

APPENDIX C.1.2  
Construction Summary Report  
CV-187 Culvert Replacement



# **Baffinland Iron Mines Corporation**

## **Construction Summary Report CV-187 Culvert Replacement**

**June 2025**

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## **APPENDICES**

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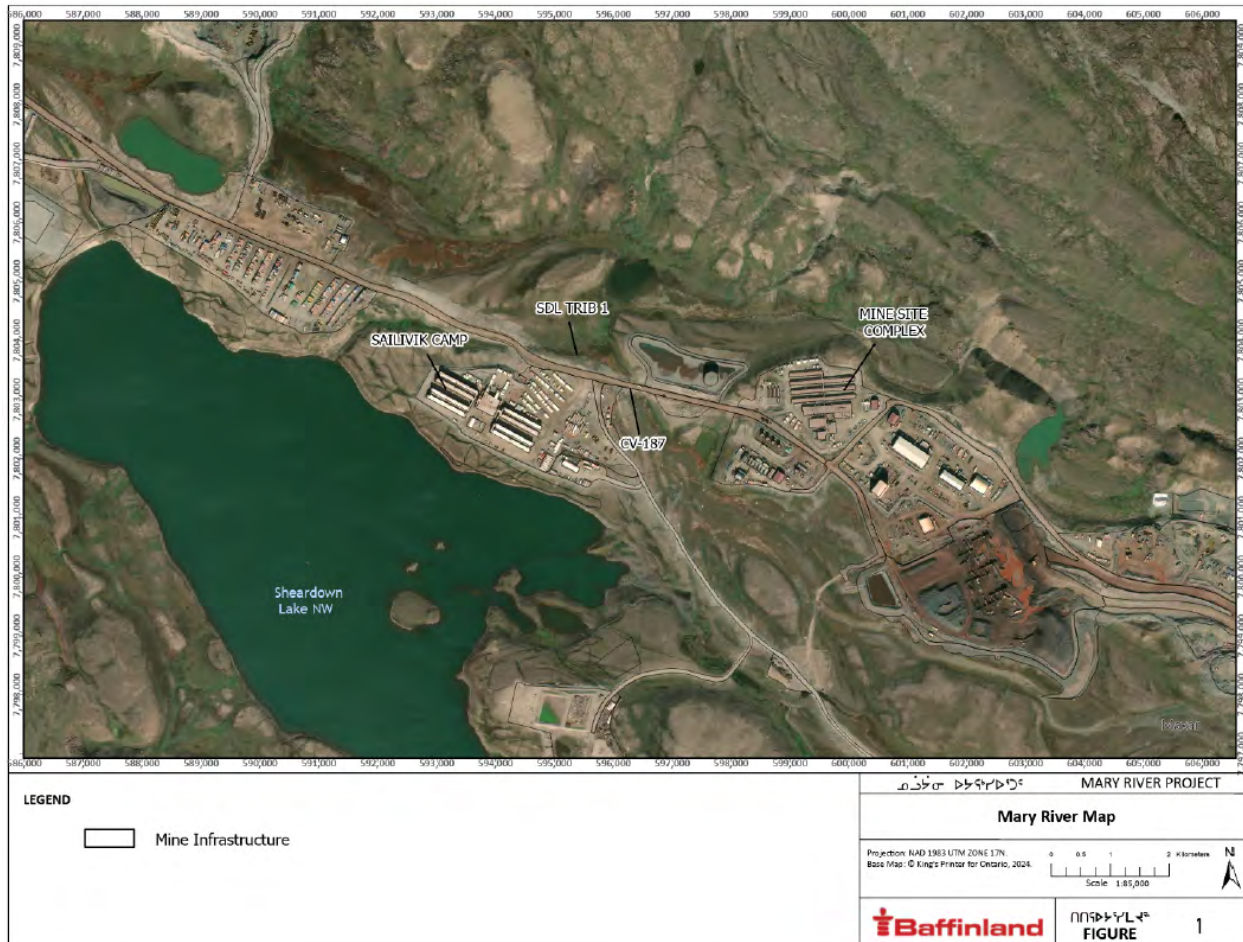
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## 1. INTRODUCTION

Each year prior to freshet, key culverts are cleared of snow then steamed to remove ice blockages, ensuring free flow of run-off and unimpeded fish passage. While steaming CV-187 at KM 103, it was observed that the culvert was blocked due to the collapse of the culverts and infilling with road aggregate (see culvert location in Figure. 1).

