		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
150	100
100	97
50	60
20	35
10	25
5	19



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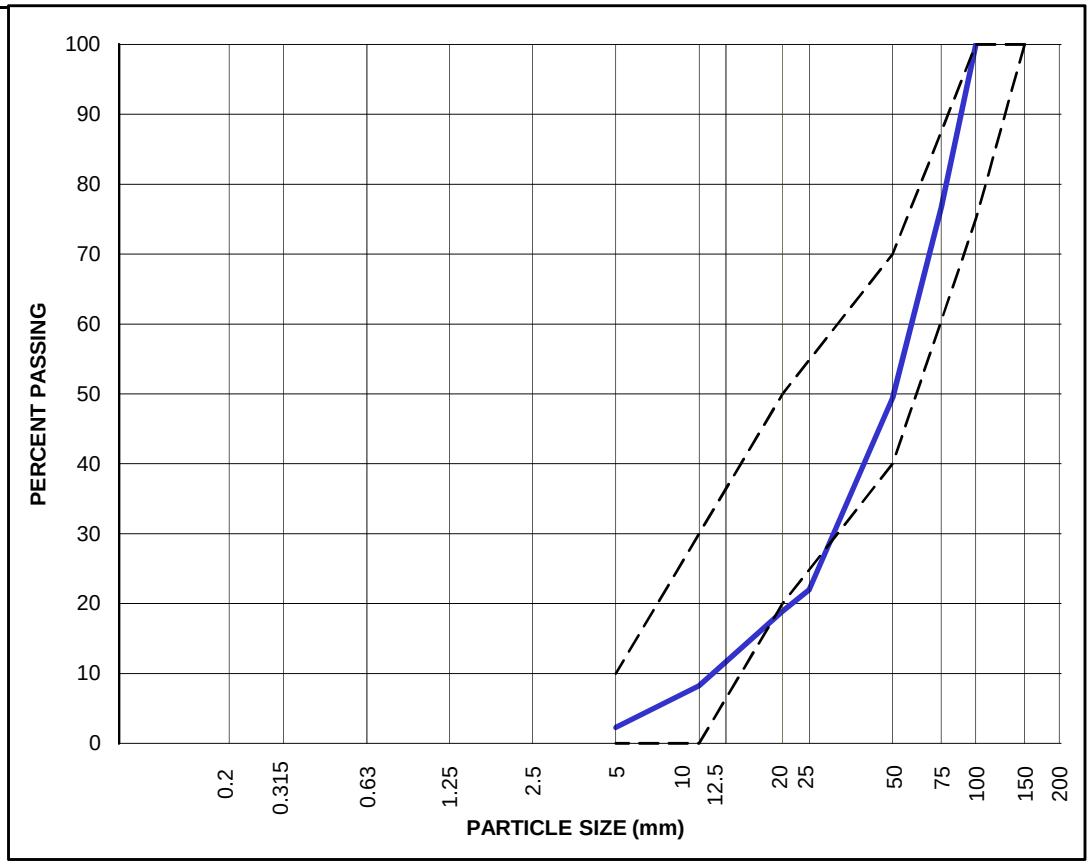
PARTICLE SIZE ANALYSIS REPORT

PROJECT: Meliadine Dike Construction
ADDRESS: Meliadine Gold Project, NU.
PROJECT NO: E14103230-01.023
DATE SAMPLED: Dec 15/16 **By:** CC
CLIENT: Agnico Eagle Mines Ltd.
ATTENTION: Mr. Duy Nguyen

SAMPLE NO: SA05
SAMPLE DESCRIPTION: Type B - 150 mm minus
Sampled from stockpile
MOISTURE CONT. : 8.6%
BULK REL DENSITY: n/a
BULK REL. DENSITY (SSD): n/a
APPARENT REL. DENSITY: n/a
ABSORPTION: n/a

PARTICLE SIZE	PERCENT PASSING
150	100
100	100
50	49
20	19
10	8
5	2



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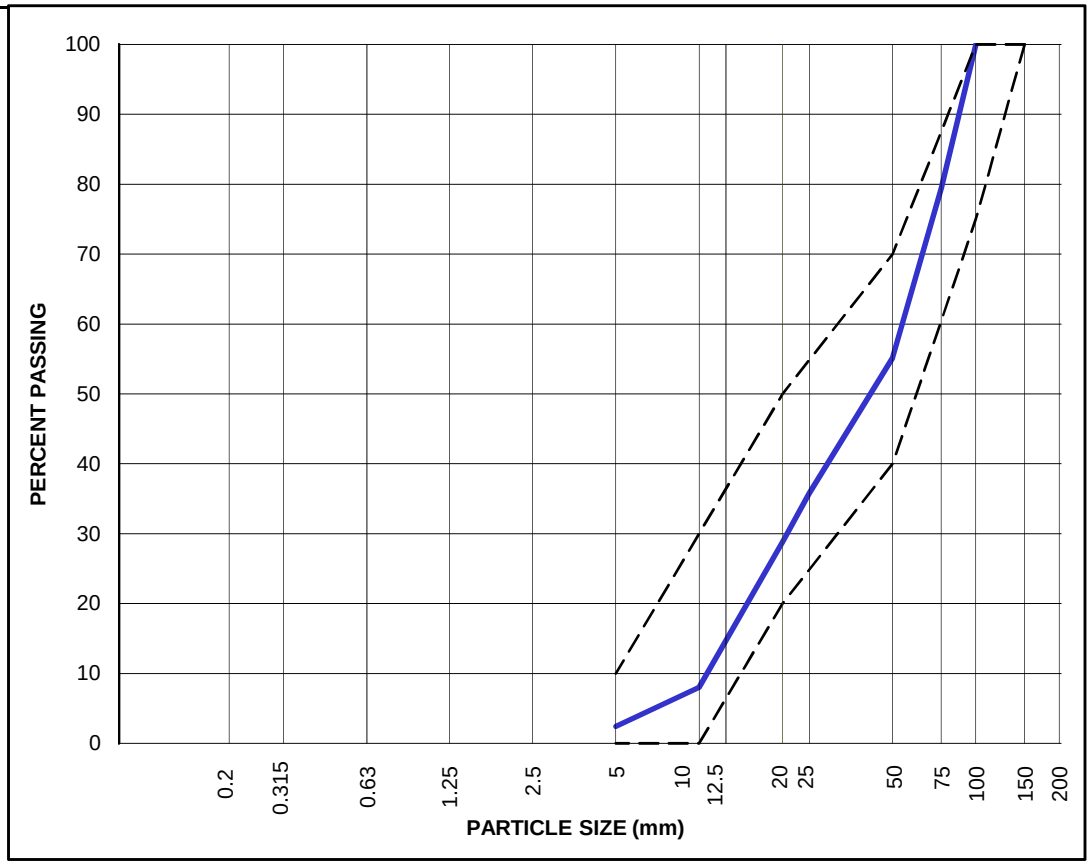
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	**Meliadine Dike Construction**	**SAMPLE NO:**	**SA06**
		SAMPLE DESCRIPTION:	**Type B - 150 mm minus**
			Sampled from stockpile
ADDRESS:	**Meliadine Gold Project, NU.**		
PROJECT NO:	**E14103230-01.023**	**MOISTURE CONT. :**	**8.1%**
DATE SAMPLED:	**Mar 01/17** **By: TW**		
CLIENT:	**Agnico Eagle Mines Ltd.**	**BULK REL DENSITY:**	**n/a**
ATTENTION:	**Mr. Duy Nguyen**	**BULK REL. DENSITY (SSD):**	**n/a**
		APPARENT REL. DENSITY:	**n/a**
		ABSORPTION:	**n/a**

PARTICLE SIZE	PERCENT PASSING
150	100
100	100
50	55
20	29
10	8
5	2



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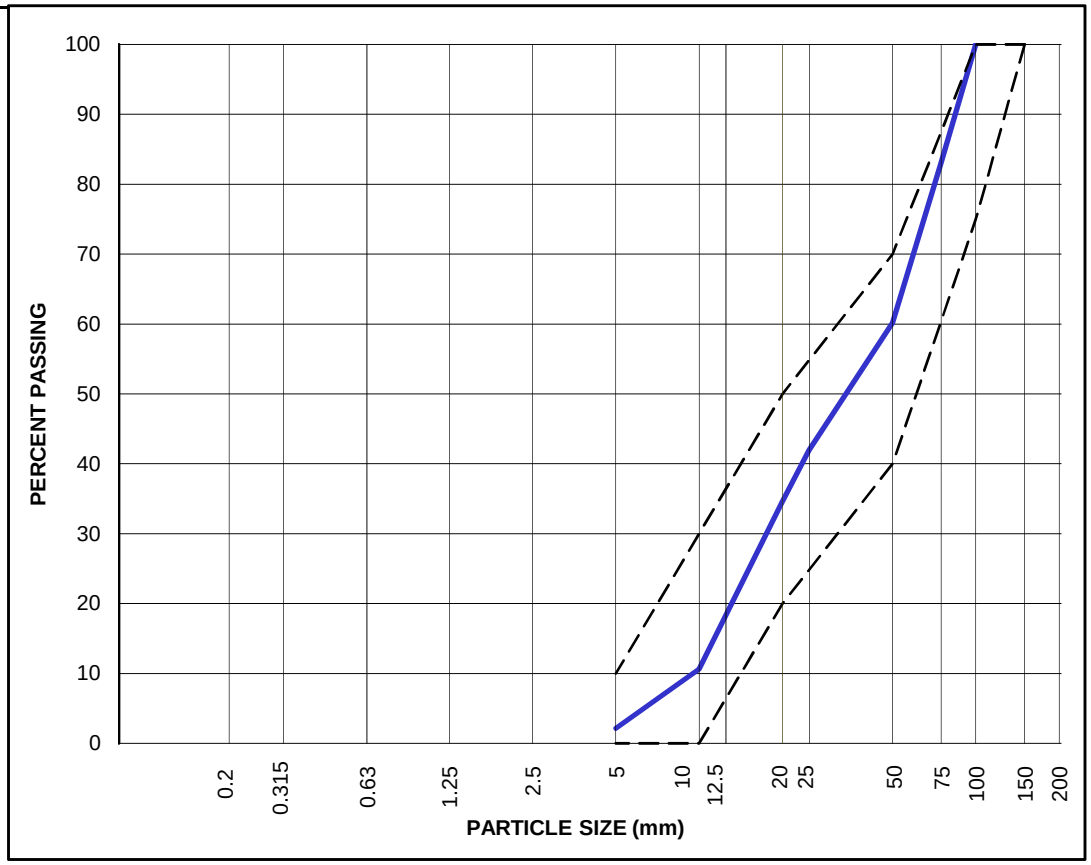
PARTICLE SIZE ANALYSIS REPORT

PROJECT: Meliadine Dike Construction
SAMPLE NO: SA07
SAMPLE DESCRIPTION: Type B - 150 mm minus
Sampled from stockpile
ADDRESS: Meliadine Gold Project, NU.
PROJECT NO: E14103230-01.023
MOISTURE CONT. : 8.7%
DATE SAMPLED: Mar 01/17 **By:** TW
CLIENT: Agnico Eagle Mines Ltd.
BULK REL DENSITY: n/a
ATTENTION: Mr. Duy Nguyen
BULK REL. DENSITY (SSD): n/a
APPARENT REL. DENSITY: n/a
ABSORPTION: n/a

PARTICLE SIZE	PERCENT PASSING
150	100
100	100
50	60
20	35
10	11
5	2



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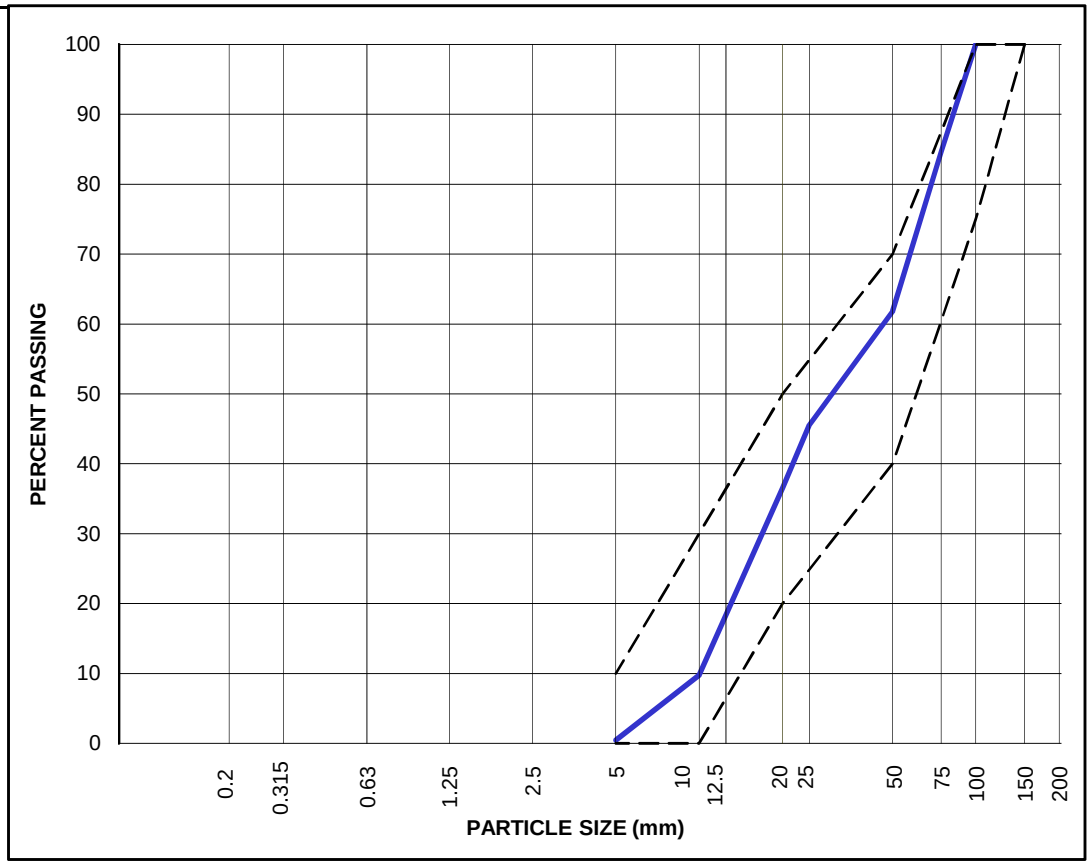
PARTICLE SIZE ANALYSIS REPORT

PROJECT: Meliadine Dike Construction
SAMPLE NO: SA08
SAMPLE DESCRIPTION: Type B - 150 mm minus
Sampled from stockpile
ADDRESS: Meliadine Gold Project, NU.
PROJECT NO: E14103230-01.023
MOISTURE CONT. : 7.2%
DATE SAMPLED: Mar 02/17 **By:** TW
CLIENT: Agnico Eagle Mines Ltd.
BULK REL DENSITY: n/a
ATTENTION: Mr. Duy Nguyen
BULK REL. DENSITY (SSD): n/a
APPARENT REL. DENSITY: n/a
ABSORPTION: n/a

PARTICLE SIZE	PERCENT PASSING
150	100
100	100
50	62
20	37
10	10
5	0



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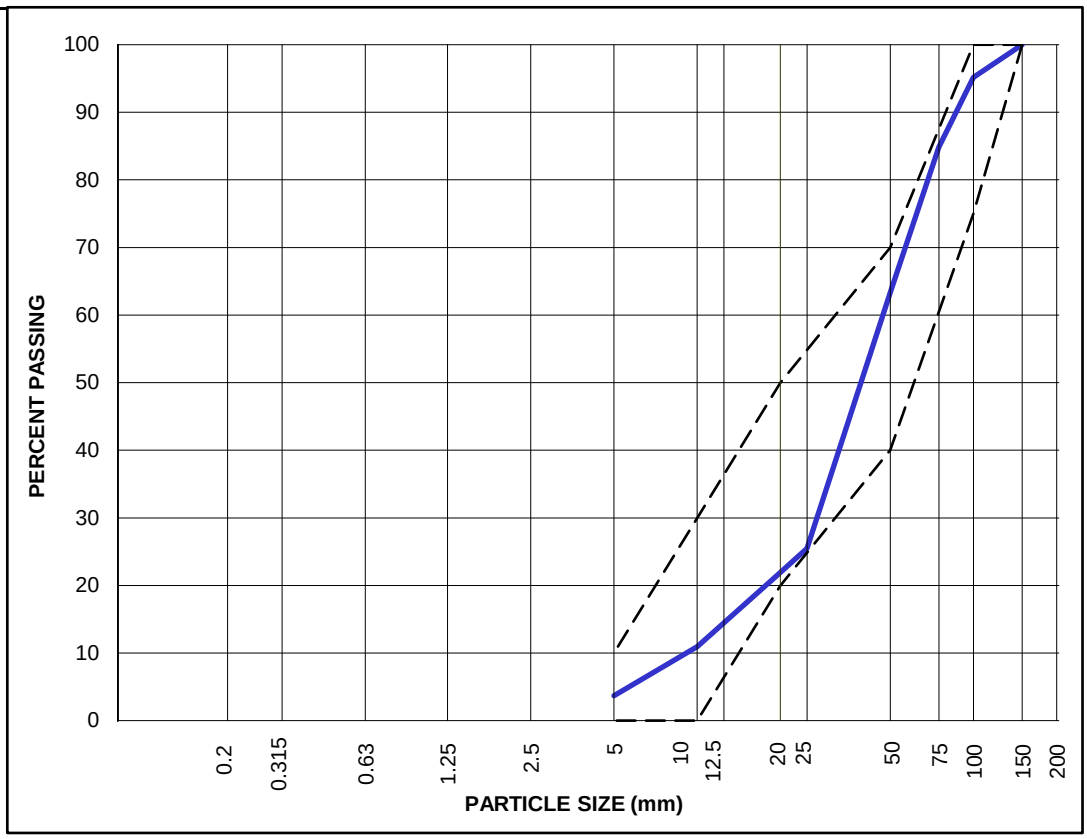
PARTICLE SIZE ANALYSIS REPORT

PROJECT: Meliadine Dike Construction
ADDRESS: Meliadine Gold Project, NU.
PROJECT NO: E14103230-01.023
DATE SAMPLED: Mar 29/17 **By:** IM/TW
CLIENT: Agnico Eagle Mines Ltd.
ATTENTION: Mr. Duy Nguyen

SAMPLE NO: SA09
SAMPLE DESCRIPTION: Type B1 - 150 mm minus
Sampled from Key Trench Stn. 0+455 at O.G. elev.
MOISTURE CONT. : 6.1%
BULK REL DENSITY: n/a
BULK REL. DENSITY (SSD): n/a
APPARENT REL. DENSITY: n/a
ABSORPTION: n/a

PARTICLE SIZE	PERCENT PASSING
150	100
100	95
50	63
20	22
10	11
5	4



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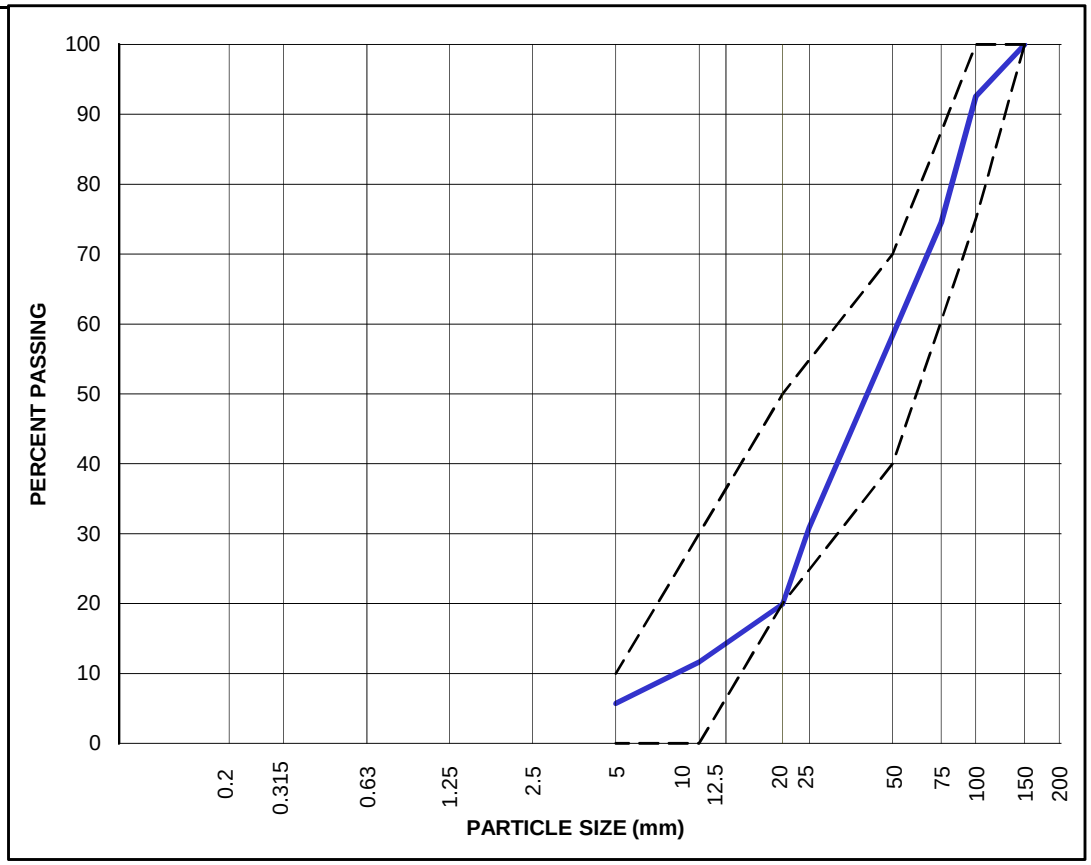
PARTICLE SIZE ANALYSIS REPORT

PROJECT: Meliadine Dike Construction
SAMPLE NO: SA10
SAMPLE DESCRIPTION: Type B1 - 150 mm minus
Sampled from Key Trench Stn. 0+455 at O.G. elev.
ADDRESS: Meliadine Gold Project, NU.
PROJECT NO: E14103230-01.023
MOISTURE CONT. : 6.1%
DATE SAMPLED: Mar 30/17 **By:** TW/WW
CLIENT: Agnico Eagle Mines Ltd.
BULK REL DENSITY: n/a
ATTENTION: Mr. Duy Nguyen
BULK REL. DENSITY (SSD): n/a
APPARENT REL. DENSITY: n/a
ABSORPTION: n/a

PARTICLE SIZE	PERCENT PASSING
150	100
100	93
50	58
20	20
10	12
5	6



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PARTICLE SIZE ANALYSIS REPORT

PROJECT: Meliadine Dike Construction
ADDRESS: Meliadine Gold Project, NU.
PROJECT NO: E14103230-01.023
DATE SAMPLED: Apr 02/17 **By:** WW
CLIENT: Agnico Eagle Mines Ltd.
ATTENTION: Mr. Duy Nguyen

SAMPLE NO: SA11
SAMPLE DESCRIPTION: Type B1 - 150 mm minus
Sampled from stockpile
MOISTURE CONT. : 6.5%
BULK REL DENSITY: n/a
BULK REL. DENSITY (SSD): n/a
APPARENT REL. DENSITY: n/a
ABSORPTION: n/a

PARTICLE SIZE	PERCENT PASSING
150	100
100	90
50	46
20	16
10	9
5	6

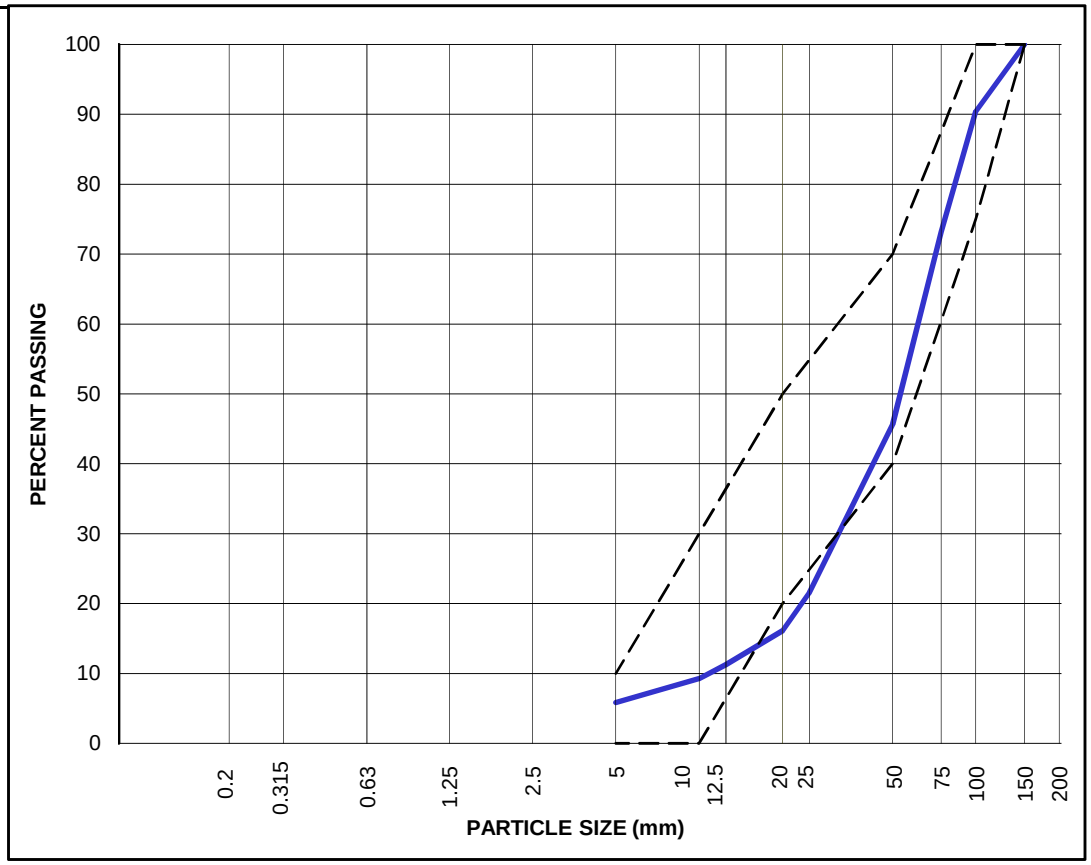

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Table E1.1: Moisture Content Results for Transition (150 mm minus) Material - Types B and B1

Sample No.	Date Tested	Moisture Content (%)	Sample Source
SA01	9-Nov-16	5.2	Sampled from Type B1 stockpile
SA02	9-Nov-16	4.3	Sampled from Type B1 stockpile
SA03	11-Nov-16	1.3	Sampled from Type B1 stockpile
SA04	13-Nov-16	2.8	Sampled from Type B1 stockpile
SA05	19-Dec-16	8.6	Sampled from Type B1 stockpile
SA06	1-Mar-17	8.1	Sampled from Type B stockpile
SA07	1-Mar-17	8.7	Sampled from Type B stockpile
SA08	2-Mar-17	7.2	Sampled from Type B stockpile
SA09	29-Mar-17	6.1	Sampled from Type B1 stockpile
SA10	30-Mar-17	6.1	Sampled from Type B1 stockpile
SA11	2-Apr-17	6.5	Sampled from Type B1 stockpile

Average Moisture Content	5.9%

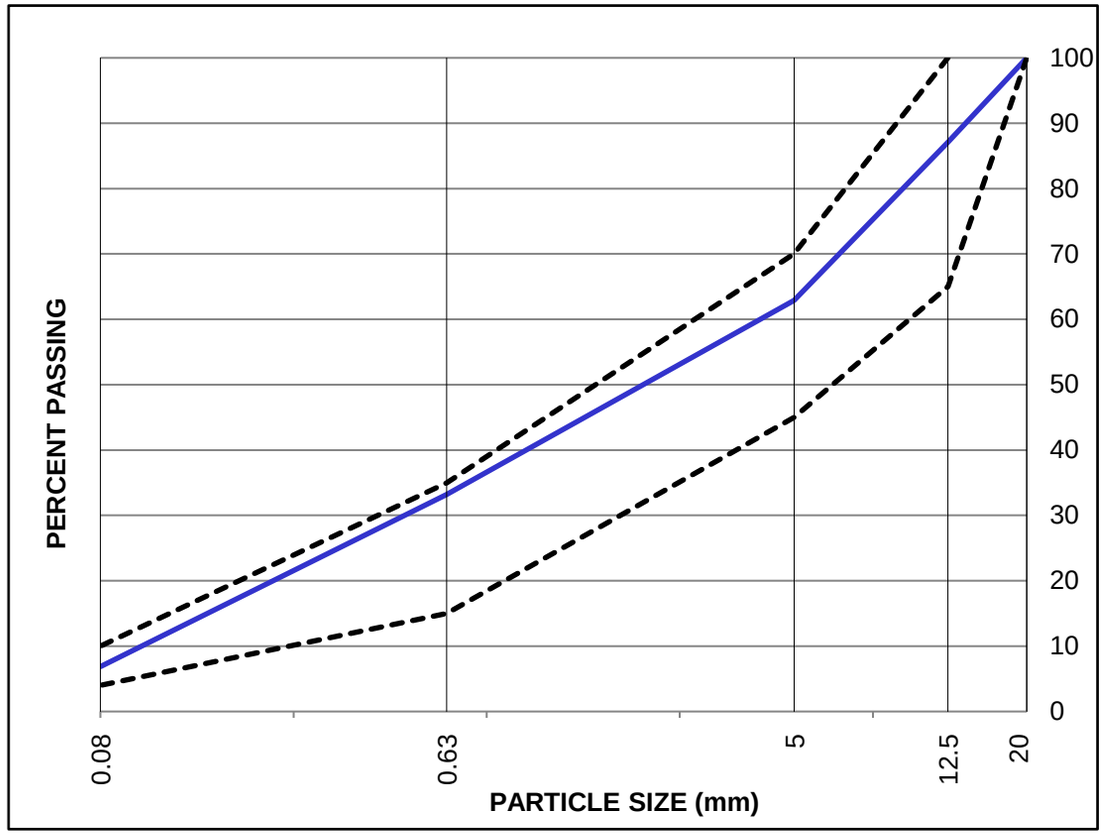
APPENDIX E2

TYPE C MATERIAL QA/QC TEST RESULTS

PARTICLE SIZE ANALYSIS REPORT

PROJECT:	DCP-1/DCP-5	**SAMPLE NO:**	SA01 to SA53
ADDRESS:	Meliadine	**SAMPLE DESCRIPTION:**	
PROJECT NO:	E14103230-01, Task 23	Type C (20 mm minus)	
UP TO DATE:	May 15/17 By: Tetra Tech	Overall Material Average, (%)	
CLIENT:	Agnico Eagle	**NAT. MOISTURE CONT (%).:**	8.2%
		Test Req'ments = 1 sample/500 m3 production	
ATTENTION:	Duy Nguyen		

PARTICLE SIZE, mm	PERCENT PASSING
20	100.0
12.5	87.1
5	62.9
0.63	33.2
0.08	6.9



Remarks: All samples taken from Meliadine Esker.

Type C gradation specs as per Geotechnical Specifications Rev 1 Table 3 (Tetra Tech, November 9, 2016)

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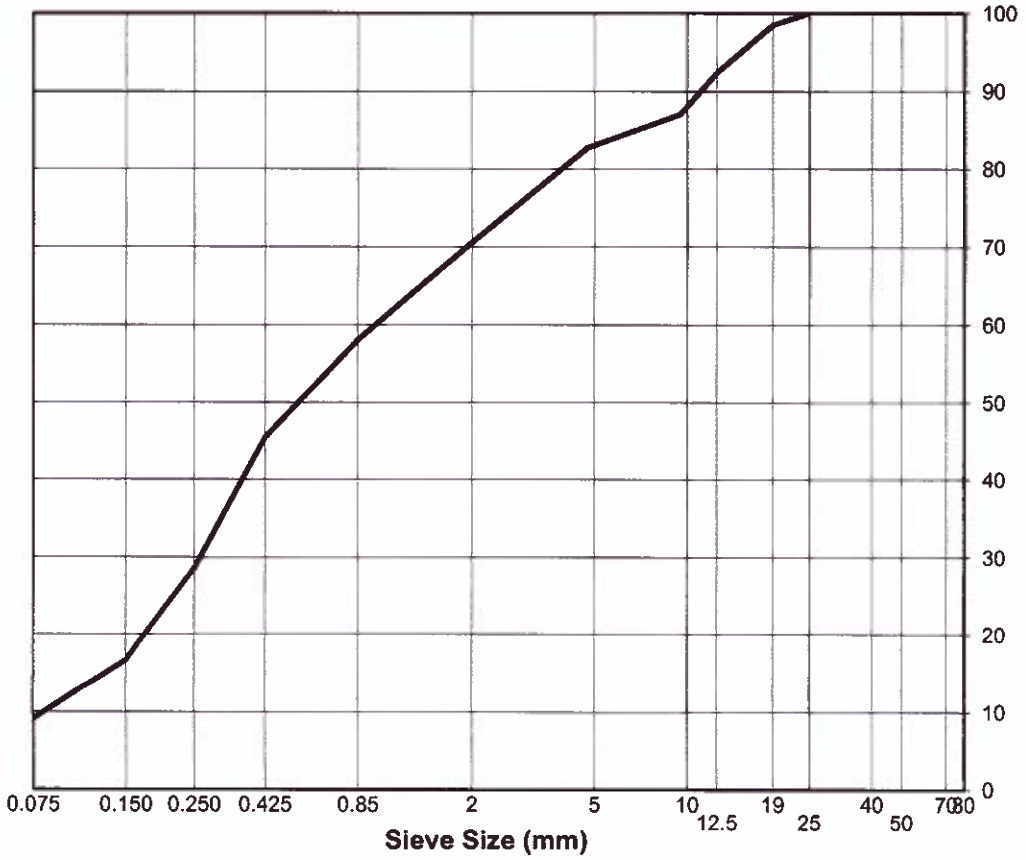
SIEVE ANALYSIS REPORT

Washed Sieve: ASTM C136 and C117

Project No.:	Meliadine Gold Project	Sample No.:	Type C Sample No 1
Project:	E14103230-01.023	Date Received:	October 26, 2016
Client:	Agnico Eagle Mines Ltd	Sampled by:	Dike QC Team
Attention:		Date Tested:	October 26, 2016
Email:		Tested by:	JH Office: Edmonton
Description:	SAND, some gravel, trace silt, brown	Moisture Content (as received):	3.0%
		No. Crushed Faces:	Two (2) or Three (3)
Source:	Meliadine Project, Dike Construction	By Particle Mass:	
Supplier:			
Sample Location:	Type C Stockpile		
Specification:			

Sieve Size	Percent Passing
25	100
19	98
12.5	92
10	87
5	83
2.0	71
0.85	58
0.425	45
0.250	29
0.150	17
0.075	9.1



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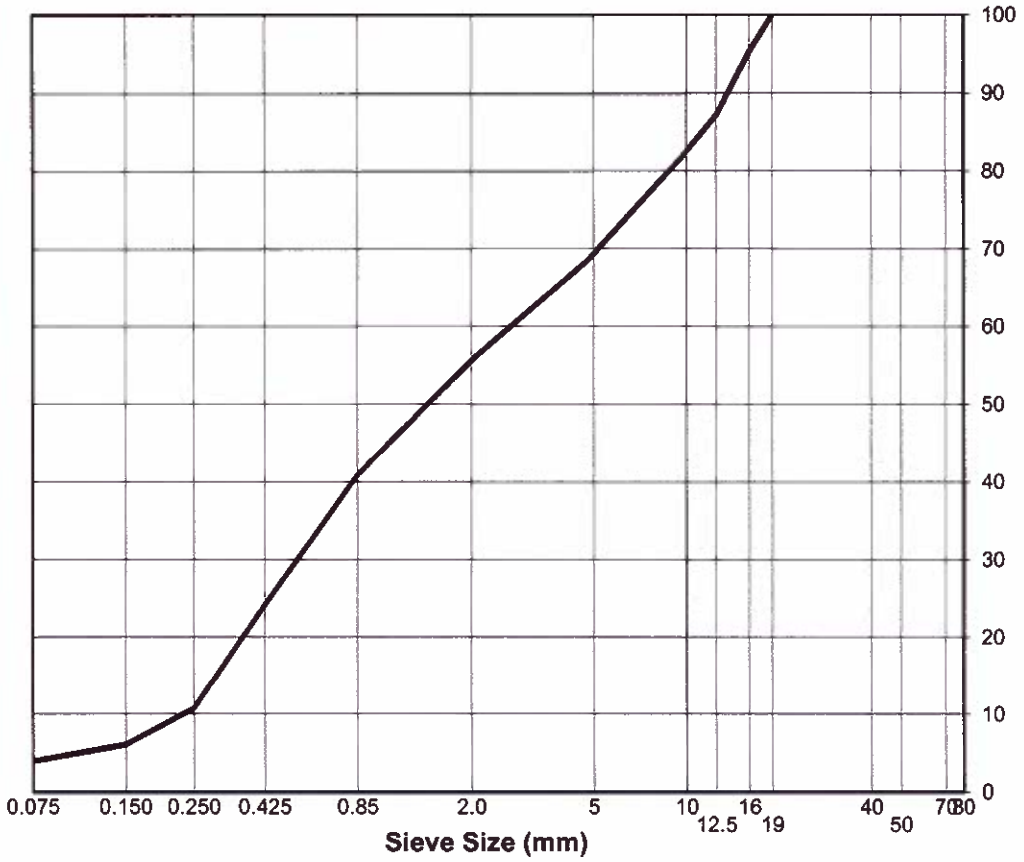
TETRA TECH

SIEVE ANALYSIS REPORT

Washed Sieve: ASTM C136 and C117

Project No.:	Meliadine Gold Project	Sample No.:	Type C Sample No 2
Project:	E14103230-01.023	Date Received:	November 21, 2016
Client:	Agnico Eagle Mines Ltd	Sampled by:	Dike QC Team
Attention:		Date Tested:	November 23, 2016
Email:		Tested by:	MC Office: Edmonton
Description:	SAND, gravelly, trace silt, grey	Moisture Content (as received):	2.1%
		No. Crushed Faces:	Two (2) or Three (3)
Source:	Meliadine Project, Dike Construction	By Particle Mass:	
Supplier:			
Sample Location:	Type C Stockpile		
Specification:			

Sieve Size	Percent Passing
19	100
16	95
12.5	87
10	81
5	68
2.0	56
0.85	41
0.425	24
0.250	11
0.150	6
0.075	3.9



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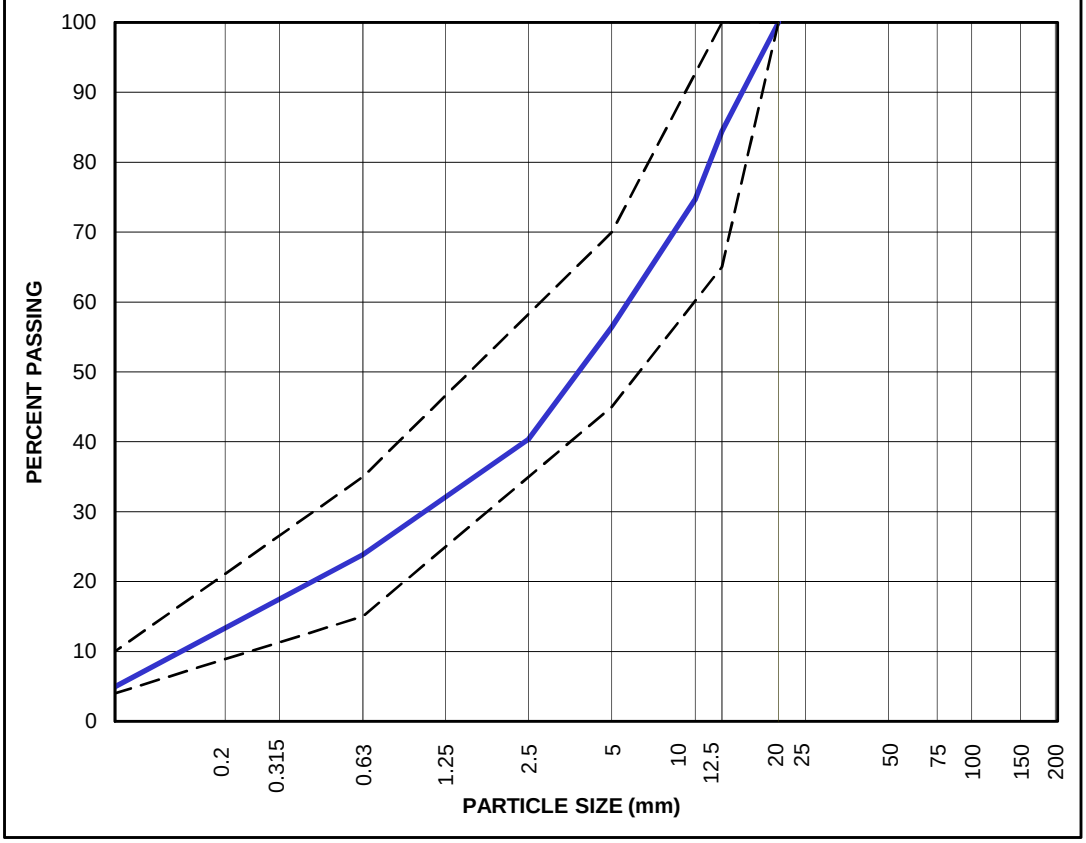
TETRA TECH

PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA02
		SAMPLE DESCRIPTION:	20 mm minus sampled from belt
ADDRESS:	Meliadine Mine		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	7.1%
DATE SAMPLED:	Oct 22/16 **By:** TW		
CLIENT:	Agnico Eagle	**BULK REL DENSITY:**	n/a
ATTENTION:		**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	84
10	75
5	56
2.5	40
0.63	24
0.08	5



Remarks: 20 mm minus particle size distribution limits shown

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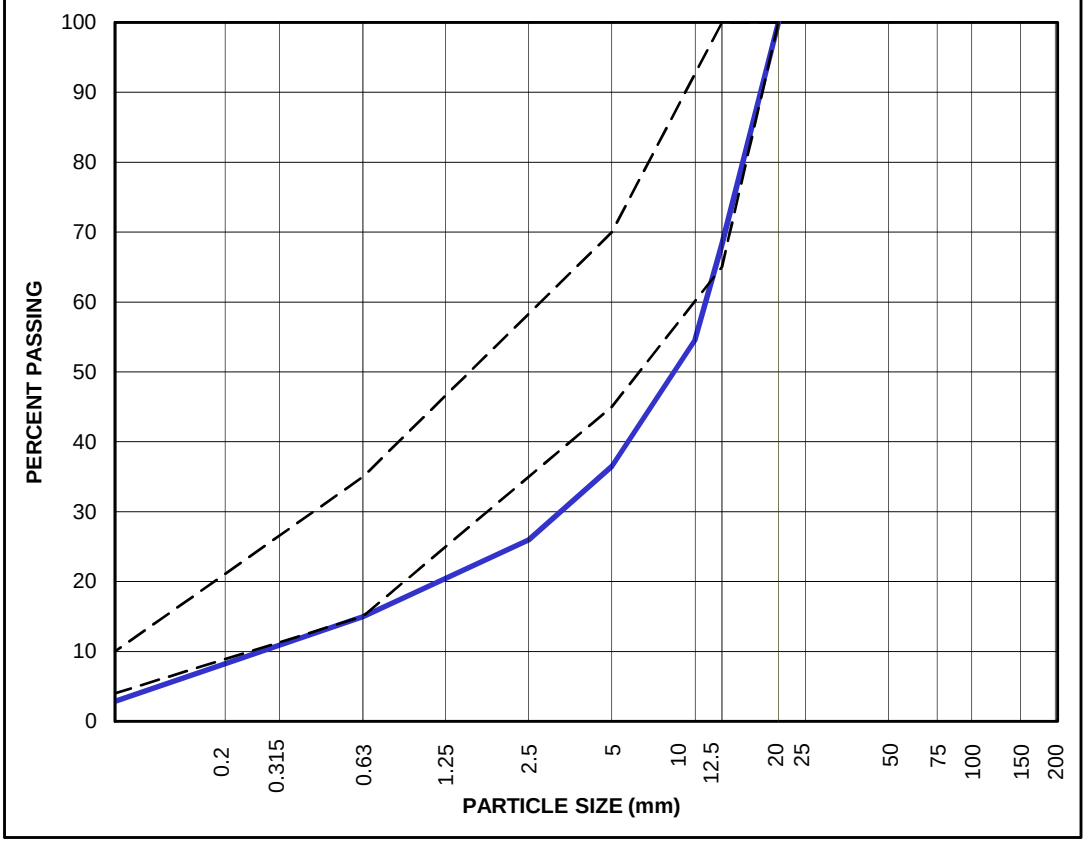
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA03
		SAMPLE DESCRIPTION:	20 mm minus sampled from belt
ADDRESS:	Meliadine Mine		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	5.4%
DATE SAMPLED:	Oct 22/16 **By:** TW		
CLIENT:	Agnico Eagle	**BULK REL DENSITY:**	n/a
ATTENTION:		**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	68
10	55
5	36
2.5	26
0.63	15
0.08	3



Remarks: 20 mm minus particle size distribution limits shown

Reviewed by: _____ P.Eng.

