September 27, 2017

Sean Joseph
Senior Technical Advisor, NWB
P.O. Box 119
Gjoa Haven, NU X0B 1J0

RE: Mary River Project – Mine Site Crusher Pad Sedimentation Pond Expansion (Modification Request)
Water Licence 2AM-MRY1325 – Amend. No. 1

In accordance with Part G of Baffinland Iron Mines Corporation's (Baffinland) Type "A" Water Licence 2AM-MRY1325 – Amend. 1 (Type A Water Licence), the purpose of this letter is to request approval from the Nunavut Water Board (NWB) for a modification that involves increasing the capacity of the Crusher Pad Sedimentation Pond (Sedimentation Pond) at the Mary River Mine Site.

Background

On April 24, 2017, Baffinland Iron Mines Corporation (Baffinland) submitted a Request for Modification to the NWB to expand the Mine Site Crusher Pad by approximately 10 percent (%). On May 9, 2017 Baffinland received comments from Indigenous and Northern Affairs Canada (INAC) that identified that the Crusher Pad's stormwater management infrastructure, including the Sedimentation Pond, would not meet the approved civil design criteria (Hatch, 2013) for Project sedimentation ponds following the planned pad expansion.

On May 19, 2017, Baffinland responded to INAC's comments and proposed a temporary and permanent solution (Golder, 2017) to ensure the Crusher Pad's stormwater management infrastructure would meet the approved civil design criteria (Hatch, 2013) following the planned pad expansion. The proposed temporary solution involved increasing the elevation of the Sedimentation Pond's emergency spillway using sand bags until the long term permanent solution was implemented. The permanent solution proposed in Baffinland's response involved expanding the Sedimentation Pond by increasing the capacity of the pond and associated emergency spillway. On May 26, 2017, Baffinland received approval from NWB to conduct the planned pad expansion and implement the temporary solution (sand bags) on the condition that Baffinland submit a subsequent Request for Modification outlining the expansion of the

Sedimentation Pond (permanent solution). Subsequently, the sand bags were placed in the spillway (temporary solution) followed by the completion of the Crusher Pad expansion in May 2017.

Modification Request

Baffinland has contracted Golder Associates (Golder) to design the expansion of the Sedimentation Pond. The proposed expansion involves increasing the capacity of the Sedimentation Pond to approximately 3,950 cubic metres (m^3) which exceeds the approved civil design criteria for Project sedimentation ponds given the Crusher Pad's current size and also incorporates contingency for an additional future pad expansion of 6,000 square metres (m^2). Golder's proposed design for the Sedimentation Pond expansion is provided in Attachment 1. It should be noted that Baffinland is not requesting approval for an additional pad expansion of 6,000 square metres (m^2) in this submission. Baffinland understands that a subsequent Request for Modification would need to be submitted to the NWB for any future expansions of the Mine Site Crusher Pad. Construction of the Sedimentation Pond expansion is planned to start in late March 2018 prior to the start of freshet (approx. May 15, 2018).

To expedite the Nunavut Impact Review Board's (NIRB) review of this submission and determination on whether it is consistent with the Project Certificate (Project Certificate 005 – Amend. 1) issued for the Mary River Project, Baffinland will submit a Request for Review to the NIRB in parallel with this submission to the NWB.

Details of the modification are provided in the subsections below and in the attached documentation, including issued-for-construction drawings, engineering documentation and environmental mitigation measures to be implemented during construction.

The requested modification is described below and is consistent with the requirements of Part G of the Type "A" Water Licence.

a. <u>Description of Facilitiies and/or Works to be Constructed</u>

   The proposed expansion involves increasing the capacity of the Sedimentation Pond to approximately 3,950 cubic metres (m^3) which exceeds the approved civil design criteria (Hatch, 2013) for Project given the Crusher Pad's current size and also incorporates contingency for an additional future pad expansion of 6,000 square metres (m^2). Golder's proposed design for the Sedimentation Pond expansion is provided in Attachment 1.

As shown in Attachment 1, the expansion will include raising and widening the existing berm and liner on the north, west and south sides of the Sedimentation Pond and constructing a 6 metre (m) wide spillway and stilling basin in the same location as the existing spillway. The expansion is designed to increase the pond's capacity without compromising the integrity or capacity of the existing Sedimentation Pond during construction.

b. Proposed Location of the Structure

The expansion of the Sedimentation Pond will occur at the Mary River Mine Site. Issued for construction drawings, developed by Golder, showing the design and coordinates of the expansion are provided in Attachment 1.

c. Identification of any Potential Impacts to the Receiving Environment

Baffinland foresees minimal impacts to the receiving environment due to the frozen ground conditions and minimal snow melt/runoff during the construction period. In the event meltwater/runoff is observed during the pond's expansion, Baffinland will employ a combination of sediment and erosion control measures to address sedimentation concerns, as outlined in Baffinland's Surface Water and Aquatic Ecosystems Management Plan (BAF-PH1-830-P16-0026).

The sandbags in the spillway (temporary solution) will remain in place until the Sedimentation Pond's expansion is completed to ensure the pond has sufficient capacity to contain the 1:10 design storm event, as required by the approved civil design criteria (Hatch, 2013) for the Project, during construction.

d. Monitoring

During construction, daily environmental monitoring will be performed including before, during and after photographs of construction activities. Minimal surface water runoff is expected during construction however in the event that meltwater/runoff is observed prior to the completion of construction, Baffinland will conduct daily water quality monitoring of surface water drainage originating from the construction area. Water quality impacts of construction activities on nearby water bodies will be assessed using established Surveillance Network Program (SNP) monitoring locations and water quality discharge criteria established under Baffinland's Type "A" Water Licence. Additional monitoring stations may be established, if

required. A map showing the SNP monitoring locations at the Mine Site is provided in Attachment 2 of this letter.

e. Schedule for Construction

Construction of the Sedimentation Pond expansion is planned to start in late March 2018 prior to the start of freshet (approx. May 15, 2018).

f. Drawings of Engineered Structures

Golder was retained to design the Sedimentation Pond expansion. Issued for construction drawings are provided in Attachment 1.

g. Proposed Sediment and Erosion Control Measures

Minimal surface water runoff is expected due to frozen ground conditions and sub-zero ambient temperatures during the planned construction period. However, in the event that runoff is observed prior to the completion of construction, Baffinland will employ a combination of sediment and erosion control measures, as outlined in Baffinland's Surface Water and Aquatic Ecosystems Management Plan (BAF-PH1-830-P16-0026), to address sedimentation concerns.