On June 17, 2025, Baffinland submitted a notification via email, to the Department of Fisheries and Oceans Canada, Fish and Fish Habitat Protection Program, under Section 38 (4.1) (a) of the Fisheries Act, advising that a blockage of fish-bearing culvert crossing CV-187 at KM 103, was identified. As obliged under Section 38(6) “Duty to take corrective action” of the Fisheries Act, Baffinland provided notice to the DFO of our intention to take corrective measures to restore fish passage at this crossing, as soon as reasonably practicable.

Due to existing conditions at the Mary River Project site (lake surfaces were still frozen), the young of year (YOY) were not yet using the tributary. Baffinland initiated the corrective measures described below in Section 2, well in advance of the use of this reach of the tributary by the YOY, which is typically around early to mid-July.



**Figure 1. CV-187 Site Location**

## **2. CULVERT REPLACEMENT DESIGN**

Culvert replacement consisted of removing the two existing culverts and replacing, in-kind, with one 900 mm diameter, low flow culvert and one 600 mm diameter, high flow culvert. See Appendix A for IFC and As-built drawings.

## **3. CONSTRUCTION ACTIVITIES**

Construction activities were carried out by Baffinland's Road Maintenance team, with planning and oversight from the Sustaining Projects department and monitoring by the Environmental team. Construction was initiated on the upstream half of the road, followed by the downstream half, to maintain traffic flow through the area. Construction included the following general activities and timelines:

- Watercourse isolation and de-watering – June 21, 2025
- Excavation and removal of all existing culverts from the upstream half of the road– June 21 to 22, 2025
- Installation of replacement 900 mm and 600 mm diameter culverts upstream half – June 22, 2025, 2025
- Backfilling and compaction of upstream half – June 22 to June 23, 2025
- Excavation and removal of all existing culverts from the downstream half of the road – June 23, 2025
- Installation of replacement 900 mm and 600 mm diameter culverts downstream half – June 23, 2025
- Backfilling and compaction of downstream half – June 24, 2025
- Re-grading the upstream and downstream embankments, placement of oversized rip rap – June 24 to 27
- Place and grade ¾ inch aggregate for road driving surface – June 27 to 28, 2025

During completion of the upstream embankment armouring, a smaller sized aggregate, 12" minus, was used in error. The embankment armouring was replaced with over-sized stone on September 9, 2025.

A selection of photographs taken during construction are included in Appendix C.

## **4. ENVIRONMENTAL MEASURES**

Prior to initiating this work, Baffinland engaged our fisheries Biologist to ensure the planned installation was sufficient from a fish passage and hydrologic perspective. A visual assessment for fish presence within the watercourse, was completed prior to initiating construction, see Figure 5. Due to the water temperatures and lake conditions at the time, it was not expected that any fish would be utilizing the stream and none were observed in this tributary.

As outlined in Baffinland's Environmental Protection Plan, specific to Tote Road Watercourse Crossings Installation and work adjacent to or in water, environmental protection measures were implemented that included, but were not limited to:

- Following DFO's Code of Practice: Culvert Maintenance, with the exception that in-water work was required.
- Limit in-stream activity, as much as possible, to low or zero flow. Develop and implement upstream isolation and pump-around plans following DFO's Interim Standard: In-water Site Isolation.

- Sediment and erosion control measures were implemented prior to work commencing and left in place and maintained until all disturbed areas were stabilized. These features were field fit.
- Any stockpiled materials were stored 31 metres away from the OHWM of any waterbody, unless for immediate use.
- Install the crossing to minimize approach grades and at right angles to the watercourse to prevent significant alteration to the original direction of stream flow.
- Stabilize crossing approaches during construction to control runoff of sediment-laden water and erosion.
- Minimize in-water work to the shortest amount of time practicable.
- Machinery is not permitted to travel up the stream bed and fording of any water body is to be kept to a minimum and limited to one area.
- Backfill water crossings with suitable material and ensure stability.