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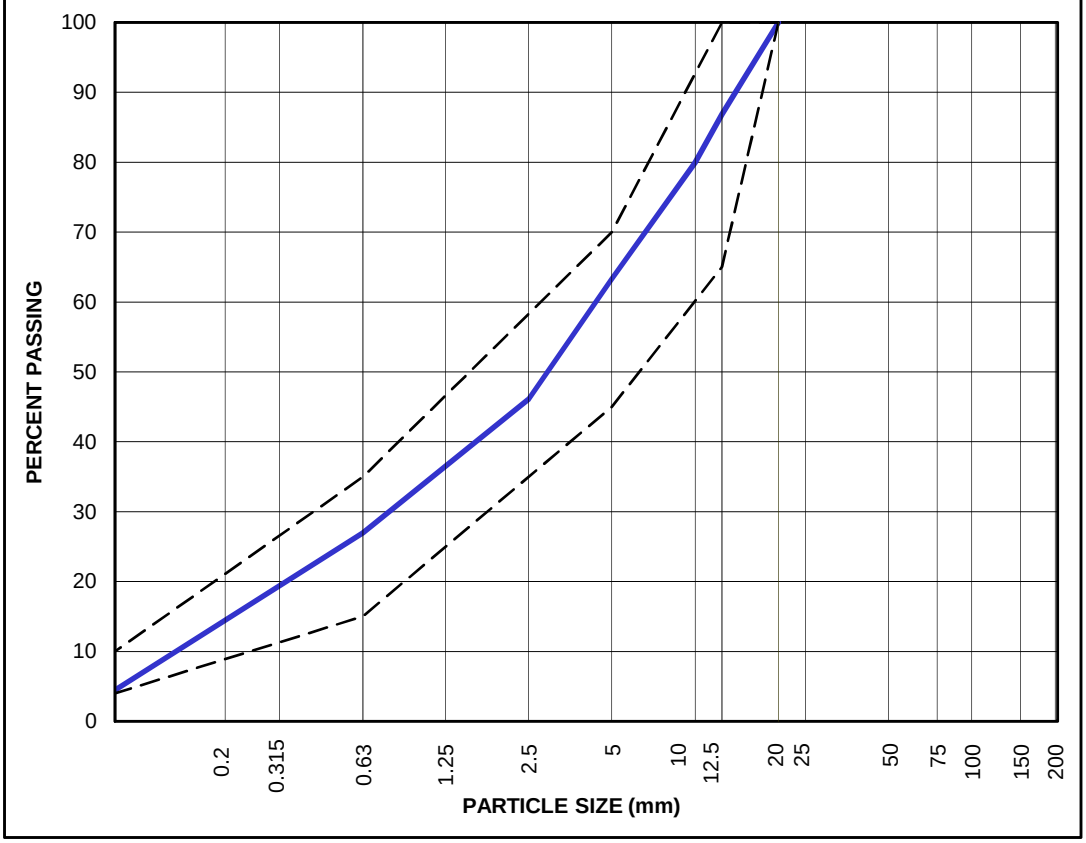
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA04
		SAMPLE DESCRIPTION:	20 mm minus sampled from belt
ADDRESS:	Meliadine Mine		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	8.7%
DATE SAMPLED:	Oct 22/16 **By:** TW		
CLIENT:	Agnico Eagle	**BULK REL DENSITY:**	n/a
ATTENTION:		**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	87
10	80
5	63
2.5	46
0.63	27
0.08	4



Remarks: 20 mm minus particle size distribution limits shown

Reviewed by: _____ P.Eng.

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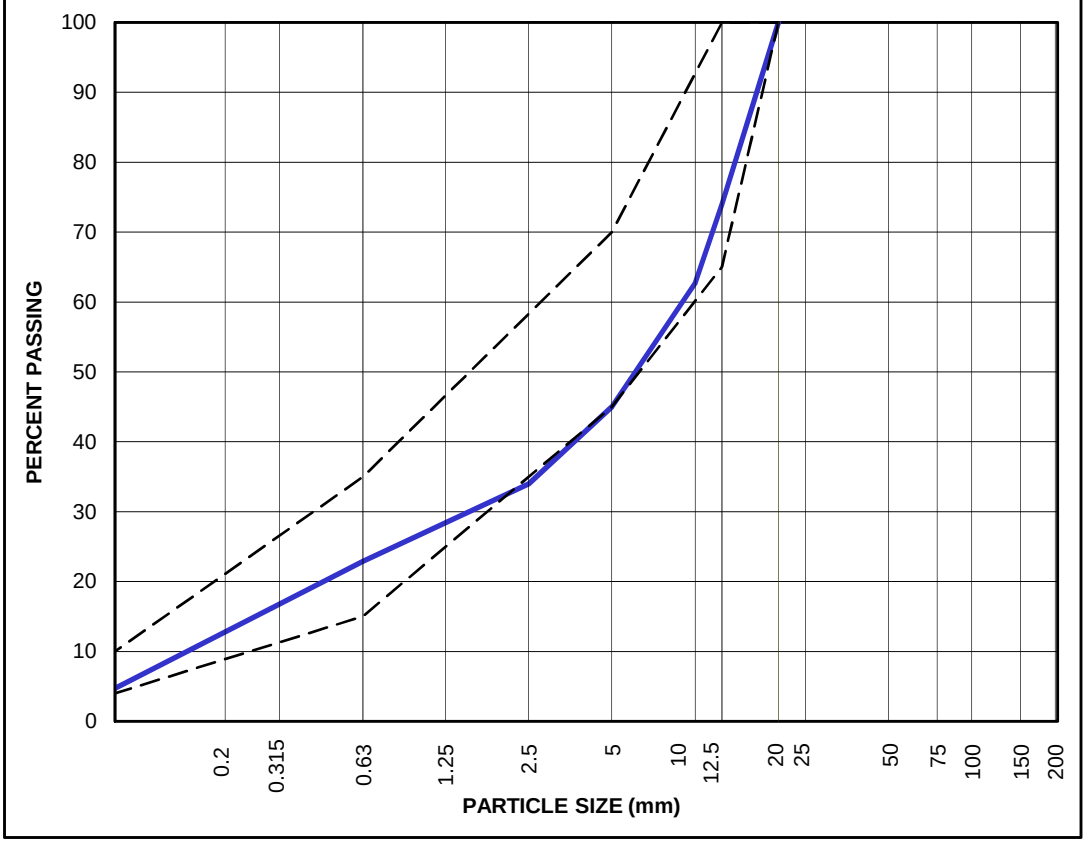
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA05
		SAMPLE DESCRIPTION:	20 mm minus sampled from belt
ADDRESS:	Meliadine Mine		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	6.0%
DATE SAMPLED:	Oct 22/16 **By:** TW		
CLIENT:	Agnico Eagle	**BULK REL DENSITY:**	n/a
ATTENTION:		**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	74
10	63
5	45
2.5	34
0.63	23
0.08	5



Remarks: 20 mm minus particle size distribution limits shown

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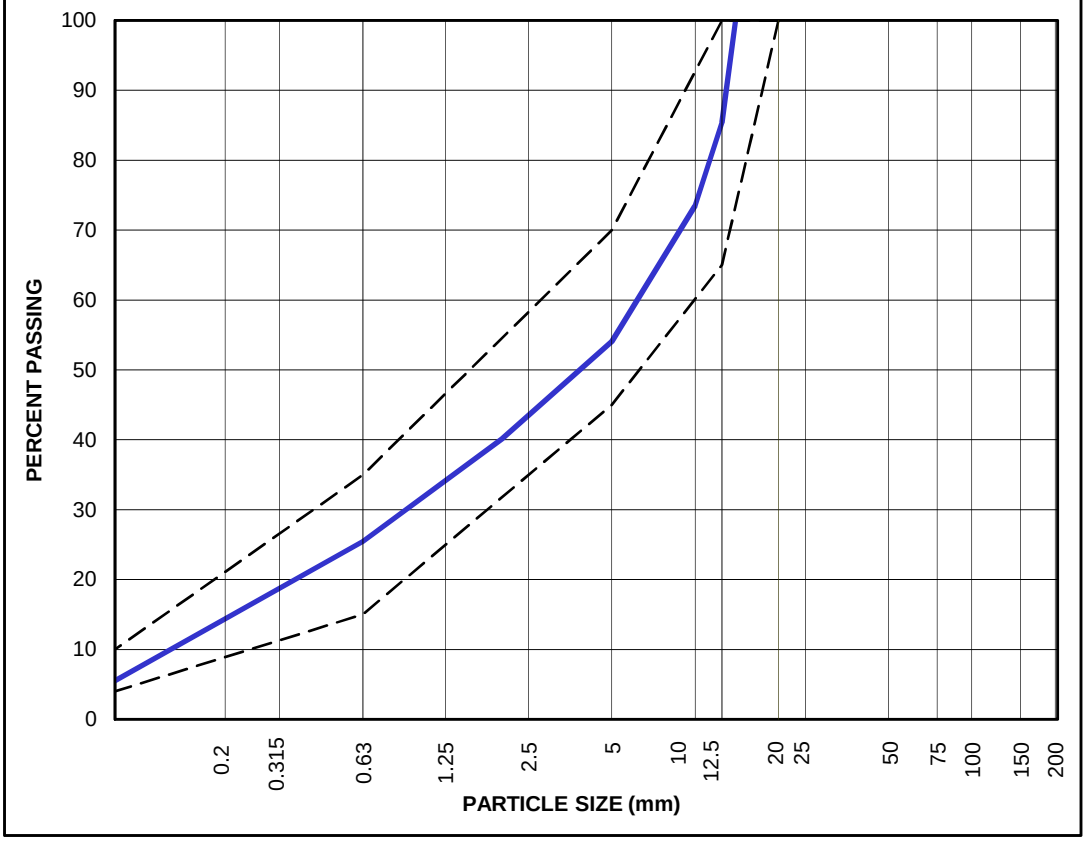
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA06
		SAMPLE DESCRIPTION:	20 mm minus sampled from belt
ADDRESS:	Meliadine Mine		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	5.5%
DATE SAMPLED:	Oct 24/16 **By:** TW		
CLIENT:	Agnico Eagle	**BULK REL DENSITY:**	n/a
ATTENTION:		**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
12.5	85
10	74
5	54
2	40
0.63	25
0.08	6



Remarks: 20 mm minus particle size distribution limits shown

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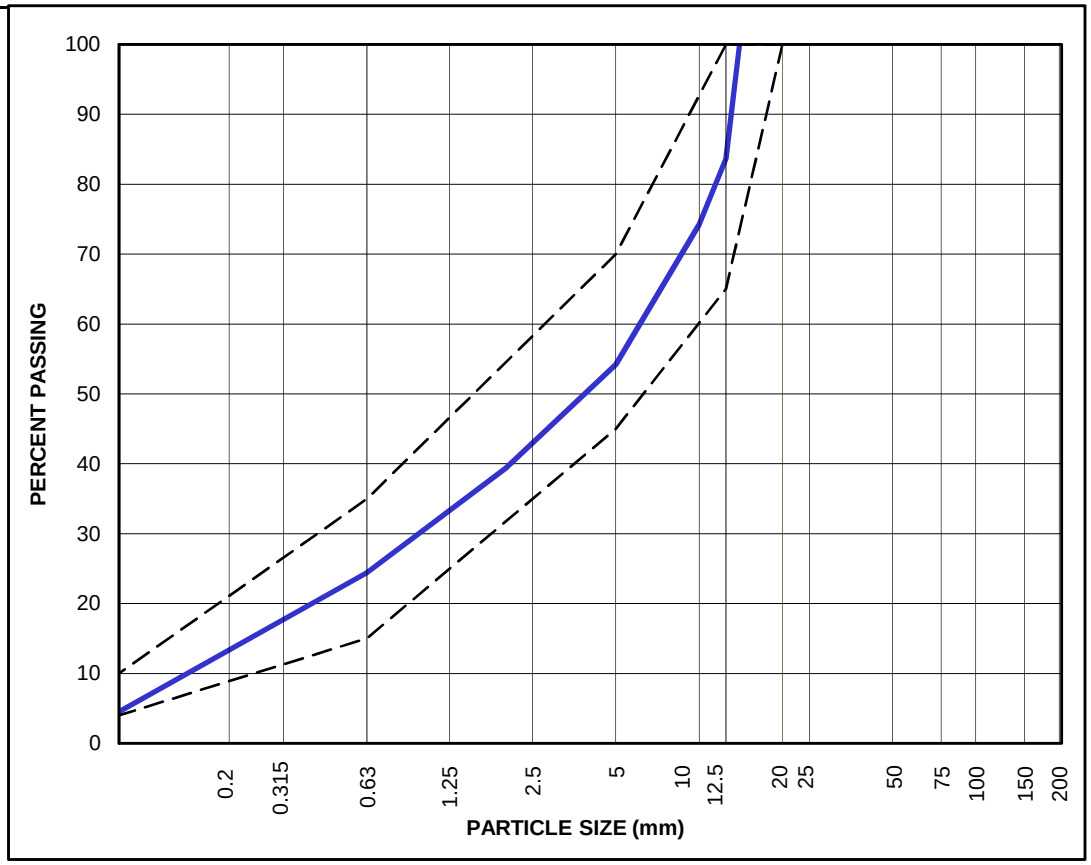
PARTICLE SIZE ANALYSIS REPORT

PROJECT: Meliadine Dike Construction
ADDRESS: Meliadine Mine
PROJECT NO: E14103230-01
DATE SAMPLED: Oct 24/16 **By:** TW
CLIENT: Agnico Eagle
ATTENTION:

SAMPLE NO: SA07
SAMPLE DESCRIPTION: 20 mm minus sampled from belt
MOISTURE CONT. : 6.3%
BULK REL DENSITY: n/a
BULK REL. DENSITY (SSD): n/a
APPARENT REL. DENSITY: n/a
ABSORPTION: n/a

PARTICLE SIZE	PERCENT PASSING
12.5	84
10	74
5	54
2	39
0.63	24
0.08	5



Remarks: 20 mm minus particle size distribution limits shown

Reviewed by: _____ P.Eng.

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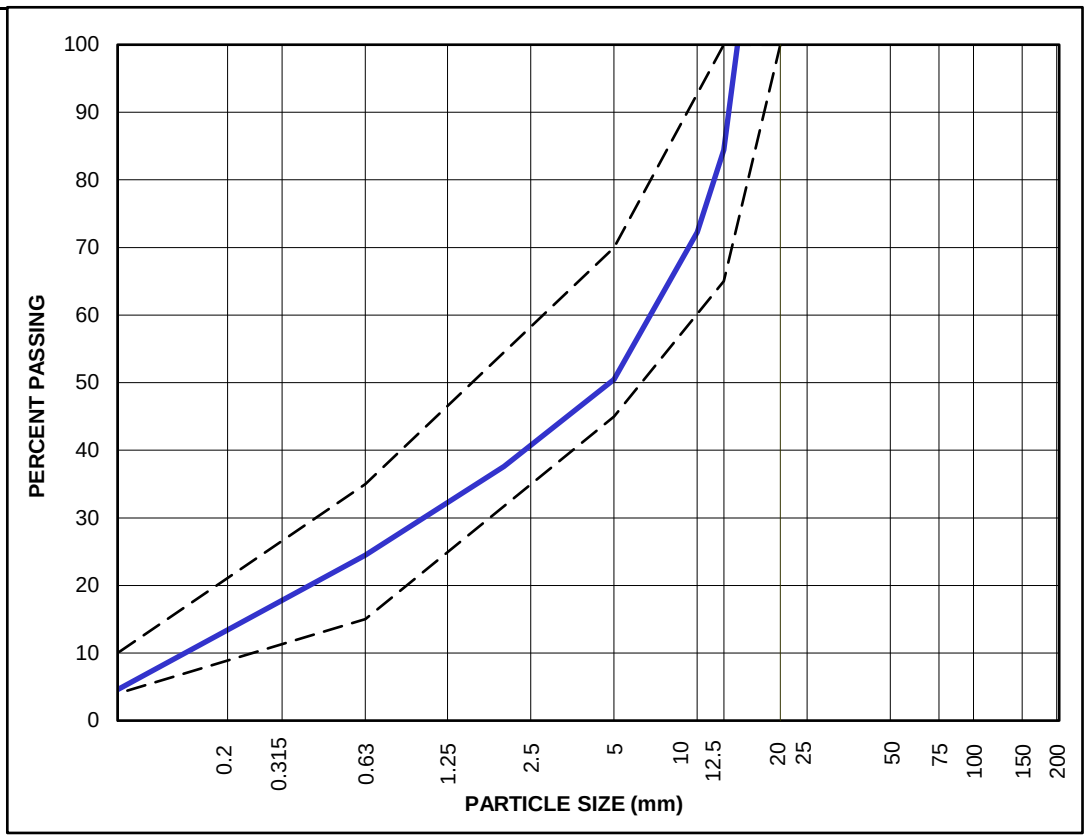
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA08
		SAMPLE DESCRIPTION:	20 mm minus sampled from belt
ADDRESS:	Meliadine Mine		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	5.0%
DATE SAMPLED:	Oct 25/16 **By:** TW		
CLIENT:	Agnico Eagle	**BULK REL DENSITY:**	n/a
ATTENTION:		**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
12.5	84
10	72
5	50
2	38
0.63	24
0.08	5



Remarks: 20 mm minus particle size distribution limits shown

Reviewed by: _____ P.Geo.

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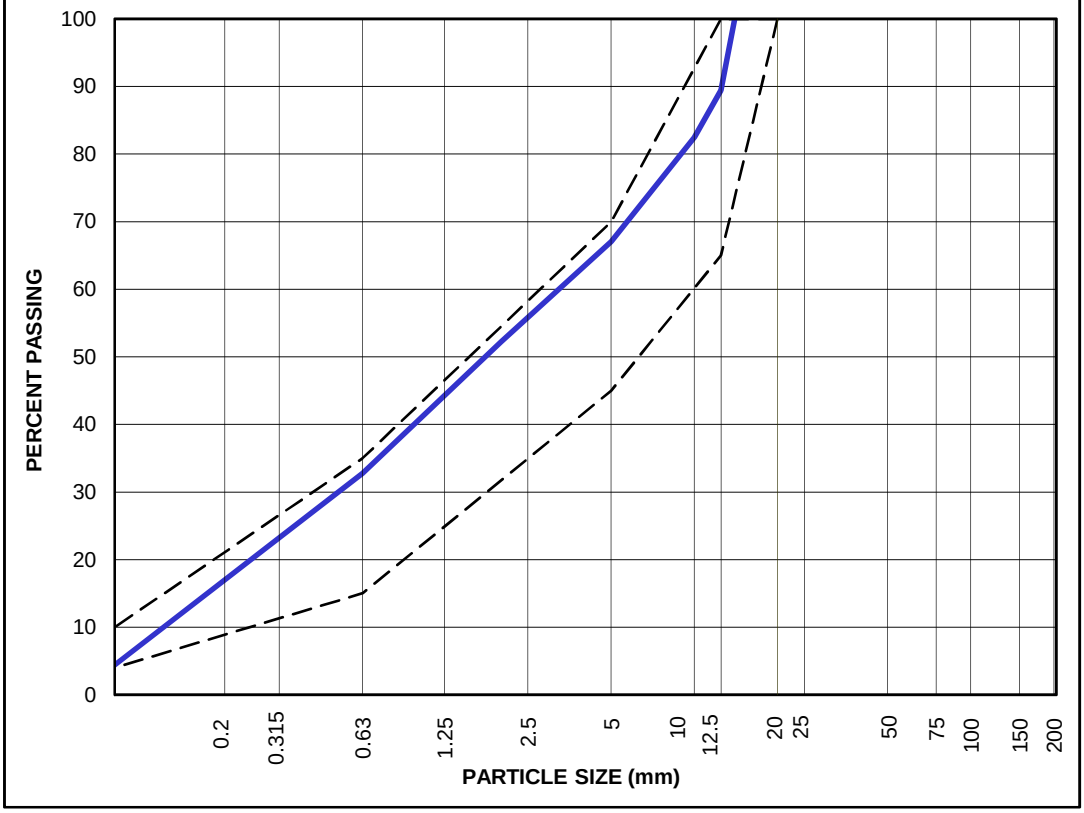
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA09
		SAMPLE DESCRIPTION:	20 mm minus sampled from belt
ADDRESS:	Meliadine Mine		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	8.4%
DATE SAMPLED:	Oct 26/16 **By:** TW		
CLIENT:	Agnico Eagle	**BULK REL DENSITY:**	n/a
ATTENTION:		**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
12.5	89
10	83
5	67
2	52
0.63	33
0.08	4



Remarks: 20 mm minus particle size distribution limits shown

Reviewed by: _____ P.Eng.

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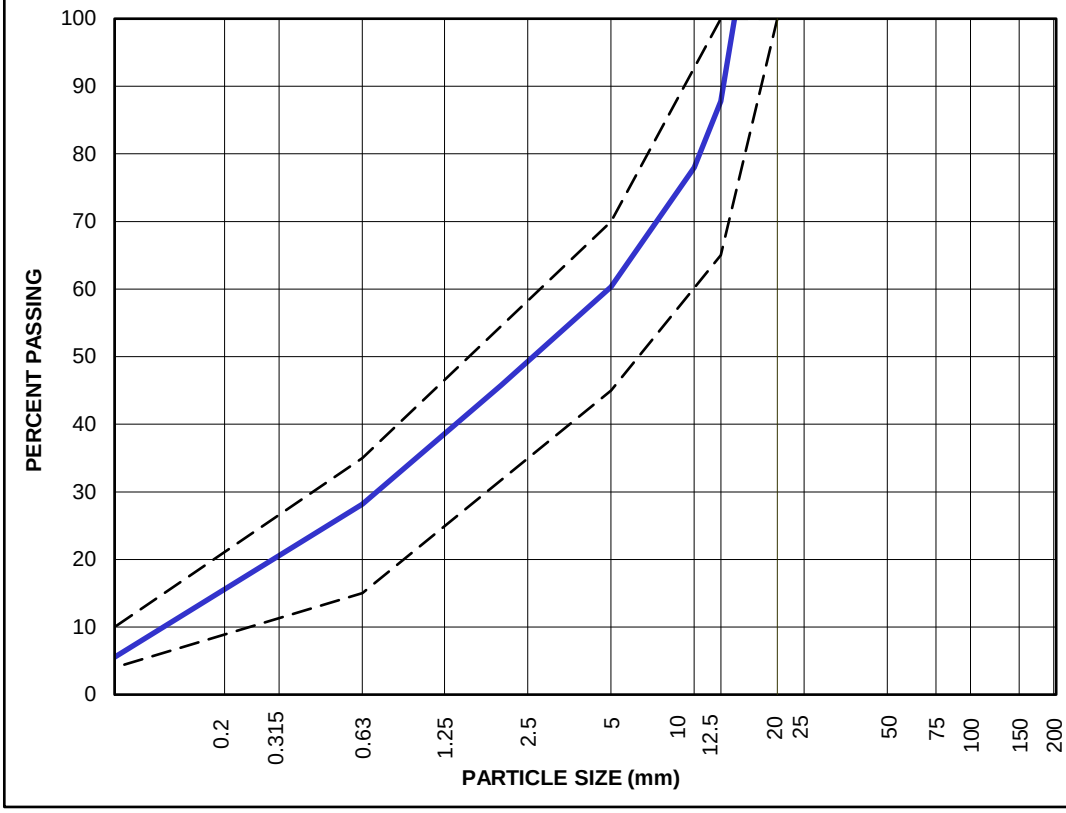
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA10
		SAMPLE DESCRIPTION:	20 mm minus sampled from belt
ADDRESS:	Meliadine Mine		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	7.1%
DATE SAMPLED:	Oct 27/16 **By:** TW		
CLIENT:	Agnico Eagle	**BULK REL DENSITY:**	n/a
ATTENTION:		**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
12.5	88
10	78
5	60
2	46
0.63	28
0.08	6



Remarks: 20 mm minus particle size distribution limits shown

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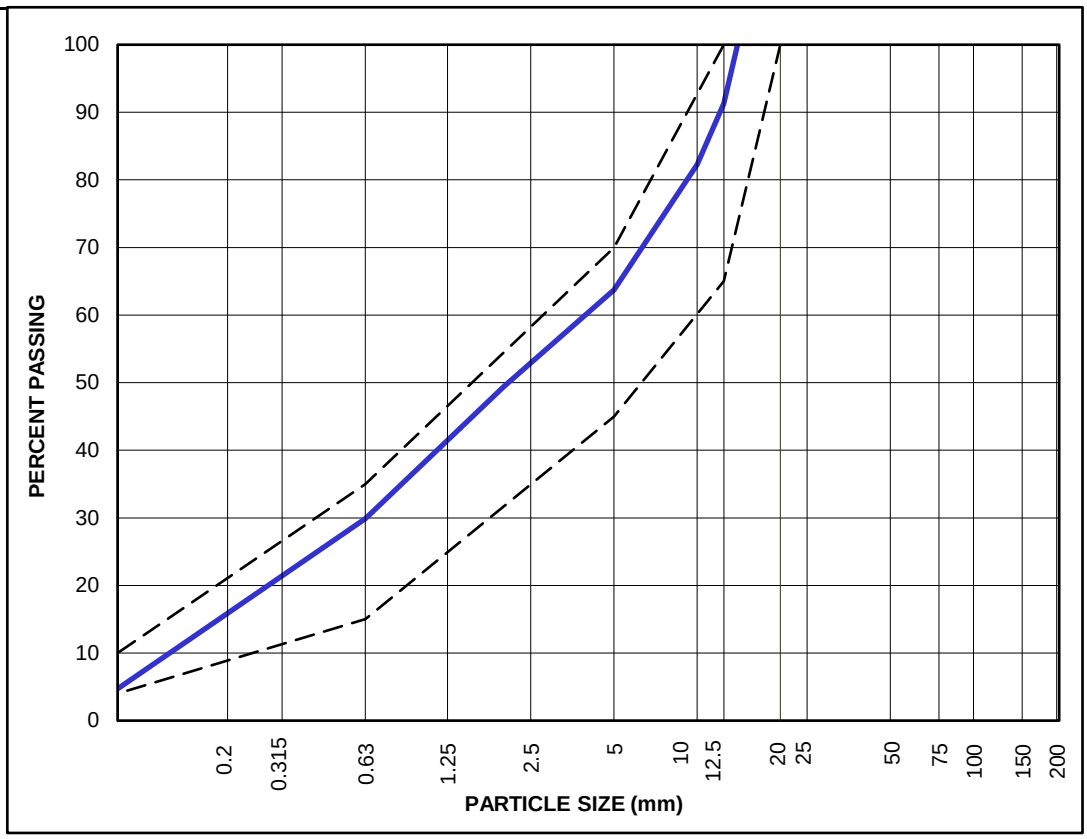
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA11
		SAMPLE DESCRIPTION:	20 mm minus sampled from belt
ADDRESS:	Meliadine Mine		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	6.1%
DATE SAMPLED:	Oct 29/16 **By:** TW		
CLIENT:	Agnico Eagle	**BULK REL DENSITY:**	n/a
ATTENTION:		**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
12.5	91
10	82
5	64
2	49
0.63	30
0.08	5



Remarks: 20 mm minus particle size distribution limits shown

Reviewed by: _____ P.Eng.

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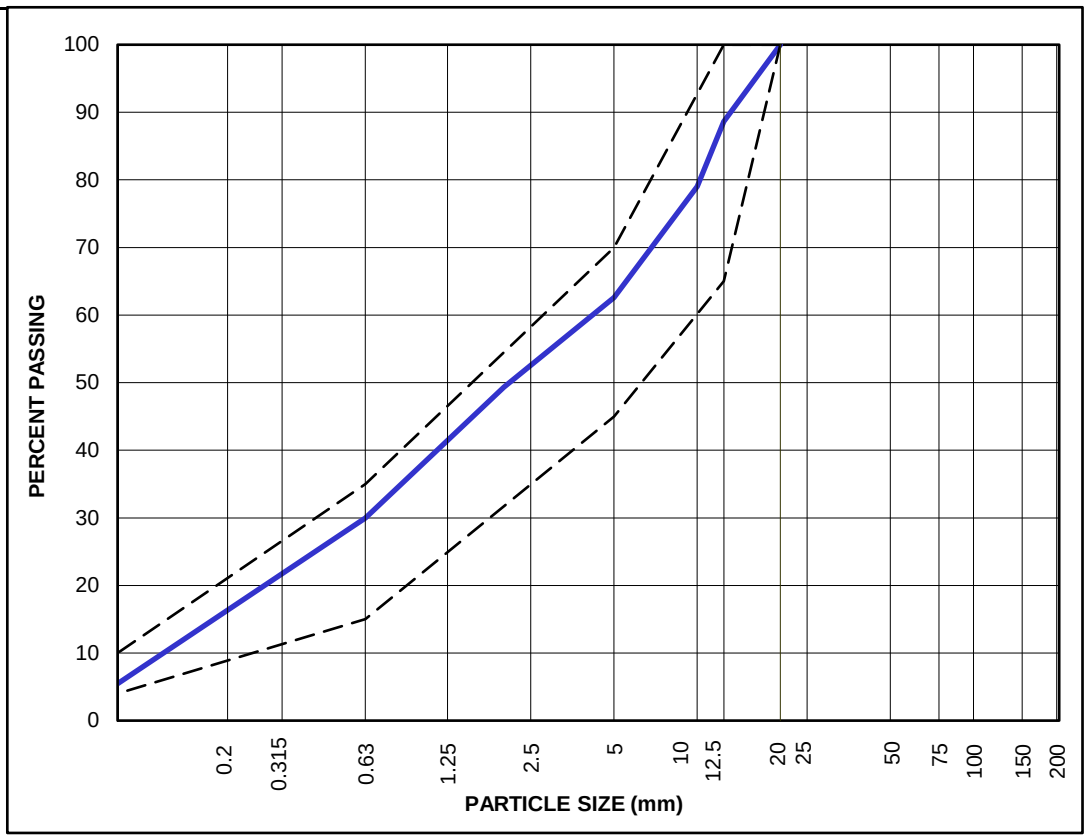
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA12
		SAMPLE DESCRIPTION:	20 mm minus sampled from belt
ADDRESS:	Meliadine Mine		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	7.6%
DATE SAMPLED:	Nov 01/16 **By:** TW		
CLIENT:	Agnico Eagle	**BULK REL DENSITY:**	n/a
ATTENTION:		**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	89
10	79
5	63
2	49
0.63	30
0.08	5



Remarks: 20 mm minus particle size distribution limits shown

Reviewed by: _____ P.Eng.

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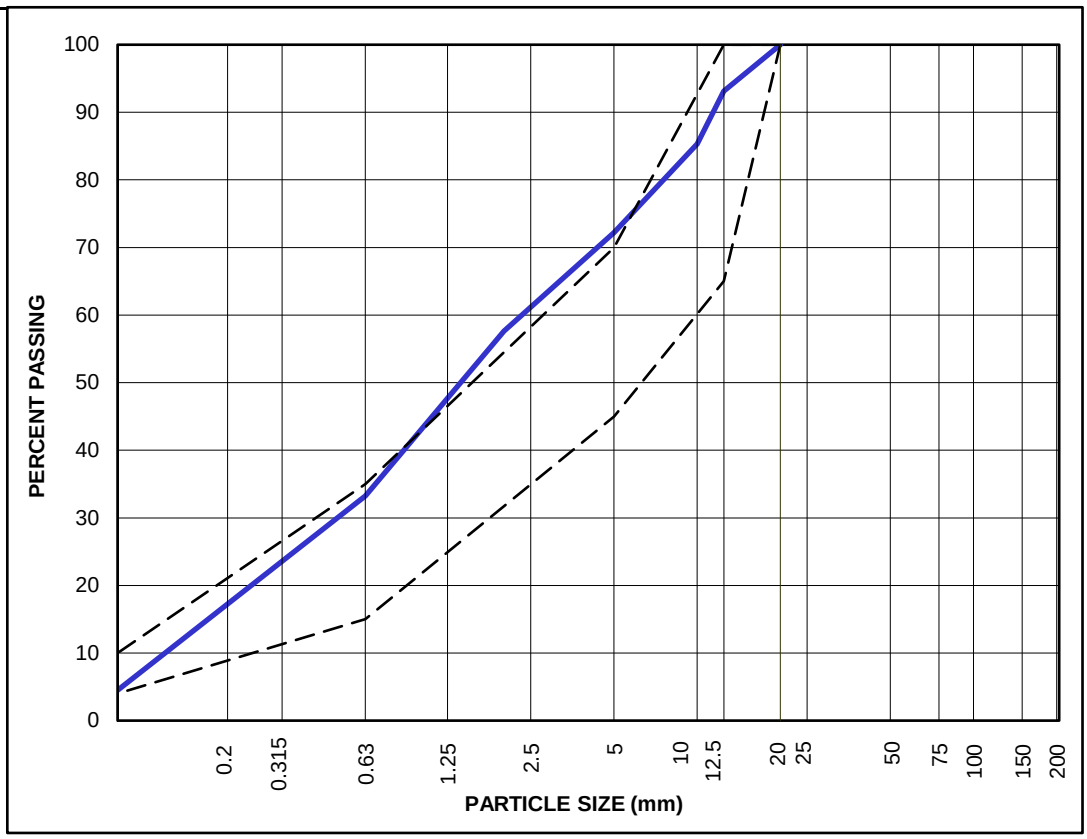
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA13
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	11.0%
DATE SAMPLED:	Nov 02/16 **By:** TW		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	93
10	85
5	72
2	58
0.63	33
0.08	4



Remarks: 20 mm minus particle size distribution limits shown

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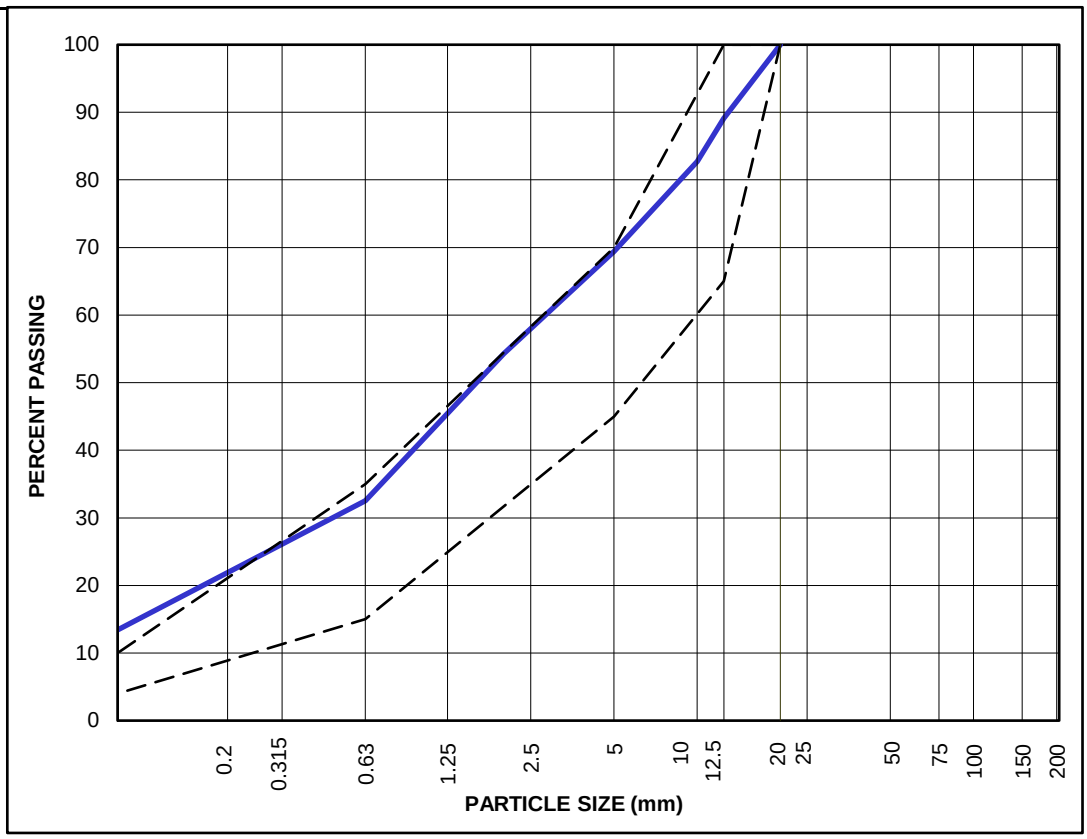
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA14
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	5.3%
DATE SAMPLED:	Nov 03/16 By: TW		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	89
10	83
5	69
2	54
0.63	33
0.08	13



Remarks: 20 mm minus particle size distribution limits shown

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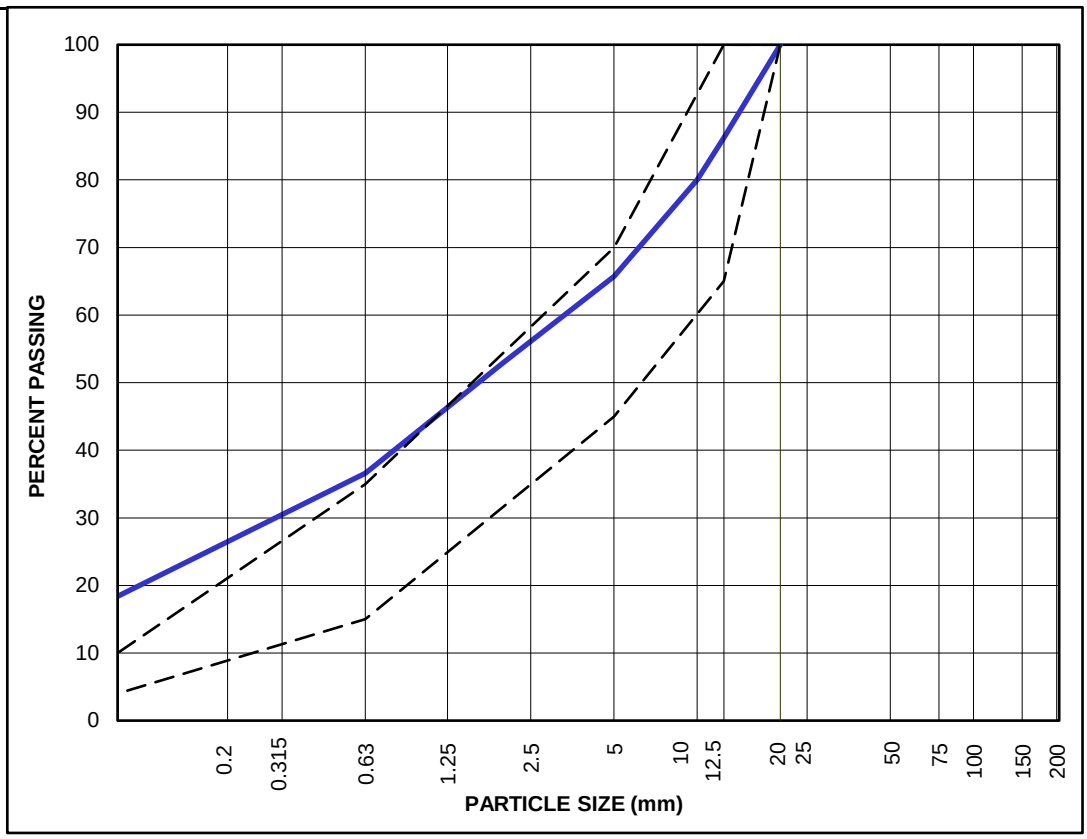
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA15
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	4.2%
DATE SAMPLED:	Nov 05/16 By: TW		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	86
10	80
5	66
2	53
0.63	37
0.08	18



