

## RECEIVED

By Licensing Administrator at 2:28 pm, Apr 23, 2011

April 23, 2011

Phyllis Beaulieu, Manager of Licencing Richard Dwyer, Licencing Administrator Nunavut Water Board P.O. Box 119 Gjoa Haven, NU X0B 1J0 Email: licensing@nunavutwaterboard.org

Dear Ms. Beaulieu / Mr. Dwyer:

Re: Mary River Project NWB License 2BB-MRY1114 Winter Geotechnical Drilling Program – Phase 2

Attention Ms. Beaulieu / Mr. Dwyer,

Baffinland Iron Mines Corporation (Baffinland) is preparing for the initiation of the second phase of its winter 2011 geotechnical drilling program, scheduled to commence in early May. The notification of our first phase of on ice geotechnical drilling was submitted to you on April 11, 2011. The purpose of the program is to collect additional data to support rail route and port design detailed design requirements. Phase 2 of its winter program will consist mainly of on-ice drilling at the proposed rail route crossings.

Specific requirements of the above noted license related to the planning of this program include:

- Part C, Items 3 and 4, which state that streams cannot be used as water sources (without the approval of the NWB) and that water use volumes can't be used such that draw down of the water source occurs;
- Part F, Item 2, which states that the Licensee may conduct geotechnical drilling within 30 metres of the high water mark of a water body provided such activities are consistent with the terms of the water licence and a request has been submitted and received by the NWB, 10 days in advance of drilling that includes a description of the proposed activities and the following:
  - A scaled map, with coordinates of planned drilling locations and associated water bodies;
  - o Locations of waste deposition, consistent with Part F, Item 4, and,
  - Mitigation measures that are planned to be in place, prior to, during drilling and following if required to protect waters.
- Part F, Item 4, which states that drill waste shall be disposed in an appropriate natural depression or constructed sump a distance of 31 metres from the high water mark of any adjacent water body where direct flow into a water body is not possible and no additional impacts are created.
- Part F, Item 5, which states that drilling additives or mud shall not be used in connection with holes drilled through lake ice unless they are re-circulated or contained such that they do not enter the water, or are demonstrated to be non-toxic.
- Part F, Item 8, which states that for "on-ice" drilling, return water released must be non-toxic and not result in an increase in total suspended solids in the immediate receiving waters above CCME Guidelines for the Protection of Freshwater Aquatic Life.



- Part F, Item 9, which states that water quality conditions must be established prior to and upon completion of any drilling program though lake ice.
- Part I, Item 17, which requires submission to the Inspector, the GPS locations of all water sources, prior to utilization.

Tables and figures summarizing winter drill hole locations as currently planned and in accordance with Part I, Item 17, are attached to this letter. The exact number and locations of drill holes are subject to adjustment based on the information obtained through the course of this program.

The open water season portion of the geotechnical drill program (ie. post June 2011) will be submitted as a notification at a later date. In accordance with the intent of Part F, Item 1, open water season drill holes will, to the extent possible, be planned for locations greater than 30 metres away from the ordinary high water mark of any adjacent water body. Approvals will be sought from the NWB at that time for any drill holes planned for locations within 30 metres of any water bodies during the open water season.

The focus of the winter portion of the geotechnical program is to advance during frozen conditions those drill holes at locations within 30 metres of the normal high water mark and on ice of the water body. These holes are required in order to evaluate ground conditions and provide the information needed for design of water crossings such as bridges and port facilities. It is expected that the river and stream crossings will be frozen to the bottom and that there will not be any water present.

Where there may be open water below the ice at on-ice drilling locations, Baffinland has implemented standards and procedures to minimize and monitor potential effects. Baffinland has developed a geotechnical drilling standard that incorporates before drilling inspection checklists, daily drilling operational monitoring forms, and a post drilling inspection checklist that help to minimize and document potential environmental impacts due to drilling activities. In addition, a pre-drilling and post-drilling monitoring procedure has been developed for drilling locations where there is open water below ice at drilling locations. The above documents are attached for information purposes.

Baffinland's Site Water Management Plan<sup>1</sup> also contains guidance on how to minimize the potential effects of drilling and on the selection of appropriate environmental controls to minimize the release of suspended solids into the receiving environment.

To support the winter program, water sources to support drilling operations have been selected in concordance with Part C, Items 3 and 4 of the water license. Streams have not been selected as water sources and a desktop threshold of 5% maximum water withdrawal has been used to guide water source selection. This criterion is consistent with the Department of Fisheries and Oceans (DFO) guideline established for under-ice water use<sup>2</sup>. The location of fresh water sources is provided in the tables and figures attached to this letter. At Steensby Inlet, ocean water will be used to the greatest extent possible for drilling.

<sup>&</sup>lt;sup>1</sup> Baffinland Iron Mines Corporation, Mary River Project, Site Water Management Plan (March 2010) and update (March 2011).

<sup>&</sup>lt;sup>2</sup> DFO Protocol for Winter Water Withdrawal from Ice-covered Waterbodies in the Northwest Territories and Nunavut, current as of June 21, 2010.



By copy of this letter, Baffinland is providing the Qikiqtani Inuit Association, the Water License, and INAC Lands inspectors with the requisite notice of intent to commence Phase 2 of drilling operations during the month of May. A copy of this letter has also been forwarded to the federal Department of Fisheries and Oceans for their information and guidance, as appropriate. Should you have any comments or concerns, please do not hesitate to contact the undersigned.

Yours sincerely,

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**Baffinland Iron Mines Corporation** 

James Millard, M.Sc., P.Geo.

Senior Environmental Superintendent

Attachments: Tables 1 and 2, Figures 1 to 11, incl.

