August 24, 2017

Ryan Barry
Executive Director
Nunavut Impact Review Board
29 Mitik Street
P.O. Box 1360
Cambridge Bay
NU, X0B 0C0

RE: Mary River Project – Mine Site Accommodations Camp Upgrade
Request for Project Certificate Review

The purpose of this letter is to request the Nunavut Impact Review Board (NIRB) to provide a review of the proposed Mine Site Accommodations Camp Upgrade at the Mary River Project and indicate to Baffinland Iron Mines Corporation (Baffinland) and the Nunavut Water Board (NWB) if the proposed camp upgrade is consistent with the Amended Project Certificate (Project Certificate) issued to the Mary River Project by the NIRB.

In accordance with Part G of Baffinland's Type "A" Water Licence 2AM-MRY1325 – Amend. 1 (Type A Water Licence), Baffinland submitted to the Nunavut Water Board (NWB) on July 26, 2017 a Request for Modification for a proposed upgrade to the camp facilities at the Mary River Mine Site that involves replacing the existing Weatherhaven softwall camp and associated tents at the Mine Site with an 800 man hardwall accommodations camp facility (provided as Attachment 1 of this letter). Upon receiving the Request for Modification, the NWB subsequently posted the request on the NWB website for comment on July 28, 2017. Because one of the requirements for carrying out a Request for Modification under Baffinland's Type A Water Licence is that "Such Modifications are consistent with the NIRB Project Certificate", Baffinland and the NWB require the NIRB to provide a determination on whether the proposed camp upgrade is consistent with the Project Certificate.

The expected bed space at the Mine Site, based on the Project Description Key Facts Table, provided in the Early Revenue Phase Addendum to the Final Environmental Impact Statement for the Mary River Project, is provided in Table 1 below. Table 1 also includes the current amount of bed space at the Mine Site and the total amount of active bed space planned at the Mine Site following the proposed camp upgrade. Table 2, provided below, further breaks down the current and proposed bed space increase at the Mine Site by camp.

Table 1 – Expected, Current and Proposed Beds at the Mine Site

Expected Beds at the Mine Site ERP Key Facts Table	Current Beds Available at Mine Site	Proposed Active Beds following Camp Upgrade at Mine Site
1200	330	810

Table 2 –Current and Proposed Bed Space at the Mine Site by Camp

Time Period	Milne Port Camps	Available Beds	Active Beds
Current (Summer 2017)	Mine Site Complex	210	210
	Weatherhaven (incl. Tents)	120	120
Total			**330**
Post Upgrade	Mine Site Complex	210	210
	Weatherhaven (incl. Tents)	0	0
	800 Man Hardwall Camp	800	600
Total			**810**

It should be noted that based on the Mine Site water withdrawal limits stipulated in Baffinland's Type A Water Licence, Baffinland, in the interim, plans on occupying a maximum of 75 percent (600 beds) of the available beds in the new accommodations camp facility following the camp's construction and commissioning. Baffinland understands that further approvals would be required in the event that additional beds are required at the new camp.

The proposed camp upgrade at the Mine Site will occur within the Project's Development Area. Financial security for the works outlined in Baffinland's 2017 Work Plan Addendum, which included the proposed camp upgrade, was provided to the Qikiqtani Inuit Association (QIA) on August 7, 2017.

Based on information provide above, it is Baffinland's understanding that proposed camp upgrade is consistent with the Project Certificate and look forward to the NIRB's determination and 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: Mine Site Accommodations Camp Upgrade – Request for Modification (July 26, 2017)

Cc: Solomon Amuno (NIRB)
Stephen Williamson Bathory (Qikiqtani Inuit Association)
Sean Joseph, David Hohnstein (NWB)
Sarah Forté, Karen Costello (INAC)
Todd Burlingame, Adam Grzegorczyk, Andrew Vermeer (Baffinland)

Attachment 1

Mine Site Accommodations Camp Upgrade – Request for Modification (July 26, 2017)

July 26, 2017

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

RE: Modification Request – Mine Site Accommodations Camp Upgrade
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), the purpose of this letter is to request approval from the Nunavut Water Board (NWB) for a planned modification at the Mary River Mine Site that involves the addition of a new accommodations camp facility and associated water treatment systems. The details of the modification are provided below and in the attached documentation.

In operating the Mary River Project since 2013, Baffinland has determined that more equipment is required to reach full production (4.2 Mt per annum). The additional equipment will require additional operators and in turn more maintenance and support personnel than originally anticipated during the Project's approvals process.

In addition, Baffinland is experiencing high turnover rates with the site workforce. Several returning contractors are refusing to send their employees to site due to the current accommodation conditions. During 2016, approximately 50% of personnel who resigned cited poor accommodations as a primary reason for their resignation.

To address the accommodations issues described above, an 800 man hardwall accommodations camp facility is proposed to upgrade the existing Weatherhaven softwall camp and associated tents. The proposed camp is a used, three storey camp in good condition and was purchased by Baffinland to take advantage of the used camp's availability on the market. The camp features 800 single rooms, each with their own bathroom and shower. The camp layout and associated facilities, including a dedicated potable water treatment plant and sewage treatment plant, are shown in Attachment 2. Upon completion of the new camp, the Weatherhaven softwall camp and associated tents will be scheduled for decommissioning and reclamation.

Table 1 outlines the proposed increase in available beds at the Mine Site and the Mine Site camps that will remain occupied following the construction of the new camp and associated facilities.

Table 1: Proposed Bed Space at Mine Site

Time Period	Milne Port Camps	Available Beds	Active Beds
Current (Summer 2017)	Mine Site Complex	210	210
	Weatherhaven (incl. Tents)	120	120
Total			**330**
Post Upgrade	Mine Site Complex	210	210
	800 Man Hardwall Camp	800	600
Total			**810**

As outlined in Table 3 of the Type "A" Water Licence, the domestic water use limit at the Mine Site is 203.8 cubic metres per day (203.8 m^3/day). As shown above in Table 1, only 75 percent (75%) of the available beds in the new accommodations camp facility will be used following its construction and commissioning. Baffinland anticipates that domestic water use at Mine Site will continue to remain significantly below the permitted 203.8 m^3/day limit following the construction and operation of the new camp and that changes to the Type "A" Water Licence Terms and Conditions are not required.

During the last two years of operation, daily domestic water consumption at both Milne Port and the Mary River Mine Site have been on average 200 L per person per day. With an expected active bed capacity of 810 beds during peak summer season, the daily water use at Mine Site is expected to be 162 m^3/day which is well below the Type "A" Water Licence permitted volume of 203.8 m^3/day.

Details of the new camp, including the location of the camp and associated water treatment systems, are provided in the subsections below and in the attached documentation, including maps, engineering documentation, construction methodologies and environmental mitigation measures to be implemented during construction.

The requested modification will occur within the Project's Development Area (PDA) and is consistent with approved activities outlined in the Project Certificate (Project Certificate 005 – Amend. 1) issued for the Mary River Project by the Nunavut Impact Review Board (NIRB).

The requested modification is described below.

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

Baffinland intends on upgrading the current Mine Site accommodation facilities by constructing an 800 man hardwall accommodations camp facility. The proposed camp is a used, three storey camp in good condition and features 800 single rooms, each with their own bathroom and shower. Construction of the new camp facility will involve the construction of a camp pad at the Mine Site along the Tote Road (approx. Km 102.5), assembly of the camp facility and installation of the associated infrastructure, including a dedicated potable water treatment plant and sewage treatment plant.

Attachment 1 shows the proposed camp pad in relation to the Mine Site's general layout. Attachments 2 and 3 present the design details and issued for construction (IFC) drawings for the camp pad as well as the general layout for the new camp facility and associated infrastructure. Attachment 4 presents the updated water management process flow diagram for Mine Site, incorporating the flows from the new camp and associated facilities. Attachment 5 details the construction methodology for the new camp facility, camp pad and associated infrastructure. Attachment 6 presents the design specifications for new camp's sewage treatment plant which is consistent with and produced by the same vendor as the Project's existing sewage treatment plants. Attachment 7 presents the vendor process guarantee for the new camp's sewage treatment plant.

b. Proposed Location of the Structure

As shown in Attachment 1, the new camp, camp pad and associated infrastructure will be located within the Mine Site PDA, north of the existing Mine Site Complex and west of the Tote Road (approx. Km 102.5).

c. Identification of any Potential Impacts to the Receiving Environment

The main concern Baffinland foresees is sedimentation from the construction of the proposed camp pad. To prevent the release of sediment into the receiving environment during construction, Baffinland will employ a combination of sediment and erosion control measures (check dams, rip-rap, silt fences, etc.) to address sedimentation concerns, as outlined in Baffinland's Environmental Protection Plan (BAF-PH1-830-P16-0008 – Rev. 1) and Surface Water and Aquatic Ecosystems Management Plan (BAF-PH1-830-P16-0026 - Rev. 4).

