



WATER LICENCE INSPECTION FORM

☒ Original  
☐ Follow-Up Report

Licensee	Licensee Representative
Baffinland Iron Mines Corporation (BIMC)	Jim MILLARD/Allan KNIGHT
Licence No. / Expiry	Representative's Title
2AM-MRY1325	Environmental Manager
Land / Other Authorizations	Land / Other Authorizations
8BC-MRY1416, 2BE-MRY1421	N2014X0012, N2014Q0016, N2014C0013
Date of Inspection	Inspector
May 18-20, 2016	Justin HACK
Activities Inspected	
<input checked="" type="checkbox"/> Camp <input checked="" type="checkbox"/> Roads/Hauling	<input type="checkbox"/> Drilling <input type="checkbox"/> Other: <input checked="" type="checkbox"/> Mining <input type="checkbox"/> Construction <input type="checkbox"/> Other: <input type="checkbox"/> Reclamation <input checked="" type="checkbox"/> Fuel Storage

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	NI		Water Management Structures	U	1,2,4,8 10,11, 12	Storage	NI	
Flow Measure. Device	NI		Culverts / Bridges	U	7	Spills	NI	
Source:	A		Drainage	C	1,4	Spill Plan	A	
Water Use:	A		Erosion / Sediment	U	6,7			
Recirculation ( y /n)	NA		Mitigation Measures	C	1,2,6,7	Administrative		
			Reclamation Activities	A		Records	NI	
			Materials Storage	C	13	Reports	A	
Waste Disposal			Signage	A		Plans	A	
Waste Water	A					Notifications	A	
Solid Waste	A		Monitoring			Other		
Hazardous Waste	A		Sample Collection / Analysis	NI		Follow-up from previous inspection	U	
*The number in the comments field will correspond with specific comments provided below.								
Samples taken by Inspector:			Location(s): (1) Sheardown Lake Tributary 1 before it enter Sheardown Lake, and (2) small Camp Lake tributary, downstream of exploration camp, before it enters Camp Lake					
<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No								

SECTION 1	<input checked="" type="checkbox"/> Comments	<input type="checkbox"/> Non-Compliance with Act or Licence	<input type="checkbox"/> Action Required
<b>Inspectors Statement</b>			
<p>On May 18-20, 2016, a water licence inspection was conducted at the Mary River Project, Qikiqtani Region, Nunavut. Sites inspected included the Mary River Mine Site, the Tote Road and related infrastructure, and the Milne Port area.</p> <p><b>Weather Conditions on Site</b></p> <p>The site remained largely snow covered at the time of the inspection; however, due to unusually warm weather freshet had just begun causing significant snowmelt to enter watercourses.</p> <p><b>Summary of Report</b></p> <p>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), Tote Road. Most major construction activities have finished and BIMC is primarily mining ore and transporting it to Milne Port in preparation for open water season.</p> <p>Prior to the Inspection, BIMC has reported high levels of suspended solids are entering watercourses. This has been reported to relevant parties through Spill Report #: 16-158, 16-176, 16-181.</p> <p>During the inspection, it was evident that sediment entering watercourses was a concern. Water flowing within the water courses at Mary River and along the Tote Road was significantly discoloured, amplified by the effect of iron oxidation. While on site, it was observed that sediment entering water was a consequence of:</p> <ul style="list-style-type: none"><li>• Over winter dust accumulation on the snow from project activities (i.e. crushing ore and material, transporting material on the Tote Road, and storing material in stockpiles). Snow stained with red iron dust is evident throughout the site,</li><li>• snowmelt entering watercourses with dust entrained in the snow,</li><li>• run-off from the road surface,</li><li>• surface water management structures not fully implemented to proactively deal with freshet and manage erosion and sedimentation; and,</li><li>• recent and continued construction of infrastructure.</li></ul>			



Due to the concerns of sediment entering watercourses, BIMC has committed to implementing a plan to address the sedimentation of watercourses around the site. This plan is to be provided to the Inspector by June 22 2016, and is to outline specific measures to be implemented within the 2016 season to effectively deal with sedimentation entering watercourses and to address freshet 2017.