Geotechnical Drilling Standard and associated inspection checklists.

cc., Salamonie Shoo, QIA,

Ian Rumbolt, INAC, Kevin Robertson, INAC,

Eric Kan, DFO

## BAFFINLAND IRON MINES CORPORATION MARY RIVER PROJECT

## PHASE 2 OF 2011 PROPOSED DRILLING PROGRAM PROPOSED WINTER DRILLHOLE LOCATIONS

	T				Print Apr/23/11 13:46:
Drillhole	Northing	Easting	Chainage	Drillhole	Related Water
Number	(Estimated)	(Estimated)		Purpose	Source
	(m)	(m)	(km+mmm)		
Railway Alignment - St	eensby to North	End of Cockburn L	ake (143+758 to	100+000)	
Bridge Crossings					
BR-141-1					
BR-141-1-2-P	7,805,018	597,519	141+400	BR-141-1	WW-37
BR-141-1-1-P	7,805,039	597,534	141+375	BR-141-1	WW-37
BR-137-1					
BR-137-1-19-P	7,807,848	598,691	138+088	BR-137-1	WW-36
BR-137-1-18-P	7,807,858	598,689	138+077	BR-137-1	WW-36
BR-137-1-17-P	7,807,870	598,686	138+066	BR-137-1	WW-36
BR-137-1-16-P	7,807,880	598,684	138+055	BR-137-1	WW-36
BR-137-1-15-P	7,807,891	598,682	138+044	BR-137-1	WW-36
BR-137-1-14-P	7,807,902	598,679	138+033	BR-137-1	WW-36
BR-137-1-13-P	7,807,912	598,677	138+022	BR-137-1	WW-36
BR-137-1-12-P	7,807,923	598,675	138+011	BR-137-1	WW-36
BR-137-1-11-P	7,807,934	598,673	138+000	BR-137-1	WW-36
BR-137-1-10-P	7,807,945	598,670	137+989	BR-137-1	WW-36
BR-137-1-9-P	7,807,956	598,668	137+978	BR-137-1	WW-36
BR-137-1-8-P	7,807,967	598,666	137+967	BR-137-1	WW-36
BR-137-1-7-P	7,807,977	598,664	137+956	BR-137-1	WW-36
BR-137-1-6-P	7,807,988	598,661	137+945	BR-137-1	WW-36
BR-137-1-5-P	7,807,999	598,659	137+934	BR-137-1	WW-36
BR-137-1-4-P	7,808,010	598,657	137+923	BR-137-1	WW-36
BR-137-1-3-P	7,808,020	598,655	137+912	BR-137-1	WW-36
BR-137-1-2-P	7,808,031	598,653	137+901	BR-137-1	WW-36
BR-137-1-1-P	7,808,042	598,650	137+890	BR-137-1	WW-36
BR-105-1					
BR-105-1-2-P	7,833,817	604,149	105+150	BR-105-1	WW-33
BR-105-1-1-P	7,833,831	604,170	105+125	BR-105-1	WW-33
Culverts (3m dia or la	rger)		ļ		ļ
CV-142-2-P	7,803,825	596,946	142+730	CV-142-2	WW-52
CV-136-2-P	7,809,072	598,553	136+840	CV-136-2	WW-36
CV-136-1-P	7,809,569	598,958	136+190	CV-136-1	WW-36
CV-134-1-P	7,810,414	600,609	134+270	CV-134-1	WW-35
CV-131-1-P	7,812,716	600,629	131+690	CV-131-1	WW-35
CV-129-1-P	7,814,490	599,375	129+450	CV-129-1	WW-51
CV-124-5-P	7,818,569	598,438	124+910	CV-124-5	WW-33
CV-123-4-P	7,819,665	598,485	123+810	CV-123-4	WW-33
CV-123-3-P	7,819,899	598,478	123+575	CV-123-3	WW-33
CV-118-2-P	7,824,544	598,603	118+775	CV-118-2	WW-33
CV-118-1-P	7,825,258	598,367	118+020	CV-118-1	WW-33
CV-117-2-P	7,825,570	598,198	117+660	CV-117-2	WW-33
CV-111-1-P	7,830,203	599,060	111+790	CV-111-1	WW-33
		•			
Railway Alignment - No	rth End of Cocki	urn Lake to Ravn I	L River Crossina (*	100+000 to 37+700)	<u> </u>
Bridge Crossings			51		
BR-99-1					
BR-99-1-2-P	7,837,159	608,452	99+550	BR-99-1	WW-33
BR-99-1-1-P	7,837,181	608,466	99+525	BR-99-1	WW-33
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## BAFFINLAND IRON MINES CORPORATION MARY RIVER PROJECT

## PHASE 2 OF 2011 PROPOSED DRILLING PROGRAM PROPOSED WINTER DRILLHOLE LOCATIONS

	T		1	I	Print Apr/23/11 13:46:01
Drillhole	Northing	Easting	Chainage	Drillhole	Related Water
Number	(Estimated)	(Estimated)		Purpose	Source
	(m)	(m)	(km+mmm)		
BR-96-2	1		1	г	
BR-96-2-2-P	7,839,691	608,711	96+910	BR-96-2	WW-33
BR-96-2-1-P	7,839,716	608,706	96+885	BR-96-2	WW-33
BR-96-1	1	Ī		ı	
BR-96-1-2-P	7,840,199	608,552	96+375	BR-96-1	WW-33
BR-96-1-1-P	7,840,221	608,539	96+350	BR-96-1	WW-33
BR-95-1	1		1	г	
BR-95-1-33-P	7,840,644	608,137	95+761	BR-95-1	WW-33
BR-95-1-32-P	7,840,651	608,128	95+750	BR-95-1	WW-33
BR-95-1-31-P	7,840,658	608,120	95+739	BR-95-1	WW-33
BR-95-1-30-P	7,840,665	608,111	95+728	BR-95-1	WW-33
BR-95-1-29-P	7,840,672	608,103	95+717	BR-95-1	WW-33
BR-95-1-28-P	7,840,679	608,094	95+706	BR-95-1	WW-33
BR-95-1-27-P	7,840,686	608,085	95+695	BR-95-1	WW-33
BR-95-1-26-P	7,840,693	608,077	95+684	BR-95-1	WW-33
BR-95-1-25-P	7,840,699	608,068	95+673	BR-95-1	WW-33
BR-95-1-24-P	7,840,706	608,060	95+662	BR-95-1	WW-33
BR-95-1-23-P	7,840,713	608,051	95+651	BR-95-1	WW-33
BR-95-1-22-P	7,840,720	608,042	95+640	BR-95-1	WW-33
BR-95-1-21-P	7,840,727	608,034	95+629	BR-95-1	WW-33
BR-95-1-20-P	7,840,734	608,025	95+618	BR-95-1	WW-33
BR-95-1-19-P	7,840,741	608,017	95+607	BR-95-1	WW-33
BR-95-1-18-P	7,840,748	608,008	95+596	BR-95-1	WW-33
BR-95-1-17-P	7,840,763	607,989	95+572	BR-95-1	WW-33
BR-95-1-16-P	7,840,777	607,971	95+548	BR-95-1	WW-33
BR-95-1-15-P	7,840,793	607,951	95+523	BR-95-1	WW-33
BR-95-1-14-P	7,840,808	607,932	95+499	BR-95-1	WW-33
BR-95-1-13-P	7,840,823	607,913	95+475	BR-95-1	WW-33
BR-95-1-12-P	7,840,839	607,894	95+450	BR-95-1	WW-33
BR-95-1-11-P	7,840,845	607,886	95+439	BR-95-1	WW-33
BR-95-1-10-P	7,840,853	607,876	95+428	BR-95-1	WW-33
BR-95-1-9-P	7,840,859	607,868	95+417	BR-95-1	WW-33
BR-95-1-8-P	7,840,866	607,859	95+406	BR-95-1	WW-33
BR-95-1-7-P	7,840,873	607,851	95+395	BR-95-1	WW-33
BR-95-1-6-P	7,840,880	607,842	95+384	BR-95-1	WW-33
BR-95-1-5-P	7,840,887	607,834	95+373	BR-95-1	WW-33
BR-95-1-4-P	7,840,893	607,825	95+362	BR-95-1	WW-33
BR-95-1-3-P	7,840,901	607,817	95+351	BR-95-1	WW-33
BR-95-1-2-P	7,840,908	607,808	95+340	BR-95-1	WW-33
BR-95-1-1-P	7,840,914	607,800	95+329	BR-95-1	WW-33
BR-92-2					
BR-92-2-2-P	7,842,457	606,500	93+275	BR-92-2	WW-32
BR-92-2-1-P	7,842,482	606,489	93+250	BR-92-2	WW-32
BR-92-1					
BR-92-1-2-P	7,842,752	606,363	92+950	BR-92-1	WW-32
BR-92-1-1-P	7,842,776	606,352	92+925	BR-92-1	WW-32
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## BAFFINLAND IRON MINES CORPORATION MARY RIVER PROJECT