The operation of the new camp will increase the number of people that can be accommodated at the Mine Site and will increase the amount of wastewater and waste generated from Mine Site operations. The volume of wastewater generated is less than the expected volume of water already approved under the current Type "A" Water Licence and the vendor has provided a process guarantee to ensure that the wastewater meets the discharge criteria specified in the Type "A" Water Licence. Regular sampling of wastewater discharge will continue as required under the Type "A" Water Licence and other permits. Waste generated by the new camp facility will be managed using the existing waste management facilities at the Mine Site and in accordance with the Project's Waste Management Plan (BAF-PH1-830-P16-0028).

d. Monitoring

Environmental monitoring of construction activities will consist of water quality monitoring and periodic environmental inspections. Water quality monitoring will focus on runoff originating from the construction area and monitoring the potential impacts of the runoff on downstream water bodies. In the event that impacted runoff is observed originating from the construction area, sedimentation mitigation measures will be installed and water quality monitoring locations will be established downstream of construction activities to assess the potential impacts on nearby water bodies. Water quality at monitoring locations will be compared to the water quality discharge criteria established under the Type "A" Water Licence.

In addition, periodic environmental inspections of the construction activities will be conducted by Baffinland's Environmental personnel in concert with the contractors' Health, Safety and Environment Leads. Inspections will ensure contractors are properly managing waste and hazardous materials and operating in accordance with Project's onsite procedures and management plans. Inspections will be documented by taking photos of any deficiencies and using Baffinland's existing environmental inspection forms. Deficiencies identified will be compiled and forwarded to the responsible contractor to be corrected and addressed. Photos will also be taken to document the construction of the new camp and associated infrastructure.

e. Schedule for Construction

The construction of the proposed camp buildings and water treatment systems is planned to start as soon as the Request for Modification approval has been received from the NWB with the intent of completing the construction of the camp facility by the end of November 2017. The camp pad area may be constructed as a laydown area prior to approval for the camp being in place in order to allow for the storage of the camp components that are arriving by sealift during August 2017. The camp pad location is within the approved PDA, is not within 31 metres of a water body, and is included in the additional security that is being posted for the new camp.

f. Drawings of Engineered Structures

Hatch Ltd. (Hatch) was retained to design and provide issued-for-construction drawings for the camp pad. The issued-for-construction (IFC) drawings for the camp pad as well as the general layout for the new camp facility and associated infrastructure are provided in Attachment 2 of this letter.

g. Proposed Sediment and Erosion Control Measures

Baffinland will employ a combination of sediment and erosion control measures (check dams, rip-rap, silt fences, etc.), as outlined in Baffinland's Environmental Protection Plan (BAF-PH1-830-P16-0008 – Rev. 1) and Surface Water and Aquatic Ecosystems Management Plan (BAF-PH1-830-P16-0026 - Rev. 4), to address and manage sedimentation concerns during construction. No sediment or erosion control measures are expected to be required once construction has been completed.

We trust that this information meets the requirements for a Request for Modification under Part G of 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: Mine Site Block Plan Layout (H353004-00000-220-272-0005-0001, Rev. 1)
Attachment 2: Mine Site – 800 Person Camp Pad Layout (H353004-10000-220-272-0001-0001, Rev. 1)
Attachment 3: Mine Site – 800 Person Camp Pad Sections (H353004-10000-220-272-0002-0001, Rev. 1)
Attachment 4: Mine Site - Water and Sewage Process Flow Diagram
(H353004-10000-221-282-0001, Rev. 2)
Attachment 5: Construction Methodology – Mine Site Accommodation Facility
(H353004-10000-400-050-0001, Rev. 0)
Attachment 6: Newterra Proposal 1704809R2 – Baffinland 800 Man WWTP
(H353004-40000-400-050-0003, Rev. 0)
Attachment 7: Mary River 800 Man WWTP – Process Guarantee

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

Mine Site Block Plan Layout

(H353004-00000-220-272-0005-0001, Rev. 1)

DWG. No. H353004-00000-220-272-0005-0001

EXISTING QUARRY (QMR2)

TRUE NORTH

TOTE ROAD

RUNWAY

800 PERSON CAMP

TOTE ROAD

EXISTING PLANT

EXISTING WORKSHOPS

EXISTING HAUL ROAD

EXISTING LANDFILL

INSERT

EMULSION PLANT

TREATED EFFLUENT DISPOSAL SITE

N +7 914 000
N +7 913 800
N +7 913 600
N +7 913 400
N +7 913 200
N +7 913 000
N +7 912 800
N +7 912 600
N +7 912 400
N +7 912 200
N +7 912 000

E +459 600
E +459 800
E +460 000
E +460 200
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E +461 600
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E +462 000
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E +462 400

DRAWING No.	DRAWING TITLE
REFERENCE DRAWINGS	

NAME
SIGNATURE
ENG REG NUMBER
REVISION DATE
ORIGINAL DATE
REG. PROFESSIONAL

NOT FOR CONSTRUCTION

No.	DESCRIPTION	BY	CHK'D	DATE
1	ISSUED FOR PERMITTING	IHB		21/07/2017
0	APPROVED FOR FEASIBILITY STUDY	SRH		15/03/2017

REVISIONS

HATCH

ROLE	NAME	SIGNATURE	DATE
DRAFTSPERSON	S HALL	NR	09/12/2016
DESIGNER	S HALL	NR	09/12/2016
CHECKER	M BRONDANI		
DESIGN COORD.	R GOOSEN		
RESP. ENG.	A GROBBELAAR		
LEAD DISC. ENG.	J CLELAND		2017-07-21 12:19:03 GMT
ENG. MANAGER			
PROJ. MANAGER	N MASON		2017-07-21 12:34:22 GMT
CLIENT	M WEAVER		