Remarks: 20 mm minus particle size distribution limits shown

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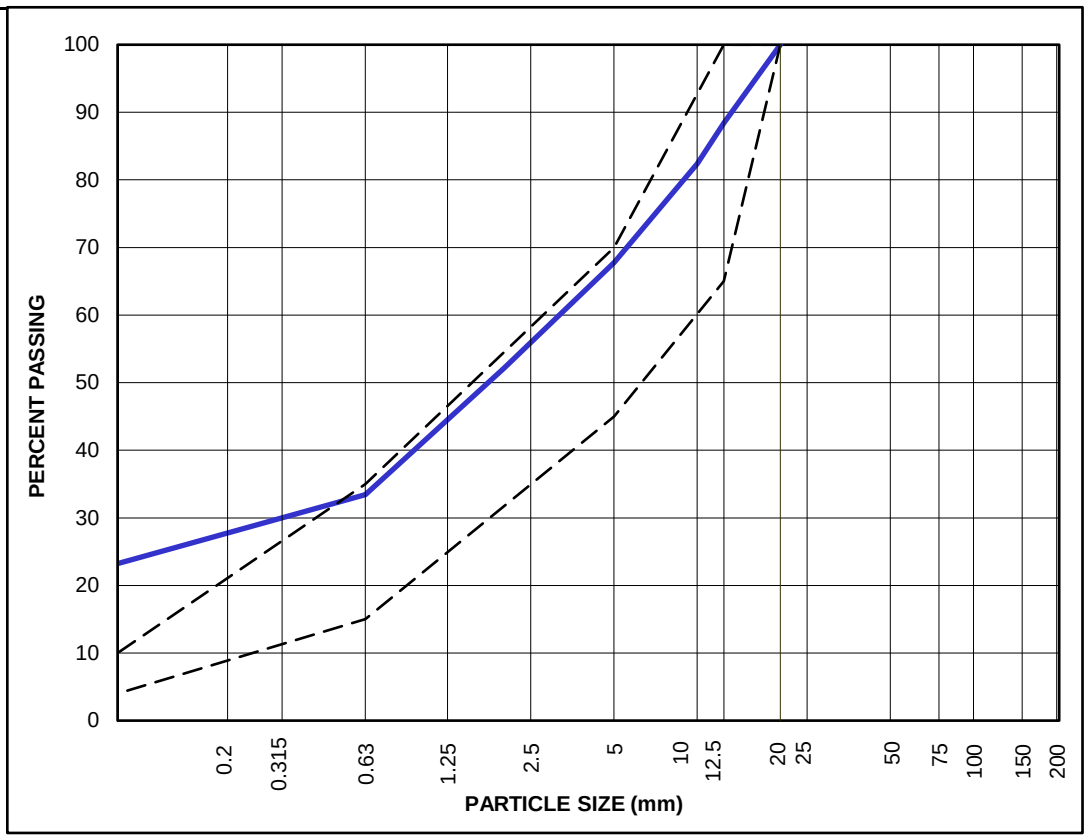
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA16
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	4.9%
DATE SAMPLED:	Nov 06/16 By: TW		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	88
10	82
5	68
2	52
0.63	33
0.08	23



Remarks: 20 mm minus particle size distribution limits shown

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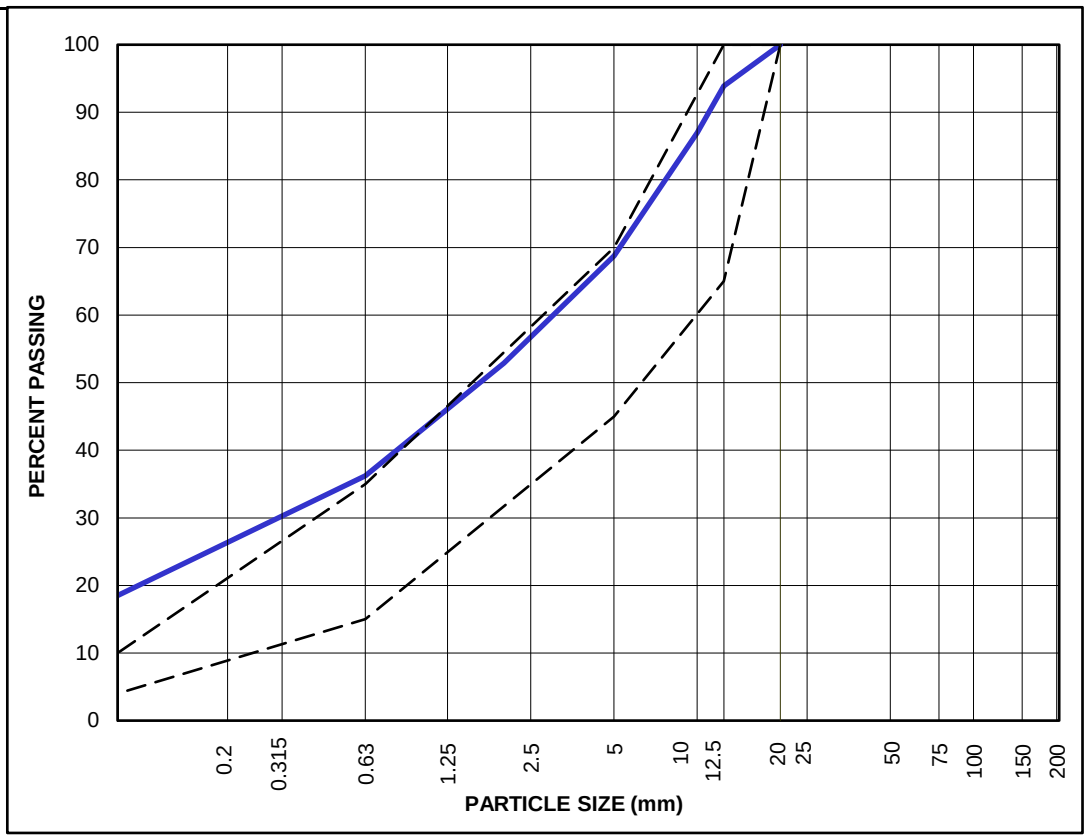
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA17
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	8.0%
DATE SAMPLED:	Nov 07/16 By: TW		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	94
10	87
5	69
2	53
0.63	36
0.08	19



Remarks: 20 mm minus particle size distribution limits shown

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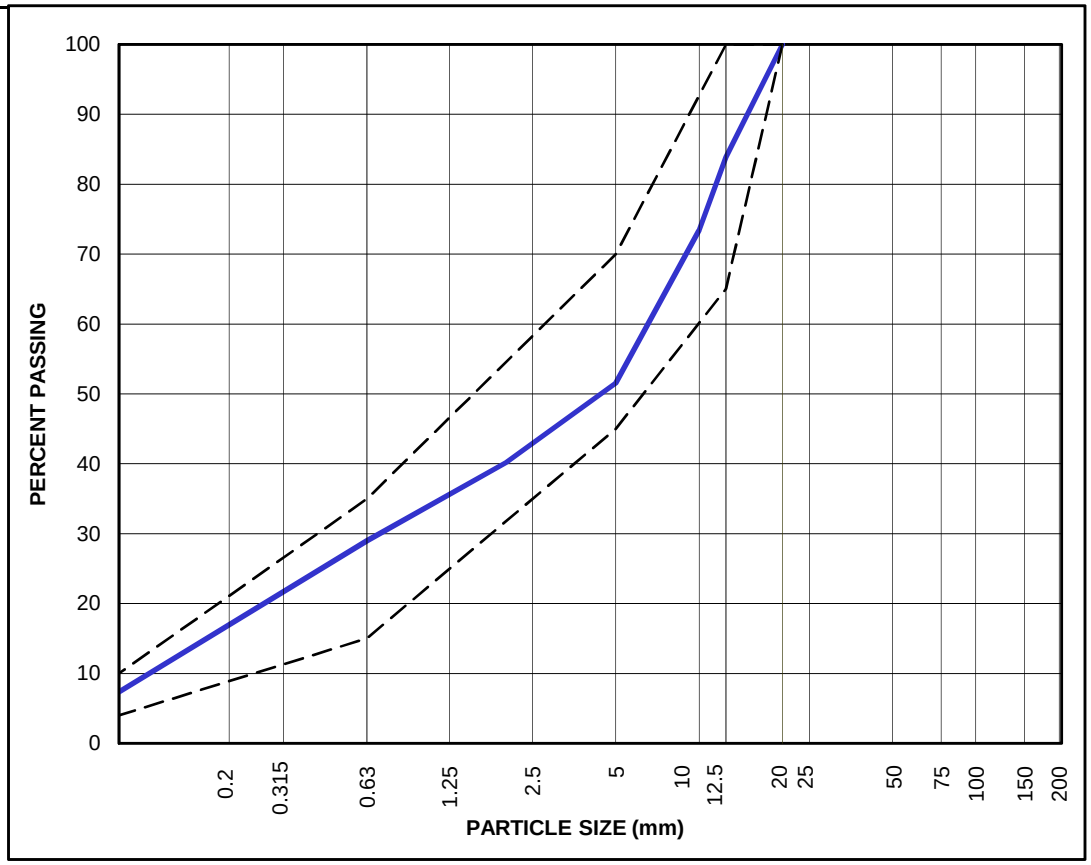
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA18
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	4.5%
DATE SAMPLED:	Nov 08/16 **By:** TW		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	84
10	73
5	52
2	40
0.63	29
0.08	7



Remarks: 20 mm minus particle size distribution limits shown

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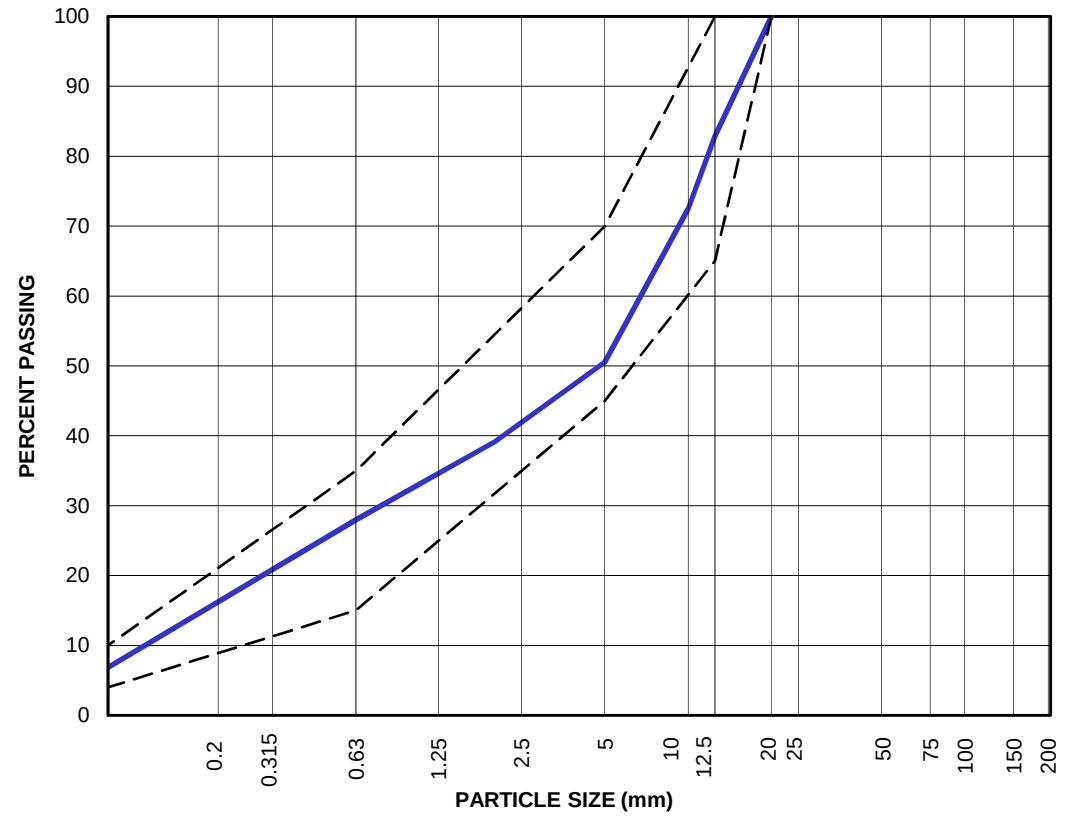
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA19
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	5.4%
DATE SAMPLED:	Nov 09/16 **By:** TW		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	83
10	72
5	51
2	39
0.63	28
0.08	7



Remarks: 20 mm minus particle size distribution limits shown

Reviewed by: _____ P.Eng.

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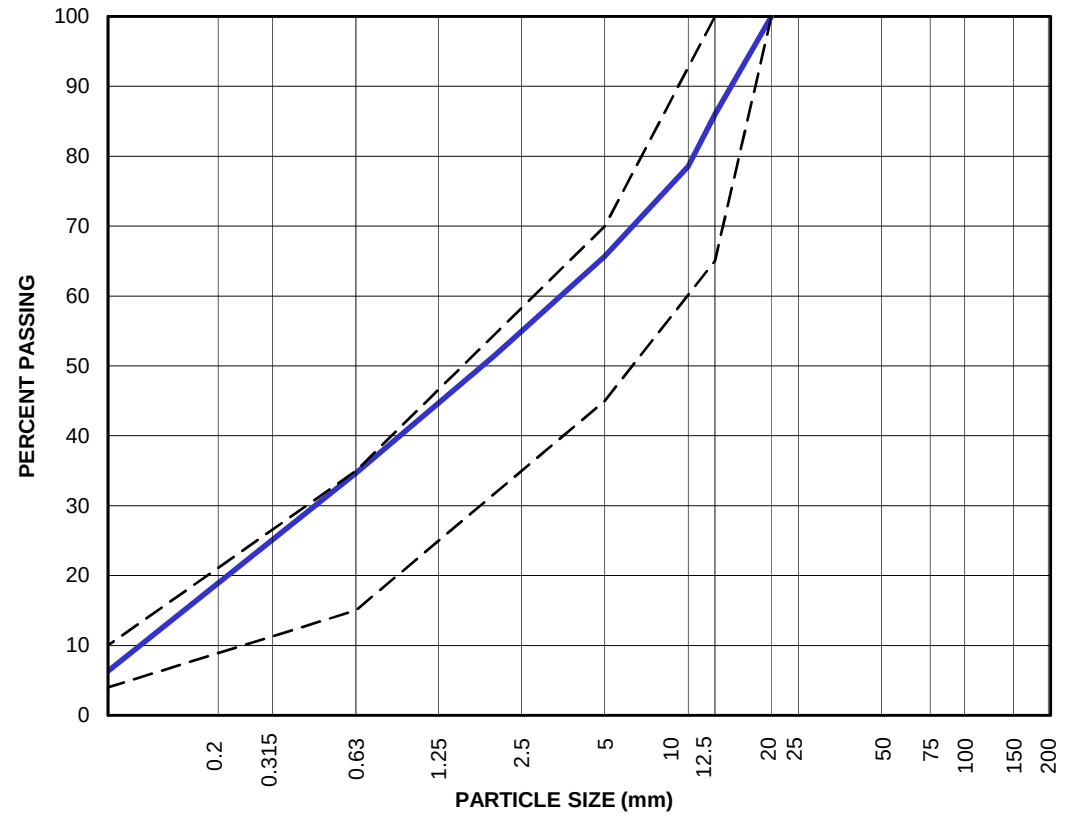
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA20
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	9.4%
DATE SAMPLED:	Nov 10/16 **By:** TW		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	86
10	79
5	66
2	51
0.63	35
0.08	6



Remarks: 20 mm minus particle size distribution limits shown

Reviewed by: _____ P.Eng.

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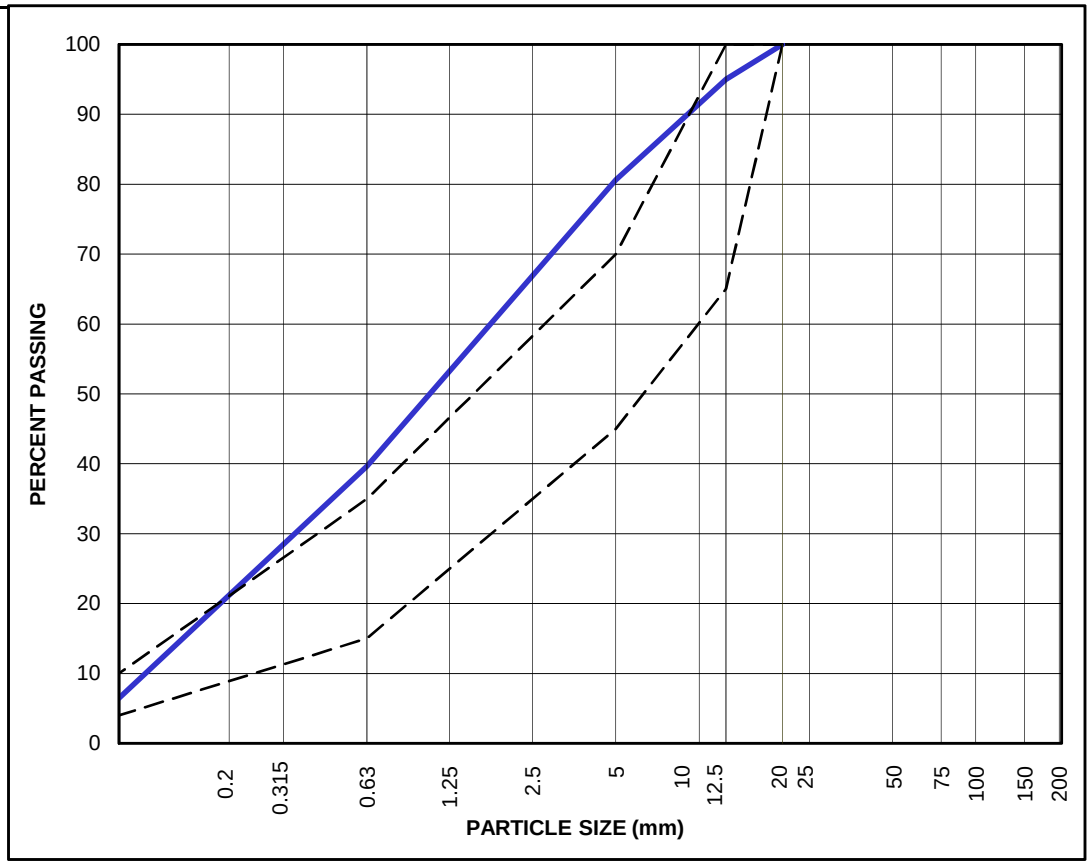
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA21
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	10.0%
DATE SAMPLED:	Nov 12/16 **By:** IM		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	95
5	81
0.63	40
0.08	6



Remarks:

Reviewed by: _____ P.Eng.

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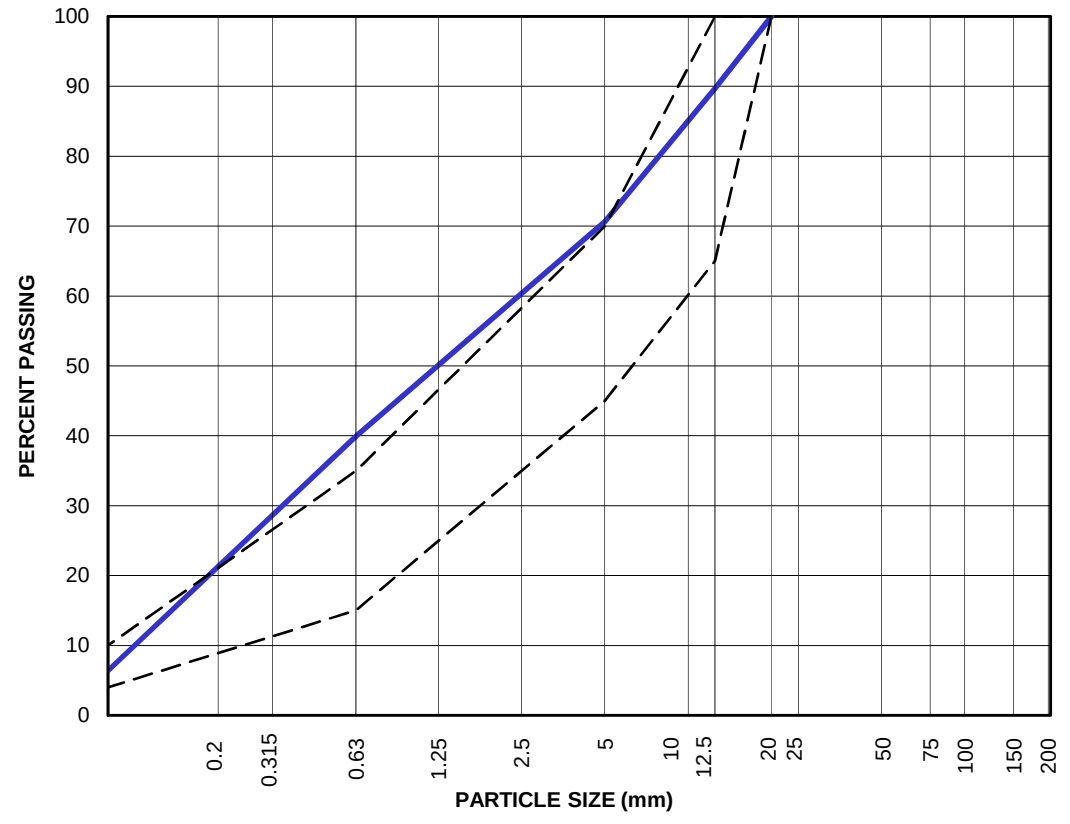
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA22
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	9.9%
DATE SAMPLED:	Nov 13/16 **By:** IM		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	90
5	71
0.63	40
0.08	6



Remarks: Sampled at 22:00.

Reviewed by: _____ P.Eng.

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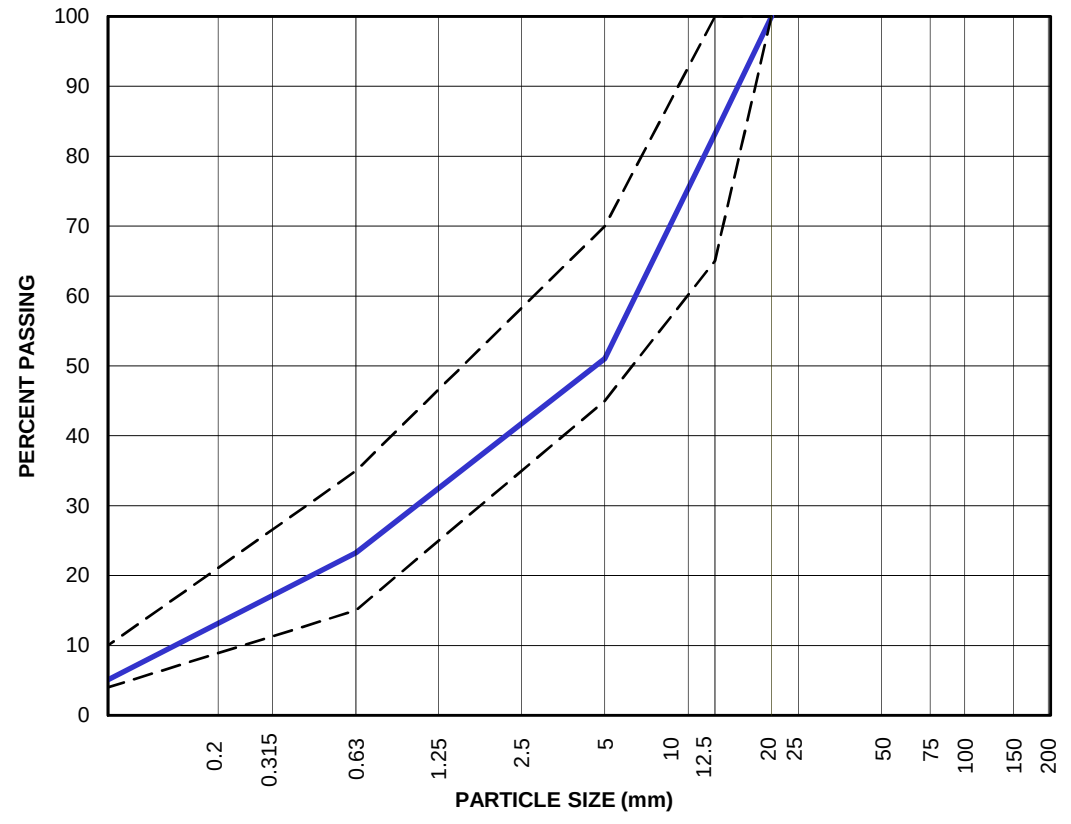
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA23
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	5.1%
DATE SAMPLED:	Nov 14/16 **By:** IM		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	83
5	51
0.63	23
0.08	5



Remarks: Sampled at 17:00.

Reviewed by: _____ P.Eng.

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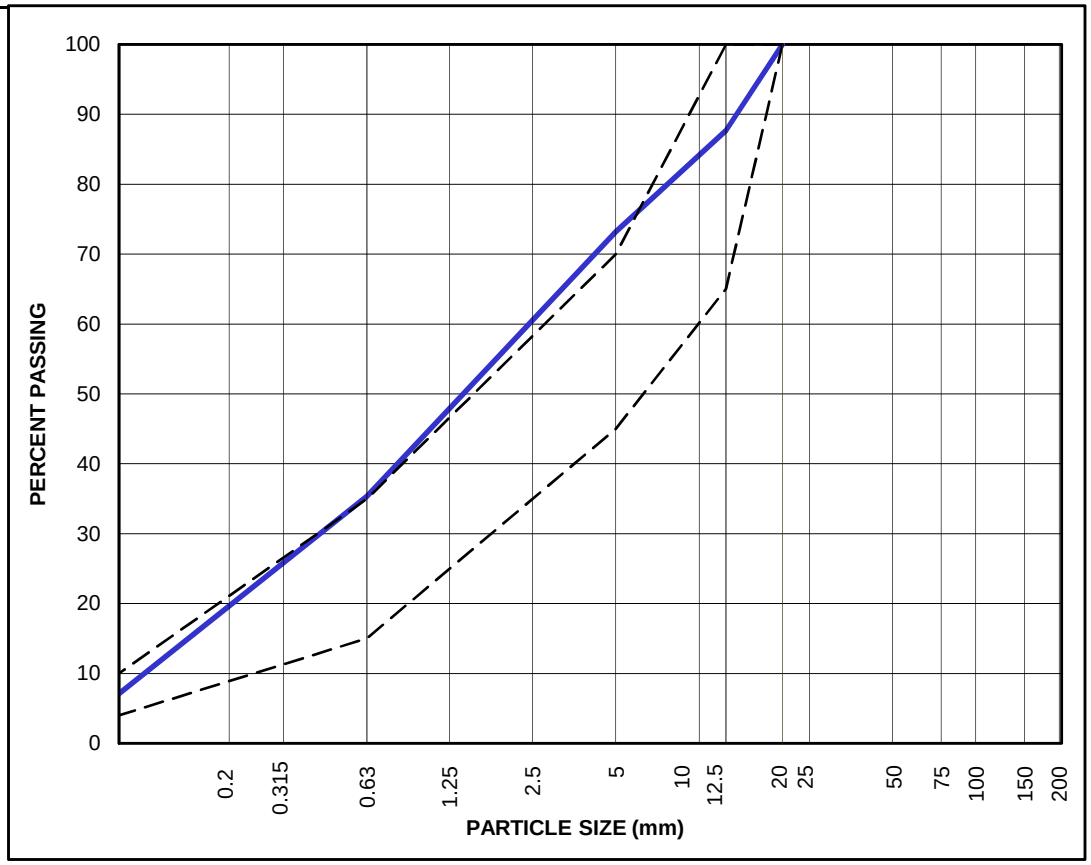
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	**Meliadine Dike Construction**	**SAMPLE NO:**	**SA24**
		SAMPLE DESCRIPTION:	**20 mm minus (Type C Mat.) Sampled from belt**
ADDRESS:	**Meliadine Gold Project, NU.**		
PROJECT NO:	**E14103230-01.023**	**MOISTURE CONT. :**	**8.2%**
DATE SAMPLED:	**Nov 17/16** **By: IM**		
CLIENT:	**Agnico Eagle Mines Ltd.**	**BULK REL DENSITY:**	**n/a**
ATTENTION:	**Mr. Duy Nguyen**	**BULK REL. DENSITY (SSD):**	**n/a**
		APPARENT REL. DENSITY:	**n/a**
		ABSORPTION:	**n/a**

PARTICLE SIZE	PERCENT PASSING
20	**100**
12.5	**88**
5	**73**
0.63	**35**
0.08	**7**



Remarks: Sampled at 19:00.

Reviewed by: _____ P.Eng.

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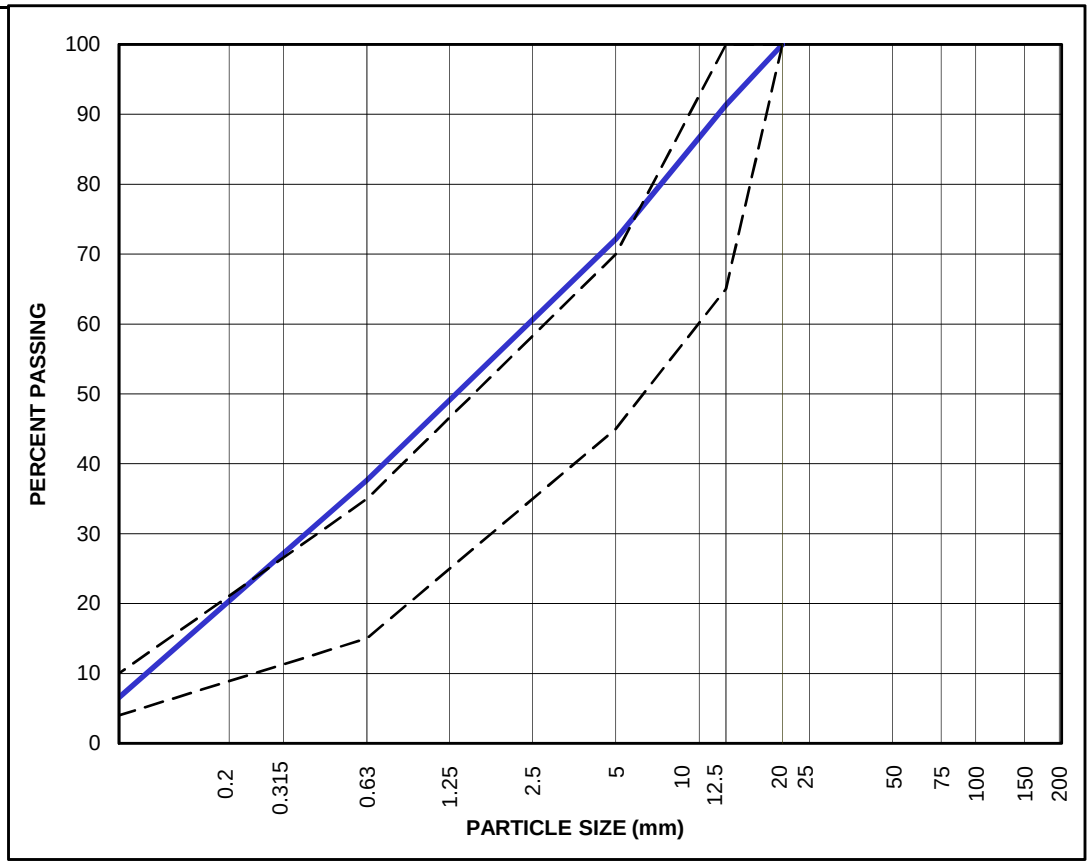
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA25
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from stockpile
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	12.4%
DATE SAMPLED:	Nov 17/16 **By:** IM		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	91
5	72
0.63	38
0.08	7



Remarks: Sampled at 19:00. Layers of snow noted in stockpile.

Reviewed by: _____ P.Eng.

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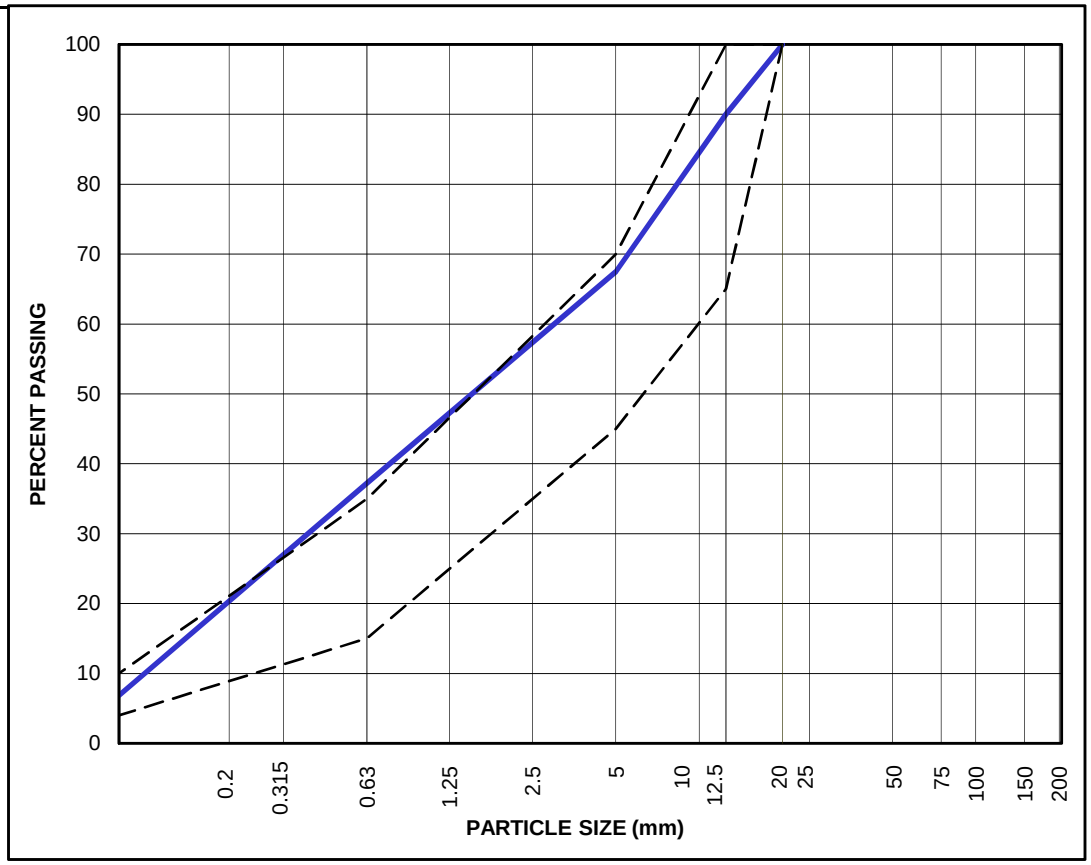
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA26
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from stockpile
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	11.5%
DATE SAMPLED:	Nov 17/16 **By:** IM		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	90
5	67
0.63	37
0.08	7



Remarks: Sampled at 19:00. Layers of snow noted in stockpile.

Reviewed by: _____ P.Eng.

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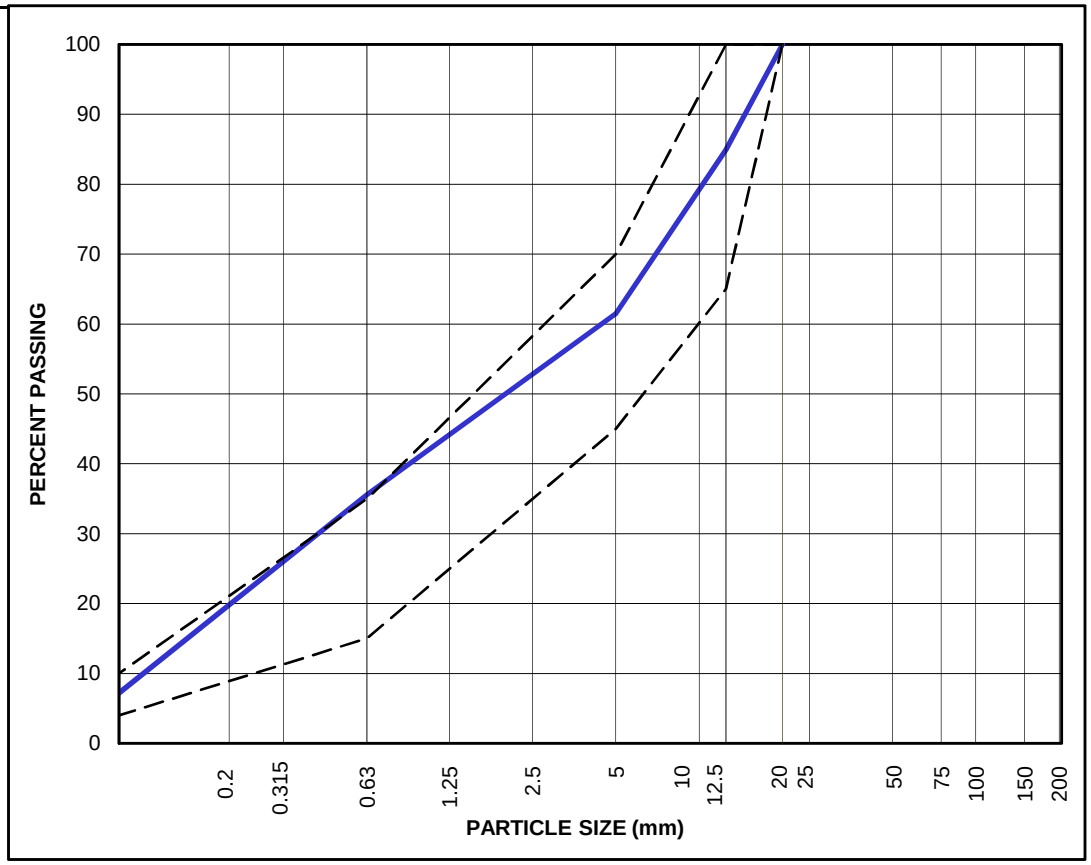
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA27
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from stockpile
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	11.2%
DATE SAMPLED:	Nov 19/16 **By:** SH		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	85
5	61
0.63	36
0.08	7



Remarks:

Reviewed by: _____ P.Eng.

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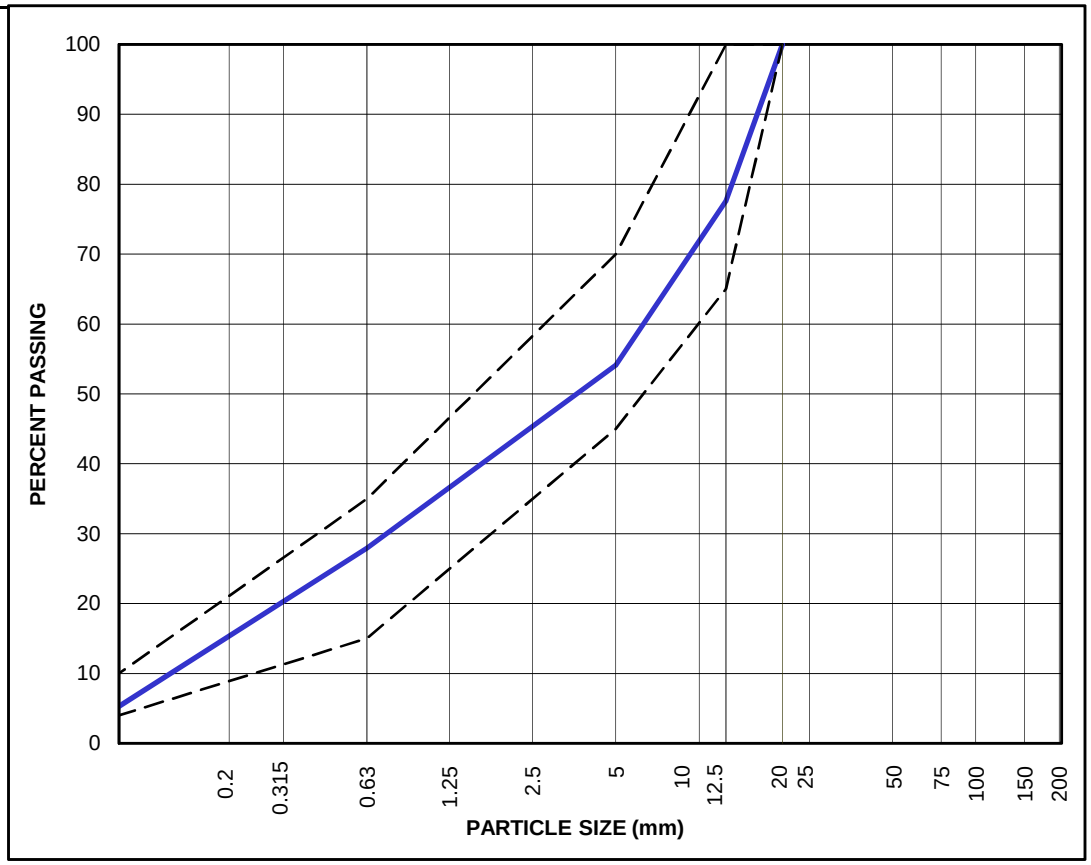
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA28
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from stockpile
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	9.2%
DATE SAMPLED:	Nov 19/16 **By:** SH		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	78
5	54
0.63	28
0.08	5



Remarks:

Reviewed by: _____ P.Eng.