## PHASE 2 OF 2011 PROPOSED DRILLING PROGRAM PROPOSED WINTER DRILLHOLE LOCATIONS

	N 27		1	I	Print Apr/23/11 13:46:01
Drillhole	Northing	Easting	Chainage	Drillhole	Related Water
Number	(Estimated)	(Estimated)		Purpose	Source
	(m)	(m)	(km+mmm)		
BR-91-1					
BR-91-1-1-P	7,843,789	605,931	91+825	BR-91-1	WW-32
BR-59-1					
BR-59-1-2-P	7,872,529	598,854	59+785	BR-59-1	WW-27
BR-59-1-1-P	7,872,553	598,860	59+760	BR-59-1	WW-27
BR-57-1			•		
BR-57-1-2-P	7,874,396	599,443	57+825	BR-57-1	WW-26
BR-57-1-1-P	7,874,421	599,447	57+800	BR-57-1	WW-26
BR-46-1					·
BR-46-1-5-P	7,886,490	596,683	46+130N	BR-46-1	WW-22 or WW-45
BR-46-1-4-P	7,886,511	596,707	46+100N	BR-46-1	WW-22 or WW-45
BR-46-1-3-P	7,886,531	596,728	46+070N	BR-46-1	WW-22 or WW-45
BR-46-1-2-P	7,886,551	596,750	46+040N	BR-46-1	WW-22 or WW-45
BR-46-1-1-P	7,886,574	596,772	46+010N	BR-46-1	WW-22 or WW-45
BR-44-1			I	T	T
BR-44-1-5-P	7,887,262	597,455	45+035N	BR-44-1	WW-22 or WW-45
BR-44-1-4-P	7,887,289	597,468	45+005N	BR-44-1	WW-22 or WW-45
BR-44-1-3-P	7,887,316	597,481	44+975N	BR-44-1	WW-22 or WW-45
BR-44-1-2-P	7,887,346	597,488	44+945N	BR-44-1	WW-22 or WW-45
BR-44-1-1-P	7,887,375	597,494	44+915N	BR-44-1	WW-22 or WW-45
BR-37-1	7 002 042	FOF 404	27 - COON	DD 27.4	1000/ 47
BR-37-1-8-P	7,893,942	595,494	37+690N	BR-37-1	WW-17
BR-37-1-7-P BR-37-1-6-P	7,893,969 7,893,997	595,482 595,469	37+660N 37+630N	BR-37-1 BR-37-1	WW-17 WW-17
	7,893,997	595,469	37+600N	BR-37-1	WW-17
BR-37-1-5-P BR-37-1-4-P	7,894,023	595,445	37+570N	BR-37-1	WW-17
BR-37-1-3-P	7,894,079				WW-17
BR-37-1-2-P	7,894,079	595,432 595,421	37+540N 37+510N	BR-37-1 BR-37-1	WW-17
BR-37-1-1-P	7,894,100	595,410	37+310N 37+480N	BR-37-1	WW-17
DIC-37-1-1-1	7,034,134	333,410	37 +40014	DIX-07-1	VVVV-17
Temporary Bridges					
AR-BR-46-1 (46+00	0)				
AR-BR-46-1-2-P	7,886,463	596,711		Temp. Bridge	WW-22 or WW-45
AR-BR-46-1-1-P	7,886,493	596,753		Temp. Bridge	WW-22 or WW-45
Culverts (3m or larger	)			1	1
CV-93-2-P	7,842,215	606,654	93+560	CV-93-2	WW-32
CV-86-1-P	7,848,859	606,180	86+610	CV-86-1	WW-32
CV-84-1-P	7,851,181	606,387	84+250	CV-84-1	WW-31
CV-81-5-P	7,853,361	605,639	81+775	CV-81-5	WW-31
CV-76-3-P	7,858,568	604,396	76+190	CV-76-3	WW-31
CV-76-2-P	7,858,624	604,309	76+080	CV-76-2	WW-31
CV-76-1-P	7,858,661	604,250	76+010	CV-76-1	WW-31
CV-75-2-P	7,858,901	603,945	75+620	CV-75-2	WW-31
CV-73-1-P	7,861,082	603,092	73+170	CV-73-1	WW-50
CV-71-1-P	7,862,400	602,564	71+740	CV-71-1	WW-50
CV-64-1-P	7,867,837	599,005	64+820	CV-64-1	WW-29