DRAWING APPROVAL STATUS: Approved for FEL

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER PROJECT

MINE SITE
BLOCK PLAN
LAYOUT

SCALE AS NOTED OR AS NOTED

DWG. No. H353004-00000-220-272-0005-0001

REV 1

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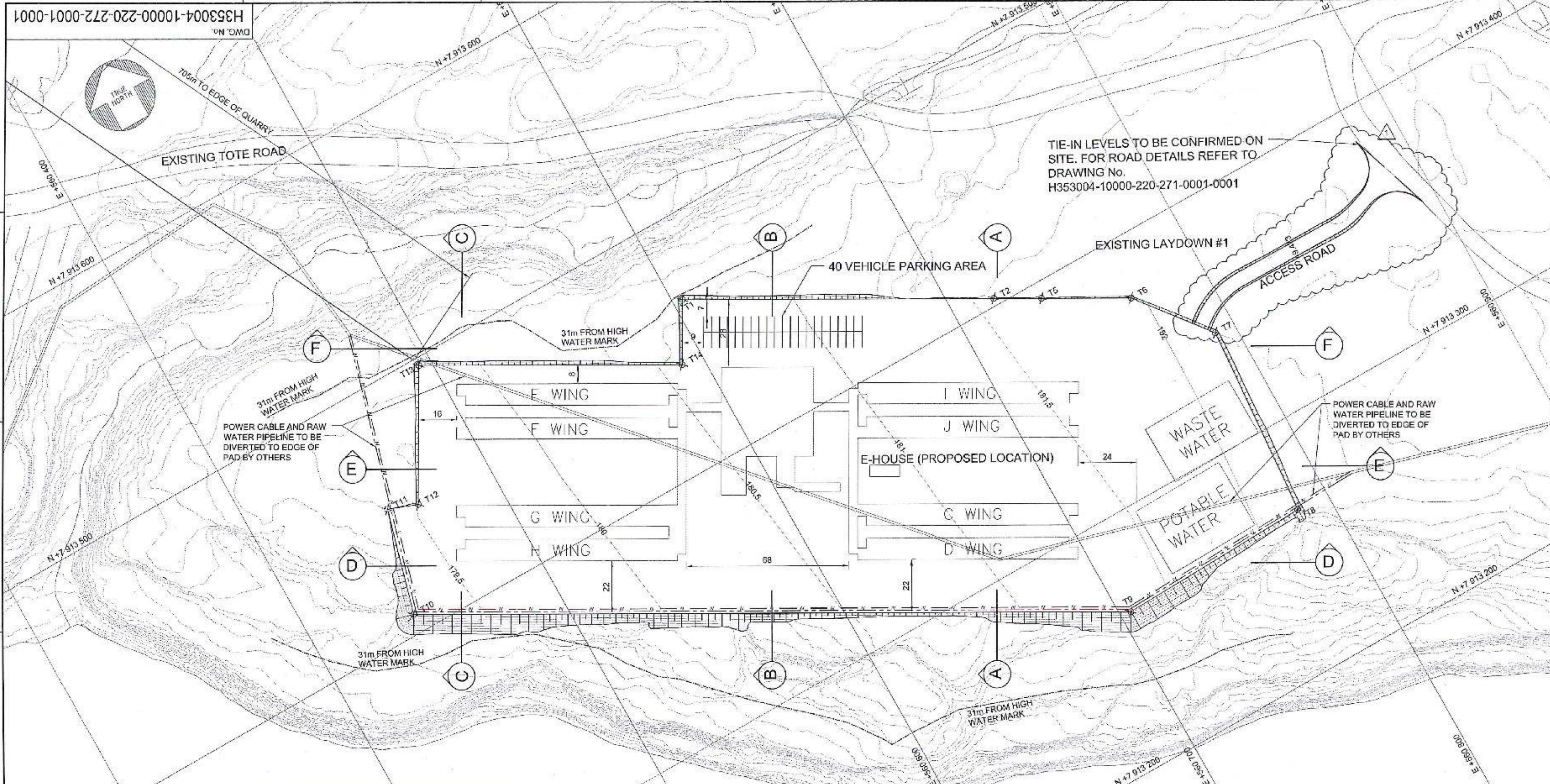
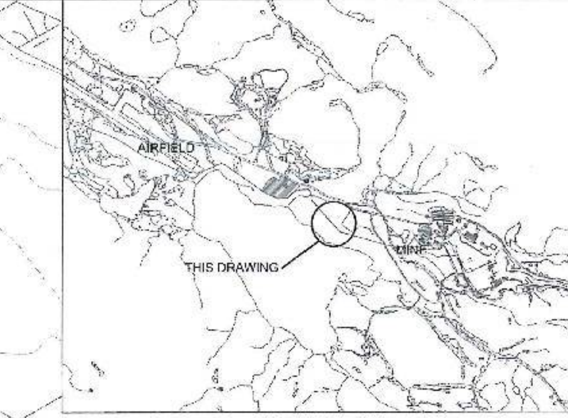
Attachment 2

Mine Site – 800 Person Camp Pad Layout

(H353004-10000-220-272-0001-0001, Rev. 1)





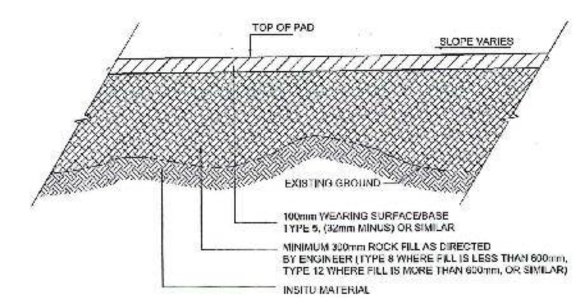
KEY PLAN

COORDINATE LIST			
POINT	N	E	EL
T1	7 913 466.630	560 604.129	180.685
T2	7 913 403.093	560 717.792	181.565
T5	7 913 393.334	560 735.250	181.700
T6	7 913 375.037	560 767.963	181.950
T7	7 913 345.212	560 791.462	182.203
T8	7 913 264.235	560 786.115	181.000
T9	7 913 261.562	560 704.551	181.300
T10	7 913 407.943	560 442.667	179.300
T11	7 913 451.277	560 454.327	179.000
T12	7 913 446.656	560 466.593	179.566
T13	7 913 496.874	560 494.690	179.825
T14	7 913 443.063	560 590.955	180.573

NOTES:

1. LIDAR SURVEY PROVIDED BY PHOTSAT (2016)
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METERS.
3. CONTOURS ARE IN METERS, CONTOUR INTERVAL IS 0.5m.
4. ALL DIMENSIONS SHOWN ARE IN METERS.
5. FOR TYPICAL CROSS SECTIONS REFER TO DRAWING No. H353004-10000-220-272-0002-0001
6. FOR THE DRAINAGE PLAN REFER TO DRAWING No. H353004-10000-228-272-0001-0001

PERMIT TO PRACTICE
HATCH LTD.
Signature [signature]
Date July 20, 2017
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU



TYPICAL EARTHWORKS FOR PADS AND LAYDOWNS
SCALE 1:20

REGISTERED PROFESSIONAL ENGINEER
RAHb
L1247
R. A. HALIM
LICENSEE
20/07/2017
NWT/NU

DRAWING No.	DRAWING TITLE
H353004-10000-228-272-0001-0001	800 PERSON CAMP PAD - DRAINAGE PLAN
H353004-10000-220-271-0001-0001	800 PERSON CAMP PAD - ACCESS ROAD
H353004-10000-220-272-0002-0001	800 PERSON CAMP PAD - CROSS SECTIONS

REFERENCE DRAWINGS

R. HALIM
NAME
RAHb
SIGNATURE
L1247
ENG REG NUMBER
20/07/2017
REVISION DATE
03/07/2017
ORIGINAL DATE
REG. PROFESSIONAL

No.	DESCRIPTION	BY	CHK'D	DATE
1	ACCESS ROAD LOCATION MOVED; PAD MODIFIED, T3 AND T4 REMOVED	FH	MB	20/07/2017
0	APPROVED FOR CONSTRUCTION	FH	MB	03/07/2017

REVISIONS

HATCH

ROLE	NAME	SIGNATURE	DATE
DRAFTSPERSON	S HALL	NR	20/07/2017
DESIGNER	S HALL	NR	20/07/2017
CHECKER	M BRONDANI	[signature]	20/07/2017
DESIGN COORD.	R GOOSEN	[signature]	20/07/2017
RESP. ENG.	R HALIM	RAHb	20/07/2017
LEAD DISC. ENG.	A GROBBELAAR	[signature]	20/07/2017
AREA MANAGER	J HOWES	[signature]	20/07/2017
PROJ. MANAGER	S HEINER	[signature]	20/07/2017
CLIENT			

DRAWING APPROVAL STATUS: Approved for Construction

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER PROJECT

MINE SITE
800 PERSON CAMP PAD
LAYOUT

SCALE 1:1,000 OR AS NOTED
DWG. No. H353004-10000-220-272-0001-0001
REV 1
SHEET SIZE: D

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Attachment 3

Mine Site – 800 Person Camp Pad Sections

(H353004-10000-220-272-0002-0001, Rev. 1)

H353004-10000-220-272-0002-0001
DWG. No.

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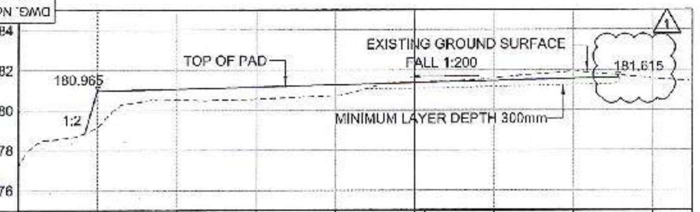
Horizontal 1:1000
Vertical 1:200

DATUM 175.000



STAKE VALUE (SV)	20	40	60	80	100	103	120	140	160
GROUND LEVELS ON CL	179.158	180.535	180.567	180.728	181.388	181.410	181.597	181.930	181.568

SECTION A-A

SCALES:
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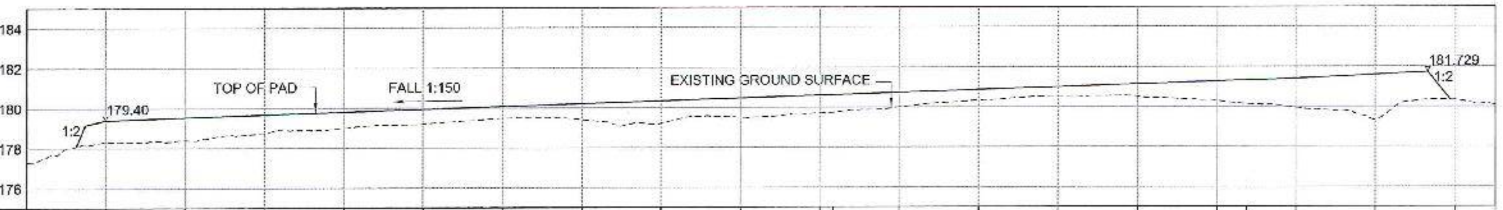
Vertical 1:200