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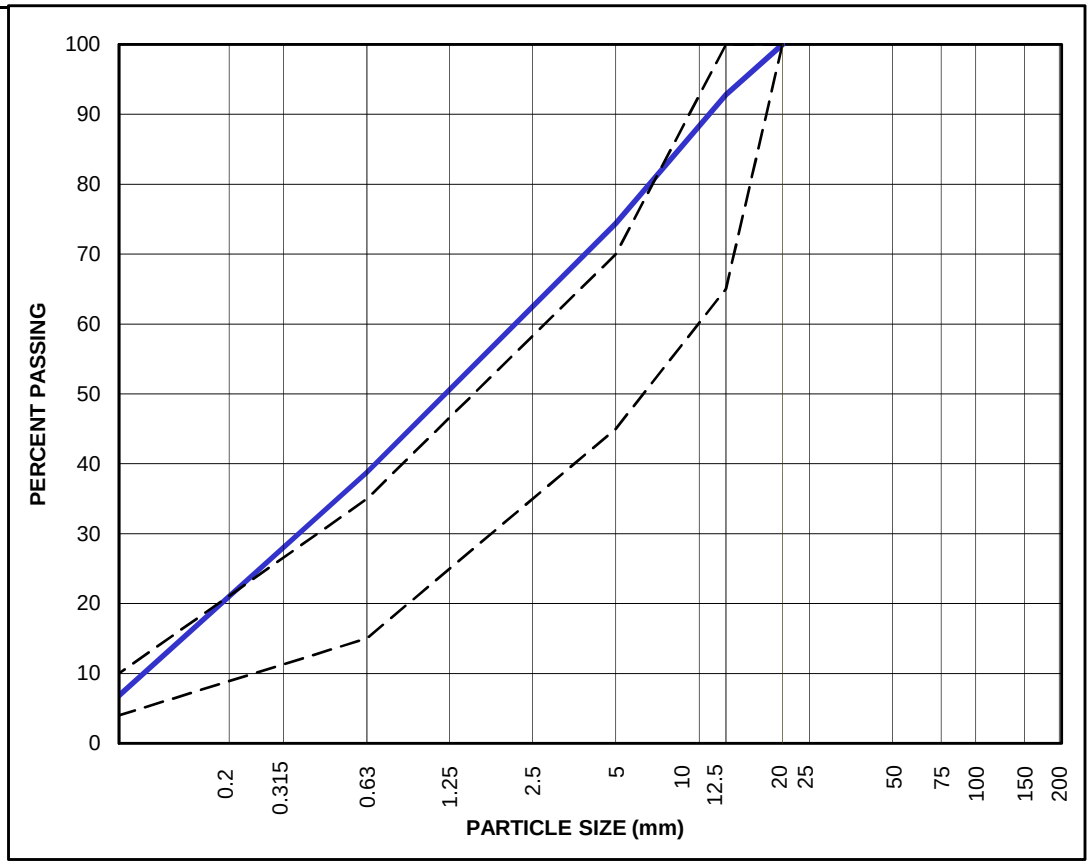
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA29
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.)
			Sampled after belt (mixed by loader)
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	11.9%
DATE SAMPLED:	Nov 19/16 **By:** SH		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	93
5	74
0.63	39
0.08	7



Remarks:

Reviewed by: _____ P.Eng.

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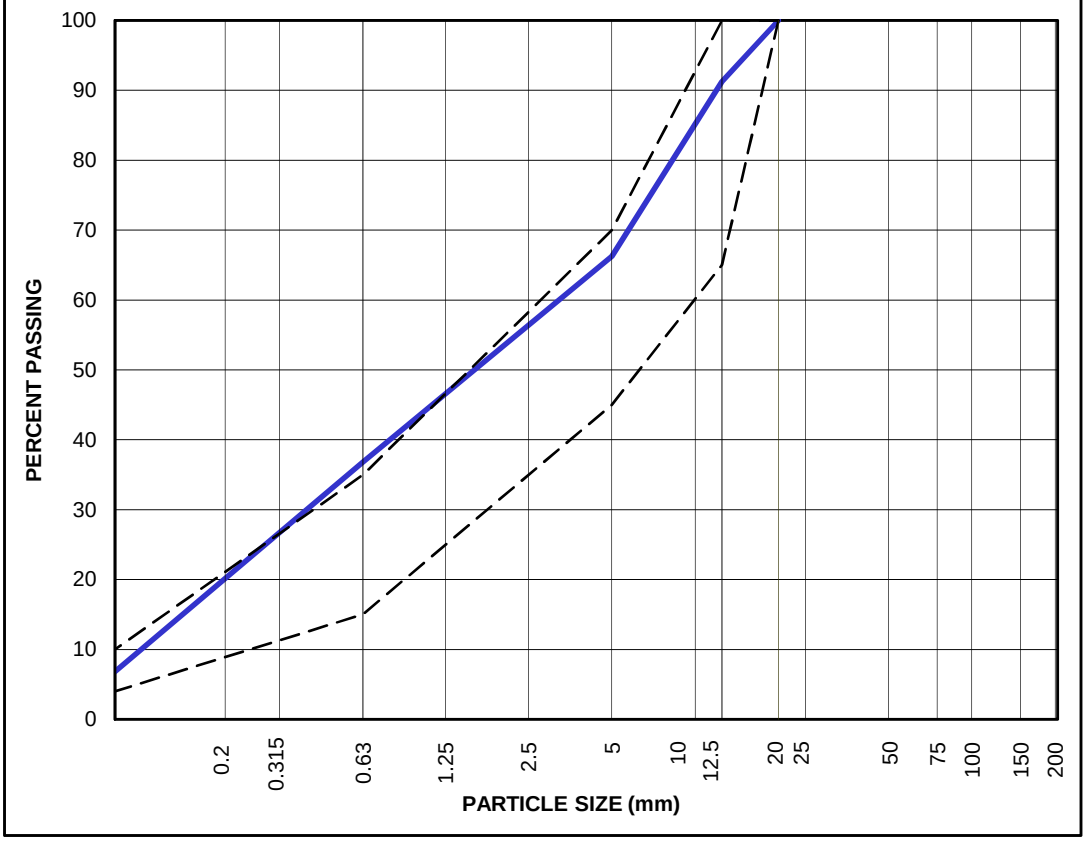
PARTICLE SIZE ANALYSIS REPORT

PROJECT: Meliadine Dike Construction
SAMPLE NO: SA30
SAMPLE DESCRIPTION: 20 mm minus (Type C Mat.)
Sampled after belt (mixed by loader)
ADDRESS: Meliadine Gold Project, NU.
PROJECT NO: E14103230-01.023
MOISTURE CONT. : 11.1%
DATE SAMPLED: Nov 21/16 **By:** SH
CLIENT: Agnico Eagle Mines Ltd.
BULK REL DENSITY: n/a
ATTENTION: Mr. Duy Nguyen
BULK REL. DENSITY (SSD): n/a
APPARENT REL. DENSITY: n/a
ABSORPTION: n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	91
5	66
0.63	37
0.08	7



Remarks:

Reviewed by: _____ P.Eng.

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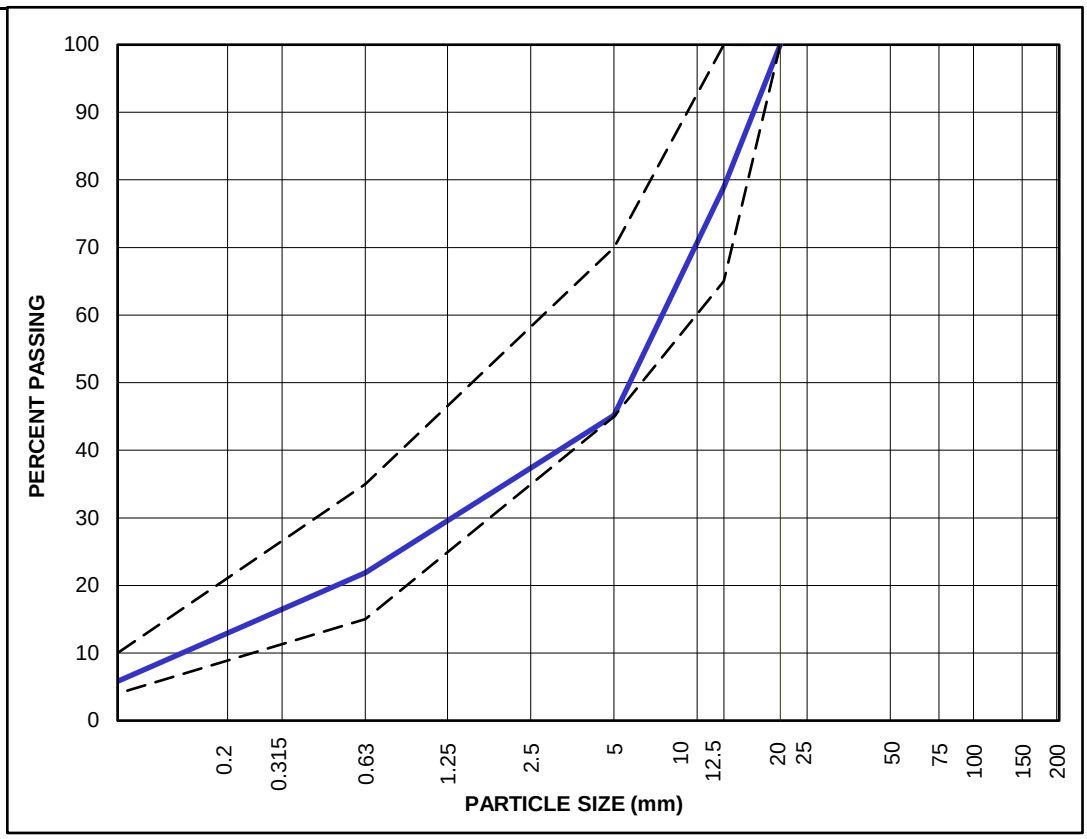
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA31
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.)
			Sampled after belt (mixed by loader)
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	4.5%
DATE SAMPLED:	Nov 23/16 **By:** SH/IM		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	79
5	45
0.63	22
0.08	6



Remarks:

Reviewed by: _____ P.Eng.

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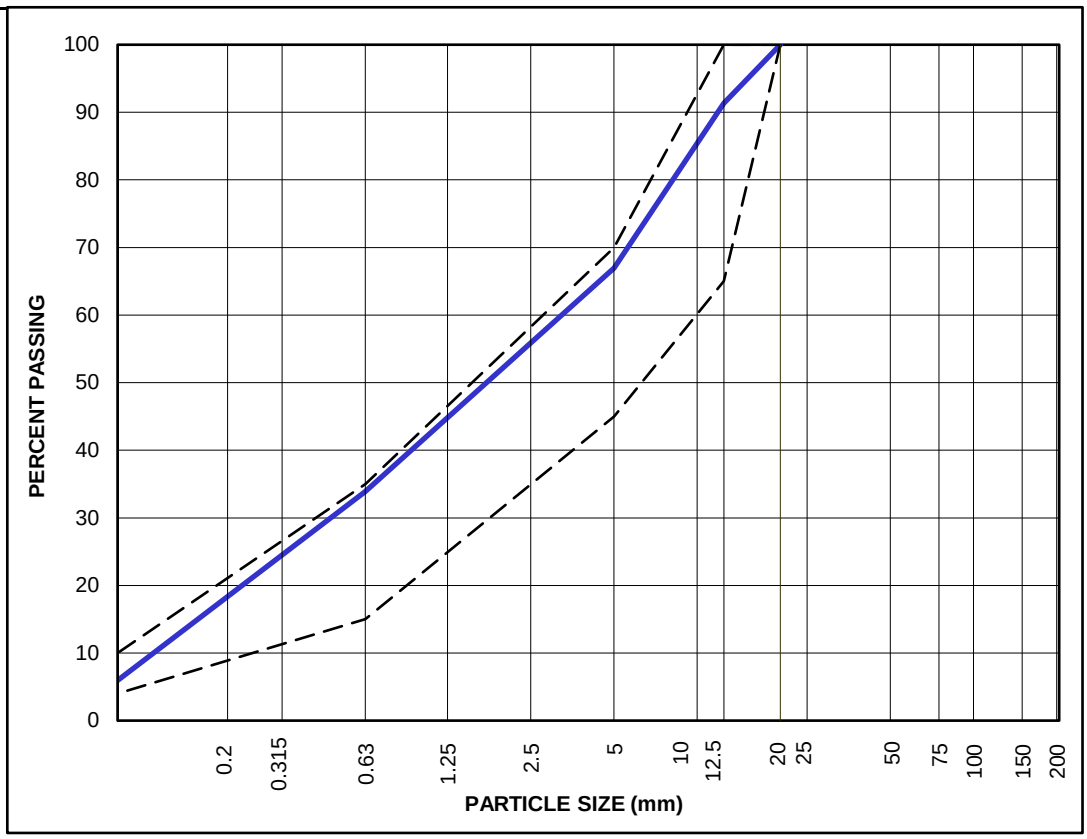
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA32
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.)
			Sampled after belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	10.3%
DATE SAMPLED:	Nov 23/16 By: SH/IM		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	91
5	67
0.63	34
0.08	6



Remarks:

Reviewed by: _____ P.Eng.

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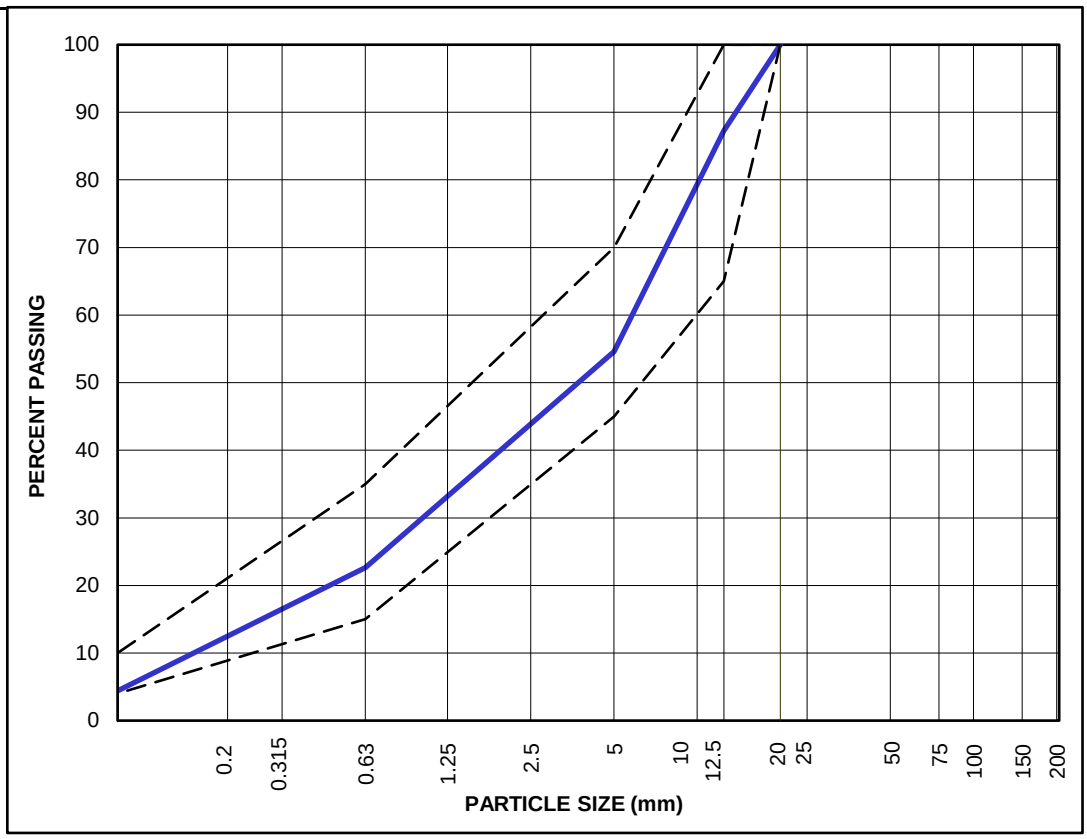
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA33
		SAMPLE DESCRIPTION:	Type C - 20 mm
			Sampled from Dayshift Stockpile
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	7.5%
DATE SAMPLED:	Nov 26/16 **By:** SH/IM		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	87
5	55
0.63	23
0.08	4



Remarks:

Reviewed by: _____ P.Eng.

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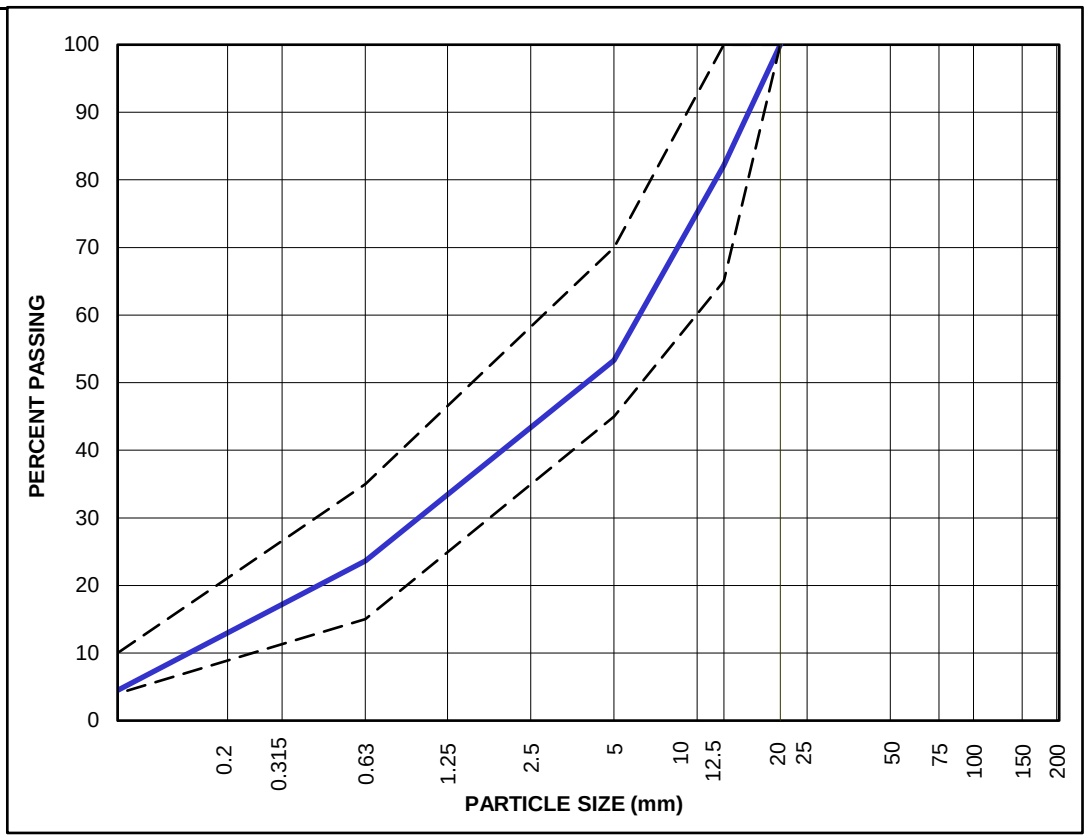
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA34
		SAMPLE DESCRIPTION:	Type C - 20 mm
			Sampled after belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	6.7%
DATE SAMPLED:	Nov 26/16 By: SH		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	82
5	53
0.63	24
0.08	4



Remarks:

Reviewed by: _____ P.Eng.

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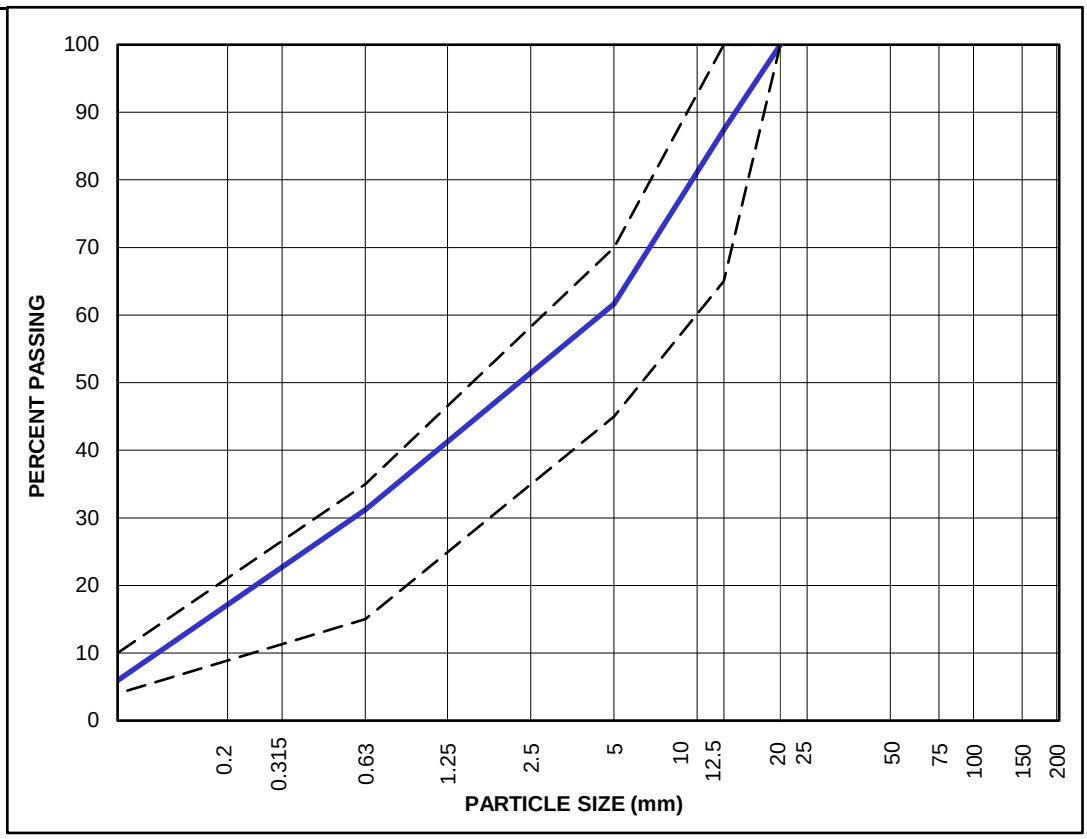
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA35
		SAMPLE DESCRIPTION:	Type C - 20 mm
			Sampled from Dayshift Stockpile
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	8.0%
DATE SAMPLED:	Nov 26/16 **By:** SH/IM		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	87
5	62
0.63	31
0.08	6



Remarks:

Reviewed by: _____ P.Eng.

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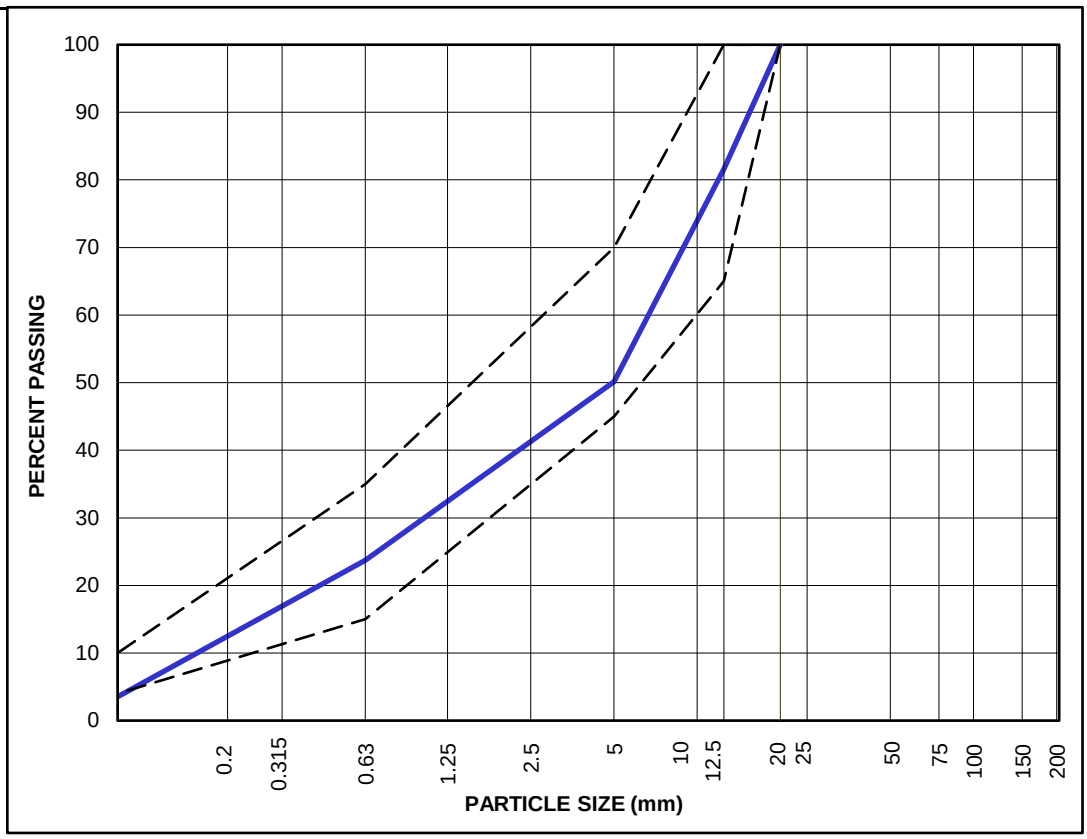
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA36
		SAMPLE DESCRIPTION:	Type C - 20 mm
			Sampled November 29 N/S
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	7.1%
DATE SAMPLED:	Nov 29/16 **By:** SH/IM		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	82
5	50
0.63	24
0.08	4



Remarks:

Reviewed by: _____ P.Eng.

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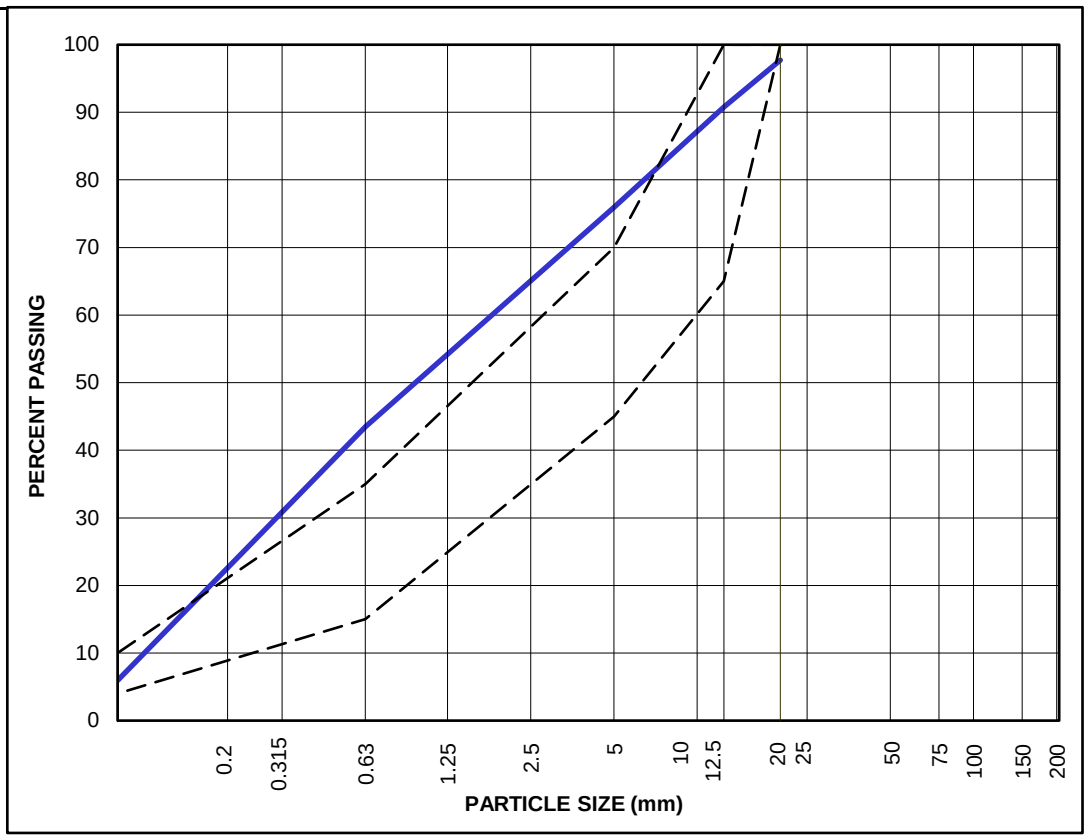
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA37
		SAMPLE DESCRIPTION:	Type C - 20 mm
			Sampled from Belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	14.3%
DATE SAMPLED:	Nov 30/16 **By:** SH/IM		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	98
12.5	91
5	76
0.63	43
0.08	6



Remarks:

Reviewed by: _____ P.Eng.

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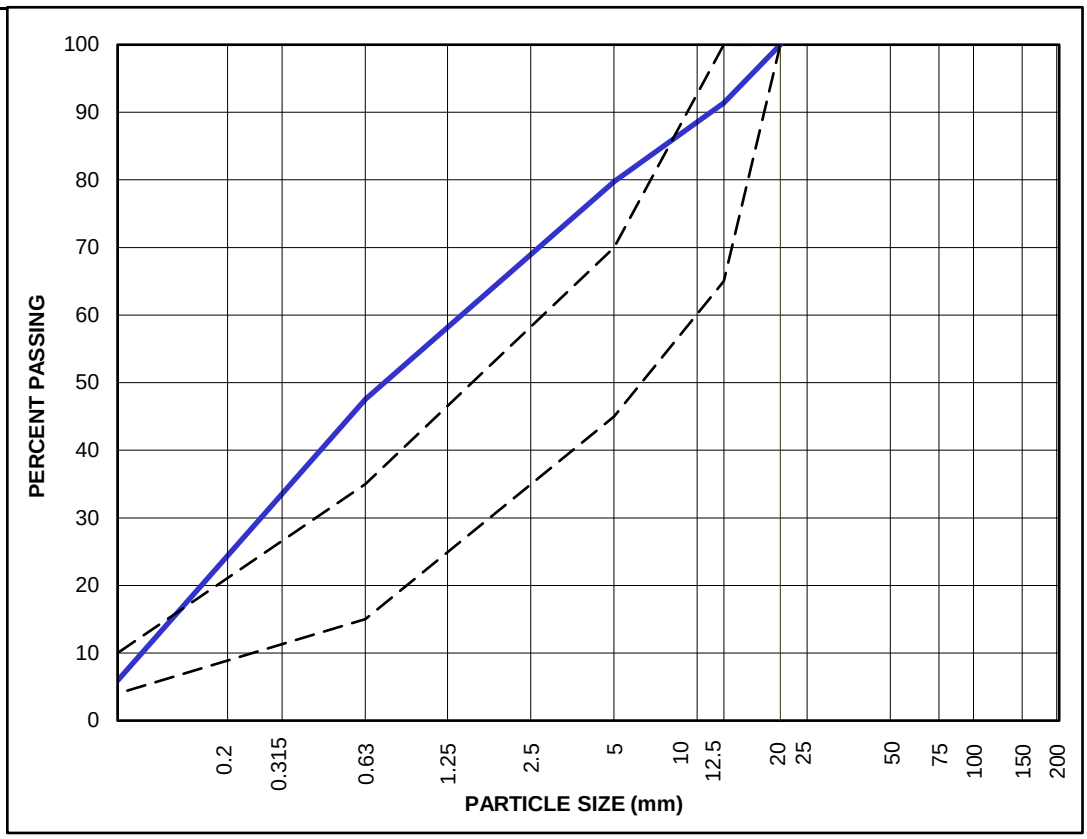
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA38
		SAMPLE DESCRIPTION:	Type C - 20 mm
			Sampled from Belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	13.3%
DATE SAMPLED:	Dec 02/16 **By:** SH/IM		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	91
5	80
0.63	48
0.08	6



Remarks:

Reviewed by: _____ P.Eng.

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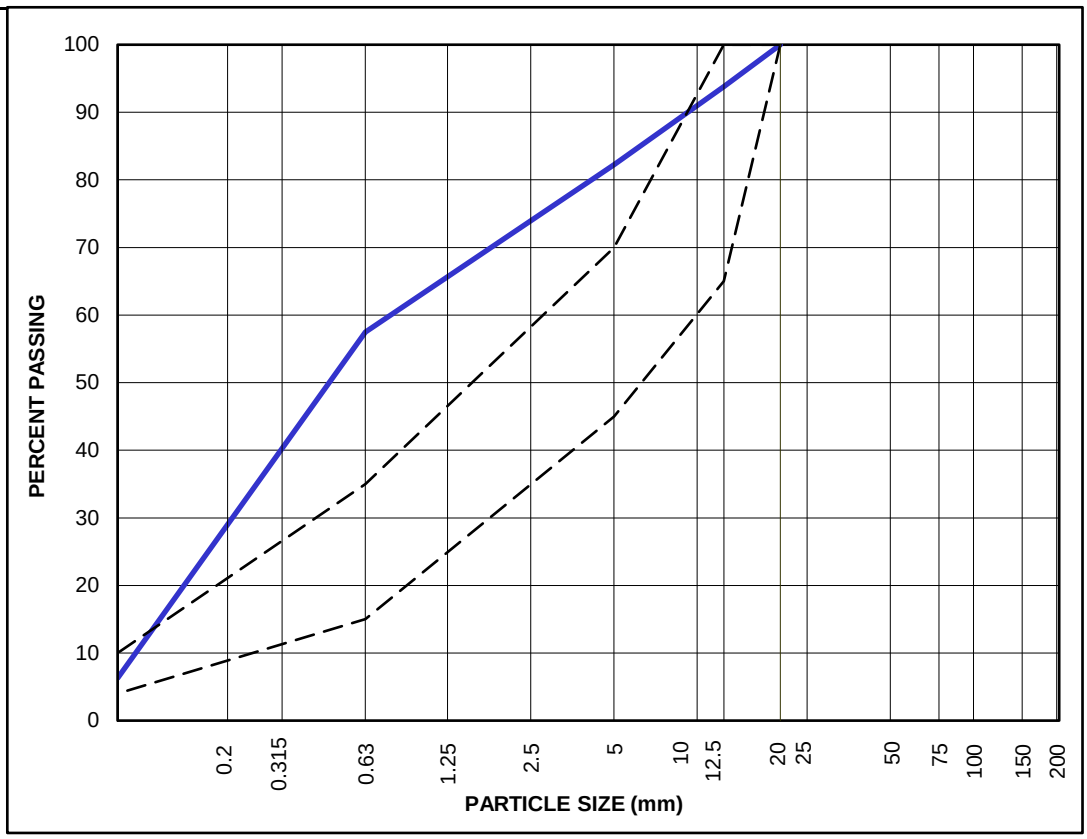
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA39
		SAMPLE DESCRIPTION:	Type C - 20 mm
			Sampled from Belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	13.8%
DATE SAMPLED:	Dec 03/16 **By:** IM/SH		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	94
5	82
0.63	57
0.08	6



Remarks: Sampled at 02:00 (Night shift)

Reviewed by: _____ P.Eng.

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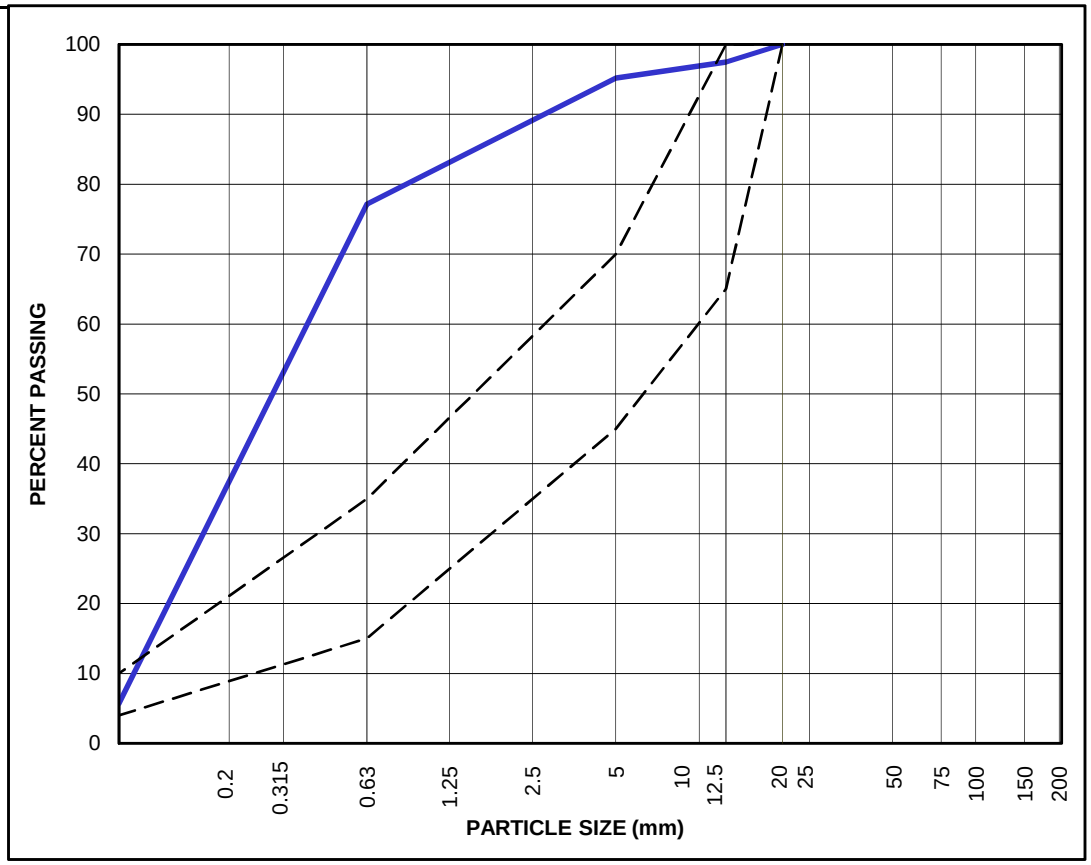
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA40
		SAMPLE DESCRIPTION:	Type C - 20 mm
			Sampled from Belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	14.4%
DATE SAMPLED:	Dec 05/16 **By:** IM		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	97
5	95
0.63	77
0.08	6



Remarks: Sampled at 03:00 (Night shift)

Reviewed by: _____ P.Eng.

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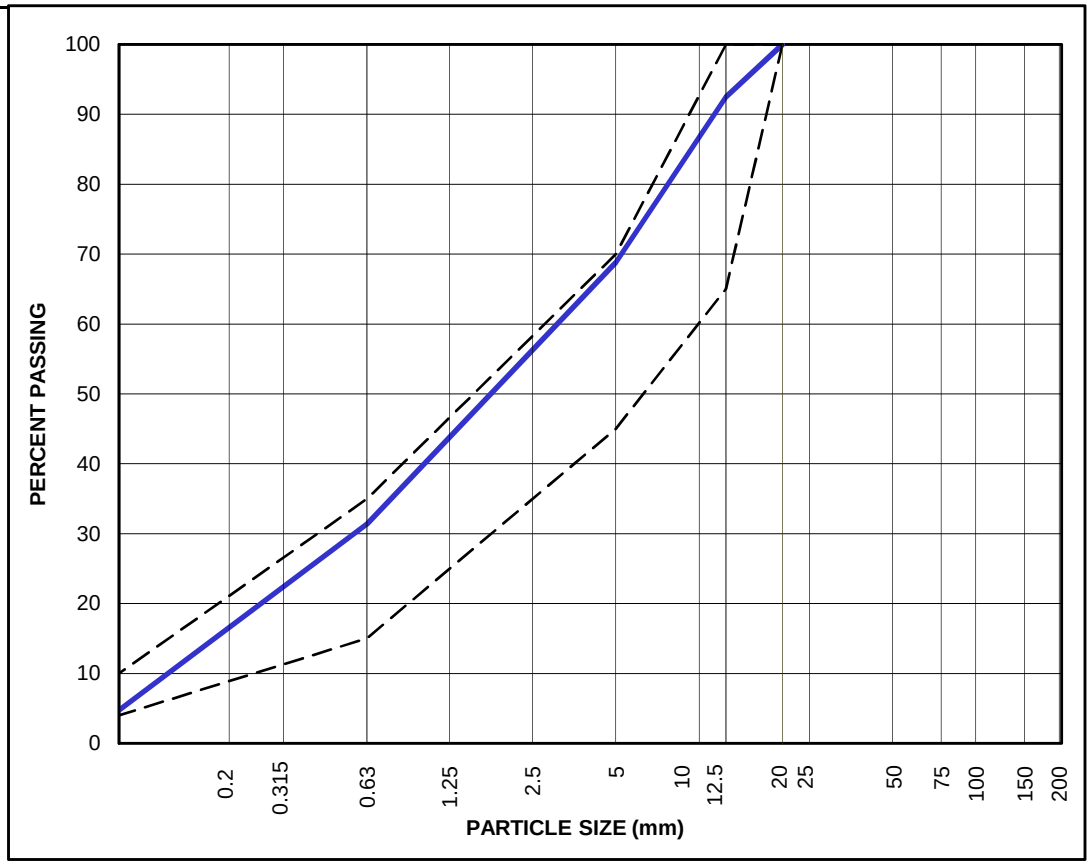
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA41
		SAMPLE DESCRIPTION:	Type C - 20 mm
			Sampled from stockpile
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	6.7%
DATE SAMPLED:	Mar 11/17 **By:** SH		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	92
5	69
0.63	31
0.08	5



Remarks: Sampled at 02:00 (Night shift)

Reviewed by: _____ P.Eng.