SECTION 2	<input type="checkbox"/> Comments	<input type="checkbox"/> Non-Compliance with Act or Licence	<input checked="" type="checkbox"/> Action Required
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**Water Management Structures:**

- 1. Ore Stockpile Pad Diversion Ditches and Ore Stockpile Settling Ponds at Milne Inlet
  - a. No snow was contained on the Ore Stockpile Pad; however, significant water was present within the facility.
  - b. During this inspection it was noted that the ore stockpile diversion ditches and the ore stockpile settling ponds were still not completed.
  - c. BIMC has not met the deadline they committed to in June 2016 whereas diversion ditches and the settling ponds would be properly commissioned prior to freshet 2016.
  - d. INAC was not informed prior to freshet 2016 that this commitment would not be met.
  - e. Following the inspection, BIMC has submitted a plan entitled, “*Milne Stockpile Pad Water Drainage System – Execution Plan and Schedule,*” whereas BIMC has again committed to completing this work prior to July 18, 2016.
- 2. Water Management Structures along the Tote Road
  - a. In previous inspections, it was recommended that BIMC proactively identify areas that are more prone to silt-loading and implement appropriate sedimentation mitigation measures. The location near to David Lake, KM78 to KM86, was identified as a high risk area.
    - i. Specifically, BIMC committed to installing armour stone in ditches that receive high levels of flow prior to Freshet 2016.
    - ii. At the time of the inspection, appropriate sedimentation mitigation measures were not installed in areas of high risk.
    - iii. INAC was not informed prior to freshet 2016 that this commitment would not be met.
    - iv. BIMC has committed to developing a plan with timelines and measureable deliverable to address their erosion prevention measures on the Tote Road prior to June 22, 2016.
- 3. Water Management Structures along the Mine Haul Road
  - a. BIMC has completed significant work, since the last inspection on the Mine Haul Road, to deal with erosion and sedimentation.
    - i. Ditches along this road were armoured with rip-rap.
    - ii. Water was being effectively diverted into these ditches and then into small sedimentation ponds before entering culverts.
    - iii. Armouring stone was installed downstream of culverts to reduce sedimentation and erosion.
  - b. Water accumulating on the road was being diverted to temporary road drainage structures.
- 4. Ore Crushing Area and associated Sedimentation Ponds
  - a. In the previous inspection, there were concerns with the erosion protection deficiencies along the natural drainage edge of this facility as well as minor tear/punctures in the liner.
    - i. It was observed during the inspection that the previous concerns noted have been addressed. Rip-rap has been installed along the natural drainage edge and minor punctures have been repaired.
  - b. During this inspection, water was pooling in the ore crushing area.
  - c. Prior to the inspection, a sinkhole formed within the facility likely from excess water accumulation.
  - d. It is recommended that BIMC grade the ore crushing area to properly drain the facility towards the sedimentation ponds.
- 5. Waste Rock Pile water collection pond
  - a. At the time of the inspection, the waste rock pile water collection pond was currently being commissioned.
  - b. Interceptor ditches not yet completed.
  - c. No major concerns with this structure.

**Sedimentation:**

- 6. During the inspection, there were significant sedimentation and erosion events (as indicated by red rust coloured water) actively occurring within watercourses along the Tote Road and entering David Lake, Mural Lake, Kabikok Lake, Sheardown Lake (see *Photo 1*), Camp Lake (see *Photo 2*), Mary River and Phillips Creek.
  - a. The cause of this sedimentation and erosion events is likely loose soils becoming suspended during higher flow events, run-off of water from the Tote Road, and from dust entrained within snow (resulting the crusher, the tote road and the ore stockpile) melting and entering the watercourses.
  - b. During freshet it was observed that BIMC prioritized sedimentation control measures in certain streams; however, the extent of the sedimentation event was too large to control with reactionary measures.
  - c. Significant pre-planned sedimentation control measures prior to sedimentation events are likely required to meet conditions of the Water Licence.