DATUM 175.000



STAKE VALUE (SV)	20	40	60	80	100	120	140	160	180	200	203	220	240	260	280	300	307	320	340	360
GROUND LEVELS ON CL	178.320	178.394	178.744	179.006	179.209	179.476	179.402	179.214	179.505	179.708	179.737	179.999	180.328	180.545	180.505	180.304	180.118	179.942	179.333	180.331

SECTION D-D

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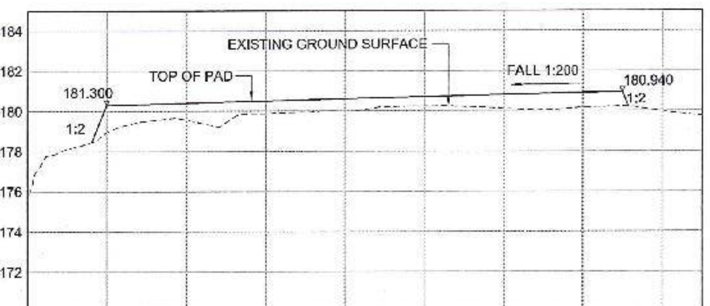
Vertical 1:200

DATUM 170.000



STAKE VALUE (SV)	20	40	60	80	100	105	120	140	160
GROUND LEVELS ON CL	178.936	179.559	179.867	179.993	180.240	180.243	180.111	180.160	179.987

SECTION B-B

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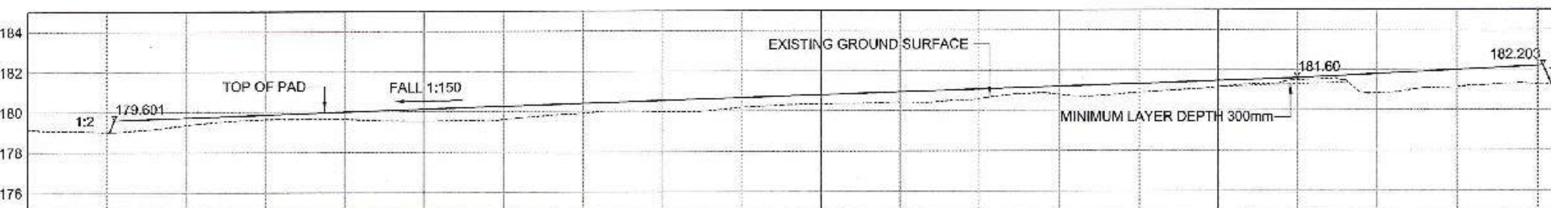
Vertical 1:200

DATUM 175.000



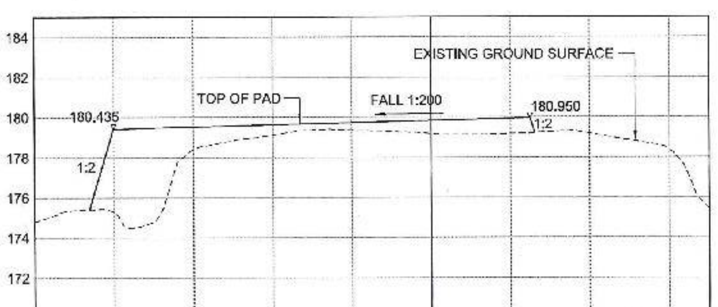
STAKE VALUE (SV)	20	40	60	80	100	120	140	160	180	200	204	220	240	260	280	300	307	320	340	360	380
GROUND LEVELS ON CL	179.013	179.354	179.637	179.643	179.548	179.611	179.921	179.980	180.184	180.340	180.358	180.434	180.590	180.796	180.888	181.157	181.284	181.489	180.835	181.142	181.268

SECTION E-E

REGISTERED PROFESSIONAL ENGINEER
RAH
L1247
R. A. HALIM
LICENSEE
20/07/2017
NWT/NU

SCALES:
Horizontal 1:1000
Vertical 1:200

DATUM 170.000



STAKE VALUE (SV)	20	40	60	80	100	102	120	140	160
GROUND LEVELS ON CL	175.295	178.354	179.114	179.354	179.179	179.156	179.176	179.187	178.345

SECTION C-C

SCALES:
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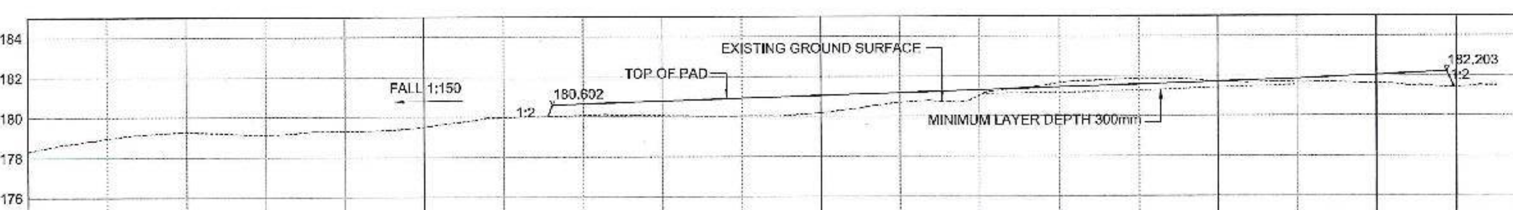
Vertical 1:200

DATUM 175.000



STAKE VALUE (SV)	20	40	60	80	100	120	140	160	180	200	206	220	240	260	280	300	307	320	340	360
GROUND LEVELS ON CL	178.970	179.268	179.135	179.316	179.513	179.969	180.095	180.071	180.041	180.177	180.312	180.692	181.039	181.642	181.865	181.686	181.667	181.681	181.621	181.416

SECTION F-F

PERMIT TO PRACTICE
HATCH LTD.
Signature
Date JULY 20, 2017
PERMIT NUMBER: P 512
The Association of Professional Engineers, Geologists and Geophysicists of NWT/NU

DRAWING No.	DRAWING TITLE
H353004-10000-220-272-0001-0001	800 PERSON CAMP PAD - LAYOUT

REFERENCE DRAWINGS

R. HALIM
NAME
RAH
SIGNATURE
L1247
ENG REG NUMBER
20/07/2017
REVISION DATE
03/07/2017
ORIGINAL DATE
REG. PROFESSIONAL

No.	DESCRIPTION	BY	CHK'D	DATE
1	SECTION A-A MODIFIED	FH	MB	20/07/2014
0	APPROVED FOR CONSTRUCTION	FH	MB	03/07/2017

REVISIONS

HATCH

ROLE	NAME	SIGNATURE	DATE
DRAFTSPERSON	S HALL	NR	20/07/2017
DESIGNER	S HALL	NR	20/07/2017
CHECKER	M BRONDANI		20/07/2017
DESIGN COORD.	R GOOSEN		20/07/2017
RESP. ENG.	R HALIM	RAH	20/07/2017
LEAD DISC. ENG.	A GROBBELAAR		20/07/2017
AREA MANAGER	J HOWES		20/07/2017
PROJ. MANAGER	S HEINER		20/07/2017
CLIENT			