We trust that this information meets the requirements under Part G under Baffinland's Type "A" Water Licence and look forward to the NWB's response. Please do not hesitate to contact the undersigned or Andrew Vermeer should you have any questions or comments.

Regards,

Wayne McPhee,
Director Sustainable Development

Attachments:

Attachment 1: Golder - Crusher Pad Sedimentation Pond Expansion Detailed Design Brief
Attachment 2: Mine Site SNP Water Quality Monitoring Locations

Cc: Stephen Williamson Bathory (Qikiqtani Inuit Association)
David Hohnstein (NWB)
Justin Hack, Jonathan Mesher, Sarah Forté, Karen Costello (INAC)
Todd Burlingame, Adam Grzegorczyk, Andrew Vermeer (Baffinland)

Attachment 1

Golder - Crusher Pad Sedimentation Pond Expansion Detailed Design Brief

TECHNICAL MEMORANDUM

DATE August 29, 2017 **PROJECT No.** 1775699 (3000) Rev.0

TO Mr. Steven Dew
Baffinland Iron Mine Corp.

CC Cody Gagne, Adam Gyorffy, Marc Rougier, Ken Bocking

FROM Michelle Tyldesley **EMAIL** MTyldesey@golder.com

CRUSHER PAD SEDIMENTATION POND EXPANSION DETAILED DESIGN BRIEF, MARY RIVER PROJECT, NUNAVUT

1.0 INTRODUCTION

Baffinland Iron Mines Corporation (Baffinland) retained Golder Associates Ltd. (Golder) to prepare a detailed design for the expansion of the Crusher Pad Sedimentation Pond at the Mary River Project Iron Mine on Baffin Island, Nunavut. An expansion of this pond is required as a result of the expansion of the Crusher Pad area (Golder 2017). An assessment was completed to determine the impact of the increased runoff area from the Crusher Pad expansion on the existing water management infrastructure (Golder 2017). With the increase in the Crusher Pad area, the existing sedimentation pond had insufficient storage capacity to store the environmental design flood (EDF) and to safely pass the inflow design flood (IDF). Baffinland requested Golder carry out a detailed design to expand the existing sedimentation pond to accommodate the EDF and IDF requirements. This technical memorandum summarizes the background, design criteria and construction details of the proposed expansion of the existing Sedimentation Pond.

2.0 BACKGROUND

The Mary River Project is owned and operated by Baffinland. The Crusher Pad is where ore is stockpiled, crushed, and loaded into B-trains trucks for haulage to the Milne Port. Two ore crushing set-ups and a single aggregate crushing set-up are located on the Crusher Pad. The aggregates produced at the Crusher Pad are used across the site as required.

The Sedimentation Pond, which is adjacent to the west side of the Crusher Pad, is used to remove suspended solids from the surface water runoff on the Crusher Pad. A perimeter ditch conveys the flows from the Crusher Pad to the Sedimentation Pond. Water collected in the Sedimentation Pond is released by pumping to a discharge location downstream near Mary River. The existing Sedimentation Pond was designed by Hatch (Hatch, 2015). The Sedimentation Pond is fully lined with a high density geomembrane. The current sedimentation pond has a capacity to store approximately 2,750 m^3 at the high water level. An emergency spillway is located on the west berm.

3.0 CRUSHER SEDIMENTATION POND EXPANSION DESIGN

The design criteria and design elements (the berm raise and the spillway) for the Crusher Pad Sedimentation Pond are provided in the following section.

3.1 Design Criteria

The design criteria for the Sedimentation Pond were obtained from the original Hatch civil design criteria for the site (Hatch, 2013). The following design criteria were considered for the Crusher Pad Sedimentation Pond Expansion:

- Pond is sized to contain a 1:10 year, 24 hour design storm volume (EDF);
- Runoff coefficient to estimate runoff is 0.9;
- Emergency overflow spillway of sufficient capacity to safely convey a 1 in 200 year return period storm event (IDF); and
- Freeboard above the maximum water level is about 0.3 m.

These criteria meet or exceed the criteria that were part of the original approval documentation. The above criteria are also considered appropriate for the proposed expansion as they are in line with industry practice and the IDF criteria exceeds the Canadian Dam Association (CDA) guidelines for a "low" consequence dam. The Sedimentation Pond berms are considered to be of "low" consequence as the volume of water and sediments retained by the berm is relatively minimal. There is no potential for loss of life, the environmental impacts to the downstream environment would be minimal (minor erosion and sediment transport along flow path to Sheardown Lake with minor sediment deposition within the lake) and there would be no third party losses.

The contributing areas to the Sedimentation Pond are outlined below in Table 1. An additional 6,000 m^2 area was requested by Baffinland to be included in the sizing calculations to allow for future pad expansions.

Table 1: Crusher Sedimentation Pond Catchment Areas

Identification	Area (m^2)
Current Crusher Pad	89,000
Crusher Pad Extension East	12,500
Future Potential Crusher pad Extension West	6,000
Total Crusher Pad Area	**107,500**

3.2 Crusher Sedimentation Pond Expansion Design Elements

The expansion will include raising and widening the existing berm and liner on the north, west and south sides of the Sedimentation Pond and constructing a 6 m wide spillway and stilling basin in the same location as the existing spillway. Table 2 summarizes the design parameters of the proposed Sedimentation Pond expansion. The details on these design elements are described in the following sections. The attached Drawings 001 to 003 present the site plan, cross-sections and typical details, respectively.

Table 2: Sedimentation Pond Upgrade Design Parameters

Design Parameters	Unit	Value
Required Volume below EDF Water Level	m^3	3,947
EDF WL Elevation[1]	masl	192.28
Maximum Operating Level	masl	pond empty[2]
Water elevation at IDF (Max WL)	masl	192.52
Spillway Invert Elevation	masl	192.28
Spillway Width	m	6.0
Spillway Depth	m	0.54
Spillway Side Slope	xH:1V	3.0
Berm Crest Elevation	masl	192.82 (spillway invert + 0.24 m flow depth + 0.30 m freeboard)
Berm Width	m	6

[1] The EDF WL elevation was calculated based on the provided as built-survey of the Sedimentation Pond.

[2] The pond should be empty during normal operating conditions. After a storm event the resulting water volume is to be managed by discharging in a timely manner.