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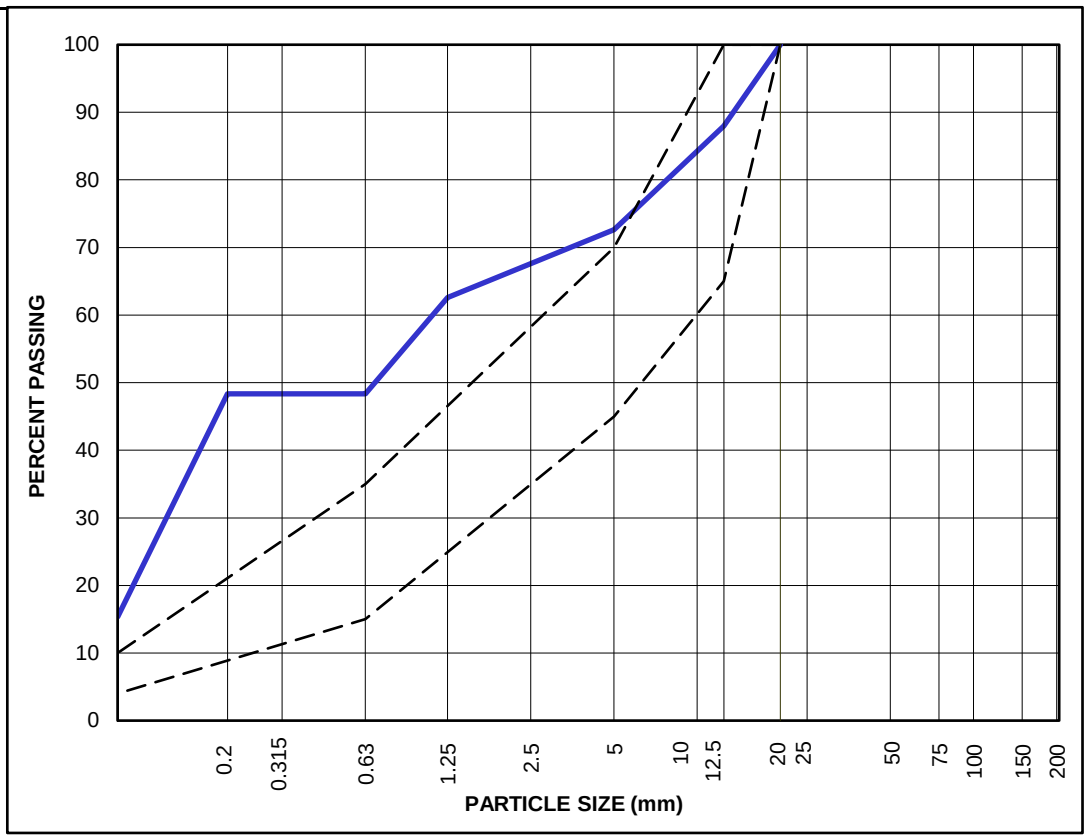
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA43
		SAMPLE DESCRIPTION:	Type C - 20 mm
			Sampled from u/s Type C fillet ~0+280 @ D-CP5
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01.023	**MOISTURE CONT. :**	11.5%
DATE SAMPLED:	Apr 18/17 **By:** WW		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	88
5	73
1.25	63
0.63	48
0.315	48
0.2	48
0.08	15



Remarks: Sampled from u/s Type C fillet ~0+280 @ D-CP5

Reviewed by: _____ P.Geo.

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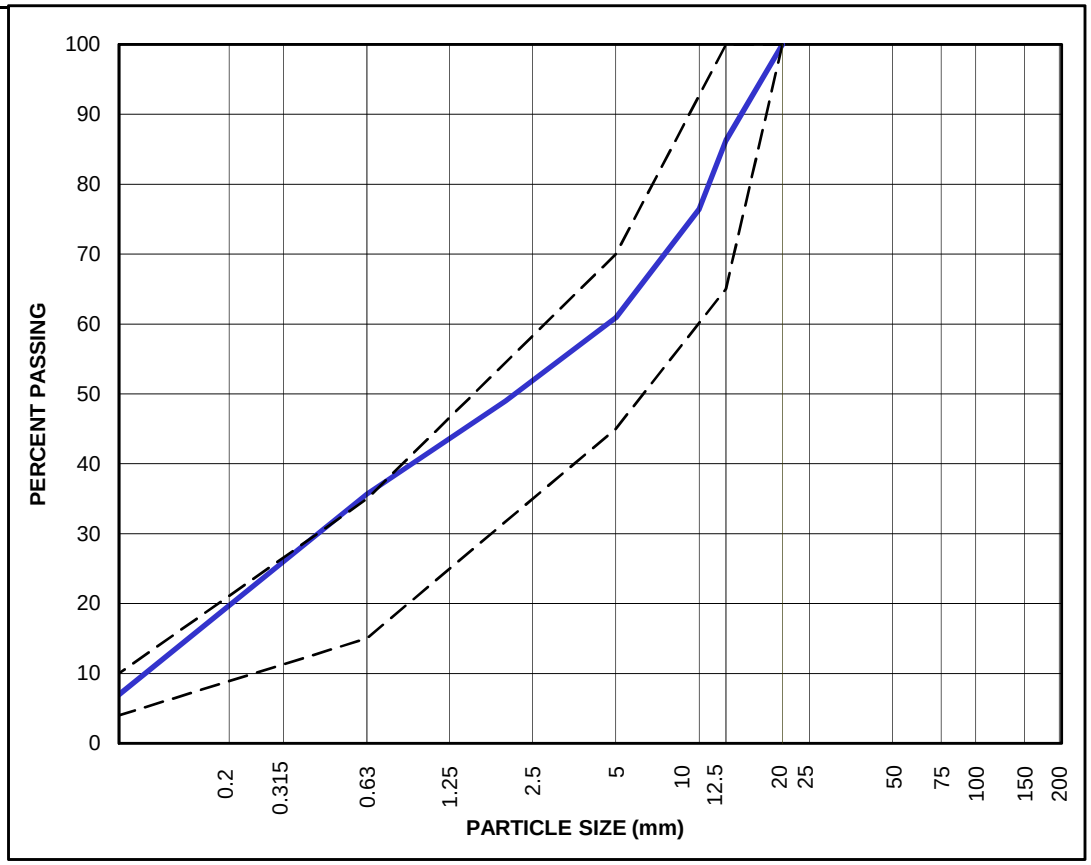
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA44
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	8.5%
DATE SAMPLED:	Apr 29/17 **By:** TW		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	86
10	76
5	61
2	49
0.63	36
0.08	7



Remarks: 20 mm minus particle size distribution limits shown

Reviewed by: _____ P.Eng.

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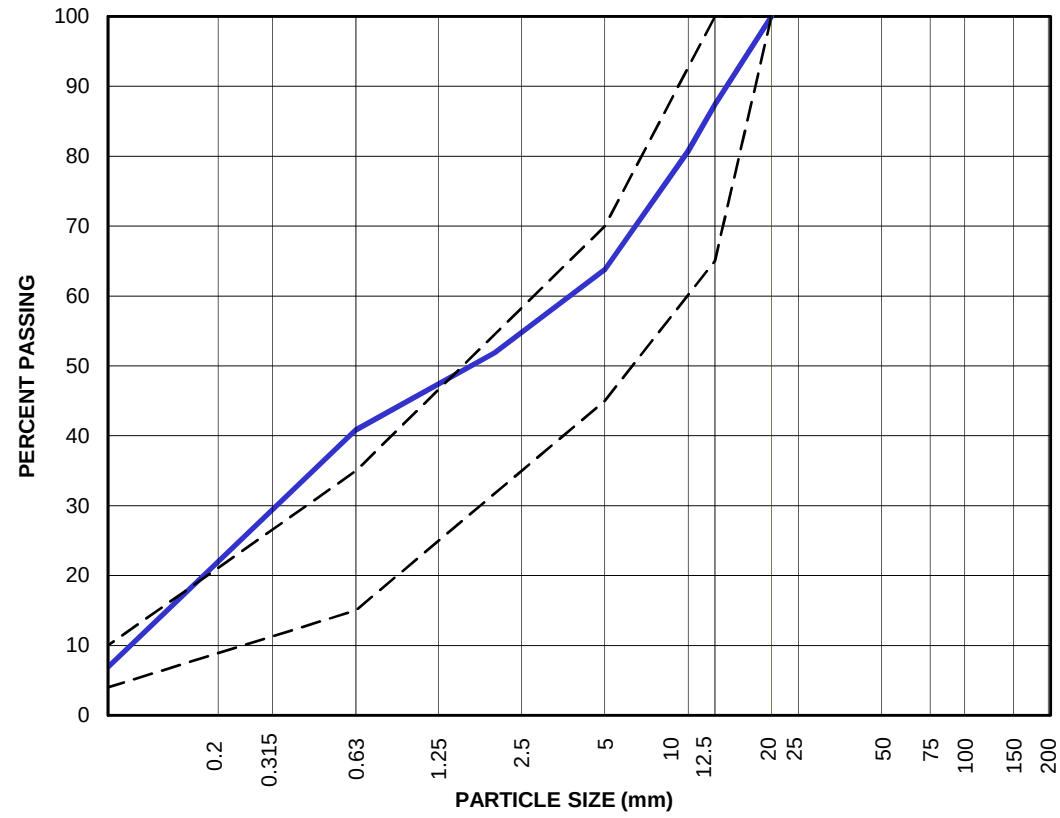
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA45
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	7.8%
DATE SAMPLED:	Apr 29/17 **By:** IM		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	87
10	81
5	64
2	52
0.63	41
0.08	7



Remarks: 20 mm minus particle size distribution limits shown

Reviewed by: _____ P.Eng.

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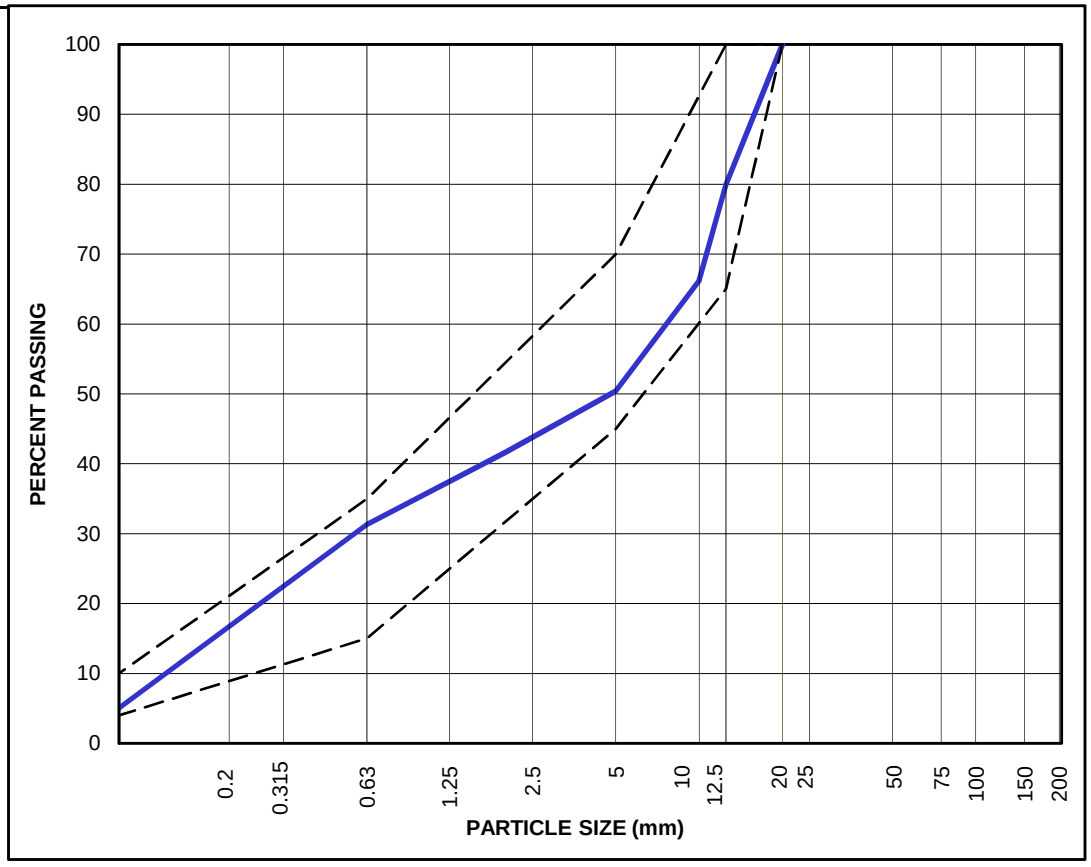
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA47
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	10.9%
DATE SAMPLED:	Apr 30/17 **By:** IM		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	80
10	66
5	50
2	42
0.63	31
0.08	5



Remarks: 20 mm minus particle size distribution limits shown
Sampled on Night Shift at 02:00

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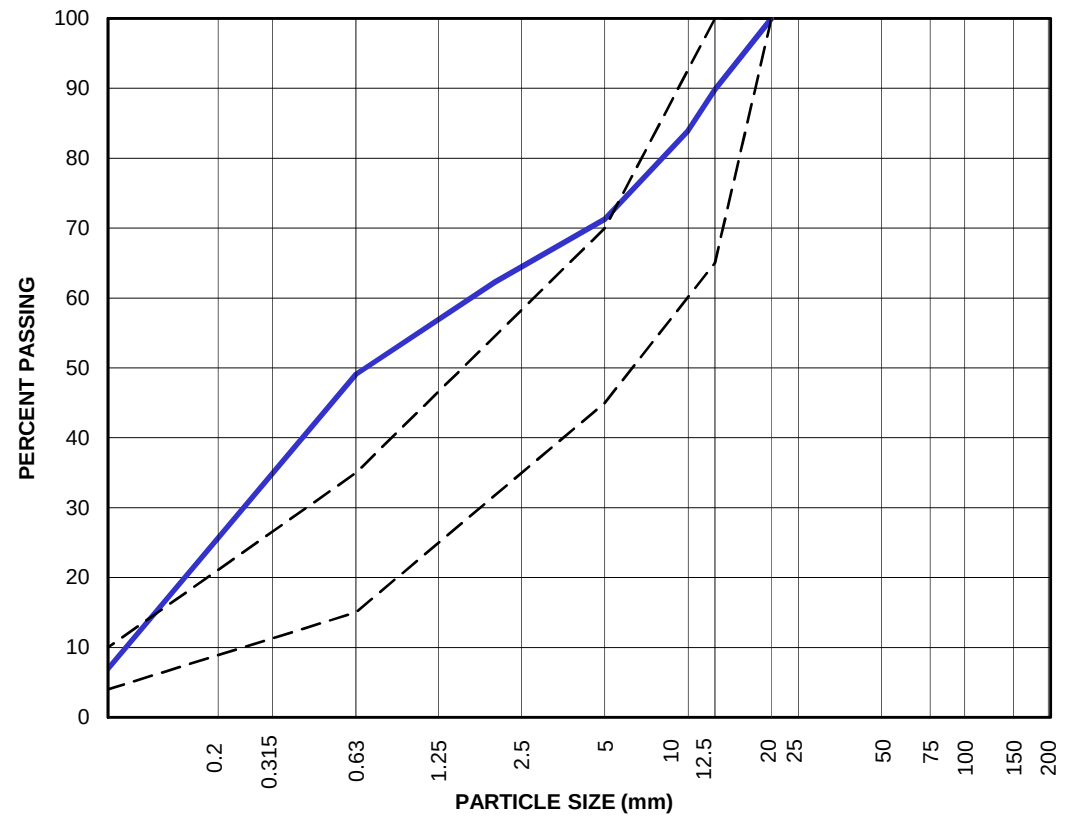
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA46
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	12.6%
DATE SAMPLED:	May 01/17 **By:** TW		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	90
10	84
5	71
2	62
0.63	49
0.08	7



Remarks: 20 mm minus particle size distribution limits shown

The moisture content of 12.6% is higher than the maximum moisture content of 10% specified.

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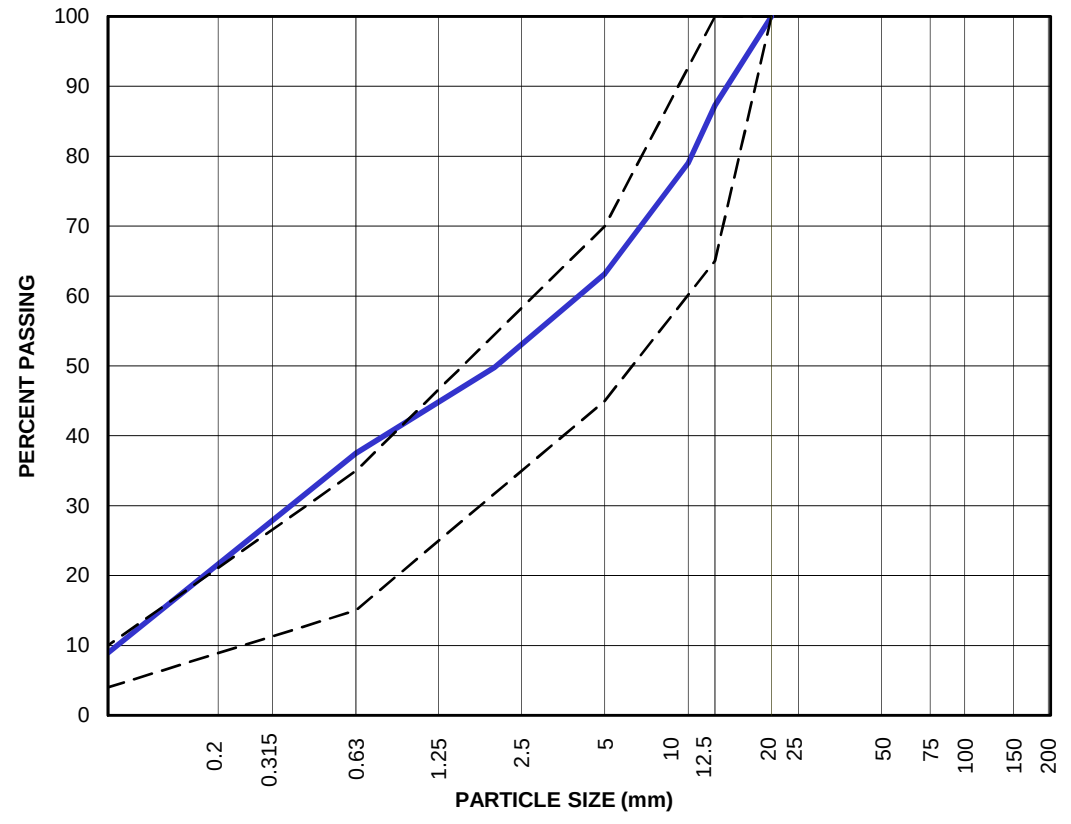
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA49
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	5.6%
DATE SAMPLED:	May 01/17 **By:** TW		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	87
10	79
5	63
2	50
0.63	38
0.08	9



Remarks: 20 mm minus particle size distribution limits shown

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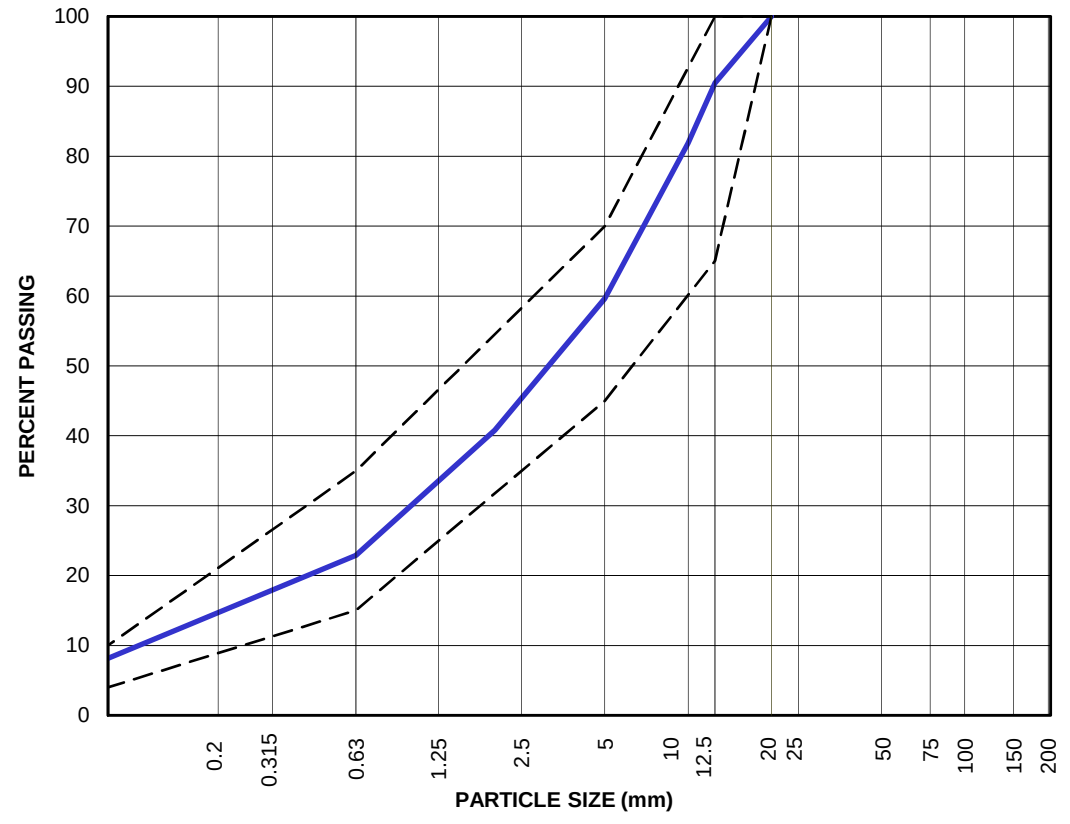
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA50
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	2.4%
DATE SAMPLED:	May 09/17 **By:** TW		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	90
10	82
5	60
2	41
0.63	23
0.08	8



Remarks: 20 mm minus particle size distribution limits shown

Reviewed by: _____ P.Eng.

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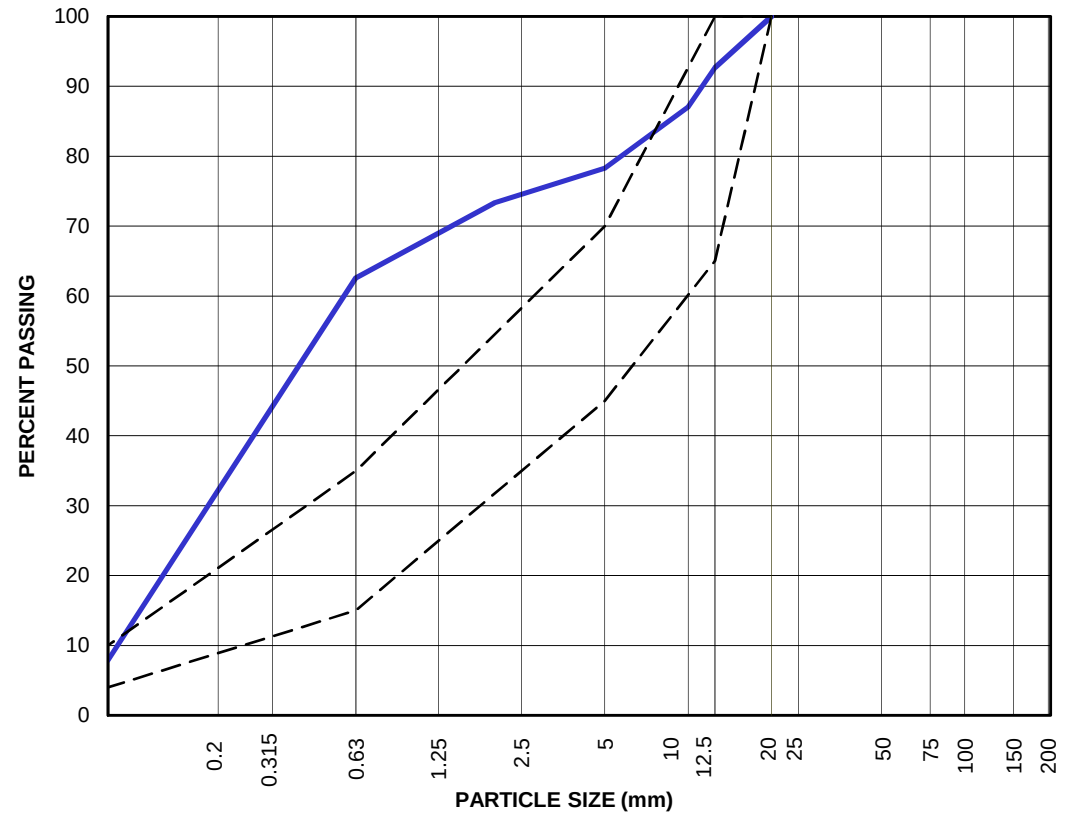
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	Meliadine Dike Construction	**SAMPLE NO:**	SA51
		SAMPLE DESCRIPTION:	20 mm minus (Type C Mat.) Sampled from belt
ADDRESS:	Meliadine Gold Project, NU.		
PROJECT NO:	E14103230-01	**MOISTURE CONT. :**	14.1%
DATE SAMPLED:	May 10/17 **By:** TW		
CLIENT:	Agnico Eagle Mines Ltd.	**BULK REL DENSITY:**	n/a
ATTENTION:	Mr. Duy Nguyen	**BULK REL. DENSITY (SSD):**	n/a
		APPARENT REL. DENSITY:	n/a
		ABSORPTION:	n/a

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	93
10	87
5	78
2	73
0.63	63
0.08	8



Remarks: 20 mm minus particle size distribution limits shown

Reviewed by: _____ P.Eng.

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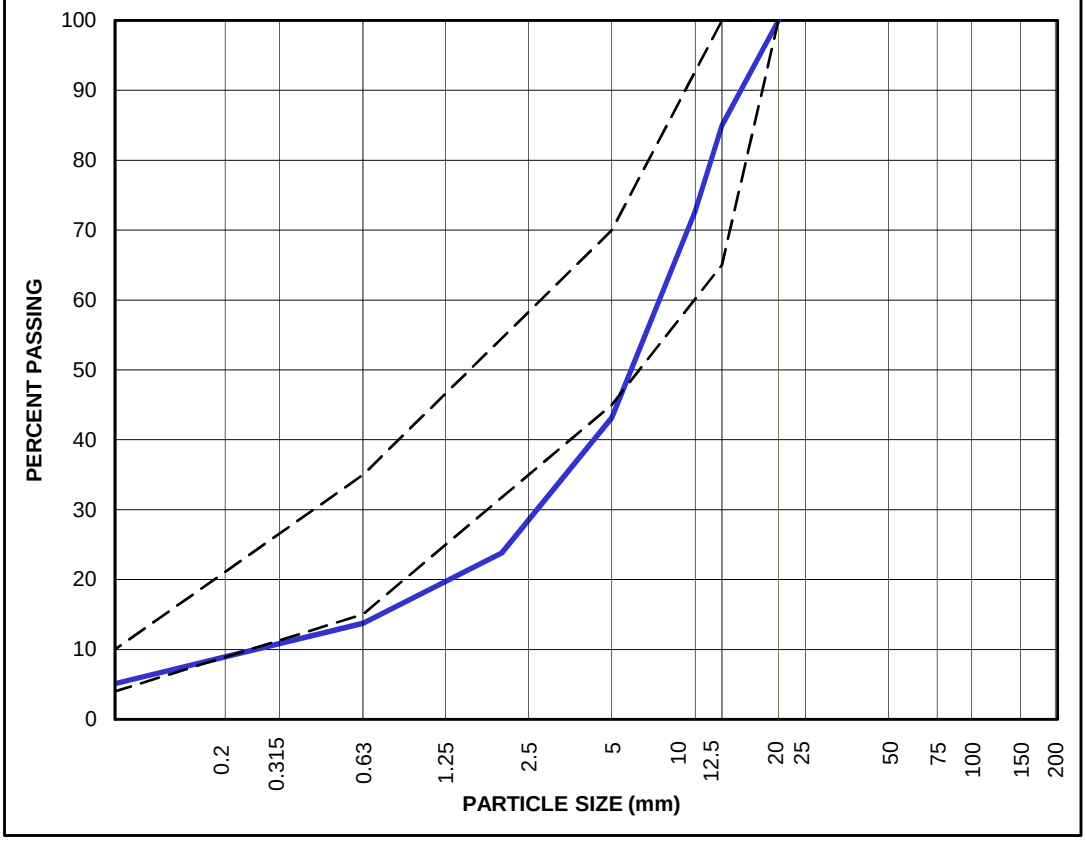
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	**Meliadine Dike Construction**	**SAMPLE NO:**	**SA52**
		SAMPLE DESCRIPTION:	**20 mm minus (Type C Mat.)**
ADDRESS:	**Meliadine Gold Project, NU.**		
PROJECT NO:	**E14103230-01**	**MOISTURE CONT. :**	**1.4%**
DATE SAMPLED:	**May 14/17** **By: IM**		
CLIENT:	**Agnico Eagle Mines Ltd.**	**BULK REL DENSITY:**	**n/a**
ATTENTION:	**Mr. Duy Nguyen**	**BULK REL. DENSITY (SSD):**	**n/a**
		APPARENT REL. DENSITY:	**n/a**
		ABSORPTION:	**n/a**

PARTICLE SIZE	PERCENT PASSING
20	**100**
12.5	**85**
10	**73**
5	**43**
2	**24**
0.63	**14**
0.08	**5**



Remarks: 20 mm minus particle size distribution limits shown

Sampled from Stockpile Under Belt

Note - Produced during dayshift

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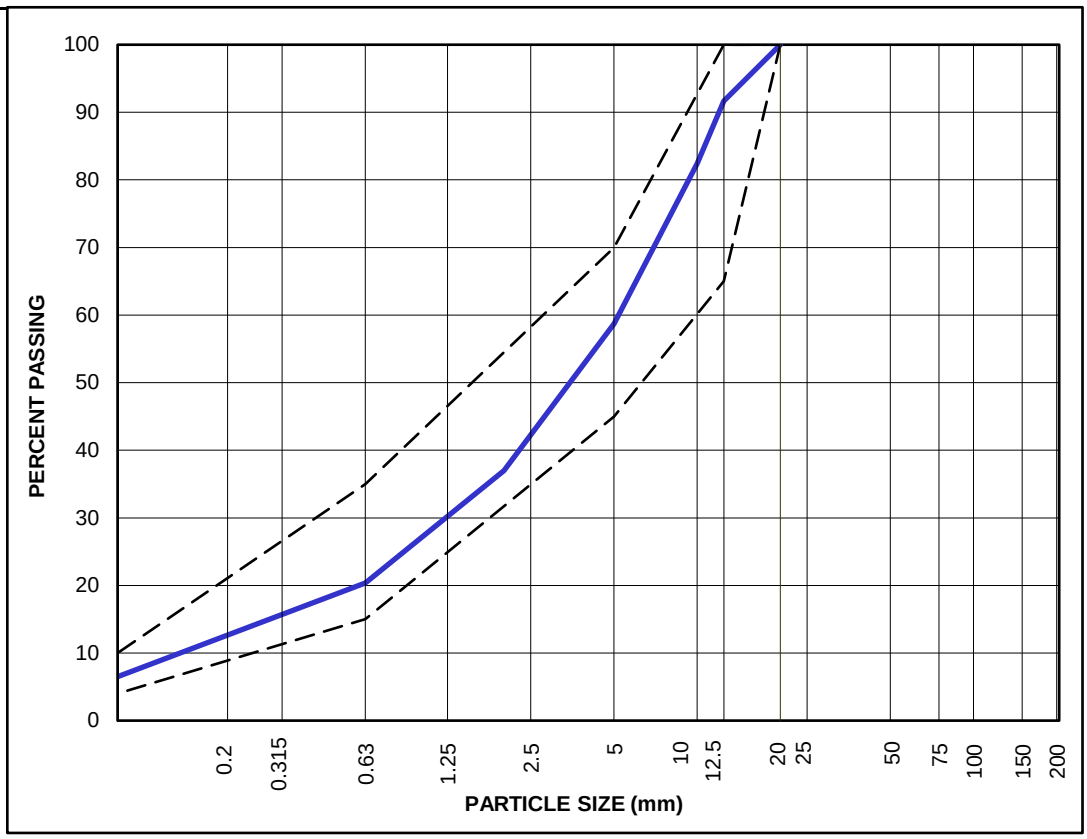
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	**Meliadine Dike Construction**	**SAMPLE NO:**	**SA53**
		SAMPLE DESCRIPTION:	**20 mm minus (Type C Mat.)**
ADDRESS:	**Meliadine Gold Project, NU.**		
PROJECT NO:	**E14103230-01**	**MOISTURE CONT. :**	**2.1%**
DATE SAMPLED:	**May 15/17** **By: IM**		
CLIENT:	**Agnico Eagle Mines Ltd.**	**BULK REL DENSITY:**	**n/a**
ATTENTION:	**Mr. Duy Nguyen**	**BULK REL. DENSITY (SSD):**	**n/a**
		APPARENT REL. DENSITY:	**n/a**
		ABSORPTION:	**n/a**

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	92
10	82
5	59
2	37
0.63	20
0.08	6



Remarks: 20 mm minus particle size distribution limits shown

Sampled from Stockpile

Note - Produced during dayshift

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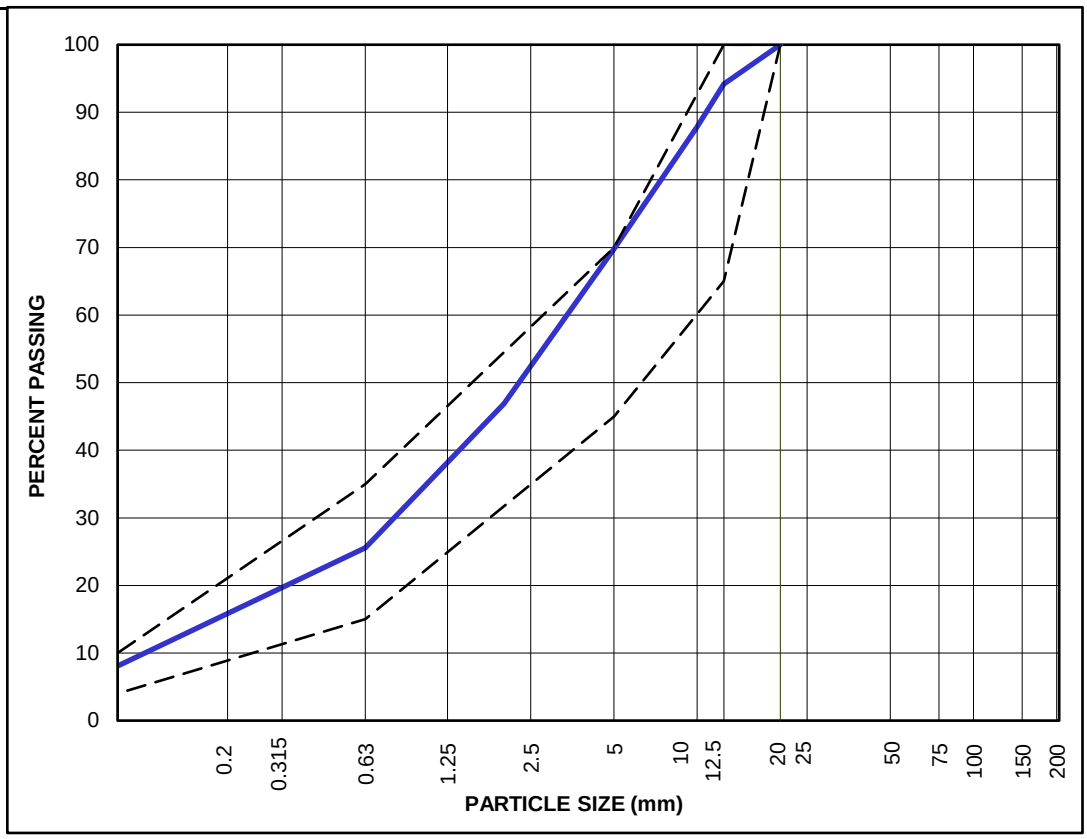
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	**Meliadine Dike Construction**	**SAMPLE NO:**	**SA54**
		SAMPLE DESCRIPTION:	**20 mm minus (Type C Mat.)**
ADDRESS:	**Meliadine Gold Project, NU.**		
PROJECT NO:	**E14103230-01**	**MOISTURE CONT. :**	**2.1%**
DATE SAMPLED:	**May 16/17** **By: IM**		
CLIENT:	**Agnico Eagle Mines Ltd.**	**BULK REL DENSITY:**	**n/a**
ATTENTION:	**Mr. Duy Nguyen**	**BULK REL. DENSITY (SSD):**	**n/a**
		APPARENT REL. DENSITY:	**n/a**
		ABSORPTION:	**n/a**

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	94
10	88
5	70
2	47
0.63	26
0.08	8



Remarks: 20 mm minus particle size distribution limits shown

Sampled from Stockpile

Note - Produced during dayshift

Reviewed by: _____ P.Eng.

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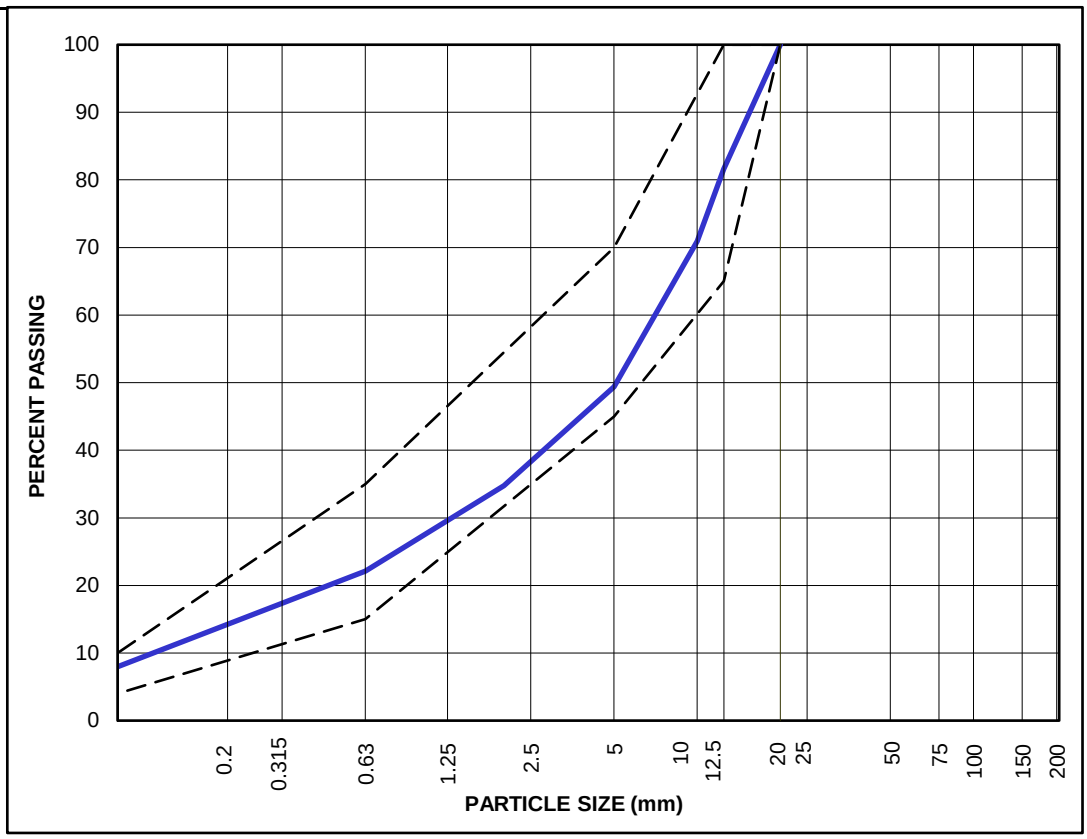
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	**Meliadine Dike Construction**	**SAMPLE NO:**	**SA55**
		SAMPLE DESCRIPTION:	**20 mm minus (Type C Mat.)**
ADDRESS:	**Meliadine Gold Project, NU.**		
PROJECT NO:	**E14103230-01**	**MOISTURE CONT. :**	**2.7%**
DATE SAMPLED:	**May 18/17** **By: IM**		
CLIENT:	**Agnico Eagle Mines Ltd.**	**BULK REL DENSITY:**	**n/a**
ATTENTION:	**Mr. Duy Nguyen**	**BULK REL. DENSITY (SSD):**	**n/a**
		APPARENT REL. DENSITY:	**n/a**
		ABSORPTION:	**n/a**

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	82
10	71
5	49
2	35
0.63	22
0.08	8



Remarks: 20 mm minus particle size distribution limits shown

Sampled from Stockpile

Note - Produced during nightshift

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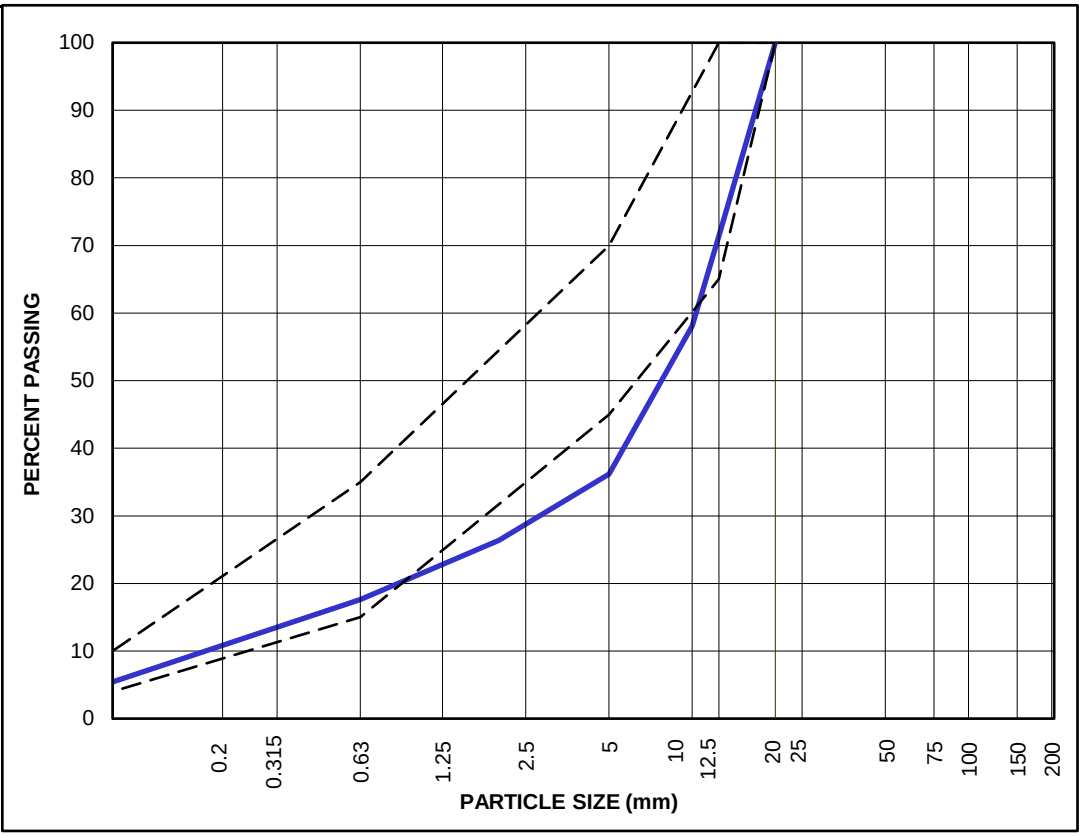
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	**Meliadine Dike Construction**	**SAMPLE NO:**	**SA56**
		SAMPLE DESCRIPTION:	**20 mm minus (Type C Mat.)**
ADDRESS:	**Meliadine Gold Project, NU.**		
PROJECT NO:	**E14103230-01**	**MOISTURE CONT. :**	**2.8%**
DATE SAMPLED:	**May 19/17** **By: IM**		
CLIENT:	**Agnico Eagle Mines Ltd.**	**BULK REL DENSITY:**	**n/a**
ATTENTION:	**Mr. Duy Nguyen**	**BULK REL. DENSITY (SSD):**	**n/a**
		APPARENT REL. DENSITY:	**n/a**
		ABSORPTION:	**n/a**

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	71
10	58
5	36
2	26
0.63	18
0.08	5



Remarks: 20 mm minus particle size distribution limits shown

Sampled from Stockpile

Note - Produced during dayshift

Reviewed by: _____ P.Eng.