DRAWING APPROVAL STATUS: Approved for Construction

Baffinland

BAFFINLAND IRON MINES LP
MARY RIVER PROJECT

MINE SITE
800 PERSON CAMP PAD
SECTIONS

SCALE 1:1,000 OR AS NOTED
DWG. No. H353004-10000-220-272-0002-0001
REV 1
SHEET SIZE: D

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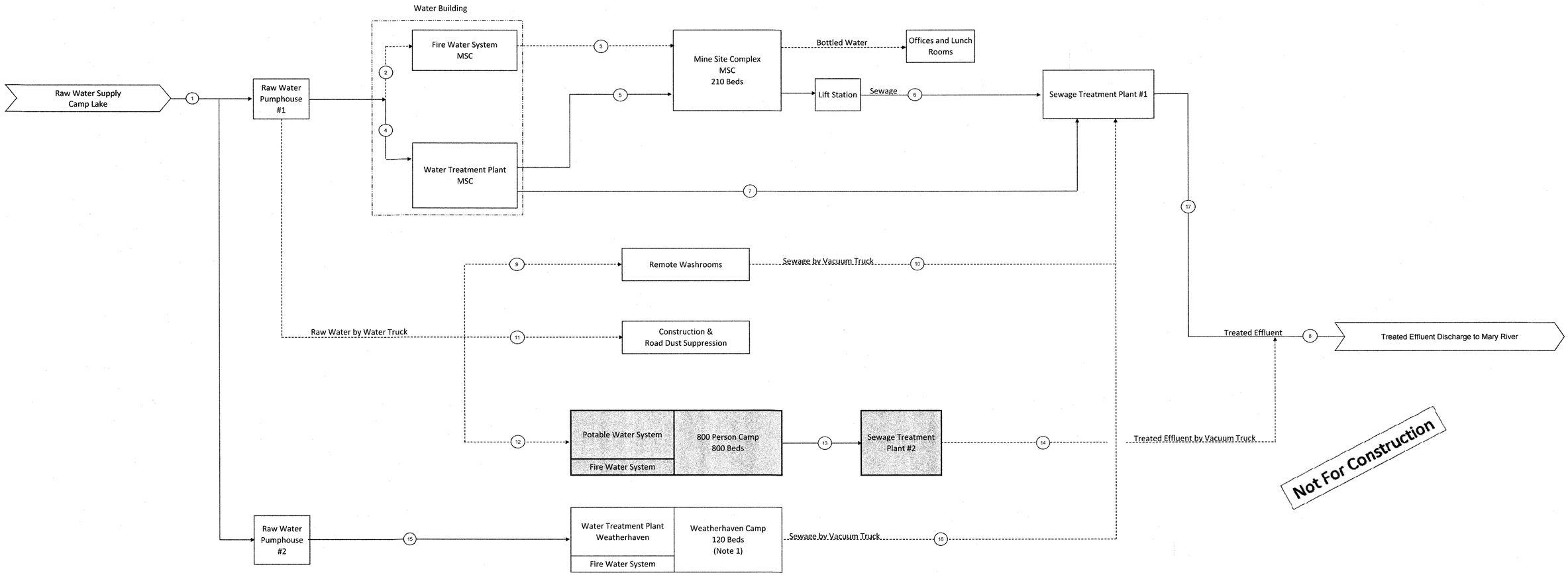
Attachment 4

Mine Site - Water and Sewage Process Flow Diagram

(H353004-10000-221-282-0001, Rev. 2)



Stream No.	1	2	3	4	5	6	7	8	9	10
Stream Description	RAW WATER FROM CAMP LAKE	RAW WATER TO FIRE TANKS	FIRE WATER TO MSC	RAW WATER TO MSC WTP	POTABLE WATER TO MSC	SEWAGE FROM MSC	POTABLE WATER TO STP	TREATED EFFL. DISCHARGE	RW TO REMOTE WASHROOMS	SEWAGE FRM REMOTE WASHROOMS
Fluid	RAW WATER	RAW WATER	RAW WATER	RAW WATER	POT. WATER	SEWAGE	POT. WATER	TRTD EFFLUENT	RAW WATER	SEWAGE
Units	m3/day	-	m3/hr	m3/day	m3/day	m3/day	m3/hr	m3/day	m3/day	m3/day
Current Permit Limit	355.4	-	-	-	-	-	-	-	-	-
Calculated Flow	255	One off fill	113	48	42	42	6	235	3	3
Stream No.	11	12	13	14	15	16	17	18	19	20
Stream Description	CONST. & ROAD DUST	RAW WATER TO CONST. CAMP	SEWAGE TO CONST. STP	TREATED EFFLUENT FROM STP NO.2	RAW WATER FROM PUMP HOUSE NO.2	SEWAGE FROM WH CAMP	SEWAGE FROM STP #1			
Fluid	RAW WATER	RAW WATER	SEWAGE	TRTD EFFLUENT	RAW WATER	SEWAGE	SEWAGE			
Units	m3/day	m3/day	m3/day	m3/day	m3/day	m3/day	m3/day			
Current Permit Limit	151.6	-	-	-	-	-	-			
Calculated Flow	20	160	160	160	24	24	75			

Notes:

1. Includes 20 beds for Tent city

LEGEND:

Continuous Flow

Intermittenet Flow

Facility - New/Upgraded for Project

Facility - Existing

REGISTERED PROFESSIONAL ENGINEER
M. J. BUYKX
LICENSEE
21 JULY 17
NT/NU

REV	ISSUE FOR	AUTH. BY		DATE
2	PERMITTING	JH	MB	21/7/2017
1	PERMITTING	TB	MB	13/7/2017
0	PERMITTING	TB	MB	26/6/2017
ISSUE AUTHORIZATION				

HATCH

Baffinland

DESIGNED BY T. BRUCE DATE:	DRAWN BY T. BRUCE DATE:	BAFFINLAND IRON MINES LP MARY RIVER PROJECT
CHECKED BY M. BUYKX DATE:	DISCIP ENGR. DATE:	MINE SITE WATER AND SEWAGE PROCESS FLOW DIAGRAM
PROJ. DES. COORD. DATE:	PROJ. ENGR. N. MASON DATE:	
PROJ. MGR S. HEINER DATE:	SCALE NTS OR AS NOTED	DWG NO. H353004-10000-221-282-0001 REV. 2

Attachment 5

Construction Methodology – Mine Site Accommodation Facility

(H353004-10000-400-050-0001, Rev. 0)

Plan

Construction Methodology - Mine Site Accommodation Facility

2017-07-25	0	Approved for Use	L Langlois	J Howes	S Heiner	M Weaver
DATE	REV.	STATUS	PREPARED BY	CHECKED BY	APPROVED BY	APPROVED BY
						Employer

1. Overview

A new accommodation camp with an 800 single bed configuration is intended to be constructed at the Mine Site. The associated infrastructure, including a dedicated sewage treatment plant and potable water treatment plant, are included within this scope.

The new accommodations camp and associated infrastructure will be situated on a new accommodation camp pad located along the Tote Road (approx. Km 102.5) at the Mine Site.

2. Scope of Work

The scope of work includes:

- Sourcing rock fill material from the Mine Site QMR2 Quarry
- Construction of the pad for the new camp and an entrance from the existing Tote Road, this includes re-routing existing utilities including a power cable and a raw water line
- Construction and assembly of the new permanent 800-person camp complete with its associated infrastructure, utilities, parking areas and refrigerated food storage (sea cans) area.

3. Methodology

3.1 Earthworks

3.1.1 Material Sourcing

Material, both bulk fill and crusher produced aggregates, required for the new accommodations camp pad and associated works will be sourced from the Mine Site QMR2 Quarry.

A coordination meeting will be held between Baffinland Operations and Projects departments and relevant contractors to determine the total aggregate requirements and the planned quarry development. During construction and quarry development, existing drainage ditching will be maintained.

Quarry operations at the QMR2 Quarry will be in accordance with the current Baffinland QMR2 Quarry Management Plan (BAF-PH1-830-P16-0040).

Reference Documents:

QMR2 Quarry Management Plan (BAF-PH1-830-P16-0040)

3.1.2 *Camp Pad and Foundations Construction*

For the camp pad construction, the sub-grade of the pad will be minimum 300mm thick constructed using Type 12 (Run of Quarry) coarse material where fill is more than 600mm or Type 8 where fill is less than 600mm and capped with Type 5 (<32mm crushed) crushed granular surface material. Type 5 material will be utilized as a final pavement for walkways and parking areas.

Pad construction will begin by the placement of Type 12 (Run of Quarry) coarse material. Upon achieving the required lift thickness, the entire surface area will be proofed and compacted with the utilization of a 10-ton vibratory compactor. Upon achieving consolidation, placement of Type 5 (<32mm crushed) crushed surface material will follow and be completed to the design elevation, including proofing and compaction with a 10-ton vibratory compactor. In addition, the pad will be graded to be free draining in order to prevent water from ponding on the pad.

An existing electrical cable and 6" raw water pipeline currently bisects the future camp pad location. Both linear installations will be relocated to the west along the perimeter of the new camp pad.

The foundations for the camp structures will be installed by the Camp Installation Contractor. These foundations will consist of precast concrete footings, which will sit on the camp pad.

The foundations for the potable water treatment plant and the sewage treatment plant will incorporate a high-density expanded polystyrene insulating layer to offset any potential thermal migration into the underlying pad.

The layout of the new accommodations camp is presented in the Hatch document: Mine Site 800 Person Camp Pad Layout (H353004-10000-220-272-0001-0001).

