WATER LICENCE INSPECTION FORM

☐ Original
☐ Follow-Up Report

Licensee	Licensee Representative
BAFFINLAND IRON MINES CORPORATION	William Bowden
Licence No. / Expiry	**Representative's Title**
2AM-MRY1325	Environmental Superintendent
Land / Other Authorizations	**Land / Other Authorizations**
8BC-MRY1416, 2BE-MRY1421	N2014X0012, N2014Q0016, N2014C0013
Date of Inspection	**Inspector**
August 22-23, 2018	Jonathan Mesher

Activities Inspected

☐ Camp ☐ Drilling ☒ Mining ☐ Construction ☐ Reclamation ☐ Fuel Storage
☐ Roads/Hauling ☐ Other: ☐ Other:

Conditions: **A - Acceptable** **C - Concern** **U - Unacceptable** **NA – Not Applicable** **NI – Not Inspected**

Water Use	Condition	Comment	Site Conditions	Condition	Comment	Haz/Mat Management	Condition	Comment
Intake/Screen	A		Water Management Structures	C	4	Storage	C	3
Flow Measure. Device	A		Culverts / Bridges	A		Spills	A	
Source:	A		Drainage	C	2	Spill Plan	A	
Water Use:	A		Erosion / Sediment	C	2,10			
Recirculation (y /n)	N		Mitigation Measures	A		**Administrative**		
Containment Ditches	U	1,2,6, 8	Reclamation Activities	A		Records	A	
			Materials Storage	A		Reports	Ni	
Waste Disposal			Signage	A		Plans	Ni	
Waste Water	U	1,2				Notifications	A	
Solid Waste	A	5	**Monitoring**			**Other**		
Hazardous Waste	C		Sample Collection / Analysis	NI				

**The number in the comments field will correspond with specific comments provided below.*

Samples taken by Inspector:	
☐ Yes ☒ No	

SECTION 1 ☒ **Comments** (s.__) ☐ **Non-Compliance with Act or Licence** (s.__) ☐ **Action Required** (s.__)

Background

At the time of inspection, the Licensee was undertaking activities related to the operation of an open-pit iron ore mine at the Milne Port (Milne Inlet), Mine Site (Mary River), and Tote Road. Construction activities on site include the construction of the new 800 man camp at Mary River site, maintenance along the tote road, increasing the capacity of the Ore Crusher Pad Sedimentation Pond and construction of a pad across from the Mine Site Complex (MSC).

The Inspector noted the following concerns listed below and is requesting that the licensee provide a response to the concerns within 30 days of receiving this Inspection Report.

1. **Ore Crushing Area and Associated Water Management Structures**
   a. At the time of the inspection the licensee was in the process of increasing the capacity of the crusher pad sedimentation pond, there we no concerns noted. See Photo 1.

   b. As mentioned in previous Inspection Reports from June 22-24 2018, Section 1b, the pooling water inside the crusher pad leads the inspector to believe that the slope of the pad is inconsistent with the approved design drawings. See Photo 2.

   c. During the inspection it was noted that, a pile of iron ore is outside of containment. Please remove the ore from outside containment, see Photo 3. A red circle labeled "#2" identifies the misplaced iron ore's location.

   d. As required in the design drawings and as mentioned in the previous Inspection Report, there is no 8m buffer for single lane traffic between the stockpile and surrounding ditches. This issue is limiting access to the ditches and causing ore to fall off the stockpile directly into these water management structures.

e. Some areas of the ditches surrounding the facility do not appear to meet the minimum design criteria for internal surface drainage as described in the document labeled, "Civil Design Criteria by Hatch, 2013." This document states that; "The design criteria proposed in this document shall be treated as minimum requirements for the intended infrastructure design."
   I. "All drainage ditches should be of trapezoidal cross sections, where possible." This does not appear to be applied at the location identified in photo #3. A red circle labeled "#1" identifies this location.
   II. "Minimum set back distance of structures from top of drainage ditch slopes shall be 3 m." This is not applied; some locations have the stockpile leading into the ditching.
   III. "All interior site grading and roads shall be designed to provide continuous overland flow without erosion to a drainage ditch system." Due to pooling inside the ditch system this does not appear to be applied.