3.2.1 Berm

Along the north, west and south side of the existing Crusher Sedimentation Pond, the existing berm will be raised by approximately 0.5 m (to crest elevation 192.82 m). The berm crest will be widened to 6 m to allow for construction and maintenance access. The berm will be raised by extending the shell in the downstream direction. As shown on Dwg 003, the downstream shell may be constructed either entirely with Type 8 (150 mm minus) material, or with a combination of Type 8 material and Type 12 (Run of Quarry) material. In the latter case, the Type 12 material must be capped with a minimum of 300 mm of Type 8 material, so that the Type 8 material can act as a filter between the Type 12 material and any overlying layers of geomembrane bedding.

The existing liner will be extended to the crest elevation by extrusion welding a new strip of liner to the existing liner. A minimum overlap of the liners of 0.30 m is required. The existing anchor trench is to remain in place. The liner will consist of the same material previously used (EnviroLiner 6000 HD). The liner will be placed on a 0.1 m thick bedding layer consisting of 9.5 mm minus material. Either screened sand or crusher fines can be used for the bedding, providing it meets the specifications. Placement of a geotextile between the bedding layer and the geomembrane is optional and depends on the angularity and fineness of the screened sand / crusher fines. Underlying the bedding layer, a 0.1 m thick layer of Type 5 (32 mm minus) material is required as a transition. The liner will be anchored into a trench at the crest of the berm. The extents of the raise are shown on Drawings 001 and 002. Typical details of the berm raise and liner raise are provided in Drawing 003.

3.2.2 Spillway

The spillway invert will be raised by approximately 0.3 m to elevation 192.28 m and the spillway will be widened to 6 m. The liner will be installed along the length of the spillway and the spillway will terminate in a stilling basin. The liner will be connected to the existing liner in the same manner as the berm raise, as described in Section 3.2.1. The outflow chute is to be contained by two side berms constructed of Type 19 erosion protection material which will also be used to anchor the geomembrane in the chute. The stilling basin is to be a minimum of 1 m thick Type 19 erosion protection underlain with geotextile (Layfield LP7).

4.0 CONSTRUCTION

4.1 Construction Considerations

The construction considerations related to the Crusher Pad Sedimentation Pond expansion are provided below:

- For safety reasons, the pond shall be drained prior to construction of the liner or alternative controls should be in place.
- Snow shall be removed from the footprint of the expansion prior to construction.
- Sedimentation and erosion mitigation measures shall be in place before commencing construction.
- All materials shall be placed in horizontal lifts with a nominal compacted thickness of 300 mm or less.
- Each lift shall be compacted by a minimum of 3 passes over all areas of a dozer, a loaded haul truck or the loader.
- Field fitting of the tie-in of the expansion into the east berm will be required.
- An as-built survey should be collected to properly document the construction.

4.2 Materials

The proposed construction materials are consistent with those previously used on site. A summary of the materials are listed below.

Table 3: Screened Material - Type 5 (32 mm minus) Fill Gradation Specification

Sieve Designation (mm)	Minimum Percent Passing, by weight	Maximum Percent Passing, by weight
32	100	100
25 (1 in.)	70	100
9.5 (3/8 in.)	40	70
4.75 (No. 4)	30	55
2.00 (No. 10)	22	42
0.6 (No. 30)	15	30
0.075 (No. 200)	4	8

Table 4: Jaw Run Material - Type 8 (150 mm minus) Fill Gradation Specification

Sieve Designation (mm)	Minimum Percent Passing, by weight	Maximum Percent Passing, by weight
200	100	100
150	95	100
100	50	100
50	30	60
19 (3/4 in.)	15	35
4.75 (No. 4)	10	25
0.075 (No. 200)	0	5

Table 5: Run of Quarry- Type 12 (1000 mm minus) Fill Gradation Specification

Sieve Designation (mm)	Minimum Percent Passing, by weight	Maximum Percent Passing, by weight
1000	100	100
600	95	100
300	50	100
150	0	80
19	0	30
4.75	0	10

Table 6: Erosion Protection material - Type 19 (D_{50} of 150 mm) Gradation Specification

Sieve Designation (mm)	Minimum Percent Passing, by weight	Maximum Percent Passing, by weight
300	100	100
285	85	100
240	65	85
210	50	75
150	25	50
135	15	45
75	0	15

Table 7: Screened Sand / Crusher Fines material - Gradation Specification

Sieve Designation (mm)	Minimum Percent Passing, by weight	Maximum Percent Passing, by weight
9.500	100	100
4.750	95	100
2.000	90	100
0.841	80	97
0.420	75	92
0.250	67	90
0.149	56	83
0.075	27	70
0.002	2	10

The proposed liner bedding material is either screened sand or crusher fines. A sample gradation of the crusher fines was provided by Baffinland and is provided below.

Table 8: Crusher Fines Material - Typical Gradation

Sieve Designation (mm)	Percent Passing, by weight
9.5 mm	100
#4	99.8

Sieve Designation (mm)	Percent Passing, by weight
#10	98.1
#20	90.2
#40	80.4
#60	72.6
#100	58.9
#200	43.2
0.051	19.0
0.037	15.8
0.026	12.7
0.019	9.5
0.014	9.5
0.01	6.4
0.007	6.4
0.005	3.3
0.003	3.7
0.002	4.0
0.001	4.2

5.0 CONCLUSIONS

Golder completed a detailed design for the Crusher Pad Sedimentation Pond expansion based on the 2017 expansion of the Crusher pad and proposed future expansion. Construction drawings for the Crusher Sedimentation Pond expansion site plan, sections, and typical details are presented in Drawings 001, 002 and 003, respectively.

6.0 CLOSING REMARKS

We trust that this technical memorandum satisfies your current requirements. Please contact the undersigned should you have any questions.

GOLDER ASSOCIATES LTD.