## BAFFINLAND IRON MINES CORPORATION MARY RIVER PROJECT

## PHASE 2 OF 2011 PROPOSED DRILLING PROGRAM PROPOSED WINTER DRILLHOLE LOCATIONS

	Northing	Easting			Print Apr/23/11 13:46:0
Drillhole Number	(Estimated)	(Estimated)	Chainage	Drillhole Purpose	Related Water Source
Number			a	Fulpose	Source
	(m)	(m) 598,242	(km+mmm)		
CV-62-1-P			62+880	CV-62-1	WW-49
CV-52-2-P	7,878,344	597,276	52+920	CV-52-2	WW-48
CV-51-2-P	7,879,340	596,622	51+660	CV-51-2	WW-47
CV-44-3-P	7,884,974	596,551	44+920	CV-44-3	WW-46
CV-44-1-P	7,885,802	596,562	44+090	CV-44-1	WW-46
NCV-45-1-P	7,886,902	597,134	45+520N	NCV-45-1	WW-46
NCV-44-2-P	7,887,489	597,519	44+790N	NCV-44-2	WW-45
NCV-43-1-P	7,888,578	597,277	43+675N	NCV-43-1	WW-44
CV-42-1-P	7,889,760	597,430	42+470N	CV-42-1	WW-43
CV-41-2-P	7,890,426	597,242	41+770N	CV-41-2	WW-43
CV-41-1-P	7,891,051	596,983	41+090N	CV-41-1	WW-42
CV-40-2-P	7,891,238	596,888	40+880N	CV-40-2	WW-42
Railway Alignment - F	Ravn River Crossii	ng to Mary River C	amp (37+700 to 0	)+000)	
Bridge Crossings					
BR-36-1					
BR-36-1-3-P	7,895,351	595,079	36+215N	BR-36-1	WW-17
BR-36-1-2-P	7,895,366	595,078	36+200N	BR-36-1	WW-17
BR-36-1-1-P	7,895,425	595,076	36+140N	BR-36-1	WW-17
BR-35-1			ı	1	1
BR-35-1-3-P	7,896,014	594,843	35+473N	BR-35-1	WW-17
BR-35-1-2-P	7,896,044	594,794	35+415N	BR-35-1	WW-17
BR-35-1-1-P	7,896,054	594,776	35+395N	BR-35-1	WW-17
BR-25-1	_!	<u> </u>		l .	Į.
BR-25-1-11-P	7,900,012	585,421	25+049	BR-25-1	WW-14
BR-25-1-10-P	7,900,020	585,412	25+038	BR-25-1	WW-14
BR-25-1-9-P	7,900,028	585,404	25+027	BR-25-1	WW-14
BR-25-1-8-P	7,900,044	585,386	25+003	BR-25-1	WW-14
BR-25-1-7-P	7,900,051	585,377	24+992	BR-25-1	WW-14
BR-25-1-6-P	7,900,059	585,369	24+981	BR-25-1	WW-14
			24+961		WW-14
BR-25-1-5-P	7,900,066	585,361		BR-25-1 BR-25-1	
BR-25-1-4-P	7,900,073 7,900,080	585,353	24+959		WW-14
BR-25-1-3-P BR-25-1-2-P	1 1	585,344	24+948	BR-25-1	WW-14
	7,900,088	585,337	24+937	BR-25-1	WW-14
BR-25-1-1-P	7,900,095	585,328	24+926	BR-25-1	WW-14
DD 44.6			l		
BR-11-1	T		1		T
BR-11-1-2-P	7,904,902	573,118	11+665	BR-11-1	WW-5
BR-11-1-P	7,904,909	573,093	11+640	BR-11-1	WW-5
BR-8-1	_	•		1	1
BR-8-1-2-P	7,906,501	570,830	8+850	BR8-1	WW-5
BR-8-1-1-P	7,906,529	570,789	8+800	BR8-1	WW-5
Culverts (3m or large	er)				
CV-36-1-P	7,895,226	595,084	36+340N	CV-36-1	WW-17
CV-34-1-P	7,896,359	593,797	34+350N	CV-34-1	WW-17
CV-33-1-P	7,896,656	592,739	33+240N	CV-33-1	WW-17
CV-32-1-P	7,896,785	592,480	32+950N	CV-32-1	WW-17

## BAFFINLAND IRON MINES CORPORATION MARY RIVER PROJECT

## PHASE 2 OF 2011 PROPOSED DRILLING PROGRAM PROPOSED WINTER DRILLHOLE LOCATIONS

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Drillhole	Northing	Easting	Chainage	Drillhole	Print Apr/23/11 13:46:01  Related Water
Number	(Estimated)	(Estimated)	- Cilamago	Purpose	Source
	(m)	(m)	(km+mmm)		
CV-31-2-P	7,897,148	591,337	31+750N	CV-31-2	WW-17
CV-31-1-P	7,897,259	590,884	31+280N	CV-31-1	WW-41
CV-30-1-P	7,897,499	590,260	30+610N	CV-30-1	WW-41
CV-29-1-P	7,897,713	589,607	29+920N	CV-29-1	WW-14
CV-28-2-P	7,898,078	588,621	28+850N	CV-28-2	WW-14
NCV-28-1-P	7,898,238	588,153	28+350N	NCV-28-1	WW-14
CV-27-2-P	7,898,625	587,467	27+850N	CV-27-2	WW-14
CV-27-1-P	7,898,803	587,185	27+230N	CV-27-1	WW-14
CV-25-2-P	7,899,452	586,177	26+000	CV-25-2	WW-14
CV-23-1-P	7,900,636	584,019	23+490	CV-23-1	WW-40
CV-21-1-P	7,901,242	581,660	21+050	CV-21-1	WW-40
CV-17-1-P	7,902,638	578,075	17+140	CV-17-1	WW-6
CV-14-3-P	7,903,649	575,881	14+720	CV-14-3	WW-6
CV-10-1-P	7,905,370	572,331	10+740	CV-10-1	WW-5
CV-8-1-P	7,906,946	570,136	08+020	CV-8-1	WW-4
CV-7-1-P	7,907,453	569,319	07+060	CV-7-1	WW-3
CV-6-1-P	7,907,923	568,607	06+210	CV-6-1	WW-2
CV-4-1-P	7,908,968	567,006	04+280	CV-4-1	WW-39
Milne Inlet Camp Area					
On Ocean Drilling	7 070 540	500 400	L 1/4	Miles Isla	Miles Inter
MMCD-A	7,976,518	503,108	N/A	Milne Inlet	Milne Inlet
MMCD-B	7,976,532	503,130	N/A	Milne Inlet	Milne Inlet
MMCD-C	7,976,546	503,153	N/A	Milne Inlet	Milne Inlet
MMCDP-1	7,976,548	503,057	N/A	Milne Inlet	Milne Inlet
MMCDP-2	7,976,576	503,123	N/A	Milne Inlet	Milne Inlet
MMCDP-3	7,976,605	503,149	N/A	Milne Inlet	Milne Inlet
MMCDP-4	7,976,541	503,090	N/A	Milne Inlet	Milne Inlet
MMCDP-5	7,976,558	503,117	N/A	Milne Inlet	Milne Inlet
MMCDP-6	7,976,572	503,141	N/A Milne Inlet		Milne Inlet

C:\Documents and Settings\Jim Millard\Desktop\Winter Drilling Phase 2 Notification\[Table 1 - Winter DHs.xls]Drillhole Locations