2. Waste Rock Stockpile and Associated Water Management Structures

a. At the time of the inspection the licensee had the majority of the waste rock stockpile sedimentation pond drained to inspect the liner for the cause of the seepage; a consultant had surveyed approximately 80% of the liner and has not identified the cause of the seepage.

b. There was minor pooling at the top of the sedimentation pond berm walls and some signs of erosion. See Photo's 4 and 5 for documentation of the pooling and erosion.

c. Some areas of the ditches surrounding the facility do not appear to meet the minimum design criteria for internal surface drainage as described in the document labeled, "Civil design criteria by Hatch, 2013." This document states that, "The design criteria proposed in this document shall be treated as minimum requirements for the intended infrastructure design. "Relevant sections to note:
   I. "All drainage ditches should be of trapezoidal cross sections, where possible." This does not appear to be fully applied to the ditches surrounding this facility.
   II. "All interior site grading and roads shall be designed to provide continuous overland flow without erosion to a drainage ditch system." Due to pooling inside the ditch system and significant sedimentation accumulation in the pond, this does not appear to be applied.
   III. "Ditches shall be designed to convey a 1 in 25 year flood event." The inspector is uncertain if all areas of the ditches are designed due to ditch width and height inconsistences. See Photo #7.
   IV. "Drainage berms diverting overland flow from the waste rock drainage area to the sedimentation ponds shall be a minimum of 1.0 m high with 1.5H:1V side slopes and 0.5 m top width." Some areas do not appear to have diversion berms to divert overland flow of non-contact water. See Photo #7

d. PART E, Item 11, of the water licence 2AM-MRY1325 states that, "The Licensee shall carry out weekly inspections of all structures designed to contain, withhold, divert or retain Waters or Wastes during periods of flow and maintain records of the inspections and findings, for review upon the request by the Board or an Inspector." Please provide the records of the inspections and findings for 2018 by October 15, 2018.

3. Hazardous Waste Berms (HWB)

a. In the past inspection reports, the inspector noted a rip in the liner of Hazardous Waste Berm #7, the licensee has since repaired the liner.

b. During the inspection all hazardous waste berms were retaining large amounts of potentially contaminated water with the exception of HWB #5; this observation leads the inspector to believe that the liner of this HWB has been jeopardized. Please conduct an internal investigation to determine the condition of this HWB, until this HWB is determined to be operating as intended please discontinue the use of the structure. See Photo #9 for a photo of the concerning HWB.

4. Polishing Waste Stabilization Ponds (PWSP)

a. During the time of the inspection there were two areas of the PWSP's at the mine site where the liners were not properly keyed-in. To prevent future damage, it's recommended that the licensee weigh down the areas on the liner that are subject to wind uplift. See Photos 10 and 11 for the areas of concern.

5. Non-Hazardous Landfill

a. In previous inspection reports there were concerns noted regarding the deposit of unauthorized waste to this facility.

b. During this inspection it was noted that the licensee now locks this facility limiting access and tracks what employees access the dump in hope to limit the unauthorized deposit of waste.

6. **Ore Stockpile Pad and Related Water Management Structures at Milne Inlet**
    a. During the inspection it was noted that the swales highlighted in photo #12 have not been installed/ implemented.

    b. There was ore outside containment on the South-West corner of the facility; the licensee is to recover this Ore from outside containment.

    c. The ditch on the East side of the conveyer belt appears to be sloping away from the sedimentation pond.

    d. Remnants of the original bulk sample are still left outside of containment to the east of the west sedimentation pond; Baffinland is to remove the remainder of the bulk sample.

7. **Bulk Fuel Storage in Milne Inlet**
    a. During the inspection it was noted that the licensee had completed the installation of a three million litre fuel tank and had completed the construction of a pad to hold a fifteen million litre tank. No concerns were noted about this construction.