Michelle Tyldesley, P.Eng.(ON)
Geotechnical Engineer

Ken Bocking, P.Eng.
Principal, Senior Geotechnical Engineer

DB/MJT/KAB/jl

Attachments: Drawing 001- Site Plan
Drawing 002- Profile and Cross–Sections
Drawing 003- Typical Details

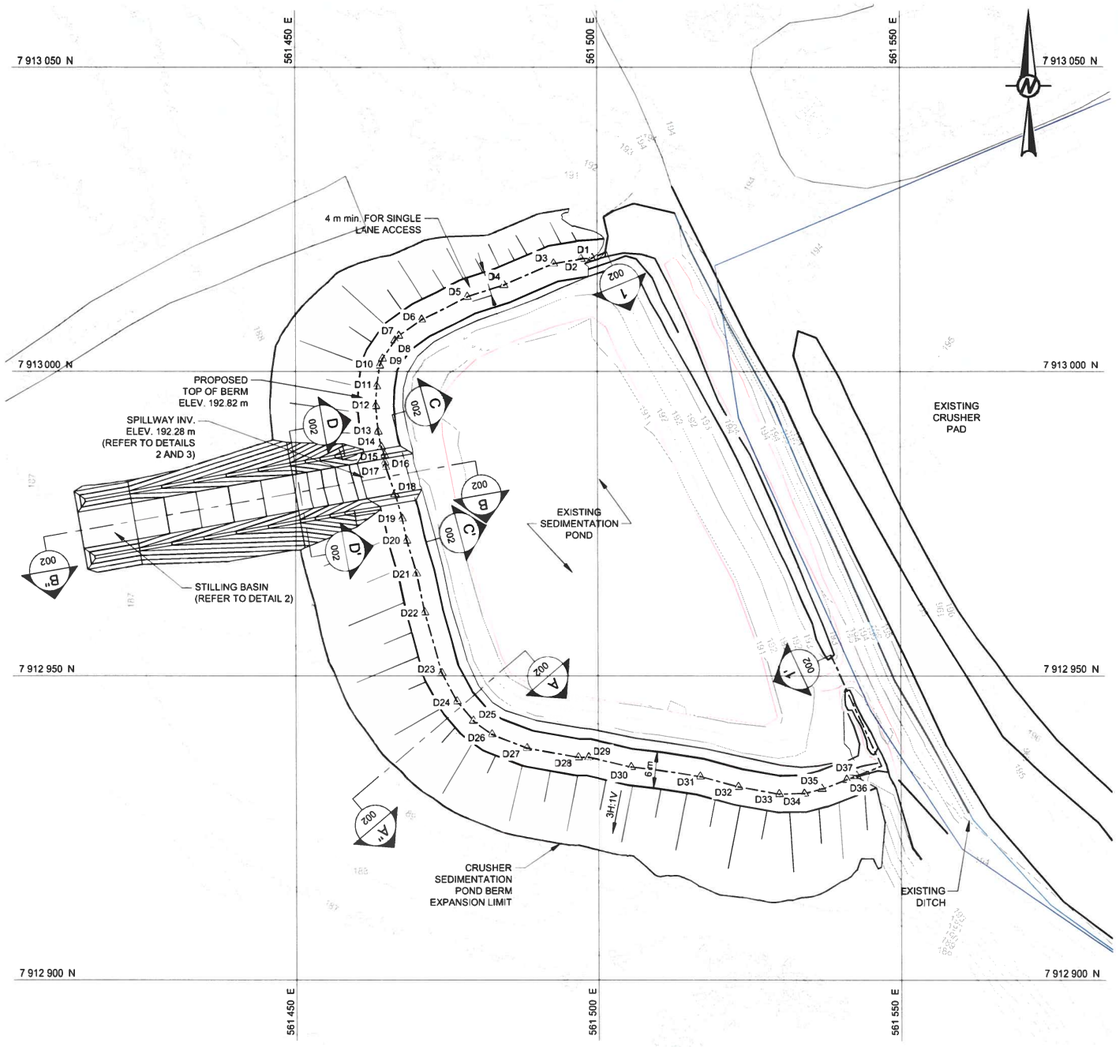
https://golderassociates.sharepoint.com/sites/11387g/shared documents/phase 6000- sedimentation pond upgrade/reporting/rev. 0/1775699 baffinland detailed design crusher pad_sedpondexpansion_29aug2017_rev0.docx

References

Golder (Golder Associates Ltd.) 2017. Crusher Pad Expansion Detailed Design Brief, Mary River Project, Nunavut. Issued to Baffinland. Golder Project No. 1775699 (3000) .17 April 2017.

Hatch (Hatch Ltd.) 2013. Civil Design Criteria. Hatch Project No. H349000. Issued to Baffinland. 28 August 2013.

Hatch (Hatch Ltd.) 2015. Crusher Pad Sedimentation Pond Earthworks & Drainage Plan. Drawing No. H34900-4385-10-035-0001. Issued for Construction. Issued to Baffinland. 27 Mar 2015.



PLAN VIEW
SCALE: 1:400 m

BERM CREST CENTERLINE LAYOUT POINTS

POINT ID	EASTING (m)	NORTHING (m)	ELEVATION (m)
D1	561499.02	7913018.62	192.82
D2	561497.24	7913018.50	192.82
D3	561492.69	7913017.73	192.82
D4	561484.48	7913014.20	192.82
D5	561478.42	7913012.26	192.82
D6	561470.89	7913008.52	192.82
D7	561467.11	7913005.86	192.82
D8	561466.47	7913005.10	192.82
D9	561464.41	7913002.11	192.82
D10	561463.94	7913000.99	192.82
D11	561463.42	7912997.56	192.82
D12	561463.26	7912994.31	192.82
D13	561463.67	7912990.12	192.82
D14	561464.16	7912987.57	192.82
D15	561464.73	7912986.24	192.82
D16	561464.78	7912985.04	192.82
D17	561464.90	7912984.33	192.82
D18	561466.42	7912979.82	192.82
D19	561467.61	7912975.82	192.82
D20	561468.35	7912972.19	192.82
D21	561469.95	7912966.78	192.82
D22	561471.31	7912960.42	192.82
D23	561474.09	7912950.42	192.82
D24	561476.59	7912945.79	192.82
D25	561479.28	7912942.61	192.82
D26	561482.33	7912940.37	192.82
D27	561488.18	7912938.11	192.82
D28	561496.57	7912936.60	192.82
D29	561498.29	7912936.61	192.82
D30	561505.37	7912934.98	192.82
D31	561516.73	7912933.44	192.82
D32	561523.05	7912931.75	192.82
D33	561529.80	7912930.56	192.82
D34	561533.92	7912930.64	192.82
D35	561536.84	7912931.42	192.82
D36	561540.92	7912932.92	192.82
D37	561542.62	7912933.56	192.82