3.1.2.1 *Reference Documents:*

Mine Site 800 Person Camp Pad Layout (H353004-10000-220-272-0001-0001

3.2 Transport of Camp Modules

All components of the new camp will be transported from Milne Port to the Mine Site via the existing Tote Road. To safely execute the transportation of the camp modules to the Mine Site, a transportation plan will be developed in conjunction with the Baffinland Operations departments prior to executing the scope of work.

3.3 Camp Construction

The layout of the new camp is presented in Hatch document: Mine Site 800 Person Camp Pad Layout (H353004-10000-220-272-0001-0001).

Following the construction of the pad, the Camp Installation Contractor will erect its temporary infrastructure, including an office and an 1,800 sq. ft. garage.

Installation and assembly of the new camp will start with the placement of precast concrete footings to serve as the camp foundations. To support the camp's three (3) story layout, an adjustable steel jack, connected to the top of the precast concrete footings, and a supporting structural steel grillage system will be used.

Placement of the modules on the steel grillage and erection of the second and third floor modules will be executed with the use of cranes.

The underside of the camp's first floor will be left open to the elements to eliminate the potential for thermal migration from the camp to the underlying pad.

Completion of the first floor will include installation of a screened or expanded metal skirting around the full perimeter of the camp. This will allow for the free flow of air underneath the camp while preventing access for wildlife.

Interconnection of the dormitory electrical and piping systems as well as communications cables will occur immediately following the erection of the modules for each dormitory wing.

Modules will be structurally fixed to the steel grillage structure and bolted together. Corridors and roof will be built in place between the two rows of modules. Once the corridors are in place, the services between the modules will be connected (electricity, plumbing, ventilation, fire protection, roofing, etc.).

The electrical feed for the new camp will come from the existing Mine Site diesel generators and terminate in a new dedicated E-house. Downstream of the dedicated E-house will be five (5) pad-mounted transformers, which will subsequently provide power for all aspects of the camp and utility systems.

In parallel to the installation of the camp modules, the installation of the potable water treatment plant and the sewage treatment plant will occur.

Sewage and greywater generated by the new camp will be directed to the camp's dedicated sewage treatment plant. The sewage treatment plant will be installed on south end of the pad along with the necessary plumbing required to connect the plant to the new camp. Treated effluent from the sewage treatment plant will be transported to the approved discharge location by vacuum truck.

Moreover, following the relocation of the existing 6" raw water line to the camp pad's perimeter, a tee connection will be incorporated into the relocated 6" raw water line. To provide the camp's potable water treatment plant and associated tanks with raw water, a water line will be installed between the potable water treatment plant and the tee connection on the 6" raw water line. External plumbing for the camp's potable and wastewater management will consist of insulated and heat-traced HDPE piping and will be installed by the Camp Installation Contractor.

Potable water tanks will be installed in the approximate area of the potable water treatment plant. These tanks will be utilized as a surge capacity for both the camp's potable water demands as well as a source of water for the camp's fire water pumps and fire suppression system (sprinkler system). The camp will have a fire suppression system installed in all buildings and rooms, including the potable water and sewage treatment plants.

The connection of the sewage and potable water treatment plants will require specialized skills and will be aided by the expertise of the vendors for both construction and commissioning of the systems.

4. Reference Documents

Document Identification	Document Title	Author
H353004-10000-220-272-0001-0001, Rev. 1	Mine Site 800 Person Camp Pad Layout	Hatch
BAF-PH1-830-P16-0040	QMR2 Quarry Management Plan	Baffinland

Attachment 6

Newterra Proposal 1704809R2 – Baffinland 800 Man WWTP

(H353004-40000-400-050-0003, Rev. 0)

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PROPOSAL 1704809R2 - Baffinland 800 Man WWTP

newterra MicroClear™ MEMBRANE BIOREACTOR WASTEWATER TREATMENT SYSTEM

Submitted To:

Baffinland

2275 Upper Middle Road East, Suite 300
Oakville, Ontario L6H 0C3

Song Yang
416.364.8820
Song.yang@baffinland.com

newterra Ltd.
3310 South Service Rd., Suite 307, Burlington
Ontario, Canada

Steve Howard
Vice President North American Western Region
T: 403.651.8094

Showard@newterra.com

At newterra we understand that our performance will have a direct impact on your success in your project. We are extremely committed to ensuring that you are successful. This means that if we do not live up to your expectations, we will do whatever it may take to resolve an issue immediately.

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ADVANTAGES OF **NEWTERRA** MBR SYSTEM:

The **newterra** MBR system employs membrane biological reactor (MBR) technology with submerged **MicroClear**™ membranes. The system is designed to be the simplest, most operator-friendly flat plate membrane technology available in the market. The **newterra** MBR system produces ultra-clean water (solids free effluent) which effectively meets any water standards for discharge and reuse.

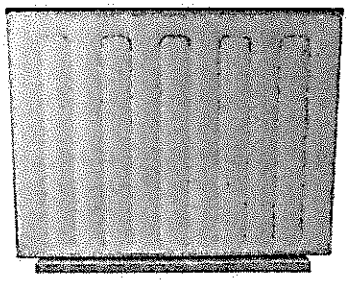
The **newterra** MBR system is a packaged wastewater treatment plant with modular design features. The system comes complete with containerized screen or primary clarifier, equalization tank, aeration tank and membrane tanks. The plant is housed inside modified high-cube shipping containers or prefabricated buildings - completely pre-assembled, pre-piped, pre-wired and pre-tested, ready for a quick site installation and start-up. The advantages that the **newterra** MBR system offers include:

- Absolute physical barrier for contaminants
- Short delivery period;
- Factory assembled and tested;
- Minimal construction work on site; Easy to relocate;
- Reliable and low maintenance system;
- Superior effluent quality that is suitable for reuse;
- Compact footprint;
- Minimal noise and odourless operation;
- Backflushable flat plate membrane system;
- Low transmembrane pressure system – only 0.1 to 0.2 bar vacuum required;
- Excellent membrane structure life;

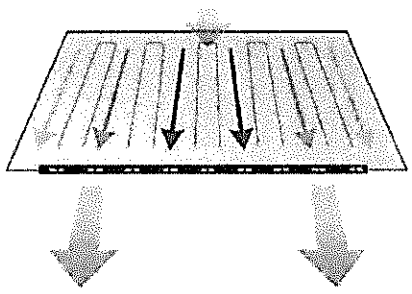
UNIQUE FEATURES OF **MICROCLEAR**™ MEMBRANES:

newterra MicroClear™ membranes provide the following unique features:

- Low electric power consumption - filtrate is drawn through and out of the filter by a slightly negative pressure (vacuum) of only 0.07 – 0.1 bar (1 to 2.9 psi)
- Membrane sheet-to-backing sheet welding by laser – perfect welding, ensures no ingress of dirty wastewater into the clean permeate



Laser-welded Flat Plate Membrane during Pressure Test



FSD™ **(full surface distribution)**

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- UF membranes with a molecular weight cut-off of 150k Dalton, equivalent to a pore size of 0.04 µm, leaving out any bacteria (1 – 2 µm), parasites (5 – 50 µm), with a bacteria removal of 99.9999% and virus removal of 99.99%
- Cleaning during operation by cyclic backflushing
- Patented special design of backing sheet surface – thus no need for a gauze between the membrane and backing sheets to prevent adhesion
- FSD™ (full surface distribution) – full membrane surface utilization for permeate collection by multiple outflow points, thus no short-circuiting and even flux distribution
- Easily expandable with modular design

INFLUENT WASTEWATER CHARACTERISTICS AND EFFLUENT QUALITY:

Parameter	Unit	Influent Wastewater Characteristics	Effluent Quality
pH	s.u	6 - 9	7 - 9
FOG	mg/L	< 30	-
BOD_5	mg/L	400	< 5
TSS	mg/L	350	< 1
TDS	mg/L	< 1,200	-
TKN	mg/L	70	-
TAN	mg/L	65	-
TP	mg/L	10	<4
Fecal Coliform	CFU/100ml	-	< 200*
Alkalinity (assumed)	mg/L as $CaCO_3$	Sufficient	-

* After UV disinfection

PROHIBITED ITEMS:

- A complete list of prohibited chemicals is included in the membrane maintenance manual.