Daily water quality monitoring was completed during active construction, and the monitoring logs are provided in, Appendix B. Following the completion of the culvert replacement, post-construction monitoring is carried out in accordance with Section 5 of the Roads Management Plan (Baffinland 2020). Monitoring consists of assessing for signs of sloughing, erosion or other potential issues and water quality monitoring.

## **5. SUMMARY**

We trust the information presented in this report meets the applicable Water Licence and Commercial Lease requirements for a Construction Summary Report.

Prepared: 

Jim Patterson P. Eng.  
Director, Sustaining Projects

Reviewed: 

Todd Swenson  
Environmental Superintendent

# **APPENDIX A**

## **IFC and As-Built Drawing**



Figure 2. IFC Drawing for CV-187 Culvert Replacement

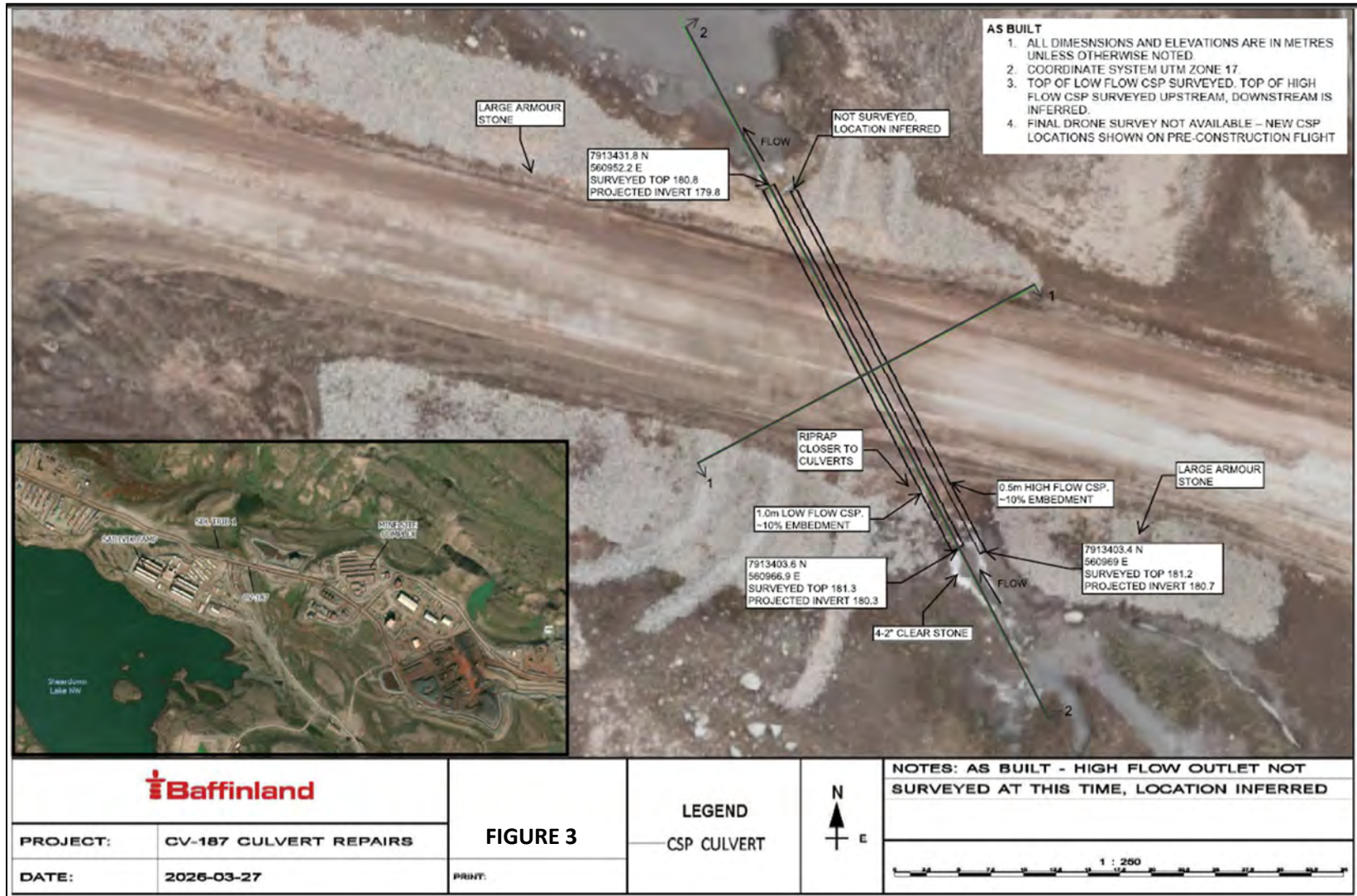


Figure 3. CV-187 Replacement As-built

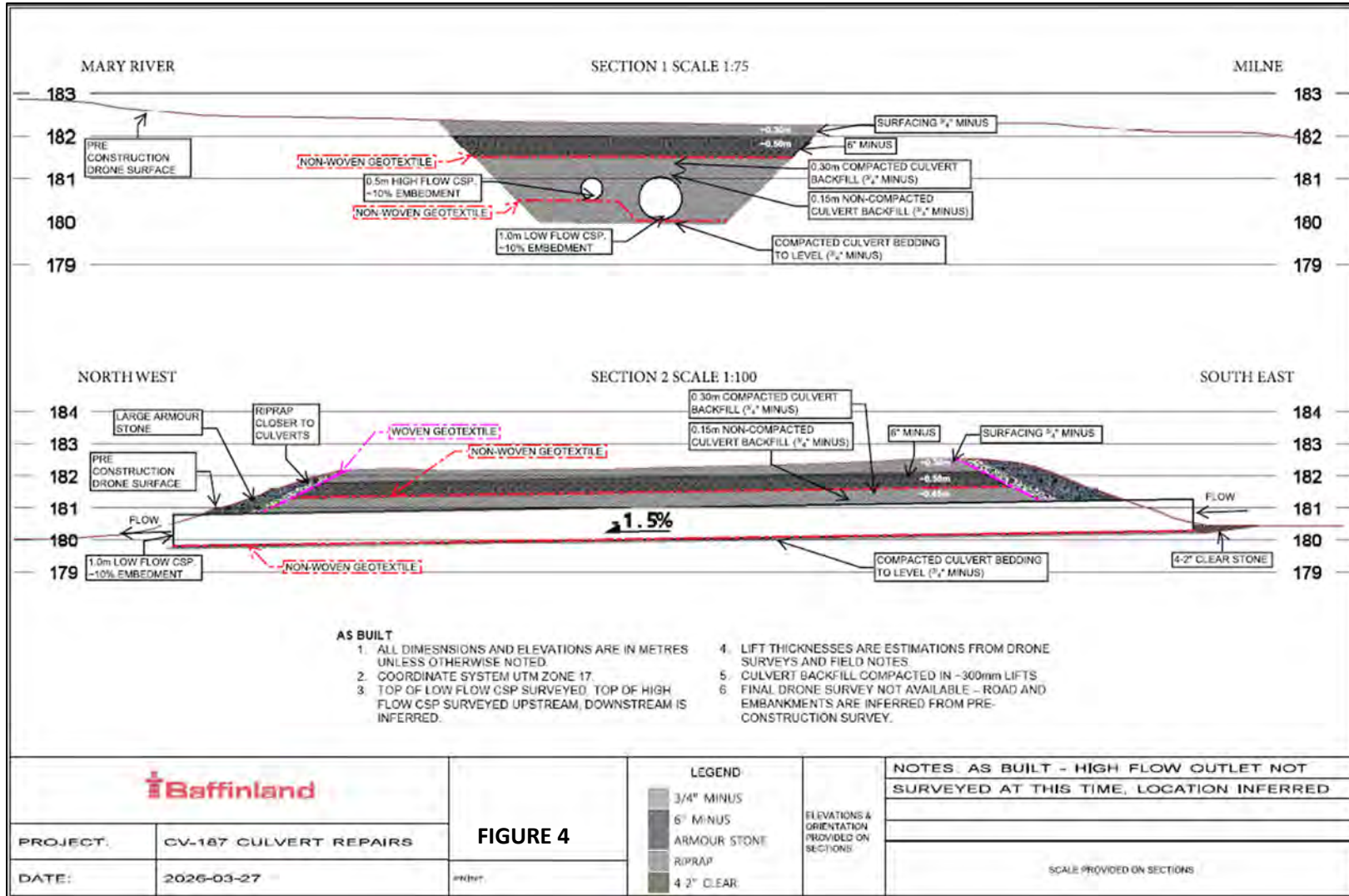


Figure 4. CV-187 Replacement As-built

## **APPENDIX B**

### **Environmental Monitoring**



**LEGEND**

- Mine Infrastructure
- Fish Assessment Area
- Culverts

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MARY RIVER PROJECT

**CV-187 Visual Fish Assessment Area**

Projection: NAD 1983 UTM ZONE 17N  