8. **Proposed Camp Pad in Milne Inlet**
    a. The recently constructed diversion ditches around this facility do not appear to be constructed properly. There is aggregate built up in the center blocking the water from flowing out of the ditch. The licensee is to return this water management structure to its approved design.

9. **Western Global Fuel Module at Milne Inlet**
    a. Due to the accumulation of dirt inside this facility it was recently modified by the licensee in an attempt to stop water from flowing from the facility into the environment. After reviewing the issued for construction drawings, it is evident that this facility is no longer operating as intended in regards to water/waste retention. The licensee is to return this facility to its approved design.

10. **Areas of Erosion and Flooding**
    a. At the time of the inspection there were two areas where surface water has flooded roads; one area is on the road leading to the effluent outfall to Mary River (see Photo #14 for the area of concern), The second area is between the run way and the Polishing Waste Stabilization Ponds(see Photo #15 for the area of concern). In Part E, Item 19 of the license 2AM-MRY1325 it states that, “The Licensee shall undertake appropriate corrective measures to mitigate impacts on surface drainage resulting from the Licensee’s operations.” And PART D CONDITIONS APPLYING TO CONSTRUCTION AND OPERATIONS, Item 5, of the license 2AM-MRY1325 states “The Licensee shall implement sediment and erosion control measures, as required, prior to and during the Construction and Operations Phases of the Mary River Project to prevent and/or minimize sediment loading into Water.”

    b. There does not appear to be any water management in place to prevent the licensee from driving through this surface water or to prevent unnecessary sedimentation and erosion. It is required that the licensee follow the procedures set out in, PART G CONDITIONS APPLYING TO MODIFICATIONS, of the license 2AM-MRY1325 and install the appropriate water management structures.

☐ Comments	☒ Non-Compliance with Act or Licence	☒ Action Required

Failure to comply with this Licence will be a violation of the Act, subjecting the Licensee to the enforcement measures and the penalties provided for in the Act.

The inspector is requesting that the licensee provide a response to the following Non-compliance and Actions required within 30 days of receiving this Inspection Report.

1. The licensee is to ensure that the crusher pad and associated diversion ditches are built to the design drawings prior to the freshet of 2019.

2. The licensee is to imminently construct the containment ditches surrounding the Waste Rock stockpile as describe in the document “Civil, Design criteria” and install the required ditches to divert non-contact surface water away from this facility.

3. The licensee is to ensure that the Hazardous Waste Berm #5 is still capable or retaining water/waste.

4. Once the Ore stockpile pad is clear of Ore, the licensee is to clear the swales highlighted in photo #12 and keep them clear of Iron Ore so that the pad operates as intended.

5. The licensee is to ensure that the slope of the ditches surrounding the Ore Stockpile Pad corresponds with the approved design.

6. The licensee is to return the Western Global Fuel module at Milne Inlet to its original approved design.

7. The licensee is to correspond with the NWB and follow the required processes to install the required water management structures to prevent water from flooding the roads identified in Photo's 14 and 15.

SECTION 3	☐ Comments	☐ Non-Compliance with Act or Licence	☐ Action Required
Click here to enter text.			

Licensee or Representative	Inspector's Name
	Jonathan Mesher
Signature	**Signature**
Date	**Date**
	September 25, 2018