LEGEND

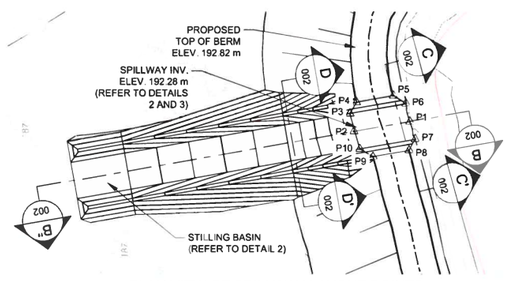
- 212 — EXISTING CONTOURS (1 m INTERVAL)
- 199 — DESIGN CONTOURS (1 m INTERVAL)
- CREST OF BERM
- P1 — SPILLWAY LAYOUT POINT
- D1 — BERM CREST LAYOUT POINT

NOTES

1. ALL DIMENSION AND ELEVATIONS ARE IN METRES UNLESS OTHERWISE NOTED.
2. COORDINATE SYSTEM IS UTM (NAD 83) ZONE 17.
3. TOPOGRAPHY PROVIDED BY BAFFINLAND.
4. THE GROUND SURFACE IS CONSIDERED APPROXIMATE.
5. IT IS THE RESPONSIBILITY OF THE USER OF THIS DRAWING TO ENSURE THE USE OF ITS MOST RECENT REVISION.
6. THE CONTRACTOR SHALL VERIFY THE COORDINATES AND ELEVATIONS BEFORE COMMENCING CONSTRUCTION.
7. THE OWNER'S REPRESENTATIVE (WITH INPUT FROM THE GEOTECHNICAL ENGINEER) SHALL APPROVE THE LAYOUT IN THE FIELD.
8. THE POND SHALL BE EMPTIED PRIOR TO COMMENCING THE LINER INSTALLATION WORK.
9. REFER TO DRAWING 002 FOR CROSS-SECTIONS AND DRAWING 003 FOR TYPICAL DETAILS.

EMERGENCY OVERFLOW SPILLWAY LAYOUT POINTS

POINT ID	EASTING (m)	NORTHING (m)	ELEVATION (m)
P1	561470.03	7912983.57	192.28
P2	561460.82	7912981.96	192.28
P3	561460.16	7912984.89	192.28
P4	561461.28	7912986.73	192.82
P5	561467.33	7912987.79	192.82
P6	561469.40	7912986.51	192.28
P7	561470.89	7912980.68	192.28
P8	561469.88	7912978.85	192.82
P9	561463.94	7912977.81	192.82
P10	561461.80	7912979.08	192.28



PLAN VIEW OF SPILLWAY LAYOUT POINTS
SCALE: 1:400 m

0 20 40
1:400 METRES

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2017-08-29	ISSUED FOR CONSTRUCTION	MJT	DD	MJT	KAB
A	2017-08-04	ISSUED FOR CLIENT REVIEW	MJT	MLF	MJT	KAB

PERMIT TO PRACTICE
GOLDER ASSOCIATES LTD.
Signature ORIGINAL SIGNED
Date
PERMIT NUMBER: P 049
NT/NU Association of Professional Engineers and Geoscientists

ORIGINAL SIGNED AND SEALED
REGISTERED PROFESSIONAL ENGINEER
K. A. BODDING
LICENSEE
NUNAVUT

STAMP/SEAL
THIS DRAWING IS THE PROPERTY OF GOLDER ASSOCIATES LTD. AND IS NOT TO BE LOANED OR REPRODUCED IN ANY WAY WITHOUT THE PERMISSION OF GOLDER ASSOCIATES LTD.

CLIENT
Baffinland

CONSULTANT
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PROJECT
MARY RIVER PROJECT
CRUSHER PAD SEDIMENTATION POND EXPANSION

TITLE
SITE PLAN

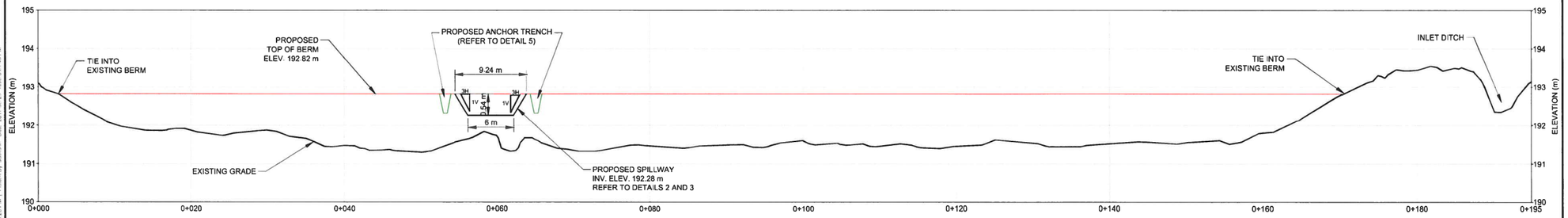
PROJECT NO.	PHASE	REV.	of	DRAWING
1775699	6000	0		001

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI D

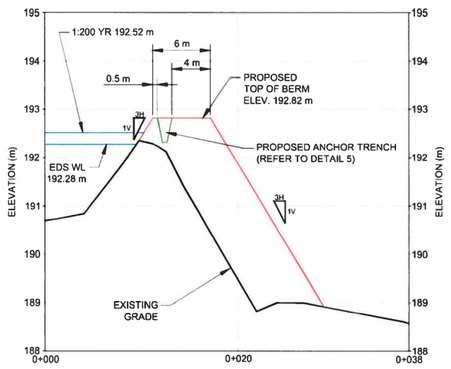
25 mm

NOTES

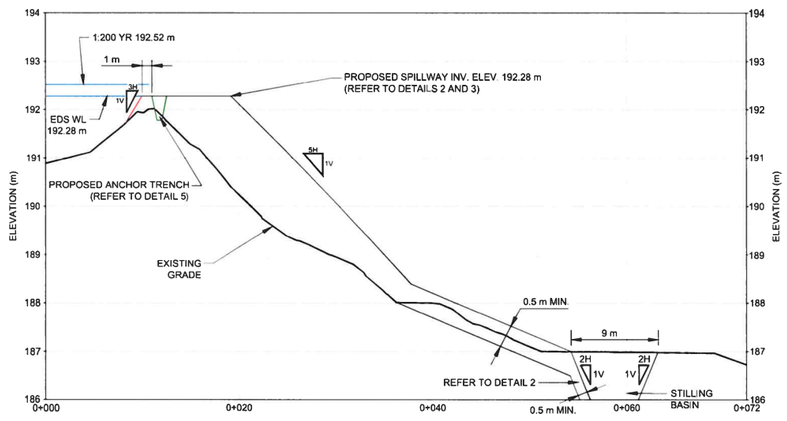
1. REFER TO DRAWING 003 FOR DETAILS.
2. REFER TO DRAWING 001 FOR ADDITIONAL NOTES.