Base Map: © King's Printer for Ontario, 2024

0 0.02 0.04 0.07 KM  
Scale: 1:2,600

N

**Baffinland** ᑭᓄᓐ ᑭᓄᓐ ᑭᓄᓐ  
**FIGURE 5**



**WATER CROSSING MONITORING FORM  
PART 1 - GENERAL INFORMATION**

WATER CROSSING ID: <u>CV-187 km 103</u>		Start (YY/MM/DD XX:XX HRS): <u>25/06/21 09:00</u>	Finish (YY/MM/DD XX:XX HRS): <u>25/06/28</u>						
Construction Duration:									
During Frozen Conditions?	Yes / <u>No</u>								
During Periods of Flow?	Yes / <u>No</u>								
<p><b>*IF CONSTRUCTION OCCURS DURING PERIODS OF FLOW, COMPLETE ENTIRE FORM (PART 1 &amp; PART 2A, B &amp; C) (PRE, DURING AND POST CONSTRUCTION WATER QUALITY MONITORING)*</b></p> <p><b>*IF CONSTRUCTION OCCURS DURING FROZEN CONDITIONS, COMPLETE PART 1 &amp; PART 2C OF THIS FORM (POST CONSTRUCTION WATER QUALITY MONITORING)*</b></p>									
<b>CROSSING MODIFICATION / REPAIR DETAILS</b>									
Change in existing design?	Yes / <u>No</u>	If Yes, details of change:							
Final Design (e.g. number of culverts, length, etc.): <u>2 culverts 1x900mm 1x600mm</u>									
Applicable Approvals									
TRAN	<u>NA</u>								
DFO Approvals	<u>NA</u>								
Notes: <u>Notification provided June 17, 2025</u>									
<b>LOCATION</b>									