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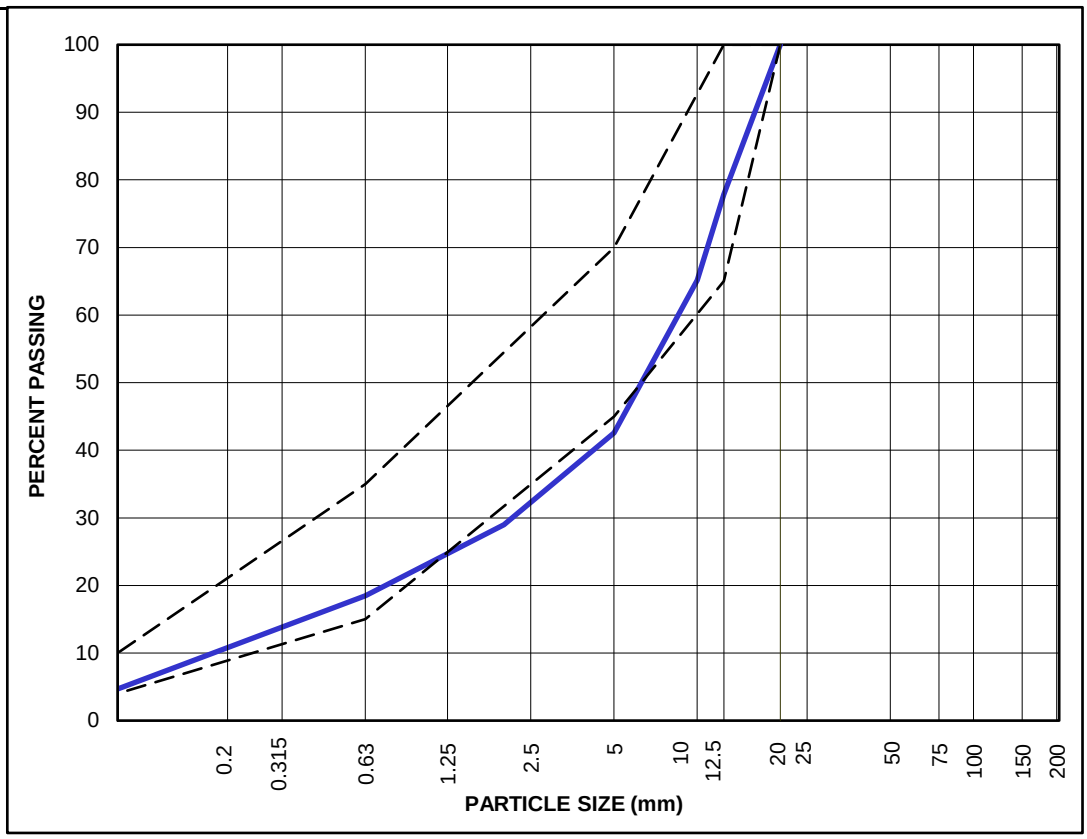
PARTICLE SIZE ANALYSIS REPORT

PROJECT:	**Meliadine Dike Construction**	**SAMPLE NO:**	**SA57**
		SAMPLE DESCRIPTION:	**20 mm minus (Type C Mat.)**
ADDRESS:	**Meliadine Gold Project, NU.**		
PROJECT NO:	**E14103230-01**	**MOISTURE CONT. :**	**3.9%**
DATE SAMPLED:	**May 20/17** **By: IM**		
CLIENT:	**Agnico Eagle Mines Ltd.**	**BULK REL DENSITY:**	**n/a**
ATTENTION:	**Mr. Duy Nguyen**	**BULK REL. DENSITY (SSD):**	**n/a**
		APPARENT REL. DENSITY:	**n/a**
		ABSORPTION:	**n/a**

PARTICLE SIZE	PERCENT PASSING
20	100
12.5	78
10	65
5	43
2	29
0.63	18
0.08	5



Remarks: 20 mm minus particle size distribution limits shown
Sampled from Stockpile
Note - Produced during dayshift

Reviewed by: _____ P.Eng.

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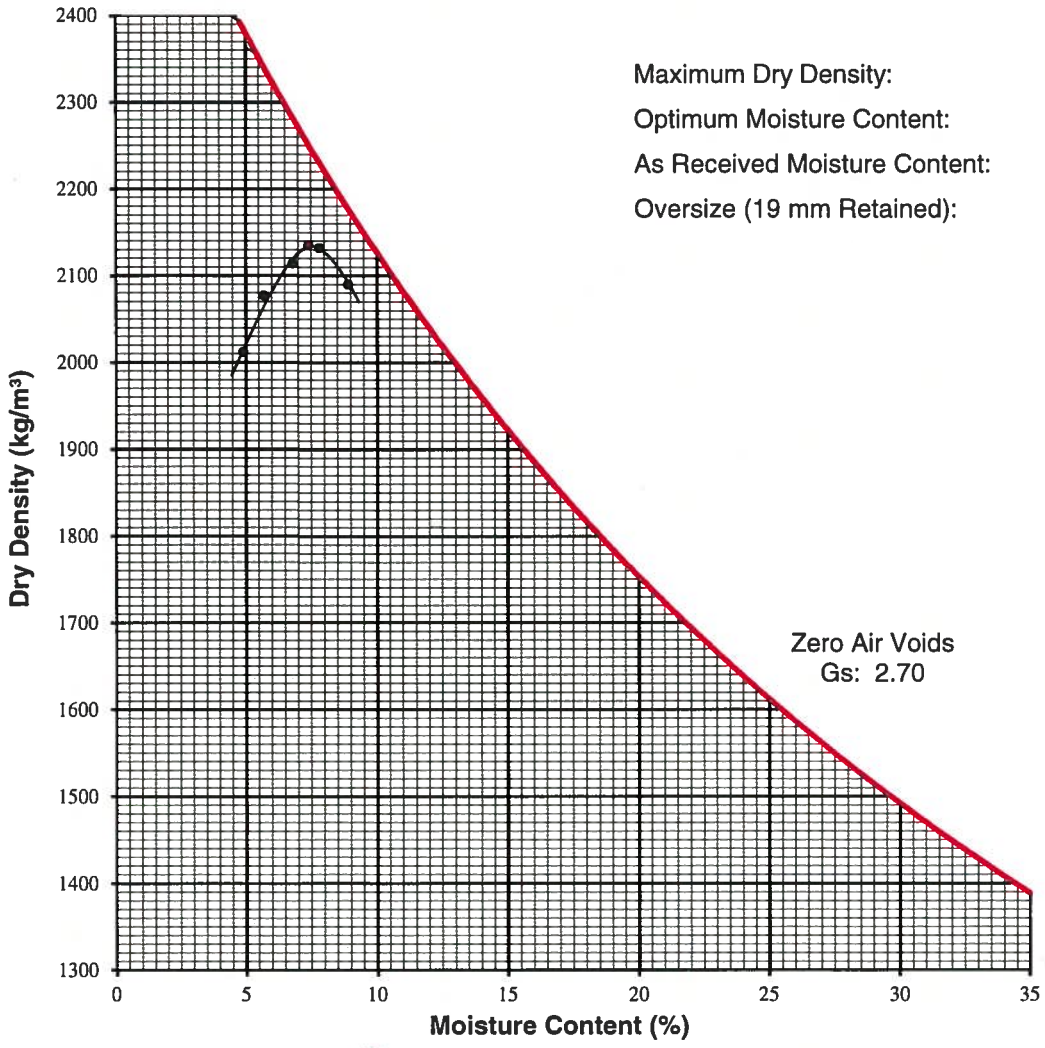
MOISTURE-DENSITY RELATIONSHIP (Proctor) REPORT

ASTM D698 (Standard Proctor)

Project:	Meliadine Gold Project	Sample No.:	Type C, Sample No 1
Project No.:	E14103230-01.023	Sampled By:	Dike QC Team
Client:	Agnico Eagle Mines Ltd	Date Received:	7-Mar-17
Attention:		Test Date:	9-Mar-17
E-mail:		Test By:	MA
Source:	Meliadine Project, Dike Construction	Test Method:	C (Manual)

Sample Location: Type C Stockpile

Sample Description: SAND, some gravel, trace silt, brown



Maximum Dry Density:	**2135**	kg/m³
Optimum Moisture Content:	**7.4**	%
As Received Moisture Content:	3.0	%
Oversize (19 mm Retained):	0	%

Remarks:

Reviewed By: _____ P.Eng.

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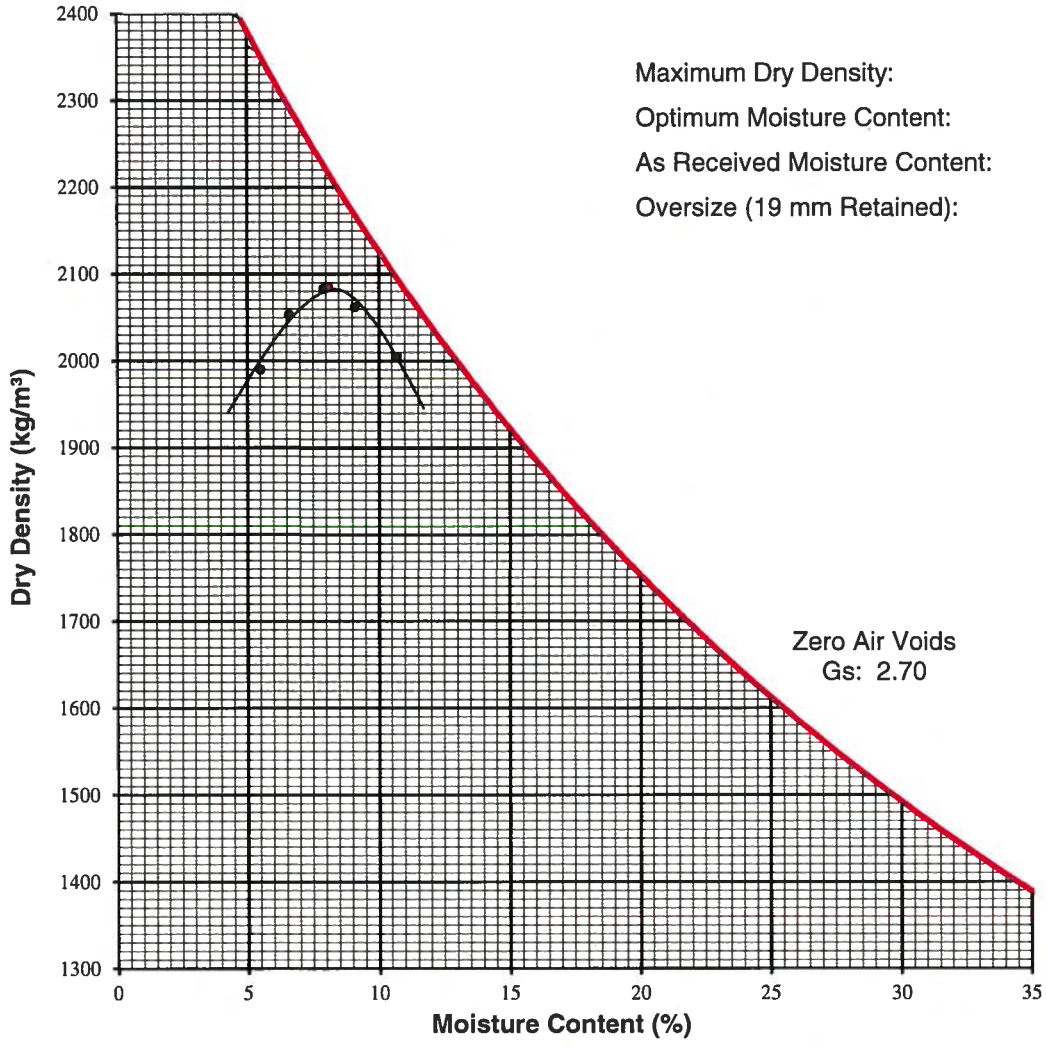
MOISTURE-DENSITY RELATIONSHIP (Proctor) REPORT

ASTM D698 (Standard Proctor)

Project:	Meliadine Gold Project	Sample No.:	Type C, Sample No 2
Project No.:	E14103230-01.023	Sampled By:	Dike QC Team
Client:	Agnico Eagle Mines Ltd	Date Received:	7-Mar-17
Attention:		Test Date:	9-Mar-17
E-mail:		Test By:	MA
Source:	Meliadine Project, Dike Construction	Test Method:	C (Manual)

Sample Location: Type C Stockpile

Sample Description: SAND, some gravel, trace silt, brown



Maximum Dry Density:	**2085**	kg/m³
Optimum Moisture Content:	**8.1**	%
As Received Moisture Content:	2.1	%
Oversize (19 mm Retained):	0	%

Remarks:

Reviewed By: _____ P.Eng.

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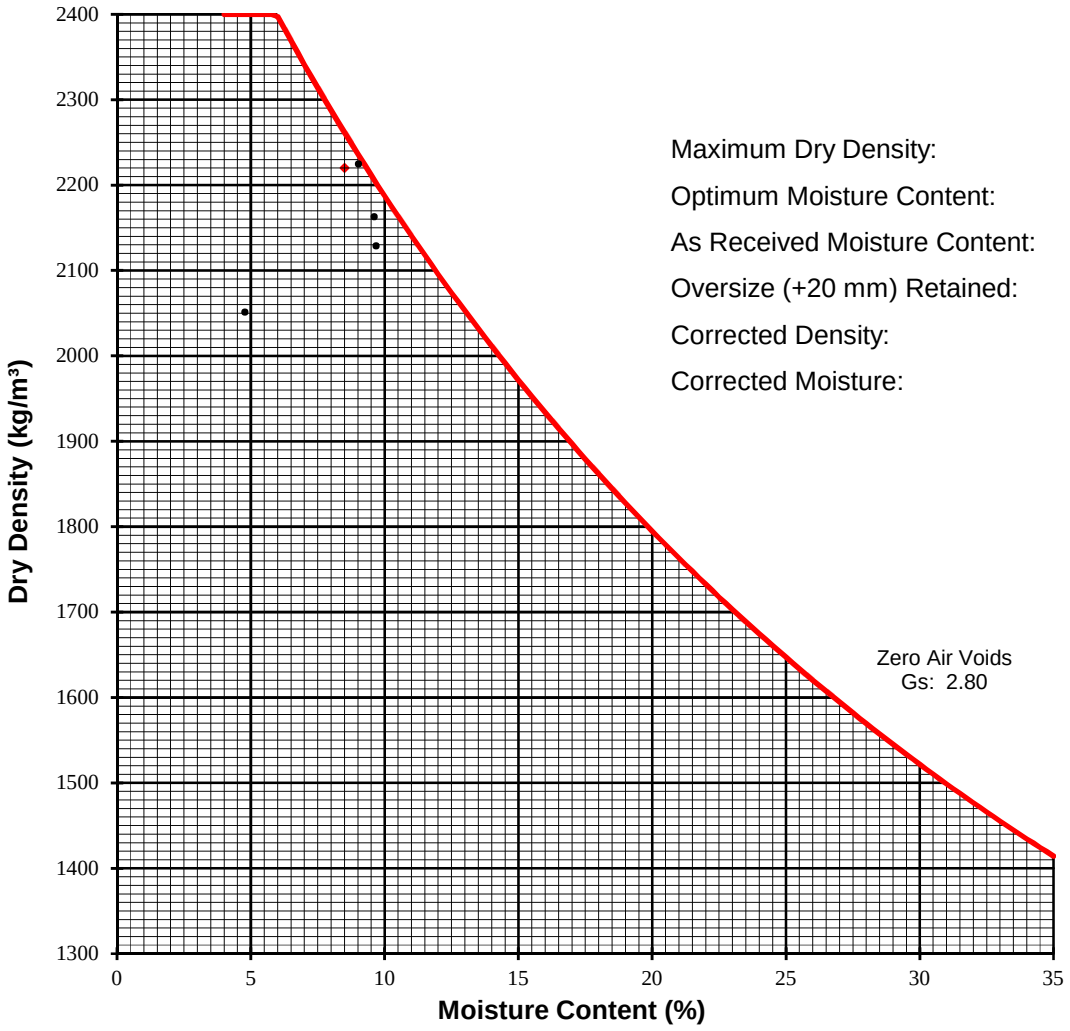
MOISTURE-DENSITY RELATIONSHIP (Proctor) REPORT

ASTM D698 Standard

Project:	Meliadine Dike Construction	Sample No.:	SA01
Client:	Agnico Eagle	Sampled By:	TW
Attention:		Sample Date:	October 23, 2016
Project No.:	E14103230-01	Test Date:	October 23, 2016
Description:	20mm minus	Preparation:	Moist
Source:	On-Site Stockpile	Compaction:	Manual



Maximum Dry Density:	**2220**	kg/m³
Optimum Moisture Content:	**8.5**	%
As Received Moisture Content:	**5.0**	%
Oversize (+20 mm) Retained:		%
Corrected Density:		%
Corrected Moisture:	**8.5**	%

Remarks:

Reviewed By: _____ C.E.T.

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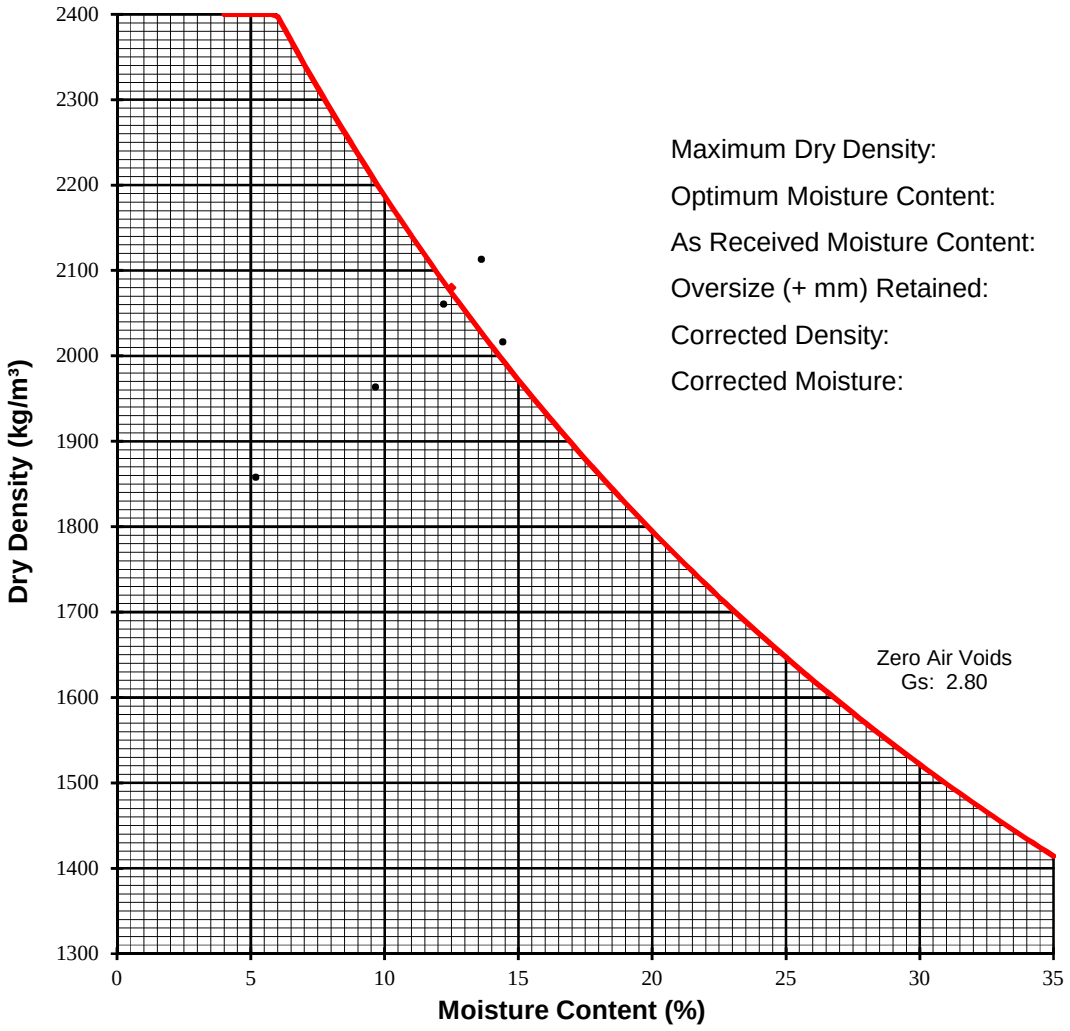
MOISTURE-DENSITY RELATIONSHIP (Proctor) REPORT

ASTM D698 Standard

Project:	Meliadine Dike Construction	Sample No.:	SA02
Client:	Agnico Eagle	Sampled By:	TW
Attention:	Duy Nguyen	Sample Date:	November 8, 2016
Project No.:	E14103230-01	Test Date:	November 8, 2016
Description:	Type C (20mm agg.)	Preparation:	Moist
Source:	Crusher	Compaction:	Manual



Maximum Dry Density:	**2080**	kg/m³
Optimum Moisture Content:	**12.5**	%
As Received Moisture Content:		%
Oversize (+ mm) Retained:		%
Corrected Density:	**2080**	%
Corrected Moisture:	**12.5**	%

Remarks:

Reviewed By: _____ C.E.T.

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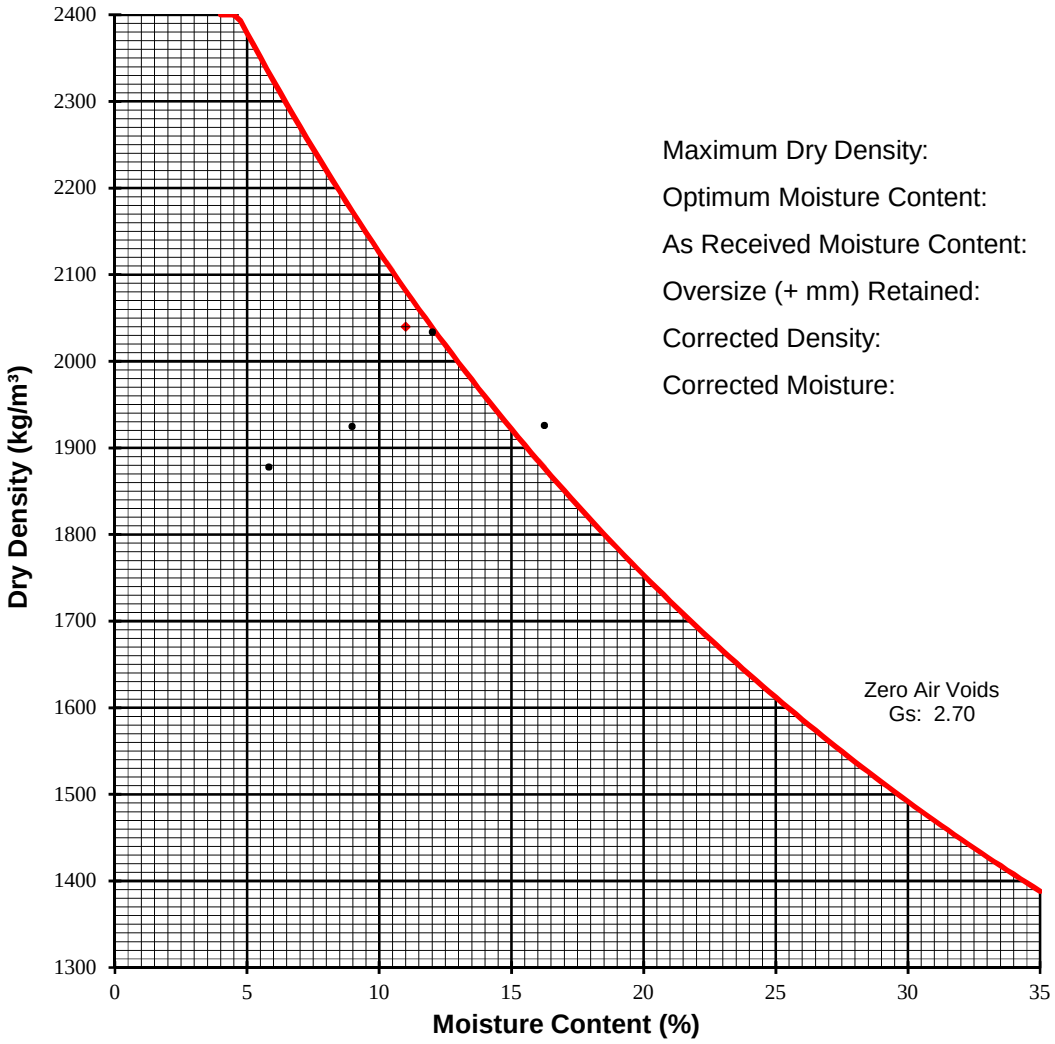
MOISTURE-DENSITY RELATIONSHIP (Proctor) REPORT

ASTM D698 Standard

Project:	Meliadine Dike Construction	Sample No.:	SA03
Client:	Agnico Eagle	Sampled By:	IM
Attention:	Duy Nguyen	Sample Date:	November 30, 2016
Project No.:	E14103230-01.023	Test Date:	November 30, 2016
Description:	Type C (20 mm agg.)	Preparation:	Moist
Source:	Crusher	Compaction:	Manual



Maximum Dry Density:	**2040**	kg/m³
Optimum Moisture Content:	**11.0**	%
As Received Moisture Content:	**14.3**	%
Oversize (+ mm) Retained:		%
Corrected Density:		%
Corrected Moisture:	**11.0**	%

Remarks: Same material used for Sieve Sample SA37

Reviewed By: _____ C.E.T.

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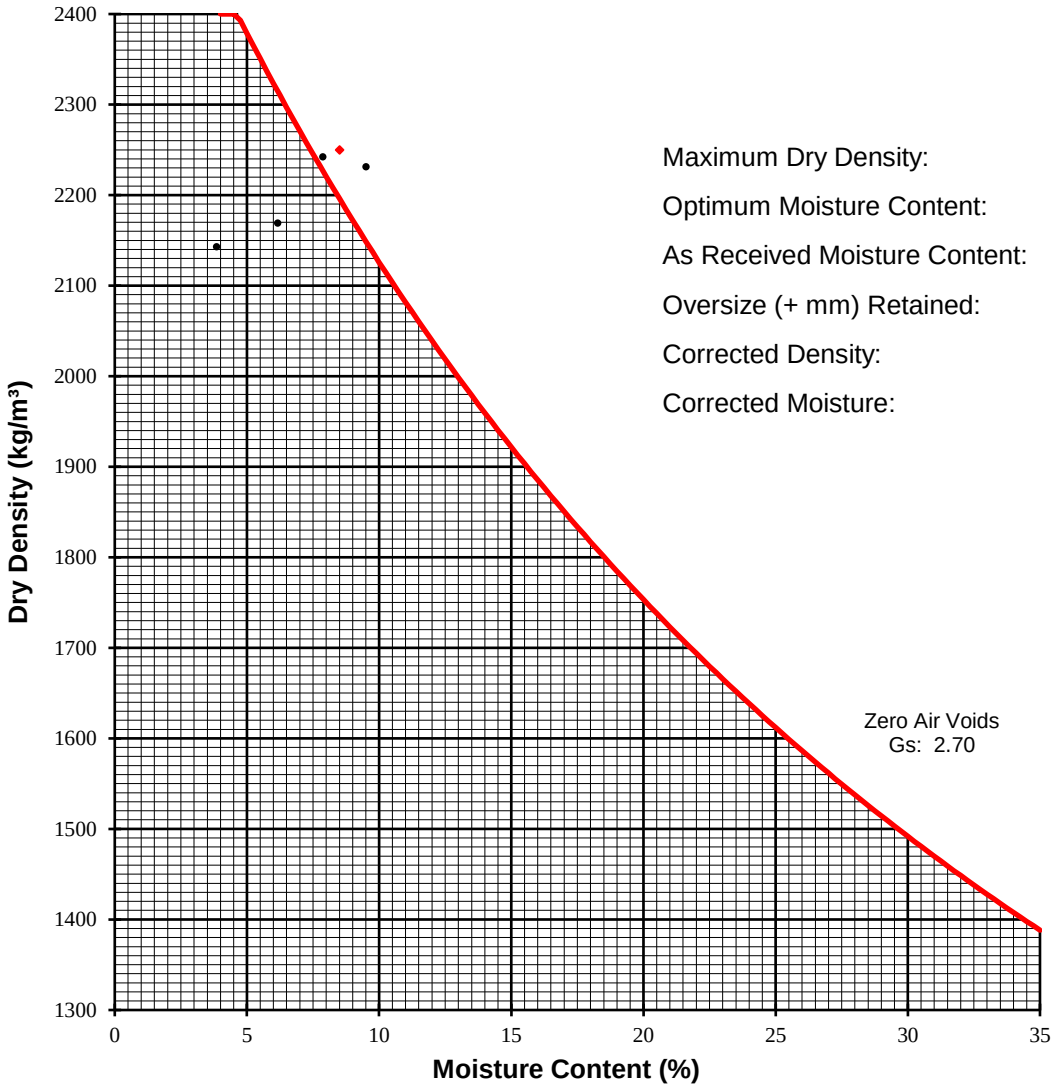
MOISTURE-DENSITY RELATIONSHIP (Proctor) REPORT

ASTM D698 Standard

Project:	Meliadine Dike Construction	Sample No.:	SA04
Client:	Agnico Eagle	Sampled By:	TW
Attention:	Duy Nguyen	Sample Date:	March 29, 2017
Project No.:	E14103230-01	Test Date:	March 29, 2017
Description:	Type C (20mm agg.)	Preparation:	Moist
Source:	Stockpile	Compaction:	Manual



Maximum Dry Density:	**2250**	kg/m³
Optimum Moisture Content:	**8.5**	%
As Received Moisture Content:		%
Oversize (+ mm) Retained:		%
Corrected Density:	**2080**	%
Corrected Moisture:	**8.5**	%

Remarks:

Reviewed By: _____ C.E.T.

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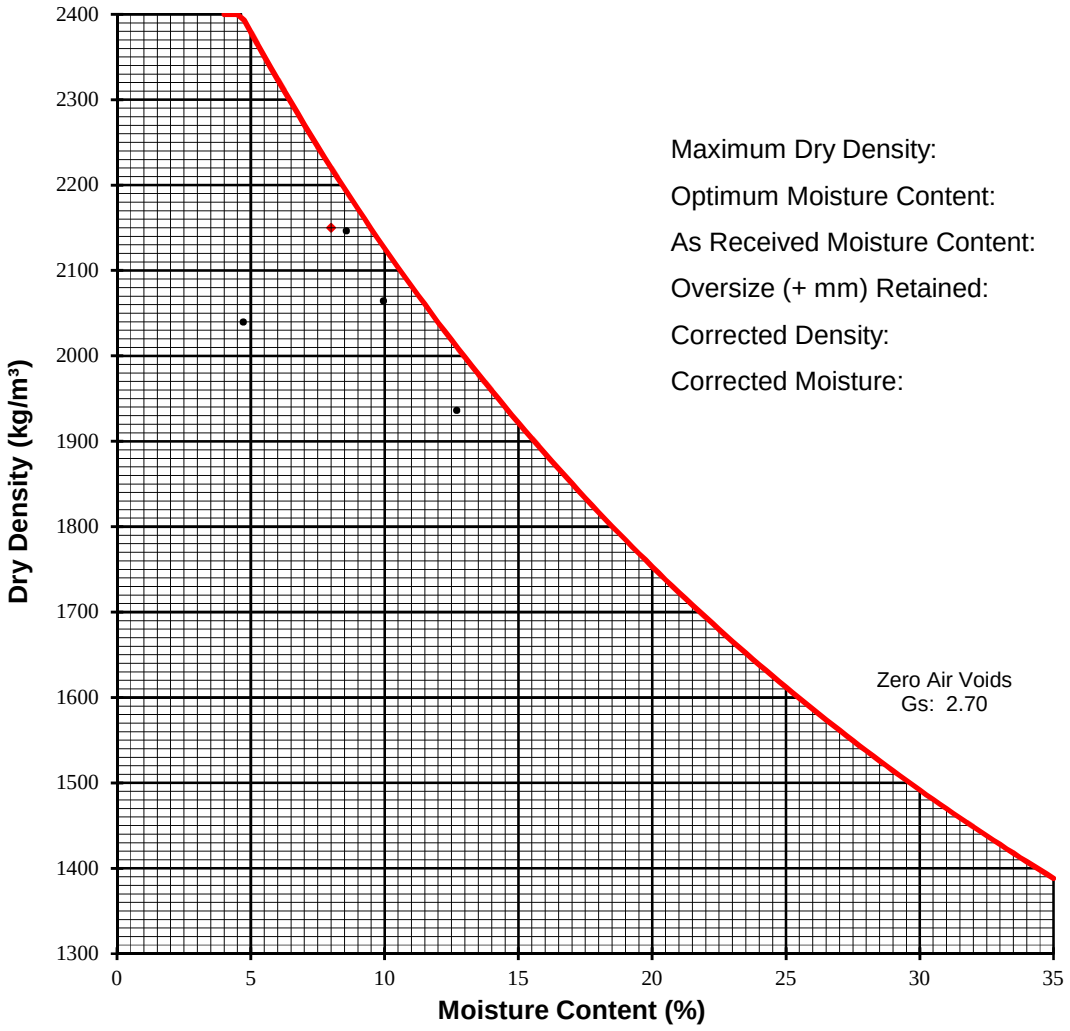
MOISTURE-DENSITY RELATIONSHIP (Proctor) REPORT

ASTM D698 Standard

Project:	Meliadine Dike Construction	Sample No.:	SA07
Client:	Agnico Eagle	Sampled By:	TW
Attention:	Duy Nguyen	Sample Date:	May 1, 2017
Project No.:	E14103230-01 Task 023	Test Date:	May 1, 2017
Description:	Type C (20mm minus)	Preparation:	Moist
Source:	Type C Stockpile	Compaction:	Manual



Maximum Dry Density:	**2150**	kg/m³
Optimum Moisture Content:	**8.0**	%
As Received Moisture Content:	**12.7**	%
Oversize (+ mm) Retained:		%
Corrected Density:		%
Corrected Moisture:		%

Remarks:

Reviewed By: _____ C.E.T.

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Table E2.1: Moisture Content Results for Granular Fill (20 mm minus) Material - Type C

Sample No.	Date Tested	Moisture Content (%)	Sample Source
SA01	22-Oct-16	9.3	sampled from belt
SA02	22-Oct-16	7.1	sampled from belt
SA03	22-Oct-16	5.4	sampled from belt
SA04	22-Oct-16	8.7	sampled from belt
SA05	22-Oct-16	6.0	sampled from belt
SA06	24-Oct-16	5.5	sampled from belt
SA07	24-Oct-16	6.3	sampled from belt
SA08	25-Oct-16	5.0	sampled from belt
SA09	26-Oct-16	8.4	sampled from belt
SA10	27-Oct-16	7.1	sampled from belt
SA11	29-Oct-16	6.1	sampled from belt
SA12	01-Nov-16	7.6	sampled from belt
SA13	02-Nov-16	11.0	sampled from belt
SA14	03-Nov-16	5.3	sampled from belt
SA15	05-Nov-16	4.2	sampled from belt
SA16	06-Nov-16	4.9	sampled from belt
SA17	07-Nov-16	8.0	sampled from belt
SA18	08-Nov-16	4.5	sampled from belt
SA19	09-Nov-16	9.4	sampled from belt
SA20	10-Nov-16	9.4	sampled from belt
SA21	12-Nov-16	10.0	sampled from belt
SA22	13-Nov-16	9.9	sampled from belt
SA23	14-Nov-16	5.1	sampled from belt
SA24	17-Nov-16	8.2	sampled from belt
SA25	17-Nov-16	12.4	sampled from stockpile
SA26	17-Nov-16	11.5	sampled from stockpile
SA27	19-Nov-16	11.2	sampled from stockpile
SA28	19-Nov-16	9.2	sampled from stockpile
SA29	19-Nov-16	11.9	sampled from belt
SA30	21-Nov-16	11.1	sampled from belt
SA31	23-Nov-16	4.5	sampled from belt
SA32	23-Nov-16	10.3	sampled from belt
SA33	26-Nov-16	7.5	sampled from stockpile
SA34	26-Nov-16	6.7	sampled from belt
SA35	26-Nov-16	8.0	sampled from stockpile
SA36	29-Nov-16	7.1	sampled from belt
SA37	30-Nov-16	14.3	sampled from belt
SA38	02-Dec-16	13.3	sampled from belt
SA39	03-Dec-16	13.8	sampled from belt
SA40	05-Dec-16	14.4	sampled from belt
SA41	11-Mar-17	6.7	sampled from stockpile
SA42	12-Mar-17	8.2	sampled from belt
SA43	18-Apr-17	11.5	sampled from spread
SA44	29-Apr-17	8.5	sampled from belt
SA45	29-Apr-17	7.8	sampled from belt
SA46	30-Apr-17	6.9	sampled from belt
SA47	30-Apr-17	10.9	sampled from belt
SA48	01-May-17	12.6	sampled from belt

SA49	01-May-17	5.6	sampled from belt
SA50	09-May-17	2.4	sampled from belt
SA51	10-May-17	14.1	sampled from belt
SA52	14-May-17	1.4	sampled from belt
SA53	15-May-17	2.1	sampled from stockpile
SP1	16-Jan-17	15.3	Sampled from stockpile at Mix Pit
SP2	16-Jan-17	15.5	Sampled from stockpile at Mix Pit
SP3	16-Jan-17	8.4	Sampled from North Crusher Stockpile
SP4	16-Jan-17	5.6	Sampled from North Crusher Stockpile
SP5	16-Jan-17	4.2	Sampled from North Crusher Stockpile
SP6	16-Jan-17	6.4	Sampled from North Crusher Stockpile
SP7	16-Jan-17	5.7	Sampled from North Crusher Stockpile
SP8	16-Jan-17	5.3	Sampled from North Crusher Stockpile
SP9	16-Jan-17	16.3	Sampled from Middle Crusher Stockpile, North End
SP10	16-Jan-17	6.2	Sampled from Middle Crusher Stockpile, North End
SP11	16-Jan-17	6.9	Sampled from South Crusher Stockpile
SP12	16-Jan-17	9.4	Sampled from South Crusher Stockpile
SP13	16-Jan-17	8.2	Sampled from South Crusher Stockpile
SP14	16-Jan-17	13.3	Sampled from East Crusher Stockpile
SP15	16-Jan-17	8.7	Sampled from East Crusher Stockpile
SP16	18-Jan-17	6.3	Sampled from Type K Mixing Station
SP17	18-Jan-17	6.8	Sampled from Type K Mixing Station
SP18	18-Jan-17	7.3	Sampled from Type K Mixing Station
SP19	29-Jan-17	10.2	Sampled from reject pile North of Type F Mixing Station
SP20	29-Jan-17	16.9	Sampled from reject pile North of Type F Mixing Station
SP21	29-Jan-17	16.3	Sampled from reject pile North of Type F Mixing Station
SP22	30-Jan-17	7.7	Sampled from stockpile North of Type F Mixing Station
SP23	30-Jan-17	6.3	Sampled from stockpile North of Type F Mixing Station
SP24	31-Jan-17	7.7	Sampled from stockpile used for Type F
SP25	31-Jan-17	7.0	Sampled from stockpile used for Type F
SP26	01-Feb-17	8.2	Sampled from stockpile North of Type F Mixing Station
SP27	11-Feb-17	6.7	Dike D-CP1 fillet zone Station 0+300, -0.3 m
SP28	11-Feb-17	7.4	Dike D-CP1 fillet zone Station 0+340, -0.3 m
SP29	11-Feb-17	6.9	Dike D-CP1 fillet zone Station 0+380, -0.3 m
SP30	16-Mar-17	8.3	Dike D-CP1 first lift over liner Station 0+425
SP31	05-Apr-17	8.2	Recyled Type C from Stockpile
SP32	05-Apr-17	9.0	Recyled Type C from Stockpile
SP33	05-Apr-17	9.1	Recyled Type C from Stockpile
SP34	07-Apr-17	9.2	Recyled Type C from Stockpile
SP35	07-Apr-17	11.8	Recyled Type C from Stockpile
SP36	08-Apr-17	11.4	Recyled Type C from Stockpile
SP37	08-Apr-17	11.5	Recyled Type C from Stockpile
SP38	09-Apr-17	9.2	Recyled Type C from Stockpile
SP39	09-Apr-17	8.6	Recyled Type C from Stockpile
SP40	02-May-17	8.2	Sampled from Type C Stockpile 1
SP41	02-May-17	7.9	Sampled from Type C Stockpile 1
SP42	02-May-17	9.3	Sampled from Type C Stockpile 5
SP43	02-May-17	16.2	Sampled from Type C Stockpile 3 - Material Rejected
SP44	02-May-17	19.8	Sampled from Type C Stockpile 3 - Material Rejected
SP45	05-May-17	6.9	Sampled from Type C stockpile floor
SP46	05-May-17	6.5	Sampled from Type C stockpile floor