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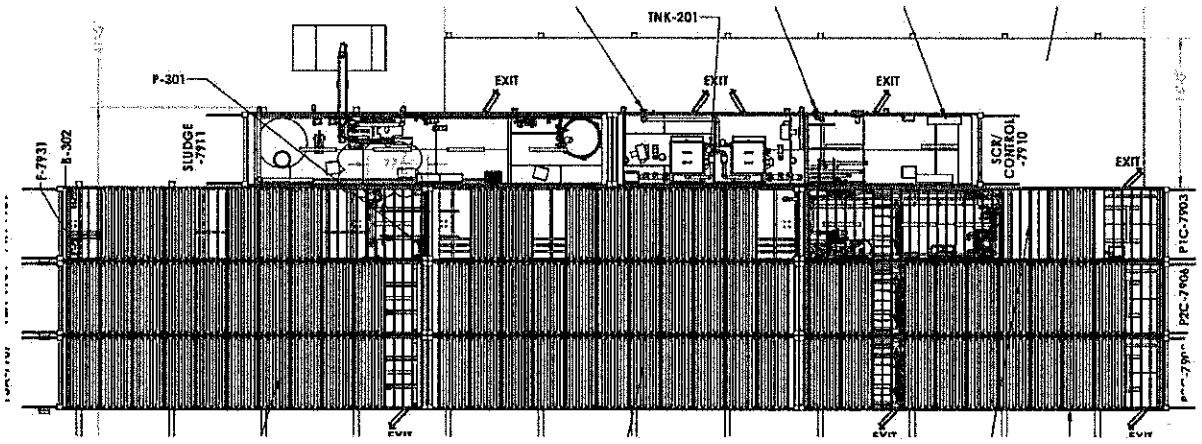
DESIGN PARAMETERS:

	Design Value	Metric Unit
Average daily flow per train	125	m^3/d
Total number of trains	2	
Total average daily flow of system	250	m^3/d
Mixed liquor suspended solids	1%	
Minimum inlet temperature	8	° C
Site power	Three-phase, 600V, 60Hz	
System Area Classification	According to NFPA 820, 2012 Edition	
Ambient temperatures	max: 37 °C, min: -40 °C	
Elevation	< 500 m	

WASTEWATER TREATMENT EQUIPMENT:

The total system will consist of a single screen system placed in front of two parallel treatment train systems all feeding into one sludge dewatering system (optional). Each train is housed inside 3 x 40' shipping containers which are designed to be placed end to end. See attached layout for schematic of the two train system.

Due to the area classification of the screen room and sludge treatment area access is not allowed from the main plant. However the control room and process rooms for the two trains are fully connected. The outside doors of the control room, screen room and sludge treatment are all on the one side, and it would be easy to build a small passageway along the side for operator protection. (Note the diagram below shows 3 trains, the system has 2)



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Summary

(1) One (1) 8' x 40' container – Screen, Control and Electrical Distribution

(2) Six(6) 8' x 40' containers – 2 process trains

(3) One(1) 8' x 40' container – optional sludge treatment

Rotary Brush Screen Module

- Insulated and heated screen room
- Two (2) Automatic cleaning perforated plate 1 mm screen
  - Stainless steel construction
  - 1 mm screen improves removal of sewage from chopper pumps
  - Polypropylene brushes
  - High level alarm switch
  - One used for normal supply from the camp, one used for truck supply
- Screen discharge pump tank:
  - High level alarm and pump control switches
  - Sacrificial anodes in steel tanks
  - Discharge pumps
- Sewage Truck Connection
  - 3" cam lock connection supplied for truck supply
  - Limited to 120 gpm from truck
  - Truck required to provide pumped sewage
  - No metering of sewage installed – available as option

Equalization Tank Module (one for each train)

- Coated steel construction with
  - Level transmitter
  - High level alarm switch
  - Temperature alarm switch
  - Sacrificial anodes in steel tanks
  - Immersion heaters
  - Air diffusers
  - Discharge pump
- Air compressor(s)

Aeration Tank Module (one for each train)

- Coated steel construction or equivalent with
  - Level transmitter
  - High level alarm switch
  - Temperature alarm switch
  - Sacrificial anodes in steel tanks

  - Immersion heaters
  - Fine bubble air diffusers
  - Discharge pumps
  - pH and dissolved oxygen dual input transmitter with sensors
- Air compressors with VFD control
- Sludge wasting valve and pump
- Foam suppression system

Membrane Tank Module (one for each train)

- 304LSS membrane tank
  - Newterra Patented Access door for ease of membrane removal at ground level
  - Sample port for MLSS testing
  - Viewing window
  - Pump control switch
- MicroClear™ submerged flat sheet membrane module with
  - Full surface distribution
  - Medium bubble scouring
  - Laser sheet welding
- High level alarm switch
- Overflow return to aeration tank

Membrane Aeration Blower Module (one for each train)

Each membrane train to include:

- Compressed air blower(s)
- Pressure gauge
- Low pressure alarm switch

Permeate Extraction Module (one for each train)

Each membrane train to include:

- Vacuum transmitter
- Vacuum gauge
- Permeate extraction system with back pulsing capabilities
- Check valve
- Water flow meter

Ultraviolet Disinfection Module (one for each train)

- UV lights piped in series for redundancy
- UV light operation alarms

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System Enclosures

cMET certified, built to NEC standards with all wiring complete and all equipment pre-piped factory tested and mounted in enclosure.

Used high cube modified shipping containers with the following standard features:

- Exterior paint
- Lifting eyes on upper corners
- Coated plywood floor
- Insulated walls, ceiling and floor
- Aluminum checker plate ceiling in control rooms
- Welded steel man door(s) with safety window and crashbar
- Barn-style rear double doors
- Lighting
- Ventilation fans
- Passive vent louvers with hoods
- Emergency stop switch
- Low temperature alarm switch
- Duplex 15 Amp GFI receptacle for heat trace inlet and discharge

Control System Module

Schneider PLC based control panel with the following standard features:

- cMET certification
- AIC rating of 5000
- NEMA 1 lockable panel enclosure
- Primary circuit protection
- Main power block
- Branch circuit protection for motors and powered devices
- Motor starters with overload protection
- 24 VDC IS power supply
- Intrinsically safe barriers for switches in classified areas
- Variable frequency drives where required
- Dry contacts to allow interlock with system inlet pumps

Outside cover of panel to contain the following:

- System ready light
- Red alarm indicator light
- Programmable touch screen with:
  - Colour P&ID display
  - Display of measurements recorded from any transmitters present in system
  - System on/off control
  - Safety control over all valves and motors with timed delay when in Hand position
  - Timers for solenoid valves and motors present in system
  - Alarm indicators with reset function
  - Run indicators for system components

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  - USB port for datalogging download (USB key included)
  - Alarm reset button
- Emergency stop button

SLUDGE DEWATERING SYSTEM (OPTIONAL)

PROCESS DESCRIPTION:

The dewatering system has been sized to allow sludge from up to three trains of the WWTP to be fed into one system.

Wasted activated sludge will be pumped out of the WWTP and into the **newterra** dewatering system inlet tank. While the volute system is processing, sludge is transferred continuously from the inlet tank to the flow control tank of the volute. Flow into the flocculation tank is controlled by a v-notch weir.

Potable water, provided by others, is combined with dry polymer in the polymer make-down/storage unit. The polymer make-down/storage unit has sufficient capacity to supply polymer for two days of high capacity operation.

Polymer is metered into the flocculation tank and mixed with the sludge prior to entering the volute dewatering press, where it is dewatered to 15-20% solids.

Filtrate flows to a discharge tank where it is pumped out of the dewatering system for return to the WWTP.

Sludge cake is deposited into a bin stored inside for disposal (by others).

The system is very hands off as opposed to a filter press. Solids content varies with type of sludge however we have been able to produce sludge in the +20% range at many systems. With this system, the unit is a bit oversized, so can be run slower to increase the dewatering.

DESIGN PARAMETERS: (WITH THREE TRAINS FULLY OPERATIONAL)

Average design throughput:	15 kg DS / h
Estimated dried solids content:	15 – +20 %
Estimated dried solids weight:	1100 – 1500 kg/day

SCOPE OF SUPPLY:

The Sludge Dewatering System must be placed within 10 m of the **newterra** MBR STP. If the terrain is not flat, the sludge pump may need to be resized.