Datum: <u>UTM</u>	Zone: <u>17</u>								
Easting (m):	Northing (m):	Elevation (from mapping):							
Notes:									
<b>FISH ASSESSMENT PRIOR TO CONSTRUCTION</b>									
Date (YY/MM/DD): <u>25/06/19</u>									
Fish Present?	Yes / <u>No</u>	If Yes, distance from crossing: US / DS							
Spawning Arctic charr present at crossing?	Yes / <u>No</u>	If Yes, contact a biologist							
Spawning site present 20 m upstream or downstream of crossing?	Yes / <u>No</u>								
Notes:									
<b>SEDIMENT AND EROSION CONTROL MEASURES</b>									
Measures Installed:	<u>Watercourse isolation, downstream silt curtain</u>		Date installed: <u>June 21, 2025</u>						
Measures taken to stabilize disturbed areas:			Date removed: <u>June 29, 2025</u>						
Notes:									
<b>PHOTOS</b>									
View across water crossing, view from upstream, view from downstream and view of sediment controls employed.									
	Photo #	Date (YY/MM/DD)	Direction	Vantage Point		Photo #	Date (YY/MM/DD)	Direction	Vantage Point
Before					After				
Across					Across				
From US					From US				
From DS					From DS				
During					Sed. Cont.				
Across					Across				
From US					From US				
From DS					From DS				
Notes:				SEE APPENDIX C Photographs					