- NOTES:

  1. COORDINATES ARE FROM UTM (NAD 83) ZONE 17 AND ARE IN METRES.

  2. COORDINATES AND CHAINAGES PROVIDED BY BAFFINLAND IRON MINES CORPORATION.

  3. DRILLHOLE LOCATIONS MAY CHANGE BASED ON ACTUAL SITE CONDITIONS.

0	19APR'11	ISSUED WITH TRANSMITTAL NB11-00205	RSM	DD	DD
REV	DATE	DESCRIPTION	PREP'D	CHKD	APP'D

### BAFFINLAND IRON MINES CORPORATION MARY RIVER PROJECT

### PHASE 2 OF 2011 PROPOSED DRILLING PROGRAM PROPOSED WINTER WATER SOURCES FOR EACH DRILLHOLE

Water Source	Water Source	Water Source	Estimated Water	Estimated Water	Estimated Water	Estimated Ice	Estimated Under-Ice	Estimated Water Volume	Estimated Volume of Water	Number of Holes To Be	Total Estimated Volume of Water	Estimated Percentage of Under-Ice	Estimated Percentage of Available
	Northing (Estimated)	Easting (Estimated)	Source Area (1)	Source Depth	Source Volume (2)	Volume (3)	Water Volume (4)	Available for Drilling (5)	Required per Drillhole (6)	Drilled Using this Source	To Be Used for Drilling (7)	Water To Be Used for Drilling (8)	Water To Be Used for Drilling (9)
	(m)	(m)	(m²)	(m)	(m <sup>3</sup> )	(m³)	(m³)	(m³)	(m³/24 hr)		(m <sup>3</sup> )	(%)	(%)
WW-2	7,908,145	567,526	129,000	5.0	562,054	244,729	317,326	31,733	54.5	1	55	0.02	0.17
WW-3	7,907,252	568,669	9,106	5.0	23,492	14,686	8,806	881	54.5	1	55	0.62	6.19
WW-4	7,906,131	569,184	13,820	5.0	41,951	23,296	18,655	1,865	54.5	1	55	0.29	2.92
WW-5	7,904,243	573,185	122,300	30.0	761,531	231,678	529,853	52,985	54.5	5	273	0.05	0.51
WW-6	7,902,940	576,627	25,290	10.2	105,349	44,704	60,645	6,065	54.5	2	109	0.18	1.80
WW-14	7,897,888	588,473	440,600	5.2	2,140,382	856,673	1,283,709	128,371	54.5	17	927	0.07	0.72
WW-17	7,896,048	593,409	1,886,000	20.2	32,920,739	3,721,255	29,199,484	2,919,948	54.5	19	1,036	0.00	0.04
WW-22	7,890,934	593,190	536,900	4.0	2,039,301	1,046,725	992,575	99,258	54.5	12	654	0.07	0.66
WW-26	7,874,237	599,181	428,600	4.5	1,806,235	833,009	973,226	97,323	54.5	2	109	0.01	0.11
WW-27	7,872,465	598,016	117,900	4.5	466,320	223,112	243,207	24,321	54.5	2	109	0.04	0.45
WW-29	7,867,621	600,060	25,870	4.0	79,707	45,797	33,911	3,391	54.5	1	55	0.16	1.61
WW-31	7,854,529	605,684	409,214	5.0	1,898,338	794,791	1,103,547	110,355	54.5	6	327	0.03	0.30
WW-32	7,843,292	606,743	3,397,000	30.0	86,586,794	6,725,897	79,860,897	7,986,090	54.5	7	382	0.00	0.00
WW-33	7,834,310	603,551	22,370,000	30.0	631,778,067	44,565,236	587,212,831	58,721,283	54.5	48	2,616	0.00	0.00
WW-35	7,811,317	600,547	931,500	30.0	19,920,956	1,827,338	18,093,619	1,809,362	54.5	2	109	0.00	0.01
WW-36	7,807,771	601,219	9,853,000	30.0	269,493,269	19,590,015	249,903,255	24,990,325	54.5	21	1,145	0.00	0.00
WW-37	7,804,870	598,986	1,980,000	7.7	14,475,321	3,908,006	10,567,315	1,056,732	54.5	2	109	0.00	0.01
WW-39	7,908,824	566,818	421,594	5.0	1,958,022	819,197	1,138,825	113,883	54.5	1	55	0.00	0.05
WW-40	7,901,169	580,465	82,294	4.7	328,244	153,988	174,256	17,426	54.5	2	109	0.06	0.63
WW-41	7,897,372	590,175	97,575	4.5	380,654	183,607	197,047	19,705	54.5	2	109	0.06	0.55
WW-42	7,891,272	596,464	59,969	4.0	203,681	110,889	92,792	9,279	54.5	2	109	0.12	1.17
WW-43	7,889,980	597,236	41,982	4.0	137,645	76,394	61,252	6,125	54.5	2	109	0.18	1.78
WW-44	7,888,874	597,868	17,524	4.0	50,529	30,156	20,373	2,037	54.5	1	55	0.27	2.68
WW-45	7,888,216	598,837	230,225	4.5	946,257	442,720	503,536	50,354	54.5	13	709	0.14	1.41
WW-46	7,885,708	596,342	63,750	4.0	217,683	118,171	99,512	9,951	54.5	3	164	0.16	1.64
WW-47	7,879,000	596,204	514,494	4.0	1,951,961	1,002,484	949,477	94,948	54.5	1	55	0.01	0.06
WW-48	7,878,055	597,212	619,263	4.0	2,360,743	1,209,449	1,151,294	115,129	54.5	1	55	0.00	0.05
WW-49	7,869,305	598,936	50,866	4.0	170,130	93,399	76,732	7,673	54.5	1	55	0.07	0.71
WW-50	7,863,967	602,978	29,874	4.0	93,950	53,361	40,588	4,059	54.5	2	109	0.27	2.69
WW-51	7,815,221	599,886	106,134	4.0	376,383	200,229	176,154	17,615	54.5	1	55	0.03	0.31
WW-52	7,803,775	597,067	243,001	4.0	899,146	467,788	431,358	43,136	54.5	1	55	0.01	0.13
Milne Inlet	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	54.5	9	491	N/A	N/A

C:Documents and Settings\Jim Millard/Desktopl\Winter Drilling Phase 2 Notificationi(Table 2 - Water Sources.xis)/Water Sources Summary

NOTES:

1. WATER SQUIRCE AREAS WHEE CALCULATED USING AUTOCAD AND ARCVIEW (ISI), AND DO NOT INCLUDE THE AREAS OF CONNECTED WATERSCORES AND WATERBOORS (AS PER DIO'S "PROTOCOL FOR WINTER WATER WITHDRAWAL FROM ICE-COYERD WATERBOORS IN THE NORTHWEST TERRITORIES AND NUMAVUIT, AND 21, 2019.