Sludge Storage

- HDPE Storage tank with
  - Air diffuser and blower
  - Transfer pump
    - To pump sludge from Sludge Inlet Tank into Volute

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- High level alarm switch
- Pump control switches
- Low level alarm switch

Sludge Dewatering

- Flow Control tank
  - Overflow to sludge storage tank
  - Weir overflow to flocculation tank
- Flocculation tank
  - Paddle type agitator
  - High level alarm switch
- Volute dewatering press
  - Solenoid valve for automatic wash down
- Wash down hose

Polymer Make-Down & Dosing

- HDPE Polymer make-down/storage tank with
  - Cone bottom
  - Low level alarm switch
  - Metering pump control switches
  - Mixer for polymer mixing
  - Automatic batch production
  - Polymer dilution and activation
- Polymer metering pump
  - Injection to flocculation tank
- Dewatered sludge cake to be stored in a dump cart inside the building.

Filtrate Discharge Tank

- Discharge tank with
  - Air diffuser and blower
  - Transfer pumps
    - To pump supernatant from Discharge Tank for return to WWTP
  - High level alarm switch
  - Pump control switches

System Enclosure

cMET certified, built to CEC standards with all wiring complete and all equipment pre-piped factory tested and mounted in enclosure.

- Exterior paint
- Lifting eyes on upper corners
- Coated plywood floor
- Insulated walls and ceiling
- Insulated floor
- Barn-style rear double doors

- Grating under HDPE tanks
- Lighting
- Ventilation fans
- Passive vent louvers with hoods
- Emergency stop switch
- Low temperature alarm switch
- Duplex 15 Amp GFI receptacle for heat trace inlet and discharge

Control System Module:

Schneider PLC based control panel with the following standard features:

- CMET certification
- AIC rating of 10000
- NEMA 1 lockable panel enclosure
- Primary circuit protection
- Surge and lightning protection for control system
- Main power block
- Branch circuit protection with circuit breakers for motors
- Motor starters with overload protection
- Branch circuit protection with circuit breakers for powered devices
- Schneider PLC control system
- 24 VDC IS power supply
- Variable frequency drives where required
- Wired and installed
- Factory tested prior to shipping

Outside cover of panel to contain the following:

- System ready light
- Red alarm indicator light
- Programmable touch screen with:
  - Colour P&ID display
  - Display of measurements recorded from any transmitters present in system
  - System on/off control
  - Safety control over all valves and motors with timed delay when in Hand position
  - Timers for solenoid valves and motors present in system
  - Alarm indicators with reset function
  - Run indicators for system components
  - USB port for datalogging download (USB key included)
  - Alarm reset button
- Emergency stop button

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OPTIONAL EQUIPMENT

Permeate Storage tank

Two sizes provided depending on permeate storage needs

- 25m^{3}Coated steel construction or equivalent with
  - Level transmitter
  - High level alarm switch
  - Temperature alarm switch
  - Sacrificial anodes in steel tanks
  - Immersion heaters
  - Installed in 40' ISO high cube container
- 53 m^3 Containerized Tank with
  - All wetted material stainless steel or poly propylene
  - Level transmitter
  - High level alarm switch
  - Temperature alarm switch
  - Immersion heaters
  - Installed in 40' ISO high cube container

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CLIENT'S SCOPE OF SUPPLY AND WORK:

- Delivery of raw sewage to the **newterra** MBR STP;
- Permitting;
- Grease trap to control entry of oil and greasy material to the **newterra** MBR. Fat, oil and grease levels entering the newterra MBR system must be less than 30 mg/L to ensure the treatment system functions as designed and to prevent damage to the membranes;
- Firm, level base for the containers customer has indicated gravel pad will be provided with no concern of container movement;
- Piping hookups to and from the **newterra** MBR;
- Electrical power supply to our electrical panel, lightning, grounding, etc. ;
- Potable water supply to the plant site for plant hydraulic test during startup;
- Seed sludge or other requirements for startup
- Wastewater testing;
- Chemicals supply and storage;
- Treated effluent and waste sludge disposal;
- Anything not mentioned in "Scope of Supply" above.

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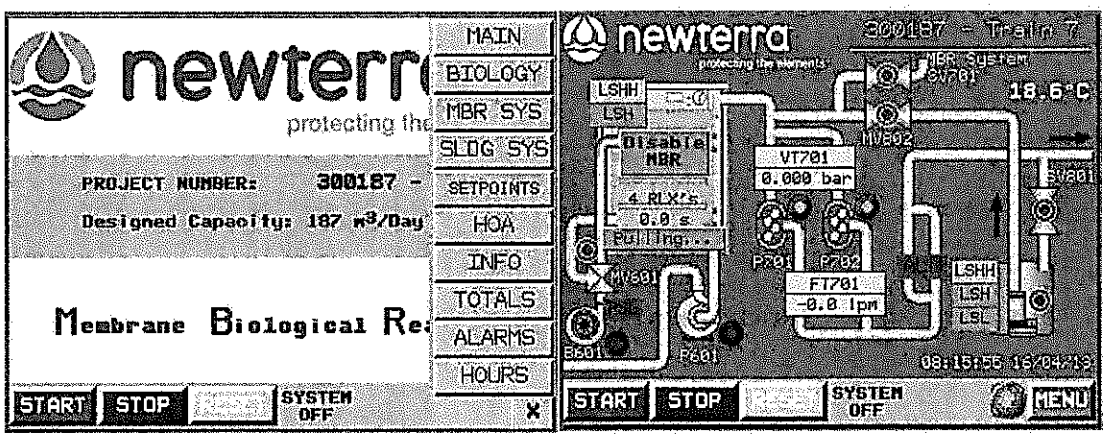
Telemetry Control and Remote Access:

Annual telemetry service contract:

newterra SITE-LINK is a customized software program and hardware configuration which provides a real-time link to a treatment system via cellular modem or customer supplied internet connection using advanced VPN technology. An annual Telemetry Service Agreement with **newterra** is required which includes all costs associated with the service.



newterra Site-Link comes with the following customizable features:

- Customized P&ID layout with system status
- Start/Stop/Reset of system
- Manual control of all system components
- Data logging downloads in .csv format†
- Daily system status reports (E-Monitor)
- Alarm history including current alarm status
- Hour meters for applicable equipment
- Customization of all system set points†
- Live and historical trending
- Immediate text & email on alarm (E-Alarm)

†certain restrictions apply

The basic system requires that the customer provide a standard computer network cable to the control panel. If the customer's computer network is accessible to the internet, this system can also be monitored from any internet enabled computer. Static IP is not required and must be provided by customer.

This system is not available if customer supplied internet connection or cellular service is not available at the site. During internet outages, reports cannot be sent and system status cannot be monitored remotely.

Attachment 7

Mary River 800 Man WWTP – Process Guarantee

newterra
clean water. modular solutions. simple.

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newterra Project #:1704809
Project Name: Baffinland - Mary River 800 Man WWTP

newterra guarantees that when the supplied wastewater treatment system is operated during a performance test in accordance with the designed conditions, the facility will be capable of producing the designed effluent quality at the designed flowrate. The plant shall be operated within the design conditions listed in the tables below, and must be operated in accordance with newterra operations manual.

The system shall process 100% of the design flow listed in Table 1 when that flow consists of sewage with constituent concentrations equal to or lower than those listed in Table 2.

Table 1

Influent Flow Rate	Design Value	Metric Unit
Average Daily Flow (ADF)	125	m^3/d

Table 2

Influent Wastewater Characteristics	Design Value	Metric Unit
Chemical Oxygen Demand, COD	800	mg/L
Biochemical Oxygen Demand, BOD	400	mg/L
Total Suspended Solids,TSS	350	mg/L
Volatile Suspended Solids, VSS	280	mg/L
Total Kjeldahl Nitrogen, TKN	70	mg/L
Ammonia nitrogen, NH_4-N	65	mg/L
Total Phosphorus, TP	10	mg/L
Fat, Oil and Grease, FOG	30	mg/L

When operated according to the design specifications, the plant shall produce treated effluent with the quality shown in Table 3. All constituents shall be equal or lower than the concentrations listed in Table 3 – with the

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exception of pH, which shall be within the specified ranged – when the influent flow and quality is equal to or lower than those listed in Table 1 and 2 above.

Table 3

Effluent Water Specification	Effluent Limit	Metric Unit
BOD_5	< 30	mg/L
Total Suspended Solids	< 35	mg/L
Fecal Coliform	< 1000	CFU/100ml
Oil and Grease	No visible sheen	-
Acidity	6.0 - 9.5	pH
Toxicity	Not acutely toxic	mg/L
Ammonia	< 4	mg/L
Total Phosphorus	< 4	mg/L

Sincerely,

Jeff Kempson P.Eng

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