**WATER CROSSING MONITORING FORM**  
**PART 2B - DURING CONSTRUCTION WATER QUALITY MONITORING**

WATER CROSSING ID: CV-187			Pg. (X/X): 1/1								
Location (e.g. 100 m downstream)	Date (YY/MM/DD)	Time (XX:XX HRS)	Field Monitoring						Water Sample Collected (Yes / No)	Lab Water Sample ID	Notes
			Turbidity (NTU)	pH (pH Units)	Sp. Cond. (µS/cm)	Water Temp. (°C)	DO (mg/L)	DO (% Sat.)			
50 US	25/06/21	12:15	1149	7.82	566	12.5	10.29	96.5	NO	—	No wind
50 DS		12:30	7.79	8.09	214.4	11.4	12.05	109.9	NO	—	Disturbed water, windy
100 DS		12:35	3.39	8.05	194.4	11.1	11.80	185.5	NO	—	
50 US	V	16:00	7.18	7.96	562	15.4	9.52	95.3	YES	CV-187-US-02	Windy water
50 DS		16:10	6.72	8.28	219.7	13.5	11.32	105.4	NO	—	
100 DS		16:20	7.33	8.15	196.4	13.8	10.85	103.1	YES	CV-187-DS-02	

**Monitoring Frequency:**

Water Sampling - Every eight (8) hours at locations 100 m downstream and 50 m upstream of the affected water crossing, during construction.

Field Monitoring - Every four (4) hours at locations 100 m and 50 m downstream and 50 m upstream of the affected water crossing, during construction.

Note: Field monitoring and water sampling shall be conducted concurrently where frequency and locations overlap.

Adaptive water sampling events will also be conducted when downstream flows are suspected of encroaching on TSS and turbidity criteria limits.





**WATER CROSSING MONITORING FORM**  
**PART 2B - DURING CONSTRUCTION WATER QUALITY MONITORING**

Pg. (X/X): 1/1

Location (e.g. 100 m downstream)	Date (YY/MM/DD)	Time (XX:XX HRS)	Field Monitoring						Water Sample Collected (Yes / No)	Lab Water Sample ID	Notes	
			Turbidity (NTU)	pH (pH Units)	Sp. Cond. (µS/cm)	Water Temp. (°C)	DO (mg/L)	DO (% Sat.)				
50 US	25/06/23	06:27	2.40	7.47	603	8.3	7.86	67.0	YES	CV-187-US-05	Cam 29 Photos 0987-0989	
50 DS		06:38	7.75	7.88	195.9	9.0	11.08	96.0	NO			
100 DS		06:41	3.50	7.78	194.7	9.0	11.05	95.6	YES			CV-187-DS-05
				water is calm, no wind								
50 US			10:35	3.07	7.67	608	14.5	8.70	85.5	NO		
50 DS			10:39	3.37	8.05	198.3	13.6	10.83	104.3	NO		
100 DS			10:41	2.85	8.08	194.1	11.3	11.00	100.4	NO		
				calm, no wind.								
50 US			15:45	2.85	8.34	623	18.0	8.41	89.0	YES	CV-187-US-06	
50 DS		15:50	3.26	8.39	198.1	15.6	10.43	104.8	NO			
100 DS		15:52	2.85	8.26	194.9	12.5	10.56	99.1	YES	CV-187-DS-06	no photo	
			light wind.									
50 US		17:50	4.37	7.92	295.8	17.1	8.30	86.2	NO			
50 DS		17:55	3.69	8.34	203.5	15.5	10.39	104.2	NO			
100 DS		17:57	3.36	8.22	195.1	14.6	10.51	103.5	NO			

**Monitoring Frequency:**

Water Sampling - Every eight (8) hours at locations 100 m downstream and 50 m upstream of the affected water crossing, during construction.

Field Monitoring - Every four (4) hours at locations 100 m and 50 m downstream and 50 m upstream of the affected water crossing, during construction.

Note: Field monitoring and water sampling shall be conducted concurrently where frequency and locations overlap.

Adaptive water sampling events will also be conducted when downstream flows are suspected of encroaching on TSS and turbidity criteria limits.