2. WATER SQUIRCE AREAS WHEE CALCULATED USING A CONSERVATIVE STIMILE OF WATERBOOY CEPT HASSED ON AREAD, HOTOGRAPHS AND FIRED EXPERIENCE OR FIELD MEASUREMENTS.

3. APPROXIMATE ICE VOLUMES ARE BASED ON AN ASSIMED ICE THOORS SO 92 and ON THE SUPPACE OF THE WATERBOOY.

5. THE CESTAMATED WATER VOLUME SAME WATER ON THE SUPPACE OF THE WATERBOOY.

5. THE STEAMATED WATER VOLUME AND AREAD OF WATER HOST OF WATER WATER VOLUME (AS PER THE GOVERNOR WATER WATER VOLUME).

5. THE STEAMATED WATER VOLUME SOURCE FOR REAL HOLD IS BASED ON THE NUMBER OF HOLD IN THE NUMBER OF WATER VOLUME OF WATER REQUIRED FER HOLE.

7. THE VOLUME OF WATER YOUR ENGINEED FOR REAL HOLE IS BASED ON THE NUMBER OF HOLE STATE AT THE WATER VOLUME OF WATER REQUIRED FER HOLE.

8. THE ESTAMATED WATER YOUR ENGINEED FOR VOLUME IS AND ON THE NUMBER OF THE WATER VOLUME OF WATER REQUIRED FER HOLE.

8. THE ESTAMATED PROCRETAGE OF AVAILABLE WATER YOUR OF THE WATER OF THE WATER VOLUME THAT IS TO BE USED FOR DRILLING.

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### **Environmental Concern**

Environmental concerns with drilling include surface disturbances, drilling fluid and cutting disposals, impacts on dust, noise, water quality, and habitat encroachment.

Use of water for drilling for the Mary River Project is subject to the conditions outlined in the water use license (2BBMRY0710 Type "B").

See also Section 2.4 Water Use, of the EPP, regarding the extraction of water for drilling.

### **Environmental Protection Procedures**

### Acceptable Locations to Drill

- Do not construct drill sites or drill sumps within 30 metres of the normal high water mark of a water body unless specific approval is obtained by Baffinland from regulatory agencies. Note: Nunavut Water Board Amendment No. 2 allows drilling within 30 m of the high water mark of any water body and provides provisions for drilling on-ice and the monitoring required for carrying out these activities.
- Do not store material on the surface of frozen streams or lakes, including immediate banks, except material
  that is for immediate use.
- Obtain archaeology clearance for all geotechnical drill locations (Section 2.1 Archaeology).
- Ensure that Pre-Drilling Checklist (Section 3.5 Drilling Checklists) is completed prior to finalizing drill site and water source locations.

### **Drill Operations and Movements**

- Ensure that the drilling area is kept clean and tidy at all times. No littering is permitted collect and package all waste for disposal at camp.
- · Do not feed wildlife.
- Carry out all operations so as to minimize surface disturbance.
- Minimize overland transportation for transport of workers due to the potential for ground disturbance.
- Do not use surface vehicles to move drill rigs or other equipment, without prior authorization of the Environmental Superintendent. The use of any vehicles off approved routes is prohibited.
- Do not move equipment or vehicles unless the ground surface is in a state capable of fully supporting the equipment or vehicles without rutting or gouging.
- Carry out daily inspections for fuel leaks, equipment condition, sediment and erosion control, water intakes
  and water management (See Inspectors Daily Report, Section 3.4 Drilling Checklists). Repair all leaks
  immediately.
- Equip drill rigs with oil absorbent materials in the event of leaks, releases and spills.
- If the bottom of the permafrost is broken through by the drill, the depth of the bottom of permafrost and location should be reported to the Project Manager/Environmental Superintendent for subsequent reporting to the Nunavut Water Board.
- Do not cause any obstruction of any stream.



- Establish water quality conditions prior to and upon completion of any drilling program through lake ice where there is a water column (See Water Sampling for On-Ice Drilling, Section 2.21)
- Implement sediment and erosion control measures prior to drilling operations and maintain these during the operation to minimize spillage of sediment onto ice and prevent entry of sediment into water.
- Conduct wildlife inspection immediately prior to movement of the drill, involving aerial survey and ground survey of the new site (see Drill Operation Work Restrictions, below).

### **Drill Operation Work Restrictions**

### Caribou

• If caribou are observed within 3 km (between May 15 and July 15) or 2 km (at all other times) of the proposed new drill site and disturbance is noted, the drill should be moved to an alternative location and activity at the site deferred until after the caribou leave the area. If the drill is already in place and operating, and caribou move into the area (within 3 km between May 15 and July 15, and within 2 km at any other time), the animals should be monitored. If the caribou show no obvious signs of disturbance, drilling activities can continue. If the animals appear agitated, then activities must cease until the caribou leave or are guided away.

### Carnivores and/or Den Sites

No drilling activity should take place within 2 km of an active wolf den between mid May and mid August if
direct line of sight and disturbance is noted. Foxes or wolves approaching humans must be discouraged by
shouting and making threatening moves. Feeding wildlife is prohibited. All work areas must be kept clear of
food scraps and garbage.

### Raptor (Hawks, Falcons, Owls) Nest Sites

 No drilling activity should take place within 500 m of an active raptor nest site during the breeding season (approximately mid May to August) unless an individual nest protection plan has been prepared by an avian biologist in conjunction with Baffinland Environmental Superintendent. Report all active nest sites to the Environmental Program Supervisor.

### Songbirds, Shorebirds, Loons and Waterfowl

 Drills, pumps and waterlines should be placed at least 500 m from active bird nests and every precaution should be taken to avoid disrupting the nests. All project personnel should remain more than 100 m from active nest sites. Time spent on the hose alignment should be minimized to reduce disturbances in areas between the water source and project activities. Active nests must not be destroyed.

### Marine Mammals

Do not drill near concentrations of animals or destroy in-ice breathing holes.

### Water Use

- No brine (calcium chloride salt mixed with water) or other additive is to be used in geotechnical drilling.
- Re-circulate drilling fluids to the extent reasonably possible.
- Do not use streams as a water source unless authorized and approved by the Nunavut Water Board.

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- DFO approved screens must be placed over the intake hoses. The pumping rate must be kept sufficiently low to ensure that fish do not become entrained (drawn against the screen) and that water is withdrawn at a rate that fish do not become impinged on the screen.
- Do not remove any material below the high water mark of any water source.
- Provide necessary controls to prevent erosion. No erosion is to be caused to the banks of any body of water. Install erosion control structures as the land use operation progresses.