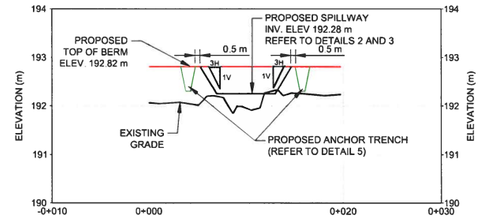
HORIZ. SCALE 1:250 m / VERT. SCALE 1:50 m — 1-1' / 001 — PROFILE



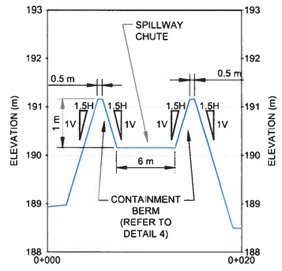
HORIZ. SCALE 1:250 m / VERT. SCALE 1:50 m — A-A' / 001 — CROSS-SECTION



HORIZ. SCALE 1:250 m / VERT. SCALE 1:50 m — B-B' / 001 — CROSS-SECTION



HORIZ. SCALE 1:250 m / VERT. SCALE 1:50 m — C-C' / 001 — CROSS-SECTION



HORIZ. SCALE 1:250 m / VERT. SCALE 1:50 m — D-D' / 001 — CROSS-SECTION

0 10 20
1:250 METRES

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
0	2017-08-29	ISSUED FOR CONSTRUCTION	MJT	DD	MJT	KAB
A	2017-08-04	ISSUED FOR CLIENT REVIEW	MJT	MLF	MJT	KAB

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Signature ORIGINAL SIGNED
Date
PERMIT NUMBER: P 049
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ORIGINAL SIGNED AND SEALED
RESPECTED PROFESSIONAL ENGINEER K. A. BODING LICENSEE NWT.

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Baffinland

CONSULTANT
Golder Associates

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CANADA
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www.golder.com

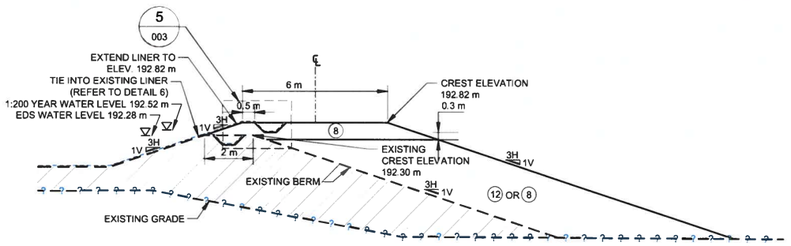
PROJECT
MARY RIVER PROJECT
CRUSHER PAD SEDIMENTATION POND EXPANSION

TITLE
PROFILE AND CROSS-SECTIONS

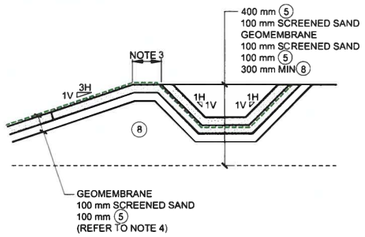
PROJECT NO	PHASE	REV.	of	DRAWING
1775699	6000	0		002

IF THIS REDUCEMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET HAS BEEN MODIFIED FROM ANSI D

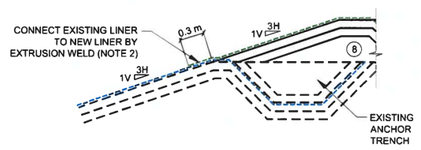
25 mm



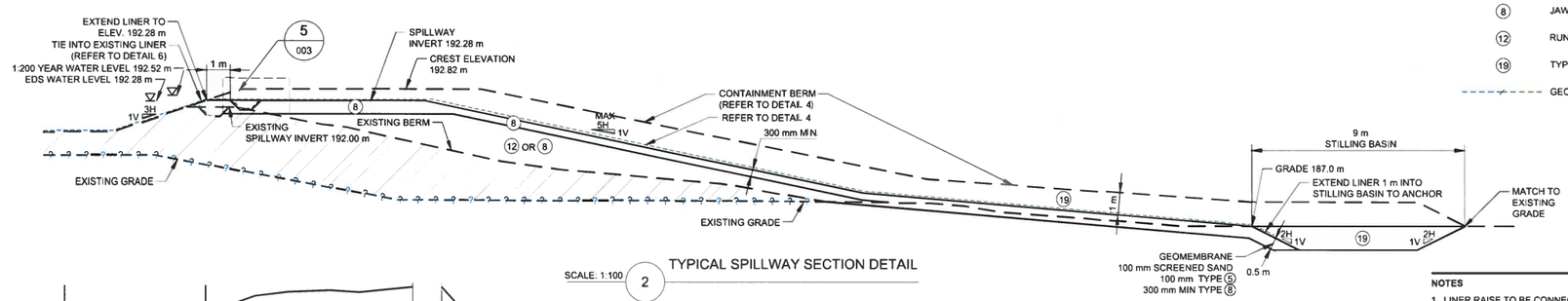
SCALE: 1:100 **1** TYPICAL BERM SECTION DETAIL



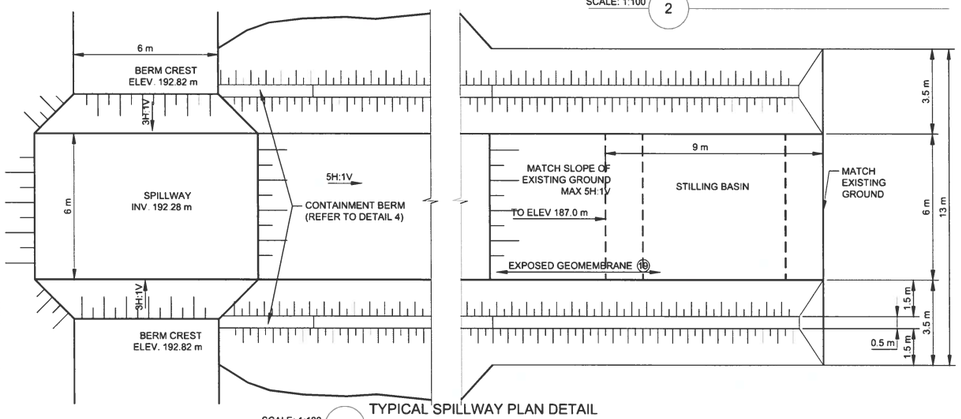
SCALE: 1:30 **5** TYPICAL ANCHOR TRENCH DETAIL