**WATER CROSSING MONITORING FORM**  
**PART 2B - DURING CONSTRUCTION WATER QUALITY MONITORING**

WATER CROSSING ID: CV-187		Pg. (X/X): 1/1									
Location (e.g. 100 m downstream)	Date (YY/MM/DD)	Time (XX:XX HRS)	Field Monitoring						Water Sample Collected (Yes / No)	Lab Water Sample ID	Notes
			Turbidity (NTU)	pH (pH Units)	Sp. Cond. (µS/cm)	Water Temp. (°C)	DO (mg/L)	DO (% Sat.)			
50 US	25/06/24	06:35	1.35	7.54	606	10.3	8.72	77.9	YES	CV-187-US-07	photos 1026 - 1028
50 DS		06:41	2.72	8.14	198.4	10.9	10.85	98.2	NO		
100 DS		06:43	2.48	8.19	188.0	10.6	10.92	98.2	YES	CV-187-DS-07	1029 - 1031
50 US		10:07	4.37	7.85	621	15.2	8.80	87.7	NO		
50 DS		10:31	3.22	8.21	193.2	14.4	10.90	106.7	NO		
100 DS		10:32	2.74	8.19	189.6	11.7	10.68	98.4	NO		
50 US		14:26	3.26	7.92	627	17.8	12.83	88.5	YES	CV-187-US-08	1052 - 1054
50 DS		14:32	4.13	8.36	196.2	17.4	9.98	104.3	NO		
100 DS		14:34	3.18	8.31	187.1	17.8	10.16	100.3	YES	CV-187-DS-08	1055 - 1057
50 US	18:23	2.56	7.87	474.6	15.6	8.39	84.4	NO			
50 DS	18:27	5.11	8.30	191.4	15.4	10.09	100.9	NO			
100 DS	18:29	4.24	8.28	184.0	13.8	10.38	100.2	NO			

**Monitoring Frequency:**

Water Sampling - Every eight (8) hours at locations 100 m downstream and 50 m upstream of the affected water crossing, during construction.

Field Monitoring - Every four (4) hours at locations 100 m and 50 m downstream and 50 m upstream of the affected water crossing, during construction.

Note: Field monitoring and water sampling shall be conducted concurrently where frequency and locations overlap.

Adaptive water sampling events will also be conducted when downstream flows are suspected of encroaching on TSS and turbidity criteria limits.



## **APPENDIX C**

### **Photographs**



**Photo 1.** Downstream, looking south west, watercourse isolation and silt fence installed, 2025-06-21



**Photo 2.** Upstream, looking west, watercourse isolation, silt fence and coir log installed, 2025-06-21



**Photo 3.** Excavating and removing existing upstream culverts, up to the road centre line, 2025-06-21



**Photo 4.** Upstream looking north,  $\frac{3}{4}$ " minus aggregate placement for crossing foundation, 2025-06-22



**Photo 5.** Survey and grading of channel to achieve proper slope for culverts, 2025-06-22



**Photo 6.** Installing non-woven geotextile over channel bed, prior to culvert placement, 2025-06-22



**Photo 7.** High flow and low flow culverts installed in the upstream half of the crossing, 2025-06-22



**Photo 8.** Upstream culverts backfilled and compacted, 2025-06-23



**Photo 9.** Downstream looking south west, de-watering work area, removing existing rip rap embankment, 2025-06-23



**Photo 10.** Downstream looking south, crossing excavated to road centreline and existing culverts removed, new upstream culvert visible, 2025-06-23



**Photo 11.** Downstream looking south west, connection of downstream culvert section to upstream section, assembly of culverts, 2025-06-24



**Photo 12.** Downstream looking north west, compaction of  $\frac{3}{4}$ " minus around and on top of culverts, 2025-06-24



**Photo 11.** Placing road base aggregate over backfilled downstream culverts, 2025-06-24



**Photo 12.** Downstream looking north, road base compaction, watercourse isolation and downstream silt curtain, 2025-06-24



**Photo 11.** Downstream embankment armoured with over-sized rip rap, 2025-06-27



**Photo 12.** Downstream embankment armoured with over-sized rip rap, rock check dams reconstructed in roadside swale, 2025-06-28