SP47	05-May-17	8.4	Sampled from Type C stockpile floor
SP48	13-May-17	5.4	Sampled from Type C stockpile
SP49	13-May-17	4.2	Sampled from Type C stockpile
SP50	13-May-17	3.3	Sampled from Type C stockpile
SP51	13-May-17	4.0	Sampled from Type C stockpile

Average Moisture Content	**8.6%**

Table E2.2: Frozen / In-situ Single Point Proctors for Type C Material

Date/Shift	Material Type	Sample	Mass of Soil in Mold (g)	Mold Volume (cm2)	Frozen Compacted Density (kg/m3)	Mass of Weight Soil and Tare (g)	Mass of Tare (g)	Mass of Dry Soil and Tare (g)	Moisture Content (%)	Dry Density (kg/m3)	Comments
Nov 26, 2016 / NS	Type C	SA01	4056.8	2122.5	1911	3701.3	1650.9	3568.8	6.9	1788	
Mar 5, 2017 / DS	Type C	SA02	3844.0	2122.5	1811	410.8	15.8	382.6	7.7	1682	Type C stockpile at Type F mixing station
Mar 7, 2017 / DS	Type C	SA03	3712.0	2122.5	1749	417.0	16.7	383.7	9.1	1603	Type C stockpile at Type F mixing station
Mar 11, 2017 / DS	Type C	SA04	3874.0	2122.5	1825	670.6	16.9	629.3	6.7	1710	Type C stockpile at Type F mixing station
Mar 12, 2017 / DS	Type C	SA05	3794.0	2122.5	1788	361.5	15.8	332.5	9.2	1638	Type C stockpile at Type F mixing station
April 5, 2017 / NS	Type C	SA06	3858.9	2122.5	1818	3509.4	1651.2	3377.4	7.6	1689	Type C used at DCP5 for U/S fillet
April 17, 2017 / DS	Type C	SA07	3890.0	2122.5	1833	5508.0	1634.0	5130.0	10.8	1654	Type C used at DCP 5 for U/S fillet between Stations 0+210 and 0+270
April 18, 2017 / DS	Type C	SA08	3694.0	2122.5	1740	4334.0	690.0	3934.0	12.3	1549	Sampled from U/s Type C fillet at D-CP5; Station ~0+280
April 30, 2017 / NS	Type C	SA09	3759.0	2126.6	1768	3562.5	695.5	3281.6	10.9	1594	Sampled from crusher belt

D-CP5 Type C Material Field Density Testing (Nuclear Densometer) Summary

Date	Density Test #	Tech	Probe Depth (mm)	Station	Depth from OG (m)	Wet Density (Mg/m3)	Moisture Content (%)	Dry Density (M/m3)	Single Point Frozen Proctor Dry Density (kg/m3)	% SPFPDD	Standard Proctor Maximum Dry Density (kg/m3)	% SPMDD	Comments (All tests approx. along Centreline unless otherwise noted)
2017-04-01	1	TW	200	0+015	0.9	1969	6.2	1854	1685	110.0	2100	88.3	1st lift of Type C U/S fillet (below liner) -frozen
2017-04-01	2	TW	200	0+005	0.9	1908	6.4	1793	1685	106.4	2100	85.4	1st lift of Type C U/S fillet (below liner) -frozen
2017-04-01	3	TW	200	0+020	0.9	1900	6.2	1789	1685	106.2	2100	85.2	1st lift of Type C U/S fillet (below liner) -frozen
2017-04-01	4	TW	200	0+035	0.9	1936	6.3	1821	1685	108.1	2100	86.7	1st lift of Type C U/S fillet (below liner) -frozen
2017-04-02	5	WW	200	0+045	0.8	1836	6.8	1719	1685	102.0	2100	81.9	2nd lift Type C us fillet - frozen
2017-04-02	6	WW	200	0+020	0.8	1840	6.3	1731	1685	102.7	2100	82.4	2nd lift Type C us fillet - frozen
2017-04-02	7	WW	200	0+055	0.6	1856	6.2	1748	1685	103.7	2100	83.2	3rd lift Type C us fillet - frozen
2017-04-02	8	WW	200	0+025	0.6	1966	6.1	1853	1685	110.0	2100	88.2	3rd lift Type C us fillet - frozen
2017-04-03	9	WW	200	0+070	0.4	1852	6.4	1741	1685	103.3	2100	82.9	4th lift u/s fillet - frozen
2017-04-03	10	WW	200	0+030	0.4	1864	6.4	1752	1685	104.0	2100	83.4	4th lift u/s fillet - frozen
2017-04-03	11	WW	200	0+060	0.4	1880	6.5	1765	1685	104.8	2100	84.1	4th lift u/s fillet - frozen
2017-04-03	12	WW	200	0+023	0.4	1840	7.5	1712	1685	101.6	2100	81.5	4th lift u/s fillet - frozen
2017-04-03	13	WW	200	0+035	0.2	1858	7.4	1730	1685	102.7	2100	82.4	5th lift u/s fillet
2017-04-03	14	WW	200	0+035	0.2	1881	6.6	1765	1685	104.7	2100	84.0	6th lift u/s fillet
2017-04-03	15	WW	200	0+035	0.2	1894	6.4	1780	1685	105.6	2100	84.8	7th lift u/s fillet
2017-04-03	16	WW	200	0+035	0.2	1861	7.3	1734	1685	102.9	2100	82.6	8th lift u/s fillet
2017-04-03	17	TW	200	0+085	1.05	1842	7.0	1721	1685	102.2	2100	82.0	1st lift of Type C U/S fillet (below liner) -frozen
2017-04-03	18	TW	200	0+097	1.05	1876	6.7	1758	1685	104.3	2100	83.7	1st lift of Type C U/S fillet (below liner) -frozen
2017-04-03	19	TW	200	0+113	1.05	1952	5.3	1854	1685	110.0	2100	88.3	1st lift of Type C U/S fillet (below liner) -frozen
2017-04-03	20	TW	200	0+081	0.75	1925	5.6	1823	1685	108.2	2100	86.8	2nd lift of Type C U/S fillet (below liner) -frozen
2017-04-03	21	TW	200	0+098	0.75	1877	6.9	1756	1685	104.2	2100	83.6	2nd lift of Type C U/S fillet (below liner) -frozen
2017-04-03	22	TW	200	0+098	0.75	1857	7.0	1736	1685	103.0	2100	82.6	2nd lift of Type C U/S fillet (below liner) -frozen
2017-04-03	23	TW	200	0+098	0.75	1838	5.4	1744	1685	103.5	2100	83.0	2nd lift of Type C U/S fillet (below liner) -frozen
2017-04-03	24	TW	200	0+098	0.75	1865	5.9	1761	1685	104.5	2100	83.9	2nd lift of Type C U/S fillet (below liner) -frozen
2017-04-03	25	TW	200	0+080	0 (OG)	1835	5.6	1738	1685	103.1	2100	82.7	4th lift of Type C U/S fillet (below liner) -frozen
2017-04-03	26	TW	200	0+108	0 (OG)	1863	6.2	1754	1685	104.1	2100	83.5	4th lift of Type C U/S fillet (below liner) -frozen
2017-04-04	27	WW	200	0+122	0.9	1938	5.6	1835	1685	108.9	2100	87.4	u/s fillet 1st lift
2017-04-04	28	WW	200	0+127	0.2	1974	6.0	1862	1685	110.5	2100	88.7	u/s fillet final lift
2017-04-05	29	WW	200	0+170	0.75	1921	4.9	1831	1685	108.7	2100	87.2	u/s fillet 1st lift
2017-04-05	30	TW	200	0+182	0.3	1812	6.3	1705	1685	101.2	2100	81.2	2nd lift of Type C U/S fillet (below liner) -frozen
2017-04-05	31	TW	200	0+192	0.3	1824	6.7	1709	1685	101.5	2100	81.4	2nd lift of Type C U/S fillet (below liner) -frozen
2017-04-06	32	WW	200	0+153	0.2	1926	5.3	1829	1685	108.5	2100	87.1	top lift of Type C us fillet
2017-04-06	33	WW	200	0+185	0.4	1891	5.7	1789	1685	106.2	2100	85.2	us fillet Type C underliner - frozen
2017-04-06	34	WW	200	0+185	0.4	1895	5.7	1793	1685	106.4	2100	85.4	us fillet Type C underliner - frozen
2017-04-06	35	WW	200	0+185	0.4	1913	5.6	1812	1685	107.5	2100	86.3	us fillet Type C underliner - frozen
2017-04-06	36	WW	200	0+185	0.4	1929	5.9	1822	1685	108.1	2100	86.7	us fillet Type C underliner - frozen
2017-04-15	37	WW	200	0+210	0.4	1840	7.5	1712	1685	101.6	2100	81.5	us fillet Type C underliner
2017-04-16	38	IM	200	0+260	1.8	1864	7.3	1737	1685	103.1	2100	82.7	3rd Lift Type C U/S Fillet - Frozen
2017-04-16	39	IM	200	0+245	1.5	1850	6.9	1731	1685	102.7	2100	82.4	4th Lift Type C U/S Fillet - Frozen
2017-04-16	40	IM	200	0+230	1.5	1857	7.5	1727	1685	102.5	2100	82.3	4th Lift Type C U/S Fillet - Frozen
2017-04-22	41	TW	200	0+160	0.3	1865	6.5	1751	1685	103.9	2101	83.3	2nd Lift of the Type C D/S Fillet - Frozen
2017-04-22	42	TW	200	0+180	0.3	1876	6.8	1757	1685	104.2	2102	83.6	2nd Lift of the Type C D/S Fillet - Frozen
2017-05-03	43	TW	200	1+080	66.1 elev	1845	7.2	1721	1685	102.1	2102	81.9	First lift of Type C material placing on the U/S slope
2017-05-03	44	TW	200	1+150	65.3 elev	1790	6.4	1682	1685	99.8	2102	80.0	First lift of Type C material placing on the U/S slope
2017-05-03	45	TW	200	1+195	64.9 elev	1798	6.6	1687	1685	100.1	2102	80.2	First lift of Type C material placing on the U/S slope
2017-05-03	46	TW	200	1+235	64.9 elev	1823	7.0	1704	1685	101.1	2102	81.1	First lift of Type C material placing on the U/S slope
2017-05-04	47	TW	200	1+270	66.3 elev	1970	6.2	1855	1685	110.1	2102	88.2	Third lift of Type C material placed on the U/S slope
2017-05-04	48	TW	200	1+239	65.95 elev	1902	8.4	1755	1685	104.1	2102	83.5	Third lift of Type C material placed on the U/S slope
2017-05-04	49	TW	200	1+166	65.6 elev	1940	6.1	1828	1685	108.5	2102	87.0	Third lift of Type C material placed on the U/S slope
2017-05-05	50	TW	200	1+180	66 elev	1905	7.3	1775	1685	105.4	2102	84.5	Fifth lift of Type C material placed on the U/S slope
2017-05-05	51	TW	200	1+125	66.1	1920	6.4	1805	1685	107.1	2102	85.8	Fifth lift of Type C material placed on the U/S slope

Dike D-CP5 Type C Material Sand Cone Tests 2017 Summary

Date	Material Type	Station	Dry Density (kg/m3) (Densometer Avg.)	Densometer Moisture Content (% Avg.)	Bentonite placed (g)	Bentonite Bulk Density* (kg/m3)	Pit Volume (m3)	Soil weight (g)	Soil Bulk Density (kg/m3)	Moisture Content (%)	Soil Dry Density (kg/m3)	Comments
3-Apr-17	Type C	0+098	1749	6.3	2810	1056	0.00266	6696	2516.4	8.5	2319.2	TW- Type C Material was frozen
6-Apr-17	Type C	0+185	1804	5.7	3159	1056	0.00299	5606	1874.0	6.2	1764.6	WW - Type C material was frozen
17-Apr-17	Type C	0+240	1667	8.8	2620	1089	0.00241	4204	1747	10.5	1581	WW- Material was u/s fillet, frozen and appeared to have a high sand content.

APPENDIX E3

TYPE F MATERIAL QA/QC TEST RESULTS

Table E3.1: Moisture Content Results for Bentonite Augmented Material - Type F

Sample No.	Date Tested	Moisture Content (%)	Sample Source
SA01	29-Jan-17	8.2	20 mm minus mixed with bentonite
SA02	30-Jan-17	7.2	20 mm minus mixed with bentonite
SA03	31-Jan-17	8.4	20 mm minus mixed with bentonite
SA04	31-Jan-17	7.4	20 mm minus mixed with bentonite
SA05	01-Feb-17	8.0	20 mm minus mixed with bentonite
SA06	18-Feb-17	6.4	20 mm minus mixed with bentonite

Average Moisture Content	7.6%

Table E3.2: Frozen / In-situ Single Point Proctors for Type F Material

Date/Shift	Material Type	Sample	Mass of Soil in Mold (g)	Mold Volume (cm3)	Frozen Compacted Density (kg/m3)	Mass of Wet Soil and Tare (g)	Mass of Tare (g)	Mass of Dry Soil and Tare (g)	Moisture Content (%)	Dry Density (kg/m3)	Comments
Nov 20, 2016 / NS	Type F	SA01	3847.6	2122.5	1813	4024.1	1643.7	3850.6	7.9	1681	
Nov 26, 2016 / NS	Type F	SA02	3879.6	2122.5	1828	1961.1	681.6	1839.4	10.5	1654	
Jan 31, 2017 / DS	Type F	SA03	3662.3	2122.5	1725	2690.7	696.7	2536.2	8.4	1592	
Jan 31, 2017 / DS	Type F	SA04	3712.4	2122.5	1749	2675.5	694.8	2539.3	7.4	1629	
Jan 31, 2017 / NS	Type F	SA05	3704.5	2122.5	1736	2783.5	693.2	2629.5	8.0	1608	
Feb 1, 2017 / DS	Type F	SA06	3707.0	2122.4	1747	2965.8	697.6	2814.9	7.1	1631	
Feb 1, 2017 / NS	Type F	SA07	3704.5	2122.5	1736	2783.5	693.2	2629.5	8.0	1608	
March 14, 2017 / DS	Type F	SA08	3865.4	2122.5	1821	160.2	4.3	148.2	8.3	1681	Mixing station - sampled from batch after mixing
April 10, 2017 / DS	Type F	SA09	3804.0	2122.5	1792	1438.6	690.3	1363.0	11.2	1611	

Dike D-CP5 Type F Material Field Density Testing (Nuclear Densometer) Summary

Note: Densities and saturation are based on Nuclear Gauge results which may not be accurate for frozen aggregate

Date	Density Test #	Tech	Probe Depth (mm)	Station	Depth from OG (m)	Wet Density (kg/m3)	Moisture Content (%)	Dry Density (kg/m3)	Single Point Frozen Proctor Dry Density Average (kg/m3)	% SPFPDD	Comments
31-Mar-17	001	TW	200	0+006	1.65	1842	6.6	1728	1635	105.7	Top of Type F below liner - frozen
31-Mar-17	002	TW	200	0+010	1.65	1848	7.2	1724	1635	105.4	Top of Type F below liner - frozen
31-Mar-17	003	TW	200	0+015	1.65	1947	5.7	1842	1635	112.7	Top of Type F below liner - frozen
31-Mar-17	004	TW	200	0+015	1.65	1883	6.9	1761	1635	107.7	Top of Type F below liner - frozen
31-Mar-17	005	TW	200	0+015	1.65	1889	6.6	1772	1635	108.4	Top of Type F below liner - frozen
31-Mar-17	006	TW	200	0+015	1.65	1890	6.4	1776	1635	108.6	Top of Type F below liner - frozen
31-Mar-17	007	TW	200	0+025	1.65	1867	6.8	1748	1635	106.9	Top of Type F below liner - frozen
1-Apr-17	008	TW	200	0+058	1.65	1885	6.3	1773	1635	108.5	Top of Type F below liner - frozen
1-Apr-17	009	TW	200	0+067	1.65	1846	6.5	1733	1635	106.0	Top of Type F below liner - frozen
1-Apr-17	010	TW	200	0+056	1.25	1856	6.8	1738	1635	106.3	Top of Type F U/S fillet - frozen
1-Apr-17	011	TW	200	0+072	1.25	1873	6.3	1762	1635	107.8	Top of Type F U/S fillet - frozen
1-Apr-17	012	WW	150	0+047	1.65	1862	7.3	1735	1635	106.1	Top lift of KT floor - frozen
1-Apr-17	013	WW	150	0+055	1.65	1882	6.1	1774	1635	108.5	Top lift of KT floor - frozen
1-Apr-17	014	WW	200	0+058	1.5	1871	5.8	1768	1635	108.2	Lift 1 of u/s Type F fillet
1-Apr-17	015	WW	150	0+040	1.5	1935	5.5	1834	1635	112.2	Lift 1 of u/s Type F fillet
1-Apr-17	016	WW	200	0+025	1.3	1933	5.3	1836	1635	112.3	Lift 2 of u/s Type F fillet
1-Apr-17	017	WW	200	0+060	1.35	1881	6.4	1768	1635	108.1	Lift 2 of u/s Type F fillet
1-Apr-17	018	WW	200	0+072	1.5	1862	6.2	1753	1635	107.2	Lift 1 of u/s Type F fillet
2-Apr-17	019	WW	200	0+070	1.5	1862	7.3	1735	1635	106.1	1st lift u/s fillet
2-Apr-17	020	WW	200	0+084	1.65	1862	6.2	1753	1635	107.2	1st lift above KT floor
3-Apr-17	021	WW	200	0+095	1.8	1859	6.5	1746	1635	106.8	1st lift above KT floor
3-Apr-17	022	WW	200	0+108	1.8	1840	7.5	1712	1635	104.7	1st lift above KT floor
3-Apr-17	023	TW	200	0+080	1.5	1852	8.4	1708	1635	104.5	1st lift of Type F U/S fillet -frozen
3-Apr-17	024	TW	200	0+095	1.5	1860	7.7	1727	1635	105.6	1st lift of Type F U/S fillet -frozen
3-Apr-17	025	TW	200	0+095	1.5	1840	8.1	1702	1635	104.1	1st lift of Type F U/S fillet -frozen
3-Apr-17	026	TW	200	0+095	1.5	1873	8.1	1733	1635	106.0	1st lift of Type F U/S fillet -frozen
3-Apr-17	027	TW	200	0+095	1.5	1805	7.9	1673	1635	102.3	1st lift of Type F U/S fillet -frozen
3-Apr-17	028	TW	200	0+100	1.35	1900	7.4	1769	1635	108.2	Top of Type F U/S fillet -frozen
3-Apr-17	029	TW	200	0+112	1.35	1948	7.4	1814	1635	110.9	Top of Type F U/S fillet -frozen
4-Apr-17	030	WW	200	0+122	1.5	1946	6.7	1824	1635	111.5	2nd lift above KT floor
5-Apr-17	031	WW	200	0+170	1.25	1897	6.1	1788	1635	109.4	1st lift u/s fillet
5-Apr-17	032	WW	200	0+165	1.4	1930	5.6	1828	1635	111.8	2nd lift above KT floor
5-Apr-17	033	TW	200	0+185	1.5	1823	6.8	1707	1635	104.4	Top of Type F U/S fillet (below liner) -frozen
7-Apr-17	034	WW	200	0+070	0.0	1904	7.0	1779	1635	108.8	Type F u/s fillet hinge under liner
7-Apr-17	035	WW	200	0+090	0.0	1844	6.7	1728	1635	105.7	Type F u/s fillet hinge under liner
14-Apr-17	036	WW	200	0+215	1.95	1820	7.9	1687	1635	103.2	2nd lift above KT floor
14-Apr-17	037	WW	200	0+210	1.8	1827	9.1	1675	1635	102.4	3rd lift above KT floor
16-Apr-17	038	WW	200	0+230	2.1	1910	7.7	1773	1632	108.6	Final lift above KT floor under liner
16-Apr-17	039	WW	250	0+245	2.4	1861	8.0	1723	1632	105.6	Final lift above KT floor under liner
16-Apr-17	040	WW	200	0+260	2.55	1949	7.7	1810	1632	110.9	Final lift above KT floor under liner
16-Apr-17	041	WW	200	0+260	2.55	1916	8.0	1774	1632	108.7	Final lift above KT floor under liner
16-Apr-17	042	WW	200	0+260	2.55	1908	8.2	1763	1632	108.0	Final lift above KT floor under liner
16-Apr-17	043	WW	200	0+260	2.55	1905	7.5	1772	1632	108.6	Final lift above KT floor under liner
16-Apr-17	044	WW	200	0+225	1.8	1881	8.3	1737	1632	106.4	Final (2nd) lift of U/S fillet under liner
16-Apr-17	045	WW	200	0+250	2.1	1917	7.6	1782	1632	109.2	Final (2nd) lift of U/S fillet under liner
17-Apr-17	046	WW	200	0+250	2	1917	7.4	1785	1632	109.4	2nd lift of U/S fillet above KT floor
18-Apr-17	047	IM	200	0+295	1	1749	7.4	1628	1632	99.8	North Abutment Type F U/S U/L
18-Apr-17	048	IM	200	0+295	0.85	1756	7.7	1630	1632	99.9	North Abutment Type F U/S U/L

Dike D-CP5 Type F Material Sand Cone Tests 2017 Summary

Date	Material Type	Station	Dry Density (kg/m3) (Densometer Avg.)	Densometer Moisture Content (% Avg.)	Bentonite placed (g)	Bentonite Bulk Density*	Pit Volume (m3)	Soil weight (g)	Soil Bulk Density (kg/m3)	Moisture Content (%)	Soil Dry Density (kg/m3)	Comments
03-04-2017	Type F	0+095	1709	8	2998	1056	0.0028	5546	1953.5	8.9	1793.8	
16-04-2017	Type F	0+260	1780	7.9	2552	1089	0.0023	4412	1882.7	9.1	1725.7	WW- Type F Material was frozen

APPENDIX E4

KEY TRENCH BASE MATERIAL JAR AND MOISTURE CONTENT TEST RESULTS

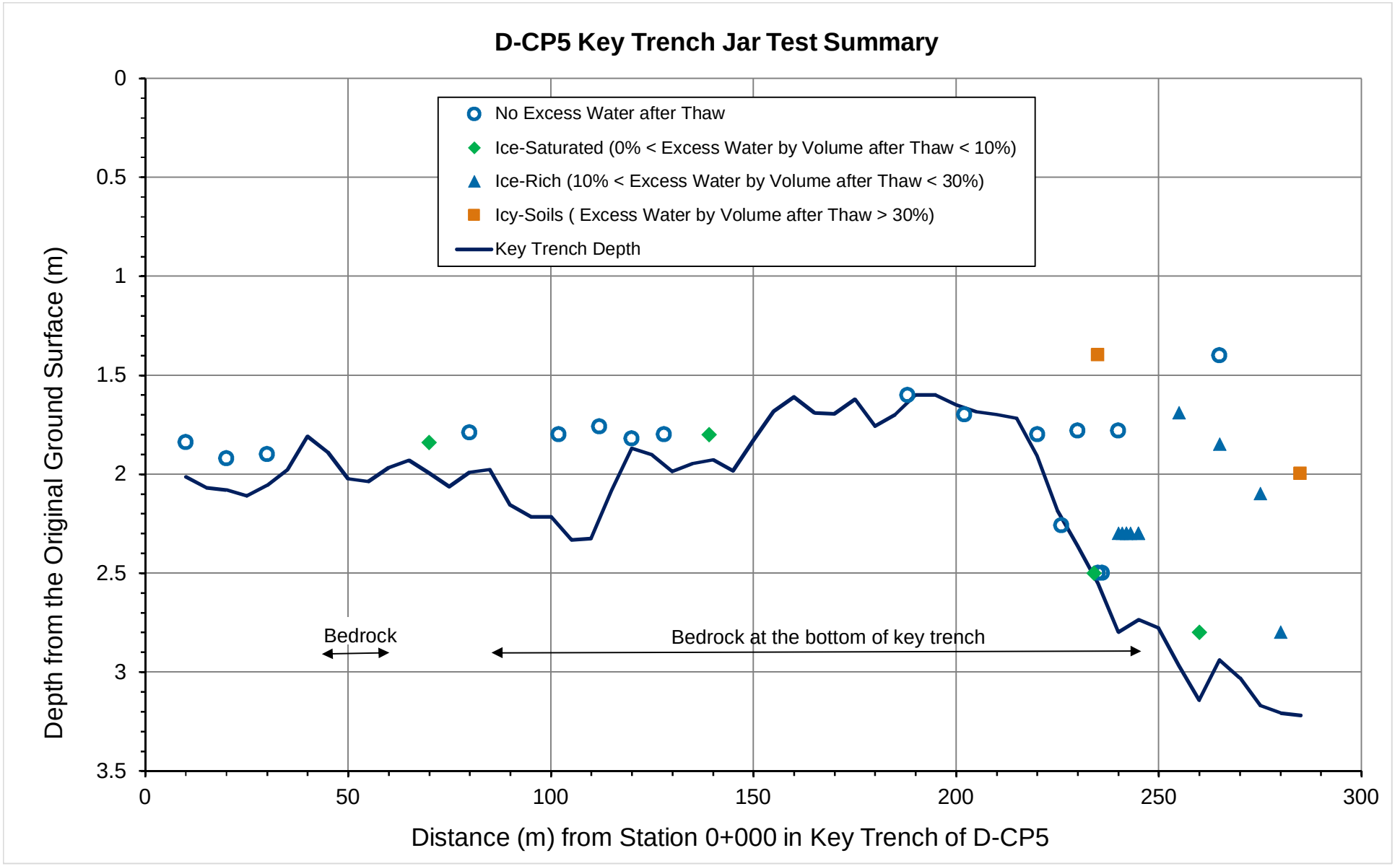
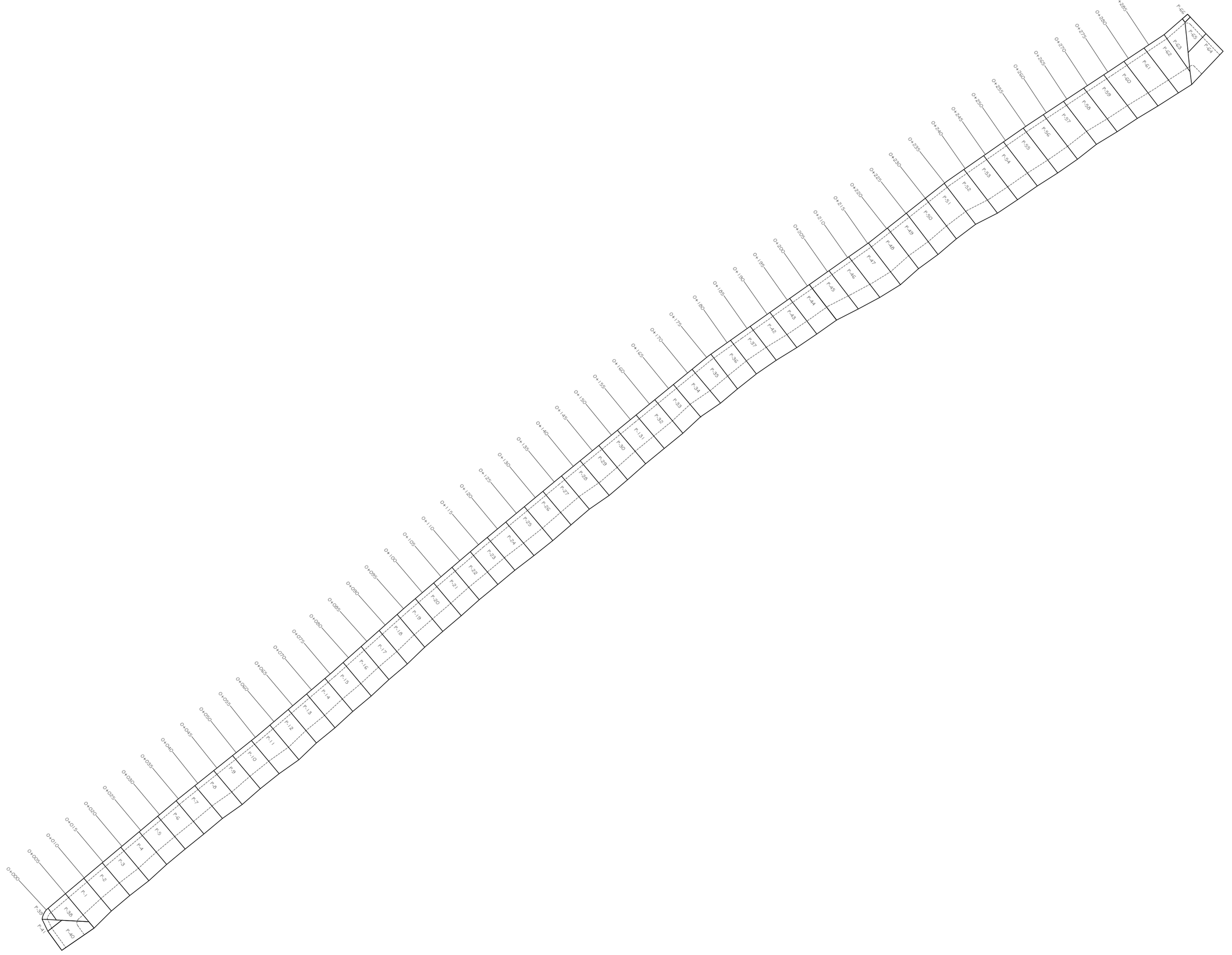

D-CP5 Key Trench Jar Test Summary
No Excess Water after Thaw
Ice-Saturated (0% < Excess Water by Volume after Thaw < 10%)
Ice-Rich (10% < Excess Water by Volume after Thaw < 30%)
Icy-Soils (Excess Water by Volume after Thaw > 30%)
Key Trench Depth
Bedrock
Bedrock at the bottom of key trench
Depth from the Original Ground Surface (m)
Distance (m) from Station 0+000 in Key Trench of D-CP5
0
0.5
1
1.5
2
2.5
3
3.5
0
50
100
150
200
250
300

TABLE E4: DIKE D-CP5 KEY TRENCH JAR TEST SAMPLES SUMMARY RESULTS

Sample #	Date Tested	Sample Type	Survey Data		Jar Test Results							Soil Description
			Approx. Station	Sample Depth (m)	Height of Supernatant Water (mm)	Height of Saturated Sediment (mm)	Percentage of Excess Supernatant Water in Thawed Soil Sample (by volume) (%)	Moisture Content (%)	Bulk Density (kg/m3)	Ice Content Description	Material Acceptance	
1	16-Jan-17	Disturbed core	0+235	1.40	40	12	76.9	184%	1099	Icy Soil	Not Acceptable	SAND, some gravel, trace silt
2	16-Jan-17	Disturbed	0+265	1.40	0	65	0.0	4%	-	Non- Ice Saturated	Not Acceptable	SILT, some sand
3	19-Jan-17	Core	0+285	2.00	42	60	41.2	63%	1205	Icy Soil	Not Acceptable	SILT, some sand, some gravel
4	19-Jan-17	Core	0+275	2.10	25	60	29.4	55%	1457	Ice-Rich Soil	Not Acceptable	SILT
5	19-Jan-17	Core	0+265	1.85	15	90	14.3	29%	1761	Ice-Rich Soil	Not Acceptable	SILT, some gravel, trace sand
6	19-Jan-17	Core	0+255	1.69	16	54	22.9	70%	1080	Ice-Rich Soil	Not Acceptable	SILT, trace gravel
7	23-Jan-17	Disturbed	0+226	2.26	0	125	0.0	12%	'	Non- Ice Saturated	Not Acceptable	SILT, some gravel
8	23-Jan-17	Disturbed	0+202	1.90	0	130	0.0	13%	'	Non- Ice Saturated	Not Acceptable	SILT, some gravel
9	23-Jan-17	Disturbed	0+188	1.75	0	145	0.0	11%	'	Non- Ice Saturated	Not Acceptable	SILT, some gravel
10	23-Jan-17	Disturbed Core	0+020	1.92	0	110	0.0	13%	'	Nearly ice-saturated	Acceptable	SILT, some gravel
11	23-Jan-17	Disturbed Core	0+010	1.84	0	110	0.0	12%	-	Nearly ice-saturated	Acceptable	SILT, some gravel
12	23-Jan-17	Disturbed Core	0+002	1.74	0	115	0.0	15%	-	Nearly ice-saturated	Acceptable	SILT, some gravel
13	25-Jan-17	Disturbed Core	0+070	1.84	3	75	3.8	12%	-	Nearly ice-saturated	Acceptable	SILT, some gravel
14	25-Jan-17	Disturbed Core	0+080	1.79	0	80	0.0	12%	-	Nearly ice-saturated	Acceptable	SILT, some gravel
15	26-Jan-17	Disturbed Core	0+230	1.78	0	118	0.0	8%	-	Non- Ice Saturated	Not Acceptable	SILT, some gravel
16	26-Jan-17	Disturbed Core	0+240	1.78	0	118	0.0	10%	-	Non- Ice Saturated	Not Acceptable	SILT, some gravel
17	26-Jan-17	Disturbed Core	0+220	1.80	0	125	0.0	8%	-	Non- Ice Saturated	Not Acceptable	SILT, some gravel
18	4-Feb-17	Disturbed Core	0+128	1.80	0	55	0.0	17.4%	-	Nearly ice-saturated	Acceptable	SILT, sandy; fine sand
19	4-Feb-17	Disturbed Core	0+139	1.80	3	45	6.3	26.4%	-	Ice-saturated	Acceptable	SAND, silty; predominately fine sand
20	10-Feb-17	Disturbed Core	0+112	1.76	0	60	0.0	7.7%	V. SMALL SAMPLE	Non- Ice Saturated	Not Acceptable	SAND, silty, some gravel, fine gravel, rock cuttings
21	10-Feb-17	Disturbed Core	0+102	1.80	0	20	0.0	6.9%	-	Non- Ice Saturated	Not Acceptable	SAND, some silt, some gravel, fine and medium gravel (subangular)
22	11-Feb-17	Disturbed Core	0+120	1.82	0	60	0.0	10.1%	-	Non- Ice Saturated	Not Acceptable	SAND, silty, some gravel, rock cuttings; predominately fine grained sand and silt
23	11-Feb-17		0+090	UNABLE TO OBTAIN CORE - BEDROCK								BEDROCK
24	13-Feb-17	Disturbed Core	0+030	1.90	0	80	0.0	12.0%	-	Nearly ice-saturated	Acceptable	SILT, sandy or SAND, silty, some gravel; when thawed: moist, grey, firm/compact,
25	6-Apr-17	Disturbed Core	0+243	2.30	13	37	26.0	30.7%	1651	Ice-Rich Soil	Not Acceptable	SILT, some gravel
26	6-Apr-17	Disturbed Core	0+242	2.30	13	50	20.6	33.9%	--	Ice-Rich Soil	Not Acceptable	SILT, some gravel
27	6-Apr-17	Disturbed Core	0+245	2.30	16	57	21.9	24.6%	1543	Ice-Rich Soil	Not Acceptable	SILT, some gravel
28	6-Apr-17	Disturbed Core	0+245	2.30	10	32	23.8	19.2%	1660	Ice-Rich Soil	Not Acceptable	SILT, some gravel
30	10-Apr-17	Disturbed Core	0+240	2.30	5	35	12.5	19%	--	Ice-Rich Soil	Not Acceptable	SILT, some sand, trace gravel
31	10-Apr-17	Disturbed Core	0+242	2.30	14	40	25.9	33%	--	Ice-Rich Soil	Not Acceptable	SILT, some sand, trace gravel
32	10-Apr-17	Disturbed Core	0+241	2.30	12	28	30.0	48%	--	Ice-Rich Soil	Not Acceptable	SILT, some sand, trace gravel
33	10-Apr-17	Disturbed Core	0+235	2.50	0	80	0.0	15%	--	Nearly ice-saturated	Acceptable	SILT, some sand, trace gravel
34	10-Apr-17	Disturbed Core	0+236	2.50	0	70	0.0	22%	--	Ice Saturated	Acceptable	SILT, some sand, trace gravel
35	10-Apr-17	Disturbed Core	0+234	2.50	3	45	6.3	24%	--	Ice Saturated	Acceptable	SILT, some sand, trace gravel
36	14-Apr-17	Disturbed Core	0+260	2.80	5	52	8.8	27%		Ice Saturated	Acceptable	SILT, some sand, trace gravel
37	14-Apr-17	Disturbed Core	0+280	2.80	6	46	11.5	31%		Slightly IceRich Soil	Acceptable	SILT, some sand, trace gravel

APPENDIX F

GEOMEMBRANE LINER INSTALLATION QC REPORTS



0 25 50m

ÉCHELLE: 1:500

NO PANNEAU / PANEL NO.	ROULEAU NO / ROLL NO.	
P-1	15000843	A
P-2	15000843	B
P-3	15000843	C
P-4	15000843	D
P-5	15000843	E
P-6	15000843	F
P-7	15000843	G
P-8	15000843	H
P-9	15000843	I
P-10	16000291	A
P-11	16000291	B
P-12	16000291	C
P-13	16000291	D
P-14	16000291	E
P-15	16000291	F
P-16	16000291	G
P-17	16000291	H
P-18	16000291	I
P-19	15000879	A
P-20	15000879	B
P-21	15000879	C
P-22	15000879	D
P-23	15000879	E
P-24	15000879	F
P-25	15000879	G
P-26	15000879	H
P-27	15000879	I
P-28	15000855	A
P-29	15000855	B
P-30	15000855	C
P-31	15000855	D
P-32	15000855	E
P-33	15000855	F
P-34	15000855	G
P-35	15000855	H
P-36	15000844	A
P-37	15000844	B
P-38	15000844	C
P-39	15000844	D
P-40	15000844	E
P-41	15000844	F
P-42	15000844	G
P-43	15000844	H
P-44	15000844	I
P-45	15000844	J
P-46	16000275	A
P-47	16000275	B
P-48	16000275	C
P-49	16000275	D
P-50	16000275	E
P-51	16000275	F
P-52	16000275	G
P-53	15000851	A
P-54	15000851	B
P-55	15000851	C
P-56	15000851	D
P-57	15000851	E
P-58	15000851	F
P-59	15000851	G
P-60	15000875	A
P-61	15000875	B
P-62	15000875	C
P-63	15000875	D
P-64	15000875	E
P-65	15000875	F
P-66	15000875	G

N

INGÉNIEUR / ENGINEER :

TETRA TECH

TETRA TECH

LÉGENDE / LEGEND:

- EMPIÈCEMENT / PATCH
- MANCHON TUYAU / PIPE BOOT
- DESTRUCTIF / DESTRUCTIVE
- SOUDURE EXTRUSION / EXTRUSION WELD
- P-1 PANNEAU NO. / PANEL NO.
- R-30474 ROULEAU NO. / ROLL NO.
- ANCRAGE MECANIQUE / MECHANICAL ANCHORAGE
- SOUDURE EXISTANTE / EXISTING SEAM

CLIENT / CUSTOMER:

NUNA LOGISTICS

NUNA

TYPE DE PRODUIT INSTALLÉ / PRODUCT TYPE INSTALLED

ESS COLETANCHE

TYPE DE PROJET / PROJECT TYPE

COLETANCHE DRZ

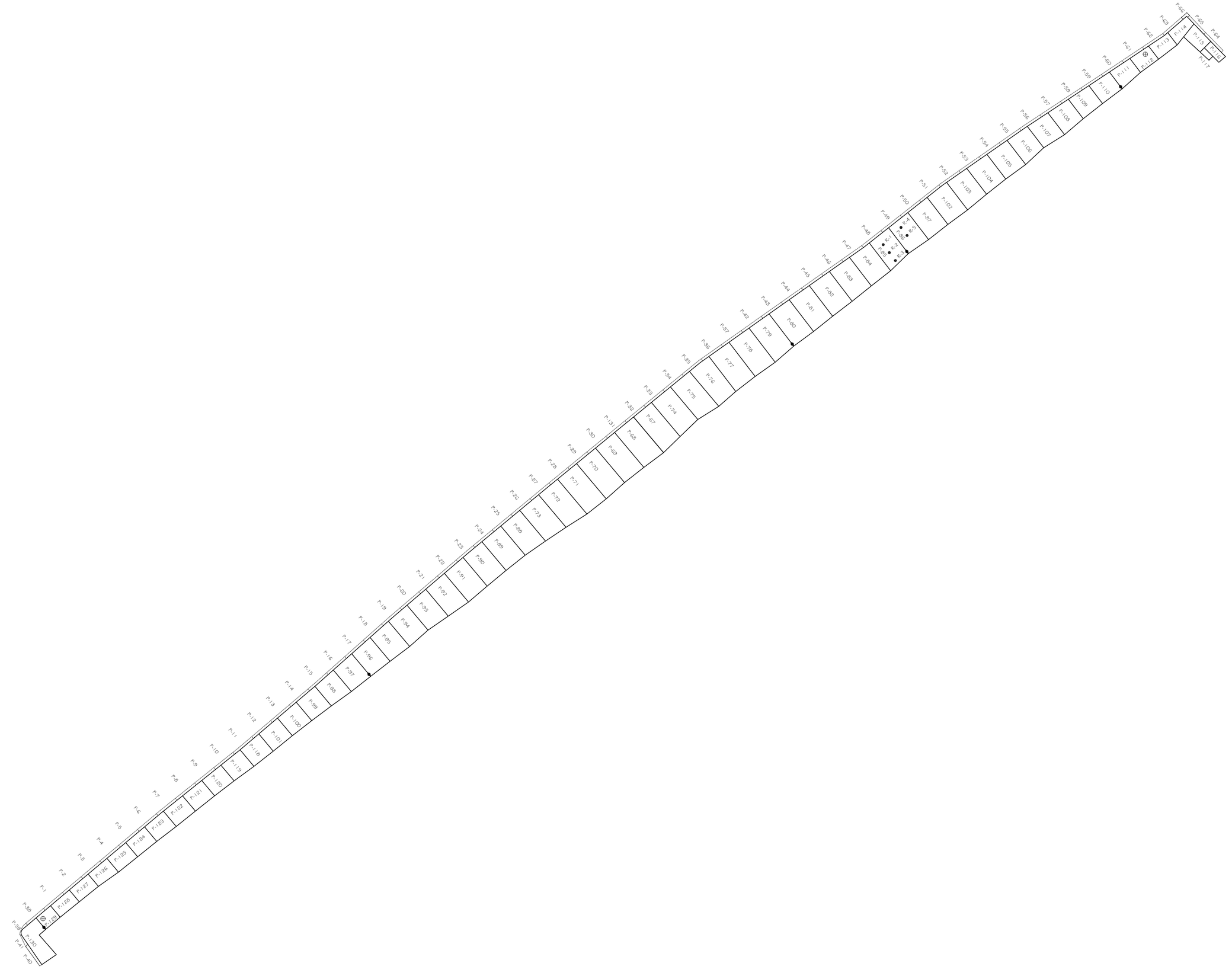
NOM DU PROJET / PROJECT NAME

MELIADINE DRZ
DCP-5

Texel GEOSOL

1300, 2e Rue, Parc industriel
Sainte-Marie, QC, Canada
G1V 4T2

NO. PROJET / PROJECT NO.:	C-16303
FICHIER AUTOCAD:	C:\16303-DCP-5.dwg
AUTOCAD FILE:	
DATE (j-mm-aa):	17-04-17
DATE (dd-mm-yy):	
DESSINÉ PAR / DRAWN BY:	M-G.
VÉRIFIÉ PAR / VERIFIED BY:	M-G.
APPROUVÉ PAR / APPROVED BY:	P.T.
ÉCHELLE / SCALE:	1:500
DESSIN NO / DRAWING NO:	17