SCALE: 1:30 **6** TYPICAL LINER CONNECTION DETAIL



SCALE: 1:100 **2** TYPICAL SPILLWAY SECTION DETAIL



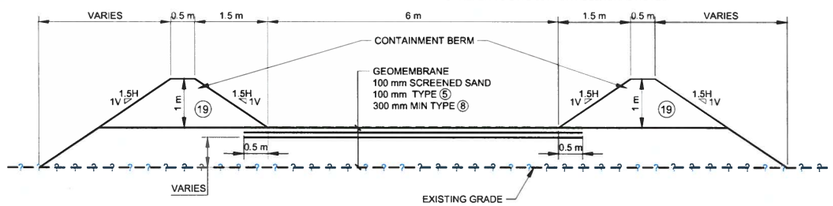
SCALE: 1:100 **3** TYPICAL SPILLWAY PLAN DETAIL

LEGEND

- EXISTING GROUND
- SCREENED SAND/CRUSHER FINES (9.5 mm MINUS)
- 5 SCREENED MATERIAL (32 mm MINUS)
- 8 JAW RUN (150 mm MINUS)
- 12 RUN OF QUARRY (1000 mm MINUS)
- 19 TYPE 19 EROSION PROTECTION (SELECT 300 mm MINUS)
- GEOMEMBRANE (ENVIRO LINER 6000 HD OR APPROVED EQUIVALENT)

NOTES

1. LINER RAISE TO BE CONNECTED TO EXISTING LINER. EXISTING ANCHOR TRENCH NOT TO BE EXCAVATED.
2. EXISTING LINER TO BE CONNECTED TO NEW LINER USING AN EXTRUSION WELD. EXISTING LINER TO BE CLEANED AND GRINDED PRIOR TO WELD.
3. ANCHOR TRENCH TO BE OFFSET 0.5 m FROM BERM U/S CREST EDGE (AS SHOWN IN DETAIL 1) AND 1.0 m FROM SPILLWAY U/S CREST EDGE (AS SHOWN IN DETAIL 2). ALONG THE SPILLWAY CHANNEL, ANCHOR TRENCH TO BE OFFSET 0.5 m FROM THE TOP OF THE SIDE SLOPES (AS SHOWN IN CROSS-SECTION C-C ON DRAWING 002).
4. TYPICAL MATERIAL PROFILE FOR LINER. A GEOTEXTILE BETWEEN GEOMEMBRANE AND CRUSHER FINES OPTIONAL, DEPENDING ON THE ANGULARITY OF THE CRUSHER FINES. TO BE DETERMINED BY THE OWNERS REPRESENTATIVE WITH INPUT FROM THE GEOTECHNICAL ENGINEER.
5. REFER TO DWG 001 FOR ADDITIONAL NOTES.



SCALE: 1:50 **4** TYPICAL SPILLWAY CHUTE DETAIL

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PROJECT
MARY RIVER PROJECT
CRUSHER PAD SEDIMENTATION POND EXPANSION

TITLE
TYPICAL DETAILS

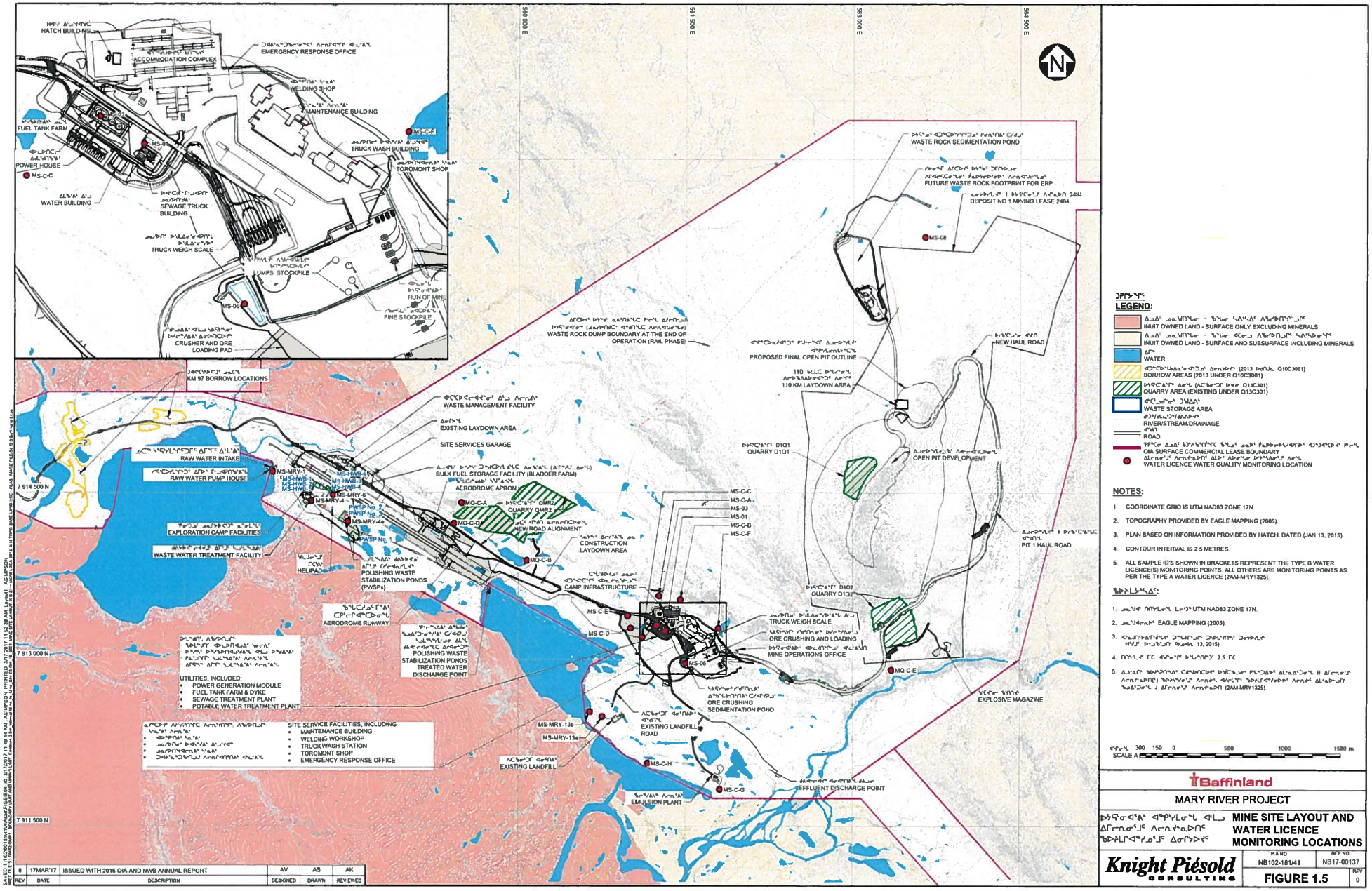
PROJECT NO.	PHASE	REV.	of	DRAWING
1775699	6000	0		003