**Photo 13.** Upstream embankment armoured with 12" minus rip rap, 2025-06-29



**Photo 14.** Upstream embankment re-armoured with over-sized rip rap, 2025-09-09

## **APPENDIX D**

### **Concordance Tables**

**NWB Water Licence No 2AM MRY1325 Amendment No.1 (Schedule D)**

Component	Minimum Information Requirements	Corresponding Section of Report Outline
1 a.	description of all infrastructure and facilities designed and constructed to contain, withhold, divert or retain Water and/or Waste	N/A
b.	a summary of construction activities including photographic records before, during and after construction of the facilities and infrastructure designed to contain, withhold, divert or retain Water and/or Waste	Section 2, Appendix C
c.	as-built drawings and design for facilities and infrastructure, in Item 1(a) of this schedule, designed and constructed to contain, withhold, divert or retain Water and/or Waste	Appendix A
d.	documentation of field decisions that deviate from the original plans and any data used to support or developed facilities and infrastructure to withhold, divert or retain Water and/or Waste	N/A
e.	a comparison of measured versus predicted performance of infrastructure and facilities	NA
f.	any blast vibration monitoring and control for quarrying activity carried out in close proximity to fish bearing waters	N/A
g.	monitoring conducted for sediment and explosives residue release from construction areas	NA
h.	monitoring undertaken in accordance with Part D of the Licence during the Construction Phase of the Project.	Section 3, Appendix B
i.	details confirming that the requirements of the CCME guidance document entitled "Aboveground Storage Tank Systems for Petroleum and Allied Petroleum Products (2003)" have been met by the Licensee	N/A
j.	data collected from instrumentation used to monitor earthworks and the interpretation of that data	N/A
k.	a discussion of any unanticipated observations including changes in risk and mitigation measures implemented to reduce risk during construction	N/A
l.	an overview of any method including frequency used to monitor deformations, seepage and geothermal responses;	N/A
m.	a summary of maintenance work undertaken as a result of settlement or deformation of dikes and dams	N/A
n.	a summary of adaptive management principles and practices applied during the relevant phases of the Project and their overall effectiveness	N/A

**Qikiqtani Inuit Association - Commercial Lease No.: Q13C301**

Component	Minimum Information Requirements	Corresponding Section of Report Outline
1	The name and contact information of the person and company responsible for completing the construction, construction monitoring and preparing the As-Built Report.	Cover page and Signature page
2	The name and contact information of the Baffinland representative(s) that QIA can contact should it have any questions or comments regarding the As-Built Report.	Cover Page
3	An introduction to the infrastructure or facilities including but not limited to the construction background, concept and construction history.	Section 1
4	Construction records including As-Built drawings signed and stamped by a professional engineer detailing surveys, planar and cross sections that illustrate all designed components. This should be provided in PDF format, and if requested in native file (e.g. CAD, .dxf, etc.).	Appendix A
5	Detailed description of any deviations from the For-Construction Design. Deviations that should be noted include, but are not limited to; changes in design and construction materials, construction methodology or monitoring.	N/A
6	Observed performance of the construction including a comparison to predicted performance. Recommendations for performance monitoring based on observations during construction if applicable.	NA
7	A description and list of instrumentation installed, if applicable, and results of construction monitoring and post construction monitoring, including all environmental data. Recommendations for additional performance or environmental monitoring based on observations and monitoring results, if applicable.	N/A
8	A summary of quality assurance testing results, if applicable, and comparison of these results to construction/design requirements to ensure performance of the infrastructure or facilities.	NA
9	A summary of adaptive management principles and practices related to environmental management and monitoring applied during the relevant phases of the Project and their overall effectiveness.	N/A
10	Photographic records before, during and after construction of the facilities or infrastructure	Appendix C
11	Map(s) to illustrate the completed construction in relation to Lease boundaries, and water bodies. The minimum distance from completed or modified facilities and infrastructure to the surveyed boundary of the Property, surveyed boundary of the Impact Area, and the ordinary high water mark should be provided.	Section 1, Figure 1