Office Use Only:	Follow-up report to be issued by Inspector	☐ Yes	☐ No

CC: Licensing Department, NWB
Justin Hack, Manager of Field Operations, INAC

PHOTO LOG

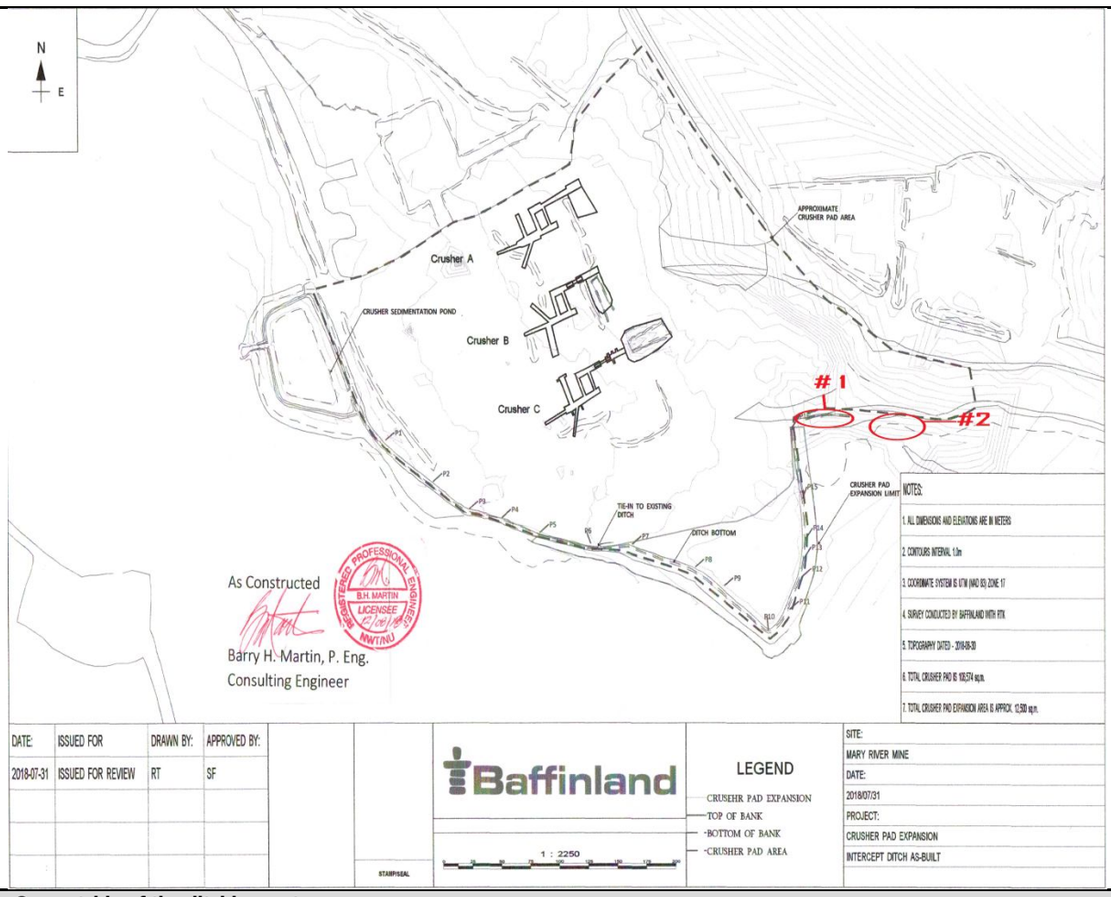
Date	Camera	Inspector	Authorization
August 22, 2018	Sony Cyber-shot	J.Mesher	2AM-MRY1325
Photo Log		**Location Baffinland**	
Photo 1			

Description: Crusher sedimentation pond increase

Photo Log #	Location Baffinland
Photo 2	

Description: Pooling facility

Photo Log #	Location Baffinland	
Photo 3	N	W



Description: Ore outside of the ditching system.

Photo Log #	**Location: Baffinland**	
Photo 4	N	W

Description: Pooling on Waste rock stockpile sedimentation pond berm

Photo Log #	Location Baffinland
Photo 5	

Description: erosion on the waste rock stockpile sedimentation pond berm wall.

Photo Log #	Location Baffinland
Photo 6	

Description: Debris in the WRSP ditches

Photo Log #	Location Baffinland
Photo 7	

Description: Debris in the WRSP ditches, not a trapezoidal shape, appears to be under capacity and no diversion berms to divert non-contact water.

Photo Log #	Location Baffinland

Photo 8

Description; inconsistencies in the ditches, lack of diversion berm and pooling inside ditches.

Photo Log #	Location Baffinland

Photo 9

Description; I Concerning Hazardous Waste Berm

Photo Log #	Location Baffinland

Photo 10

Description; PWSP liner not weighed down.