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI D

25 mm

Attachment 2

Mine Site SNP Water Quality Monitoring Locations


HATCH BUILDING
ACCOMMODATION COMPLEX
EMERGENCY RESPONSE OFFICE
WELDING SHOP
MAINTENANCE BUILDING
FUEL TANK FARM
TRUCK WASH BUILDING
TOROMONT SHOP
POWER HOUSE
WATER BUILDING
SEWAGE TRUCK BUILDING
TRUCK WEIGH SCALE
LUMPS STOCKPILE
RUN OF MINE FINE STOCKPILE
CRUSHER AND ORE LOADING PAD
KM 97 BORROW LOCATIONS
WASTE MANAGEMENT FACILITY
EXISTING LAYDOWN AREA
SITE SERVICES GARAGE
BULK FUEL STORAGE FACILITY (BLADDER FARM)
AERODROME APRON
QUARRY QMR2
NEW ROAD ALIGNMENT
CONSTRUCTION LAYDOWN AREA
CAMP INFRASTRUCTURE
RAW WATER INTAKE
RAW WATER PUMP HOUSE
EXPLORATION CAMP FACILITIES
WASTE WATER TREATMENT FACILITY
HELIPADS
POLISHING WASTE STABILIZATION PONDS (PWSPs)
AERODROME RUNWAY
POLISHING WASTE STABILIZATION PONDS TREATED WATER DISCHARGE POINT
UTILITIES, INCLUDED:
• POWER GENERATION MODULE
• FUEL TANK FARM & DYKE
• SEWAGE TREATMENT PLANT
• POTABLE WATER TREATMENT PLANT
SITE SERVICE FACILITIES, INCLUDING:
• MAINTENANCE BUILDING
• WELDING WORKSHOP
• TRUCK WASH STATION
• TOROMONT SHOP
• EMERGENCY RESPONSE OFFICE
WASTE ROCK DUMP BOUNDARY AT THE END OF OPERATION (RAIL PHASE)
PROPOSED FINAL OPEN PIT OUTLINE
110 KM LAYDOWN AREA
WASTE ROCK SEDIMENTATION POND
FUTURE WASTE ROCK FOOTPRINT FOR ERP
DEPOSIT NO 1 MINING LEASE 2484
NEW HAUL ROAD
QUARRY D1Q1
OPEN PIT DEVELOPMENT
PIT 1 HAUL ROAD
QUARRY D1Q2
TRUCK WEIGH SCALE
ORE CRUSHING AND LOADING
MINE OPERATIONS OFFICE
ORE CRUSHING SEDIMENTATION POND
EXISTING LANDFILL ROAD
EXISTING LANDFILL
EMULSION PLANT
EXPLOSIVE MAGAZINE
EFFLUENT DISCHARGE POINT
560 000 E
565 000 E
570 000 E
575 000 E
7 914 500 N
7 913 000 N
7 911 500 N
MS-MRY-1
MS-MRY-4
MS-MRY-4a
MS-MRY-5
MS-MRY-13a
MS-MRY-13b
MS-HWB-1
MS-HWB-2
MS-HWB-3
MS-HWB-4
PWSP No. 1
PWSP No. 2
PWSP No. 3
MQ-C-A
MQ-C-B
MQ-C-D
MS-C-C
MS-C-A
MS-01
MS-C-B
MS-C-F
MS-C-E
MS-C-D
MS-05
MS-C-H
MS-C-G
MS-C-E
MS-08
MS-C-C
MS-C-F
MS-01
MS-05
LEGEND:
INUIT OWNED LAND - SURFACE ONLY EXCLUDING MINERALS
INUIT OWNED LAND - SURFACE AND SUBSURFACE INCLUDING MINERALS
WATER
BORROW AREAS (2013 UNDER Q10C3001)
QUARRY AREA (EXISTING UNDER Q13C301)
WASTE STORAGE AREA
RIVER/STREAM,DRAINAGE
ROAD
QIA SURFACE COMMERCIAL LEASE BOUNDARY
WATER LICENCE WATER QUALITY MONITORING LOCATION
NOTES:
1. COORDINATE GRID IS UTM NAD83 ZONE 17N.
2. TOPOGRAPHY PROVIDED BY EAGLE MAPPING (2005).
3. PLAN BASED ON INFORMATION PROVIDED BY HATCH, DATED (JAN 13, 2015)
4. CONTOUR INTERVAL IS 2.5 METRES.
5. ALL SAMPLE ID'S SHOWN IN BRACKETS REPRESENT THE TYPE B WATER LICENCE(S) MONITORING POINTS. ALL OTHERS ARE MONITORING POINTS AS PER THE TYPE A WATER LICENCE (2AM-MRY1325).
SCALE A 300 150 0 500 1000 1500 m
0 17MAR'17 ISSUED WITH 2016 QIA AND NWB ANNUAL REPORT AV AS AK
REV DATE DESCRIPTION DESIGNED DRAWN REVIEWED
Baffinland
MARY RIVER PROJECT
MINE SITE LAYOUT AND WATER LICENCE MONITORING LOCATIONS
Knight Piésold CONSULTING
P.A.NO NB102-181/41
REF NO NB17-00137
FIGURE 1.5
REV 0