### **Drill Water and Runoff**

- Contain and recirculate drill water to the fullest extent possible and prevent it from running into watercourses.
- Separate clean water from "dirty" water streams whenever possible, (e.g., by means of hose extensions and snow berms or other means that direct and keep discharge away from the immediate area of the drillhole) to prevent migration and expansion of a "dirty" water plume.
- The drill water supply temperature should be monitored during drilling and kept to a temperature as low as
  possible (but not so low as to cause an imminent risk of frozen water lines).
- To maximize drill return water recirculation, casing is to be frozen into the ground to a depth of 3 to 6 m below grade. The specific depth of casing to be frozen into each hole and length of time to allow for freezing will be specified by the Baffinland Project Manager.
- Minimize the footprint of any drill water and cuttings spillage by means of berms and/or other means of containment.
- Dispose of drill water into a properly constructed sump, or a naturally occurring contained depression. Do not
  deposit any deleterious substance into any water body. Recycle drill water wherever possible.
- Prior to the commencement of drilling for each hole, establish a dedicated sump location where collected
  "dirty" drill water and cuttings are to be disposed. The location should be a minimum of 30 m from surface
  water bodies and preferably be located such that any flow toward a surface water body is minimized. This
  implies that the location for the sump should be either in a bowl or depression or be on a relatively flat
  surface.
- Use portable containment sumps (e.g., bins), for drill water and cuttings where containment in the ground is
  impractical. The bins are not to be allowed to overflow and are to be dumped by means of helicopter or pump
  to the location identified for disposal of dirty drill water and cuttings.
- Install silt fences, diversion channels or berms downstream of drill rigs if required to contain drill water runoff.
- Drilling waste must not be allowed to spread to the surrounding lands or water bodies; the footprint of any spillage must be minimized to the greatest degree practicable.
- If artesian flow is encountered, drillholes shall be immediately plugged and permanently sealed to prevent
  induced contamination of groundwater or salinization of surface waters. Report the artesian occurrence
  within 48 hr to the Engineer and Environmental Superintendent. All artesian flows, including location (GPS
  NAD83), should be reported in the annual report to the Project Manager/Environmental Superintendent for
  subsequent reporting to the Nunavut Water Board.
- For on-ice drilling, returned water released must be nontoxic, and not result in an increase in Total Suspended Solids (TSS) in the immediate receiving water above the CCME guidelines for the protection of Fresh Water Aquatic life (i.e. 10 mg/L for lakes with background levels under 100 mg/L or 10% for those above 100 mg/L).
- Sampling of drill water decant collected in bins is to be undertaken on occasion at the direction of the Baffinland Environmental Superintendent using established water quality protocols.

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### **Drillhole Abandonment**

- During winter conditions, where there has been spillage of dirty drill water and cuttings at locations on ice or
  within 30 m of a water body, periodic monitoring of the drill site will be conducted prior to freshet and a cleanup crew may be mobilized to the drill site at the direction of the Baffinland Project Manager and Environmental
  Superintendant.
- No materials (i.e. debris, drill cuttings) shall be left on the ice when there is potential for that material to enter the water (i.e. during freshet)
- Plug all drillholes upon completion, and where possible return drill cuttings at surface to the drillhole at all land-based drilling locations.
- Restore all constructed drill sumps to the natural surrounding contours of the land immediately upon completion of drilling (before drill is moved).
- Contour and stabilize all other disturbed areas upon completion of work and restore these areas to a predisturbed state
- Upon completion of a hole in rock, the casing will be removed. If the casing cannot be removed it will be cut
  off to be flush with surface and backfilled.
- Remove all non-combustible garbage and debris from the land use area to an approved disposal site.
- Return all combustible waste and petroleum products to camp for proper management.
- Ensure that Post-Drilling Checklist (Section 3.5 Drilling Checklists) is completed at the completion of each drill
  hole. The consultant will be asked to complete all drill forms and submit copies of them to Baffinland after the
  completion of each borehole as soon as practical.

			PRE-DRILLING INSP	<b>ECTION RE</b>	PORT		
			BIM personnel:				
l <b>E</b> Bat	tın	land	Date:				
Iron Mine			Time:				
	0 00.	p 0. 0 0.0	Proposed hole ID:		Final hole ID:		
PROPOSED HOLE IN	FORMATIC	ON:					
Deposit #: 1			Collar lo	cation:	E		
Project: MARY RIV	ER		(NAD 83)	)	N		
Area: BAFFIN IS	LAND		Dip:				
NTS: 37G/5			Azimuth	:			
Elevation:			Target d	epth:			
Description of drillho	le location	:					
Purpose of drillhole:							
DRILLING INFORMAT							
Has site been approv	ed by drill	foreman?:					
Drill contractor:							
Drill personnel:							
Drill #:							
Expected start of dril							
Is moving of drillhole		:					
If yes, provide reason	า:						
New collar location:		E	N				
WATER MANAGEME	NT.	<u>E</u>	N				
Water source: Pump Station #:	Mary River						
Sump Station #:		notruotod?.	Yes / No (Photo re	auirod)			
Corner 1:	neu anu co	E	Yes / No   (Photo re	(quireu)			
Corner 2:		E	N				
Silt fence(s) construc	tod2:	Yes / No (Photo red	• •				
Corner 1:	, leu : .	E	N			-	
Corner 2:		E	N				
SITE ASSESSMENTS			11				
Are wildlife present?		ord in log)					
Are wildlife present:	· (ii yes, iec	ord in log)					
Is site safe for drilling	n?:						
Stable platform	Yes / No		Fire Extinguisher	Yes / No			
First Aid kit	Yes / No		Eye Wash	Yes / No			
PPE	Yes / No		Spill Kits	Yes / No			
Safety concerns/issu	L						
Environmental conce	rns?:						
PHOTOGRAPHIC RECORD:							
Photo of drillhole locat	ion prior to	setup?	Yes / No				
Name: Folder:							
Uploaded to hard drive	?:	- AMERICAN AND AND AND AND AND AND AND AND AND A					
COMMENTS:							