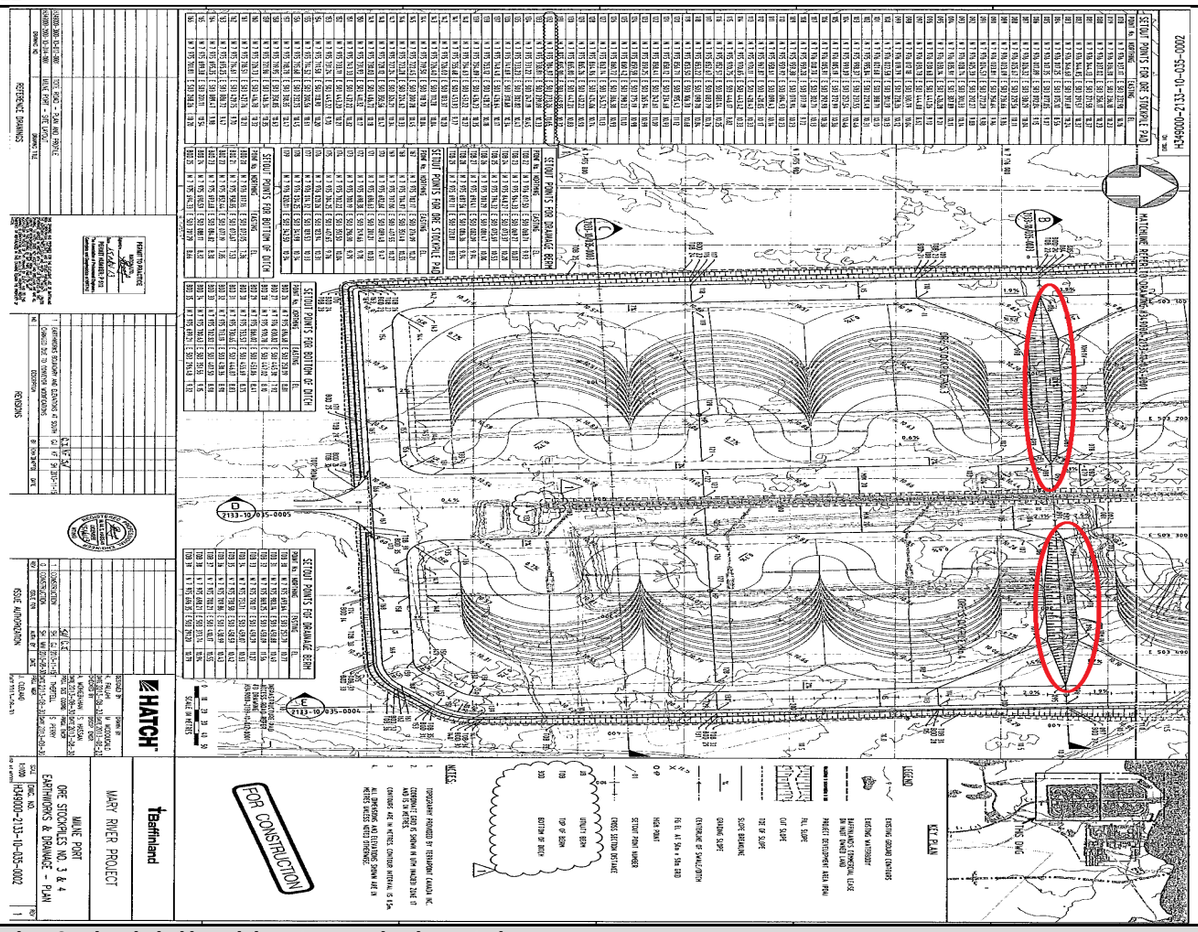
Photo Log #	Location Baffinland

Photo 11

Description; PWSP liner not weighed down.

Photo Log #	Location: Baffinland

Photo 12



Description; Swales circled in red do not appear implemented.

Photo Log #	Location Baffinland

Photo 13

Description; Ditch not constructed to design.

Photo Log #	Location Baffinland
Photo 14	

Description; Flooding of the Mary River outfall access road

Photo Log #	Location Baffinland
Photo 15	

Description; flooding of the road between the polishing waste stabilization ponds and the runway