0 25 50m

ÉCHELLE: 1:500

NO PANNEAU / PANEL NO.	ROULEAU NO / ROLL NO.	
P-67	16000287	A
P-68	16000287	B
P-69	16000287	C
P-70	16000287	D
P-71	16000287	E
P-72	16000287	F
P-73	16000287	G
P-74	16000287	H
P-75	16000526	A
P-76	16000526	B
P-77	16000526	C
P-78	16000526	D
P-79	16000526	E
P-80	16000526	F
P-81	16000526	G
P-82	16000526	H
P-83	16000526	I
P-84	16000287	I
P-85	15000891	A
P-86	15000891	B
P-87	15000891	C
P-88	15000891	D
P-89	15000891	E
P-90	15000891	F
P-91	15000891	G
P-92	15000891	H
P-93	15000891	I
P-94	15000891	J
P-95	15000891	K
P-96	15000882	A
P-97	15000882	B
P-98	15000882	C
P-99	15000882	D
P-100	15000882	E
P-101	15000882	F
P-102	15000882	G
P-103	15000882	H
P-104	15000882	I
P-105	15000882	J
P-106	15000882	K
P-107	15000882	L
P-108	15000882	M
P-109	15000882	N
P-110	16000526	J
P-111	?	?
P-112	?	?
P-113	?	?
P-114	?	?
P-115	?	?
P-116	15000882	O
P-117	?	?
P-118	?	A
P-119	?	B
P-120	?	C
P-121	?	D
P-122	?	E
P-123	?	F
P-124	?	G
P-125	?	H
P-126	?	I
P-127	?	J
P-128	?	K
P-129	?	L
P-130	?	M

N

INGÉNIEUR / ENGINEER :

TETRA TECH

TETRA TECH

LÉGENDE / LEGEND:

- EMPIÈCEMENT / PATCH
- MANCHON TUYAU / PIPE BOOT
- DESTRUCTIF / DESTRUCTIVE
- SOUDURE EXTRUSION / EXTRUSION WELD
- 1 PANNEAU NO. / PANEL NO.
- 1-30474 ROULEAU NO. / ROLL NO.
- TEST ULTRASONS / ULTRASOUND TEST
- SOUDURE EXISTANTE / EXISTING SEAM

CLIENT / CUSTOMER:

NUNA LOGISTICS

NUNA

TYPE DE PRODUIT INSTALLÉ / PRODUCT TYPE INSTALLED

ESI2 COLETANCHE

TYPE DE PROJET / PROJECT TYPE

COLETANCHE DRZ

NOM DU PROJET / PROJECT NAME

MEJAGNE DRZ
DCP-5, STAGE 2, DIKE RAISE

Texel GEOSOL
1300, 2e Rue, Parc industriel
Sainte-Marie, QC, Canada
G6V 4T2

NO. PROJET / PROJECT NO.:	C-16203
FICHIER AUTOCAD: AUTOCAD FILE:	C-16203-DCP-5.dwg
DATE (j-mm-aa) DATE (dd-mm-yy):	17/05/17
DESSINÉ PAR / DRAWN BY:	M.G.
VÉRIFIÉ PAR / VERIFIED BY:	M.G.
APPROUVÉ PAR / APPROVED BY:	F.T.
ÉCHELLE / SCALE:	1:500
DESSIN NO / DRAWING NO:	17

P-1	8.9	4.9	43.61
P-2	8.8	4.9	43.12
P-3	8.8	4.9	43.12
P-4	8.8	4.9	43.12
P-5	8.7	4.9	42.63
P-6	8.75	4.9	42.875
P-7	8.75	4.9	42.875
P-8	8.85	4.9	43.365
P-9	8.9	4.9	43.61
P-10	8.8	4.9	43.12
P-11	9	4.9	44.1
P-12	9.05	4.9	44.345
P-13	8.95	4.9	43.855
P-14	8.9	4.9	43.61
P-15	8.85	4.9	43.365
P-16	8.85	4.9	43.365
P-17	8.85	4.9	43.365
P-18	8.8	4.9	43.12
P-19	8.7	4.9	42.63
P-20	8.7	4.9	42.63
P-21	8.65	4.9	42.385
P-22	8.65	4.9	42.385
P-23	8.8	4.5	39.6
P-24	8.9	4.9	43.61
P-25	8.95	4.9	43.855
P-26	8.95	4.9	43.855
P-27	8.85	4.9	43.365
P-28	9	4.9	44.1
P-29	9.15	4.9	44.835
P-30	9	4.9	44.1
P-31	8.9	4.9	43.61
P-32	8.9	4.9	43.61
P-33	8.8	4.9	43.12
P-34	8.85	4.9	43.365
P-35	8.95	4.7	42.065
P-36	8.75	4.9	42.875
P-37	8.65	4.9	42.385
P-38	5.3	4.9	25.97
P-39	3.2	3	4.8
P-40			32.3
P-41	3.6	2.7	4.86
P-42	8.85	4.9	43.365
P-43	9.05	4.9	44.345
P-44	9.1	4.9	44.59
P-45	9.45	4.9	46.305
P-46	10.1	4.9	49.49
P-47	10.55	4.9	51.695
P-48	10.55	4.9	51.695
P-49	10.5	4.9	51.45
P-50	10.5	4.9	51.45
P-51	10.45	4.9	51.205
P-52	10.85	4.9	53.165
P-53	11.25	4.9	55.125
P-54	11.3	4.9	55.37
P-55	11.4	4.9	55.86
P-56	11.45	4.9	56.105
P-57	11.2	4.9	54.88
P-58	11.1	4.9	54.39
P-59	11.2	4.9	54.88
P-60	11.3	4.9	55.37
P-61	5.7	4.9	27.93
P-62	0	4.9	52.3
P-63	0	4.9	24.9
P-64	0	4.9	36.5
P-65	0	4.9	15.8
P-66	0	4.9	1.5
		TOTAL	2806.545

QUANTITÉ HEBDO		
DATE	PANEL	M²
07-avr	P-1 to P-17	737.45
09-avr	P-18 to P-23	252.75
12-avr	P-24 to P-29	263.62
13-avr	P-30 to P-37	345.13
14-avr	P-38 to P-41	67.93
16-avr	P-42 to P-46	228.095
19-avr	P-47 to P-66	911.57
SOUS	TOTAL	2806.545

MELIADINE DIKE DCP-5 stage 2 dike raise

P-67	9.1	4.9	44.59
P-68	9.2	4.9	45.08
P-69	9.05	4.9	44.345
P-70	9.1	4.9	44.59
P-71	9.15	4.9	44.835
P-72	8.8	4.9	43.12
P-73	8.25	4.9	40.425
P-74	8.8	4.9	43.12
P-75	8.9	4.9	43.61
P-76	8.95	4.7	42.065
P-77	8.7	4.9	42.63
P-78	8.6	4.9	42.14
P-79	8.35	4.9	40.915
P-80	8.05	4.9	39.445
P-81	7.85	4.8	37.68
P-82	7.6	4.9	37.24
P-83	7.35	4.9	36.015
P-84	7.1	4.9	34.79
P-85	6.75	4.9	33.075
P-86	6.65	4.9	32.585
P-87	6.8	4.9	33.32
P-88	7.8	4.9	38.22
P-89	7.55	4.9	36.995
P-90	7.5	4.9	36.75
P-91	7.5	4.9	36.75
P-92	7.25	4.9	35.525
P-93	6.75	4.9	33.075
P-94	6.55	4.9	32.095
P-95	6.4	4.8	30.72
P-96	6.05	4.9	29.645
P-97	5.75	4.9	28.175
P-98	5.35	4.9	26.215
P-99	4.95	4.9	24.255
P-100	4.7	4.9	23.03
P-101	4.55	4.9	22.295
P-102	6.85	4.9	33.565
P-103	6.7	4.9	32.83
P-104	6.35	4.9	31.115
P-105	6.15	4.9	30.135
P-106	5.75	4.9	28.175
P-107	5.45	4.9	26.705
P-108	5.2	4.9	25.48
P-109	4.7	4.9	23.03
P-110	4.35	4.9	21.315
P-111	3.85	4.9	18.865
P-112	3.4	4.9	16.66
P-113	3.2	4.9	15.68
P-114	2.8	4.9	13.72
P-115	3.15	2.8	8.82
P-116	4.15	1.8	7.47
P-117	2.4	1.2	2.88
P-118	4.4	4.9	21.56
P-119	4.2	4.9	20.58
P-120	4.05	4.9	19.845
P-121	4	4.9	19.6
P-122	4	4.9	19.6
P-123	3.9	4.9	19.11
P-124	3.75	4.9	18.375
P-125	3.65	4.9	17.885
P-126	3.4	4.9	16.66
P-127	3.15	4.9	15.435
P-128	3.05	4.9	14.945
P-129	3	3.8	11.4
P-130	1.5	4.9	33.6
		TOTAL	1864.4

QUANTITÉ HEBDO		
DATE	PANEL	M²
12-mai	p-67 to p-73	306.985
13-mai	p-74 to p-101	972.375
14-mai	p-102 to p-130	585.04
SOUS	TOTAL	1864.4

Trial Tests
Calibration

Project Name / Nom de Projet: **Meliadine dike - DCP-5**

Project No. / No. de Projet: **C-16203**

QC Inspector / Inspecteur CQ: **Michael Gilbert**

Trial Test No. / No. de Calibration	Date (mm/dd/yy)	Time / Heure	Ambient Temp. / Temp. Ambiante	Ultrasons	Shear Test / Essais en Cisaillement	Shear Resistance / Résist. Cisaillement (ppi)	Shear Type of Break / Type de Brisure	Approved (Yes/No) / Approuvé (Oui/Non)	Tech.-Welder / Soudeur	Tensiometer No. / No. Tensiomètre
DCP-5, Stage 1										
C-1	04-07-17	PM	-2 °C	X	X	281	BRK	Y	S.B.	T-CO-1
"	"	"	"	"	"	332	BRK	Y	"	"
"	"	"	"	"	"	278	BRK	Y	"	"
C-2	04-09-17	PM	-25 °C	X	X	294	BRK	Y	S.B.	T-CO-1
"	"	"	"	"	"	210	BRK	Y	"	"
"	"	"	"	"	"	264	BRK	Y	"	"
C-3	04-12-17	PM	-17 °C	X	X	228	BRK	Y	S.B.	T-CO-1
"	"	"	"	"	"	210	BRK	Y	"	"
"	"	"	"	"	"	206	BRK	Y	"	"
C-4	04-13-17	AM	-27 °C	X	X	233	BRK	Y	S.B.	T-CO-1
"	"	"	"	"	"	246	BRK	Y	"	"
"	"	"	"	"	"	237	BRK	Y	"	"
C-5	04-14-17	PM	-25 °C	X	X	272	BRK	Y	S.B.	T-CO-1
"	"	"	"	"	"	217	BRK	Y	"	"
"	"	"	"	"	"	239	BRK	Y	"	"
C-6	04-16-17	PM	-8 °C	X	X	197	BRK	Y	S.B.	T-CO-1
"	"	"	"	"	"	246	BRK	Y	"	"
"	"	"	"	"	"	210	BRK	Y	"	"

Trial Tests
Calibration

Project Name / Nom de Projet: **Meliadine dike - DCP-5**

Project No. / No. de Projet: **C-16203**

QC Inspector / Inspecteur CQ: **Michael Gilbert**

Trial Test No. / No. de Calibration	Date (mm/dd/yy)	Time / Heure	Ambient Temp. / Temp. Ambiante	Ultrasons	Shear Test / Essais en Cisaillement	Shear Resistance / Résist. Cisaillement (ppi)	Shear Type of Break / Type de Brisure	Approved (Yes/No) / Approuvé (Oui/Non)	Tech.-Welder / Soudeur	Tensiometer No. / No. Tensiomètre
C-7	04-19-17	PM	-18 °C	X	X	200	BRK	Y	S.B.	T-CO-1
"	"	"	"	"	"	168	BRK	Y	"	"
"	"	"	"	"	"	261	BRK	Y	"	"
DCP-5, Stage 2										
C-8	05-12-17	AM	3 °C	X	X	249	BRK	Y	P.A/O.B	T-CO-1
"	"	"	"	"	"	224	BRK	Y	"	"
"	"	"	"	"	"	290	BRK	Y	"	"
C-9	05-13-17	AM	-2 °C	X	X	319	BRK	Y	P.A/O.B	T-CO-1
"	"	"	"	"	"	296	BRK	Y	"	"
"	"	"	"	"	"	269	BRK	Y	"	"
C-10	05-14-17	AM	-3 °C	X	X	341	BRK	Y	P.A/O.B	T-CO-1
"	"	"	"	"	"	347	BRK	Y	"	"
"	"	"	"	"	"	321	BRK	Y	"	"

Texel GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Meliadine dike - DCP-5**

Project No. / No. de Projet: **C-16203**

QC Inspector / Inspecteur CQ: **Michael Gilbert**

Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
DCP-5, Stage 1														
1-2	04-07-17	PM	-2°C	8.9	C-1	S.B.	04-07-17	PM			X		Full Seam	Y
2-3	04-07-17	PM	-2°C	8.7	C-1	S.B.	04-07-17	PM			X		Full Seam	Y
3-4	04-07-17	PM	-2°C	8.9	C-1	S.B.	04-07-17	PM			X		Full Seam	Y
4-5	04-07-17	PM	-2°C	8.7	C-1	S.B.	04-07-17	PM			X		Full Seam	Y
5-6	04-07-17	PM	-2°C	8.7	C-1	S.B.	04-07-17	PM			X		Full Seam	Y
6-7	04-07-17	PM	-2°C	8.8	C-1	S.B.	04-07-17	PM			X		Full Seam	Y
7-8	04-07-17	PM	-2°C	8.7	C-1	S.B.	04-07-17	PM			X		Full Seam	Y
8-9	04-07-17	PM	-2°C	9	C-1	S.B.	04-07-17	PM	X		X		First meter of WEOS	Y
9-10	04-07-17	PM	-2°C	8.8	C-1	S.B.	04-07-17	PM			X		Full Seam	Y
10-11	04-07-17	PM	-2°C	8.8	C-1	S.B.	04-07-17	PM			X		Full Seam	Y

Texel GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Meliadine dike - DCP-5**

Project No. / No. de Projet: **C-16203**

QC Inspector / Inspecteur CQ: **Michael Gilbert**

Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
11-12	04-07-17	PM	-2°C	9.2	C-1	S.B.	04-07-17	PM			X		Full Seam	Y
12-13	04-07-17	PM	-2°C	8.9	C-1	S.B.	04-07-17	PM			X		Full Seam	Y
13-14	04-07-17	PM	-2°C	9	C-1	S.B.	04-07-17	PM			X		Full Seam	Y
14-15	04-07-17	PM	-2°C	8.8	C-1	S.B.	04-07-17	PM			X		Full Seam	Y
15-16	04-07-17	PM	-2°C	8.9	C-1	S.B.	04-07-17	PM			X		Full Seam	Y
16-17	04-07-17	PM	-2°C	8.8	C-1	S.B.	04-07-17	PM			X		Full Seam	Y
17-18	04-09-17	PM	-25°C	8.9	C-2	S.B.	04-09-17	PM			X		Full Seam	Y
18-19	04-09-17	PM	-25°C	8.7	C-2	S.B.	04-09-17	PM	X		X		Ultrasound at 0.2m of WEOS	Y
19-20	04-09-17	PM	-25°C	8.7	C-2	S.B.	04-09-17	PM			X		Full Seam	Y
20-21	04-09-17	PM	-25°C	8.7	C-2	S.B.	04-09-17	PM			X		Full Seam	Y
21-22	04-09-17	PM	-25°C	8.6	C-2	S.B.	04-09-17	PM			X		Full Seam	Y

Texel GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Meliadine dike - DCP-5**

Project No. / No. de Projet: **C-16203**

QC Inspector / Inspecteur CQ: **Michael Gilbert**

Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
22-23	04-09-17	PM	-25°C	8.7	C-2	S.B.	04-09-17	PM			X		Full Seam	Y
23-24	04-12-17	PM	-17°C	8.9	C-3	S.B.	04-12-17	PM			X		Full Seam	Y
24-25	04-12-17	PM	-17°C	8.9	C-3	S.B.	04-12-17	PM			X		Full Seam	Y
25-26	04-12-17	PM	-17°C	9	C-3	S.B.	04-12-17	PM			X		Full Seam	Y
26-27	04-12-17	PM	-17°C	8.9	C-3	S.B.	04-12-17	PM	X		X		Ultrasound at 0.1m of WEOS	Y
27-28	04-12-17	PM	-17°C	8.8	C-3	S.B.	04-12-17	PM			X		Full Seam	Y
28-29	04-12-17	PM	-17°C	9.2	C-3	S.B.	04-12-17	PM			X		Full Seam	Y
29-30	04-13-17	AM	-27°C	9.1	C-4	S.B.	04-13-17	AM			X		Full Seam	Y
30-31	04-13-17	AM	-27°C	8.9	C-4	S.B.	04-13-17	AM			X		Full Seam	Y
31-32	04-13-17	AM	-27°C	8.9	C-4	S.B.	04-13-17	AM			X		Full Seam	Y
32-33	04-13-17	AM	-27°C	8.9	C-4	S.B.	04-13-17	AM			X		Full Seam	Y

Texel GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Meliadine dike - DCP-5**

Project No. / No. de Projet: **C-16203**

QC Inspector / Inspecteur CQ: **Michael Gilbert**

Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
33-34	04-13-17	AM	-27°C	8.7	C-4	S.B.	04-13-17	AM	X		X		Ultrasound at 0.1m of WEOS	Y
34-35	04-13-17	AM	-27°C	9	C-4	S.B.	04-13-17	AM			X	X	Full seam DT at 0,2m of WEOS	Y
35-36	04-13-17	AM	-27°C	8.9	C-4	S.B.	04-13-17	AM			X		Full Seam	Y
36-37	04-13-17	AM	-27°C	8.6	C-4	S.B.	04-13-17	AM			X		Full Seam	Y
38-1	04-14-17	PM	-25°C	7.4	C-5	S.B.	04-14-17	PM			X		Full Seam	Y
38-39	04-14-17	PM	-25°C	3.2	C-5	S.B.	04-14-17	PM			X		Full Seam	Y
40-41	04-14-17	PM	-25°C	3.6	C-5	S.B.	04-14-17	PM			X		Full Seam	Y
40-38	04-14-17	PM	-25°C	5.5	C-5	S.B.	04-14-17	PM			X		Full Seam	Y
41-38	04-14-17	PM	-25°C	1.1	C-5	S.B.	04-14-17	PM			X		Full Seam	Y
41-39	04-14-17	PM	-25°C	3.8	C-5	S.B.	04-14-17	PM			X		Full Seam	Y
40-1	04-14-17	PM	-25°C	1.7	C-5	S.B.	04-14-17	PM	X		X		Ultrasound at 0.1m of EEOS	Y

Texel GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Meliadine dike - DCP-5**

Project No. / No. de Projet: **C-16203**

QC Inspector / Inspecteur CQ: **Michael Gilbert**

Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
37-42	04-16-17	PM	-8°C	8.7	C-6	S.B.	04-16-17	PM	X		X		Ultrasound at 0.2m of WEOS	Y
42-43	04-16-17	PM	-8°C	9	C-6	S.B.	04-16-17	PM			X		Full Seam	Y
43-44	04-16-17	PM	-8°C	9.1	C-6	S.B.	04-16-17	PM			X		Full Seam	Y
44-45	04-16-17	PM	-8°C	9.1	C-6	S.B.	04-16-17	PM			X		Full Seam	Y
45-46	04-16-17	PM	-8°C	9.8	C-6	S.B.	04-16-17	PM			X		Full Seam	Y
46-47	04-19-17	AM	-18°C	10.4	C-7	S.B.	04-19-17	AM			X		Full Seam	Y
47-48	04-19-17	AM	-18°C	10.7	C-7	S.B.	04-19-17	AM			X		Full Seam	Y
48-49	04-19-17	AM	-18°C	10.4	C-7	S.B.	04-19-17	AM			X		Full Seam	Y
49-50	04-19-17	AM	-18°C	10.6	C-7	S.B.	04-19-17	AM			X		Full Seam	Y
50-51	04-19-17	AM	-18°C	10.4	C-7	S.B.	04-19-17	AM			X		Full Seam	Y
51-52	04-19-17	AM	-18°C	10.5	C-7	S.B.	04-19-17	AM	X		X		Ultrasound at 0.1m of WEOS	Y

Texel GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Meliadine dike - DCP-5**

Project No. / No. de Projet: **C-16203**

QC Inspector / Inspecteur CQ: **Michael Gilbert**

Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
52-53	04-19-17	AM	-18°C	11.2	C-7	S.B.	04-19-17	AM			X		Full Seam	Y
53-54	04-19-17	AM	-18°C	11.3	C-7	S.B.	04-19-17	AM			X		Full Seam	Y
54-55	04-19-17	AM	-18°C	11.3	C-7	S.B.	04-19-17	AM			X		Full Seam	Y
55-56	04-19-17	PM	-18°C	11.5	C-7	S.B.	04-19-17	PM			X		Full Seam	Y
56-57	04-19-17	PM	-18°C	11.4	C-7	S.B.	04-19-17	PM			X		Full Seam	Y
57-58	04-19-17	PM	-18°C	11	C-7	S.B.	04-19-17	PM			X		Full Seam	Y
58-59	04-19-17	PM	-18°C	11.2	C-7	S.B.	04-19-17	PM	X		X		Ultrasound at 0.2m of WEOS	Y
59-60	04-19-17	PM	-18°C	11.2	C-7	S.B.	04-19-17	PM			X		Full Seam	Y
60-61	04-19-17	PM	-18°C	11.4	C-7	S.B.	04-19-17	PM			X		Full Seam	Y
61-62	04-19-17	PM	-18°C	11.5	C-7	S.B.	04-19-17	PM			X		Full Seam	Y
62-63	04-19-17	PM	-18°C	9.2	C-7	S.B.	04-19-17	PM			X		Full Seam	Y

Texel GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Meliadine dike - DCP-5**

Project No. / No. de Projet: **C-16203**

QC Inspector / Inspecteur CQ: **Michael Gilbert**

Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
64-65	04-19-17	PM	-18°C	5.3	C-7	S.B.	04-19-17	PM			X		Full Seam	Y
65-66	04-19-17	PM	-18°C	1.5	C-7	S.B.	04-19-17	PM			X		Full Seam	Y
63-66	04-19-17	PM	-18°C	0.9	C-7	S.B.	04-19-17	PM	X		X		Ultrasound at 0.1m of WEOS	Y
65-63	04-19-17	PM	-18°C	6.2	C-7	S.B.	04-19-17	PM			X		Full Seam	Y
64-63	04-19-17	PM	-18°C	3.9	C-7	S.B.	04-19-17	PM			X		Full Seam	Y
64-62	04-19-17	PM	-18°C	2.6	C-7	S.B.	04-19-17	PM			X		Full Seam	Y
DCP-5, Stage 2														
67-68	05-12-17	AM	3°C	9.3	C-8	P.A/O.B	05-12-17	AM			X		Full Seam	O
68-69	05-12-17	AM	3°C	9.1	C-8	P.A/O.B	05-12-17	AM			X		Full Seam	O
69-70	05-12-17	AM	3°C	9	C-8	P.A/O.B	05-12-17	AM			X		Full Seam	O
70-71	05-12-17	AM	3°C	9.2	C-8	P.A/O.B	05-12-17	AM			X		Full Seam	O

Texel GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Meliadine dike - DCP-5**

Project No. / No. de Projet: **C-16203**

QC Inspector / Inspecteur CQ: **Michael Gilbert**

Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
71-72	05-12-17	AM	3°C	9.1	C-8	P.A/O.B	05-12-17	AM			X		Full Seam	O
72-73	05-12-17	AM	3°C	8.5	C-8	P.A/O.B	05-12-17	AM			X		Full Seam	O
67-74	05-13-17	AM	-2°C	8.9	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
74-75	05-13-17	AM	-2°C	8.7	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
75-76	05-13-17	AM	-2°C	9.1	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
76-77	05-13-17	AM	-2°C	8.8	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
77-78	05-13-17	AM	-2°C	8.6	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
78-79	05-13-17	AM	-2°C	8.6	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
79-80	05-13-17	AM	-2°C	8.1	C-9	P.A/O.B	05-13-17	AM	X		X		Full Seam Ultrasound at 0,5m of EEOS	O
80-81	05-13-17	AM	-2°C	8	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
81-82	05-13-17	AM	-2°C	7.7	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O

Texel GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Meliadine dike - DCP-5**

Project No. / No. de Projet: **C-16203**

QC Inspector / Inspecteur CQ: **Michael Gilbert**

Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
82-83	05-13-17	AM	-2°C	7.5	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
83-84	05-13-17	AM	-2°C	7.2	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
84-85	05-13-17	AM	-2°C	7	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
85-86	05-13-17	AM	-2°C	6.5	C-9	P.A/O.B	05-13-17	AM	X		X		Full Seam Ultrasound at 0,5m of EEOS	O
86-87	05-13-17	AM	-2°C	6.8	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
73-88	05-13-17	PM	4°C	8	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
88-89	05-13-17	PM	4°C	7.6	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
89-90	05-13-17	PM	4°C	7.5	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
90-91	05-13-17	PM	4°C	7.5	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
91-92	05-13-17	PM	4°C	7.5	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
92-93	05-13-17	PM	4°C	7	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O

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Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
93-94	05-13-17	PM	4°C	6.5	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
94-95	05-13-17	PM	4°C	6.6	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
95-96	05-13-17	PM	4°C	6.2	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
26-73	05-13-17	PM	4°C	2.8	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
27-73	05-13-17	PM	4°C	2.1	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
27-72	05-13-17	PM	4°C	2.9	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
28-72	05-13-17	PM	4°C	2	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
28-71	05-13-17	PM	4°C	2.9	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
29-71	05-13-17	PM	4°C	2	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
29-70	05-13-17	PM	4°C	3	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
30-70	05-13-17	PM	4°C	1.9	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O

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Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
30-69	05-13-17	PM	4°C	3	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
31-69	05-13-17	PM	4°C	1.9	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
31-68	05-13-17	PM	4°C	3.1	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
32-68	05-13-17	PM	4°C	1.8	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
32-67	05-13-17	PM	4°C	3.1	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
33-67	05-13-17	PM	4°C	1.5	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
33-74	05-13-17	AM	-2°C	3.5	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
34-74	05-13-17	AM	-2°C	1.5	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
34-75	05-13-17	AM	-2°C	3	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
35-75	05-13-17	AM	-2°C	1.9	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
35-76	05-13-17	AM	-2°C	3.6	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O

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Seaming Procedures
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Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
36-76	05-13-17	AM	-2°C	1.4	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
36-77	05-13-17	AM	-2°C	3.6	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
37-77	05-13-17	AM	-2°C	1.4	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
37-78	05-13-17	AM	-2°C	3.6	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
42-78	05-13-17	AM	-2°C	1.3	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
42-79	05-13-17	AM	-2°C	3.7	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
43-79	05-13-17	AM	-2°C	1.2	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
43-80	05-13-17	AM	-2°C	3.7	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
44-80	05-13-17	AM	-2°C	1.2	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
44-81	05-13-17	AM	-2°C	3.8	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
45-81	05-13-17	AM	-2°C	1.4	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O

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Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
45-82	05-13-17	AM	-2°C	3.8	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
46-82	05-13-17	AM	-2°C	1	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
46-83	05-13-17	AM	-2°C	3.9	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
47-83	05-13-17	AM	-2°C	1	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
47-84	05-13-17	AM	-2°C	3.9	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
48-84	05-13-17	AM	-2°C	0.9	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
48-85	05-13-17	AM	-2°C	4	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
49-85	05-13-17	AM	-2°C	0.9	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
49-86	05-13-17	AM	-2°C	4	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
50-86	05-13-17	AM	-2°C	0.9	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
50-87	05-13-17	AM	-2°C	4	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O

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Seaming Procedures
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Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
51-87	05-13-17	AM	-2°C	1.1	C-9	P.A/O.B	05-13-17	AM			X		Full Seam	O
26-88	05-13-17	PM	4°C	2.2	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
25-88	05-13-17	PM	4°C	2.8	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
25-89	05-13-17	PM	4°C	2.2	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
24-89	05-13-17	PM	4°C	2.7	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
24-90	05-13-17	PM	4°C	2.2	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
23-90	05-13-17	PM	4°C	2.7	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
23-91	05-13-17	PM	4°C	1.8	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
22-91	05-13-17	PM	4°C	3.2	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
22-92	05-13-17	PM	4°C	1.8	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
21-92	05-13-17	PM	4°C	3.2	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O

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Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
21-93	05-13-17	PM	4°C	1.8	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
20-93	05-13-17	PM	4°C	3.1	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
20-94	05-13-17	PM	4°C	1.9	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
19-94	05-13-17	PM	4°C	3	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
19-95	05-13-17	PM	4°C	1.9	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
18-95	05-13-17	PM	4°C	2.8	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
18-96	05-13-17	PM	4°C	2	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
17-96	05-13-17	PM	4°C	2.9	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
17-97	05-13-17	PM	4°C	2	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
16-97	05-13-17	PM	4°C	2.9	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
16-98	05-13-17	PM	4°C	2	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O

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Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
15-98	05-13-17	PM	4°C	2.9	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
15-99	05-13-17	PM	4°C	2.1	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
14-99	05-13-17	PM	4°C	2.9	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
14-100	05-13-17	PM	4°C	2.1	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
13-100	05-13-17	PM	4°C	2.9	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
13-101	05-13-17	PM	4°C	2.1	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
12-101	05-13-17	PM	4°C	2.9	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
51-102	05-14-17	AM	-3°C	4.1	C-10	P.A/O.B	05-14-17	AM			X		Full Seam	O
52-102	05-14-17	AM	-3°C	0.9	C-10	P.A/O.B	05-14-17	AM			X		Full Seam	O
52-103	05-14-17	AM	-3°C	4	C-10	P.A/O.B	05-14-17	AM			X		Full Seam	O
53-103	05-14-17	AM	-3°C	0.9	C-10	P.A/O.B	05-14-17	AM			X		Full Seam	O

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Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
53-104	05-14-17	AM	-3°C	4	C-10	P.A/O.B	05-14-17	AM			X		Full Seam	O
96-97	05-13-17	PM	4°C	5.9	C-9	P.A/O.B	05-13-17	PM	X		X		Full Seam Ultrasound at 0,5m of EEOS	O
97-98	05-13-17	PM	4°C	5.6	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
98-99	05-13-17	PM	4°C	5.1	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
99-100	05-13-17	PM	4°C	4.8	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
100-101	05-13-17	PM	4°C	4.6	C-9	P.A/O.B	05-13-17	PM			X		Full Seam	O
87-102	05-14-17	AM	-3°C	6.8	C-10	P.A/O.B	05-14-17	AM			X		Full Seam	O
102-103	05-14-17	AM	-3°C	6.9	C-10	P.A/O.B	05-14-17	AM			X		Full Seam	O
103-104	05-14-17	AM	-3°C	6.5	C-10	P.A/O.B	05-14-17	AM			X		Full Seam	O
104-105	05-14-17	AM	-3°C	6.2	C-10	P.A/O.B	05-14-17	AM			X		Full Seam	O
105-106	05-14-17	AM	-3°C	6.1	C-10	P.A/O.B	05-14-17	AM			X		Full Seam	O

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Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
106-107	05-14-17	AM	-3°C	5.4	C-10	P.A/O.B	05-14-17	AM			X		Full Seam	O
107-108	05-14-17	AM	-3°C	5.5	C-10	P.A/O.B	05-14-17	AM			X		Full Seam	O
108-109	05-14-17	AM	-3°C	4.9	C-10	P.A/O.B	05-14-17	AM			X		Full Seam	O
109-110	05-14-17	AM	-3°C	4.5	C-10	P.A/O.B	05-14-17	AM			X		Full Seam	O
110-111	05-14-17	AM	-3°C	4.2	C-10	P.A/O.B	05-14-17	AM	X		X		Full Seam Ultrasound at 0,5m of EEOS	O
54-104	05-14-17	AM	-3°C	0.9	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
54-105	05-14-17	AM	-3°C	4	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
55-105	05-14-17	AM	-3°C	0.9	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
55-106	05-14-17	AM	-3°C	4	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
56-106	05-14-17	AM	-3°C	1	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
56-107	05-14-17	AM	-3°C	4	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O

Texel GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Meliadine dike - DCP-5**

Project No. / No. de Projet: **C-16203**

QC Inspector / Inspecteur CQ: **Michael Gilbert**

Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
57-107	05-14-17	AM	-3°C	1	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
57-108	05-14-17	AM	-3°C	4	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
58-108	05-14-17	AM	-3°C	1	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
58-109	05-14-17	AM	-3°C	3.9	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
59-109	05-14-17	AM	-3°C	1	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
59-110	05-14-17	AM	-3°C	4	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
60-110	05-14-17	AM	-3°C	1	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
60-111	05-14-17	AM	-3°C	4.1	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
61-111	05-14-17	AM	-3°C	0.8	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
111-112	05-14-17	AM	-3°C	3.5	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
112-113	05-14-17	AM	-3°C	3.3	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O

Texel GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Meliadine dike - DCP-5**

Project No. / No. de Projet: **C-16203**

QC Inspector / Inspecteur CQ: **Michael Gilbert**

Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
113-114	05-14-17	AM	-3°C	3.1	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
114-115	05-14-17	AM	-3°C	3.3	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
115-116	05-14-17	AM	-3°C	1.8	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
115-117	05-14-17	AM	-3°C	1.2	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
61-112	05-14-17	AM	-3°C	4.2	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
62-112	05-14-17	AM	-3°C	0.7	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
62-113	05-14-17	AM	-3°C	4.1	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
63-113	05-14-17	AM	-3°C	0.9	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
63-114	05-14-17	AM	-3°C	4	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
66-114 N-S	05-14-17	AM	-3°C	1.1	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
66-114 E-W	05-14-17	AM	-3°C	0.7	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O

Texel GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Meliadine dike - DCP-5**

Project No. / No. de Projet: **C-16203**

QC Inspector / Inspecteur CQ: **Michael Gilbert**

Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
65-114	05-14-17	AM	-3°C	1.8	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
65-115	05-14-17	AM	-3°C	2.8	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
64-115	05-14-17	AM	-3°C	2	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
64-116	05-14-17	AM	-3°C	3	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
116-117	05-14-17	AM	-3°C	2.4	C-10	P.A/O.B	05-14-17	AM			X		Full seam	O
101-118	05-14-17	PM	0°C	4.5	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
118-119	05-14-17	PM	0°C	4.3	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
119-120	05-14-17	PM	0°C	4.1	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
120-121	05-14-17	PM	0°C	4	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
121-122	05-14-17	PM	0°C	4	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
122-123	05-14-17	PM	0°C	4	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O

Texel GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Meliadine dike - DCP-5**

Project No. / No. de Projet: **C-16203**

QC Inspector / Inspecteur CQ: **Michael Gilbert**

Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
123-124	05-14-17	PM	0°C	3.8	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
124-125	05-14-17	PM	0°C	3.7	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
125-126	05-14-17	PM	0°C	3.6	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
126-127	05-14-17	PM	0°C	3.2	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
127-128	05-14-17	PM	0°C	3.1	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
128-129	05-14-17	PM	0°C	3	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
129-130	05-14-17	PM	0°C	3	C-10	P.A/O.B	05-14-17	PM	X		X		Full Seam Ultrasound at 0,5m of EEOS	O
12-118	05-14-17	PM	0°C	1.9	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
11-118	05-14-17	PM	0°C	3	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
11-119	05-14-17	PM	0°C	1.8	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
10-119	05-14-17	PM	0°C	2.1	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O

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Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Meliadine dike - DCP-5**

Project No. / No. de Projet: **C-16203**

QC Inspector / Inspecteur CQ: **Michael Gilbert**

Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
10-120	05-14-17	PM	0°C	1.8	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
9-120	05-14-17	PM	0°C	3.1	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
9-121	05-14-17	PM	0°C	1.8	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
8-121	05-14-17	PM	0°C	3.1	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
8-122	05-14-17	PM	0°C	1.8	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
7-122	05-14-17	PM	0°C	3.2	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
7-123	05-14-17	PM	0°C	1.7	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
6-123	05-14-17	PM	0°C	3.2	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
6-124	05-14-17	PM	0°C	1.7	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
5-124	05-14-17	PM	0°C	3.2	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
5-125	05-14-17	PM	0°C	1.8	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O

Texel GEOSOL

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Meliadine dike - DCP-5**

Project No. / No. de Projet: **C-16203**

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Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
4-125	05-14-17	PM	0°C	3.2	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
4-126	05-14-17	PM	0°C	1.7	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
3-126	05-14-17	PM	0°C	3.2	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
3-127	05-14-17	PM	0°C	1.6	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
2-127	05-14-17	PM	0°C	3.3	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
2-128	05-14-17	PM	0°C	1.6	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
1-128	05-14-17	PM	0°C	3.3	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
1-129	05-14-17	PM	0°C	1.7	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
38-129	05-14-17	PM	0°C	2	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
38-130	05-14-17	PM	0°C	2.8	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
39-130	05-14-17	PM	0°C	2.9	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O

Seaming Procedures
Procédures de Soudures

Project Name / Nom de Projet: **Meliadine dike - DCP-5**

Project No. / No. de Projet: **C-16203**

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Seaming Procedures / Procédures de Soudures							Non-Destructive Testing / Essai Non-Destructif							
Seam No. No. de Soudure	Date of Seaming Date de Soudure (mm/dd/yy)	Time of Seaming Heure de Soudure	Temperature Température (°C)	Seam Length Longueur Soudure (m)	Trial Test No. No. Calibration	Technician-Welder Soudeur	Test Date Date de l'essai (mm/dd/yy)	Time Heure	Ultrasons	Vacuum Box Boîte à Vide	Visual Inspection Inspection visuelle	Destructive test Essai destructif	Testing Details/Location Détails de l'essai/Localisation	Approved (Yes/No) Approuvé (Oui/Non)
41-130	05-14-17	PM	0°C	2.5	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O
40-130	04-14-17	PM	0°C	4.9	C-10	P.A/O.B	05-14-17	PM			X		Full seam	O

Total Seam Length 1293.1

Texel GEOSOL

Repair Report
Rapport de Réparation

Project Name / Nom de Projet: **Meliadine dike - DCP-5**

Project No. / No. de Projet: **C-16203**

QC Inspector / Inspecteur CQ: **Michael Gilbert**

Repair No. / No. Réparation	Type & Dimensions / Type et Dimensions			Location of Repair / Localisation de la Réparation				Temperature (°C) / Température (°C)	Date Repaired (mm/dd/yy) / Date Réparée (mm/jj/aa)	Date Repair Verified / Date Réparée Vérifiée (mm/dd/yy)	Approved (Yes/No) / Approuvé (Oui/Non)
	Patch / Empiècement	Extrusion Weld or Bead / Soudure Extrusion	Pipe Boot / Manchon d'étanchéité	On Panel No. / Sur Panneau No.	On Seam No. / Sur Soudure No.	Intersection of Panels / Intersection des Panneaux	Sample Location / Localisation de l'échantillon				
DCP-5, Stage 2											
R-1	P2			85			At 2m of West and 2m of South	-1	05-14-17	05-14-17	Y
R-2	P2			85			At 2m of South and 4m of West	-1	05-14-17	05-14-17	Y
R-3	P2			85			At 2m of South and 6m of West	-1	05-14-17	05-14-17	Y
R-4	P2			86			At 1,5m of West and 2m of South	-1	05-14-17	05-14-17	Y
R-5	P2			86			At 3,5m of West and 2m of South	-1	05-14-17	05-14-17	Y
R-6	P1			111			At 0,8m of North and 0,8m of West	-1	05-14-17	05-14-17	Y
R-7			B	112			At 1,5m of North and 1m of West	-1	05-14-17	05-14-17	Y
R-8			B	129			At 1m of South and 1m of West	-1	05-14-17	05-14-17	Y

CHARTE/CHART : Empiècement/Patch (**P1** 0.3m à/to 0.6m; **P2** 0.6m à/to 1m; **P3** over 1m et plus), Extrusion (**E**), Embout/Pipe Boot (**B**), Cap strip (**CS**), Doublure/Reinforcement (**DB**) et/and Reconstruction