- d. Water samples were taken by the Inspector to confirm water quality at Sheardown Lake Tributary 1, and a small tributary entering Camp Lake.
  - i. The water quality sample at Sheardown Lake Tributary 1 had a Total Suspended Solid (TSS) result of 50.4mg/L. This level is within the Effluent Quality Limits for Surface Runoff during the Construction phase as construction was occurring directly upstream of this sample location.
  - ii. The water quality sample taken at the stream entering Camp Lake near the monitoring location MS-MRY-1 had a TSS result of 114mg/L. This sample exceeded all effluent quality limits within the licence.
  - iii. **A letter of Non-Compliance has been issued as a warning to BIMC because previous commitments were not addressed to mitigate the effects of sediment loading to water.**
7. Bridges along Tote Road
  - a. During wet conditions on the Tote Road, it was noted that road material is being pushed into all water courses that are crossed by a bridge.
  - b. During the inspection, there was significant sediment on snow below the bridge (see *Photo 3*).
  - c. It is requested that BIMC address this concern in their plan due June 22, 2016 which is to address sedimentation issues along the Tote Road.

#### **Sites of Concern noted from Previous Inspections:**

##### **Water Management Structures:**

###### *Mine Site*

8. Jetty at Camp Lake
  - a. Significant erosion has occurred at the Jetty at Camp Lake. Further erosion and sedimentation is likely to occur if this issue is not addressed.
  - b. BIMC has provided a schedule and plan on timelines to address this concern:
    - i. In Late June 2016: install silt curtains around the facility.
    - ii. In July 2016: complete work on the structure.
9. Jet Fuel Tank Farm Containment at Aerodrome
  - a. During a previous inspection, it was noted that the crest and profile of the embankments were not maintained.
  - b. During the May 2016 inspection the berms/ embankments appeared to be well maintained.
10. Bulk Fuel Storage Facility Containment.
  - a. The embankment crest and some side slopes were not maintained to the design profile as required.
  - b. During the May 2016 inspection this structure was not inspected, INAC will follow up in the next inspection.
11. Hazardous Waste Containment
  - a. During a previous inspection, it was noted that the crest width and profiles of some of these facilities near the aerodrome were not in good shape. There were indications of manoeuvring of tracked machinery over the embankment resulting in a disturbed embankment profile. It is recommended these containments receive maintenance.
  - b. During the May 2016 inspection this structure was not inspected, INAC will follow up in the next inspection.

###### *Milne Port Site*

12. Hazardous Waste Containment Facility
  - a. During a previous inspection, it was noted that some of the berm crest widths and profiles were not in good shape and there were indications of manoeuvring of tracked machinery over the berms.
  - b. It is suggested that these containments be sign-posted warning of the shallow cover material thickness over the liner limiting traffic movements and caution when placing heavy, sharp, or other large objects which may have the potential to puncture the liner.
  - c. BIMC has addressed this and said consideration is being given to the strategic installation of barriers and/or signs.
  - d. During the May 2016 inspection this structure was not inspected, INAC will follow up in the next inspection.

##### **Materials Storage:**

13. Calcium Chloride Storage Area
  - a. It is recommended that a perimeter berm/drainage ditch be installed to route the runoff away from the storage and down the slope hill to the drainage ditch along the Tote Road as a preventative measure.
  - b. BIMC has committed to visual monitoring and flow mapping of the area during Freshet 2016 and that drainage measures will be implemented as appropriate.
  - c. During the May 2016 inspection this structure was not inspected, INAC will follow up in the next inspection.





Waste Water:

14. Accumulated Water at the new maintenance building at KM60 on the Tote Road
- a. During a previous inspection concern was expressed on how BIMC would deal with accumulated wastewater within this facility.

b. BIMC has provided justification that water will not accumulate within this facility or migrate from this facility. BIMC has committed to monitor this structure.

Inspector's Name

Justin Hack

Signature

Date

June 16, 2016

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Photo Log # 1

Location: Sheardown Lake Tributary #1



Description: Water laden with sediment entering Sheardown Lake





Photo Log # 2

Location: Camp Lake near Water Intake



Description: Sedimentation entering Camp Lake from small camp lake tributary downstream of exploration camp

Photo Log # 2

Location KM62 Bridge



Description: Road material entering stream at KM62 Bridge