Revision 1 June 19, 2009

			DAILY DRILL INSPECT	TION REPO	PRT
<b>+</b>			BIM personnel:		
I Bat	tın	land	Date:		
Iron Mine			Time:		
Inon wine	8 001	.bonacion	Hole ID:		
HOLE INFORMATION	l:		•		
Deposit #: 1			Collar location:	E	
Location:			(NAD 83)	N	
DRILLING INFORMAT	ΓΙΟΝ		(14.12.00)		
Drill contractor:	Boart Long	TVA2r			
Drill personnel:	Doan Long	jycai			
Drill #:					
DRILLING PROGRES	e.				
	<b>3</b> .		Nimbe Obite		
Day Shift			Night Shift		
Start depth:			Start depth:		
End depth:			End depth:		
Total depth drilled:			Total depth drilled:		
Casing installed:			Casing installed:		
Any rods/casing/tool:	s lost in th	e drillhole?	If yes, what was lost?:		
Delays/Problems: (bro	eakdowns,	stuck rods, bit change,	weather, wait time, drill r	nove, etc) F	Provide time estimate
WATER USE ASSESS	SMENT:				
Sediment control me	asures in I	olace:			
Assessment of effect					
Approximate water le		no:			
Color of water in sum	~*~*	<u> </u>			
Color of runoff?:	.p.				
Conductivity reading	e?·	Station #	Reading		
Conductivity reading	J : .	Station #	Reading		
		Station #	Reading		
Turbidity sample(s) to	okon2:	Sample #	Reading		
Turbiuity Sample(S) to	anelii.	Sample #	Reading		
SITE ASSESSMENT:		Sample #	Reading		
	<del>,, ,,</del>		41.14.3		
Are wildlife present?	(check lo	g for previous wildlife	e activity)		
Is site safe for drilling					
Stable platform	Yes / No		Fire Extinguisher	Yes / No	
First Aid kit	Yes / No		Eye Wash	Yes / No	
PPE	Yes / No		Spill Kits	Yes / No	
			Lined Berms	Yes / No	
Safety concerns/issu	es:				
Environmental conce	rns?:				
***************************************					
Corrective action req	uired?				
Action plan (if require					
Responsible party:	<i>.</i>		Date to be completed:		
	uirad ta d	ocument problems an			
PHOTOGRAPHIC RE		Jeument problems an	d corrective actions)		
		Di			N (N
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	g drilling?	Photo of water manage			Yes / No
Name:			Folder:		
Uploaded to hard drive	?:				
COMMENTS:					

Revision 1 June 19, 2009

	POST-DRILLING INSPECTION REPORT
TD - (() - 1	BIM personnel:
<b>T</b> Baffinland	Date:
Iron Mines Corporatio	
Thorn Willies Compensation	Final hole ID:
HOLE INFORMATION:	•
Deposit #:	Collar location: E
Project: MARY RIVER	(NAD 83) N
Area: BAFFIN ISLAND	Dip:
NTS: 37G/5	Azimuth:
Elevation:	EOH:
Description of drillhole location:	LOII.
Purpose of drillhole:	
ruipose oi uriiliole.	
DRILLING INFORMATION:	
Drill contractor:	
Drill personnel:	
Drill #:	
End of drilling:	
Casing:	
Any rods/casing/tools lost in the drillhole?	If yes, what was lost?:
Are rods/casing left in the ground cut at ground	d level and is the hole properly plugged and capped?  Yes / No
Next set-up collar location:	N
WATER USE ASSESSMENT:	
Water source: Mary River	
Pump station #:	
Total amount of hours water was pumped from	pumpstation:
SITE ASSESSMENT:	· ·
All materials and debris removed from site?	Yes / No
	s / No If yes, please decribe below:
Any additional work required? Yes	s / No If yes, please decribe below:
This additional work required:	ii yes, piedse decinbe below.
Corrective action:	
Responsible party:	
Date to be completed by:	
Date to be completed by.	
DUOTOOD A DUUG DEGODD	
PHOTOGRAPHIC RECORD:	
Photo of drillhole location following demobilization	
Name:	Folder:
Uploaded to hard drive?:	
COMMENTS:	
INSPECTION COMPLETED BY:	
BIM signature:	Drill contractor signature:
نستنست ب	

Revision 1 June 19, 2009



Section 2.22 Water Sampling for On-Ice Drilling

### **Environmental Concerns**

On-ice drilling is critical for geotechnical investigations so that information for bridges and water crossing structures may be collected for use in design. Marine and lake environments are sensitive to disturbances, such as on-ice drilling. As such, overall water quality, including occurrence and concentrations of suspended solids and trace metals, must be monitored and protected. Water samples should be taken prior to on-ice drilling and after on-ice drilling to ensure appropriate water quality standards are maintained. It is important that the procedures for water sampling and on-ice drilling, indicated herein, are followed as these are requirements of the water licence (No. 2BB-MRY0710 Type "B" - Amendment No. 2 issued to Baffinland Iron Mines Corporation by the Nunavut Water Board, February 29, 2008). Water sampling, for the purposes of water monitoring and detection of exceedences, will ensure that the water quality is not compromised in the water bodies where on-ice drilling occurs.

### **Environmental Protection Procedures**

The following procedures will be followed to ensure that on-ice drilling (for both inland and marine environments) will not compromise the water quality of the underlying water body:

- A location not more than 30 m downstream (if applicable) from the proposed drillhole location will be selected for pre-drilling and post-drilling water samples.
- The pre-drilling water sample will be taken no more than four hours prior to drilling commencing at that location.
- The post-drilling water sample will be taken within four hours of the rods and casing being removed from the hole and the drill being decommissioned.
- The following methodology will be used to collect the water samples:
  - 1. A hole will be augered through the ice and ice cuttings will be cleared from the hole
  - 2. A bailer will be used to obtain a representative water sample from the water column below the bottom of the ice
  - 3. The water sample will be transferred to sample bottles
  - 4. The same hole will be used to collect the pre-drilling and post-drilling water samples
- Water samples will be tested to ensure that the total suspended solids (TSS) concentration does not increase by more than 10 mg/L for water bodies with background levels under 100 mg/L, or by more than 10% of the background level for water bodies with background levels above 100 mg/L.
- Before and after water samples will be tested to monitor TSS, pH and electrical conductivity in the field.
- Before and after water samples will be submitted for laboratory testing to monitor total trace metals as determined by a standard ICP scan (to include at a minimum, the following elements: Al, Sb, Ba, Be, Cd, Cr, Co, Cu, Fe, Pb, Li, Mn, Mo, Ni, Se, Sn, Sr, Tl, Ti, U, V, Zn), and total arsenic and mercury.
- Drill water and cuttings reporting to surface from on-ice drilling will be discharged into a portable containment sump and removed from the ice. Water and cuttings will be stored in a pit at least 30 m from any water body, as specified by Baffinland and Knight Piésold.
- The Operational Standard (Section 2.5) for Drilling Operations will also be followed in conjunction with the procedures listed above.