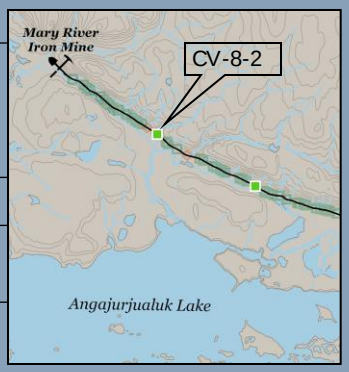
Mary River Iron Mine
Nunavut Water Board Water License
Application Section 9
Representative Crossing Summary Sheet

CV-8-2

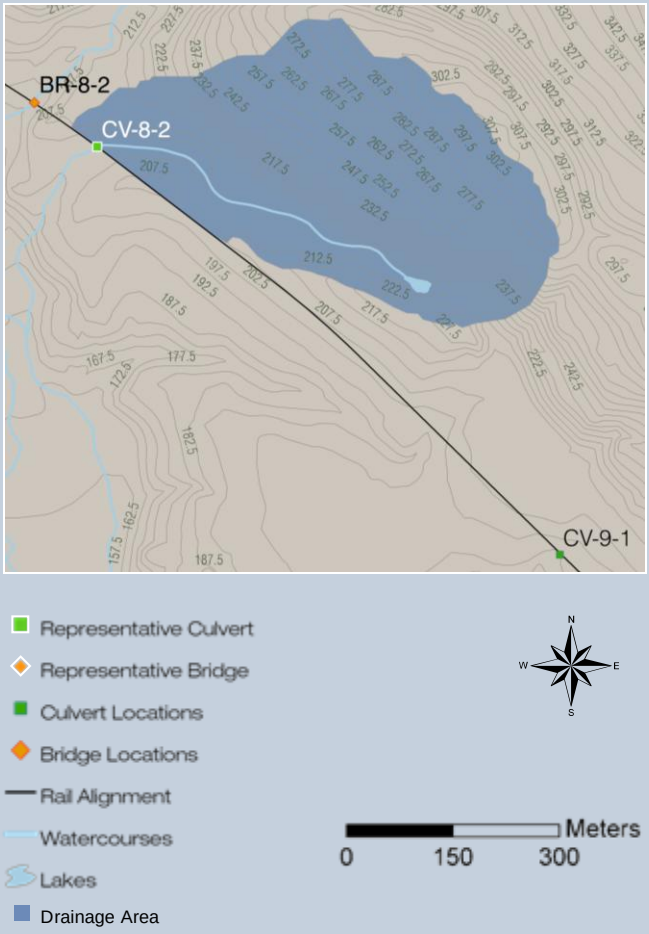
Zone: 17W
Easting: 570909
Northing: 7906444
Station: 8+946

Fish Habitat	No fish habitat
Structure Design	No. Barrels: 1 Diameter: 1.6m Length: 107m Slope: 1.7 %
Drainage Area	1.54 km^2
Design Flow	10 yr 3 day delay = 0.09 m^3/s 200-yr = 0.71 m^3/s
Velocity per Barrel	10 yr 3 day delay = 1.35 m/s 200 yr = 2.95 m/s



Description of Crossing Structure

The representative culvert CV-8-2 is located approximately 130 m southeast BR-8-2. The structure at CV-8-2 will consist of a single 1.6m corrugated steel pipe approximately 107 m long including the fully integrated access road culvert. The rail embankment slopes will be 1:5:1 with 8.1 m of fill over the culvert invert. The projected 25 year settlement is less than 0.2 m.



Crossing Construction

Machinery to be used for the construction includes trucks, crane, and backhoe (for spoils removal) Materials and machinery will be transported to and from the site on an access road or on the rail alignment.

Crossing construction will occur in frozen conditions and thus there will be no water flow during construction. Temporary crossing of the watercourse will be required and will be constructed using a snow fill or ice bridge in accordance with applicable DFO, Nunavut Operation Statement. The temporary watercourse crossing will remain in place for the duration of the culvert construction only and will be removed as soon as possible The temporary crossing will not impact water flow as it will be removed prior to the spring melt

DILLON CONSULTING

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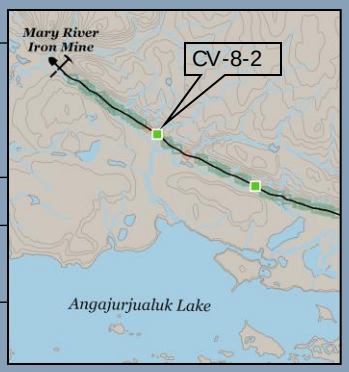

Site Photos

1

2

3

Photo 1 is looking upstream of CV-8-2; both Photo 2 and Photo 3 look downstream.

Existing Conditions at Crossing Site

CV-8-2 is an area of flooded land with a shallow, slightly meandering channel flowing though it. The streambed consists primarily of outwash deposits of sand and gravel intermixed with cobbles and boulders. The channel is a tributary from a pond approximately 500 m upstream of the crossing location. The channel intersects with a larger watercourse (crossed by BR-8-2) that eventually empties into Angjurjualuk Lake. The watercourse at CV-8-2 is not considered fish habitat based on the presence of a very steep cascade downstream of the crossing which fish could not traverse even in high water levels.

Navigability	Not navigable	
Width and Depth	Bankfull width = undetermined Wetted width = 2.6 m Maximum Depth = 0.13 m	
Substrate and Vegetation	Channel Morphology: 50% Pool, 50% Ripple Substrate Composition: 44% Flat, 50% Fines, 5% Cobble, 1% Boulder Stream Cover: None	
Channel Meander Pattern	Floodplain Width (m): > 71.3 m Channel Pattern: slightly meandering Channel Confinement: Unconfined Channel Gradient: 1°	Bank Height (L/R; m): no banks Bank Shape (L/R): N/A Bank Stability: N/A
Fish Habitat	At the crossing site there is a shallow channel running though an area of flooded terrestrial vegetation. NNST might use this habitat if accessible; however, access is likely restricted. Downstream of the crossing there is a very steep cascade that fish could not climb even with increased water levels.	

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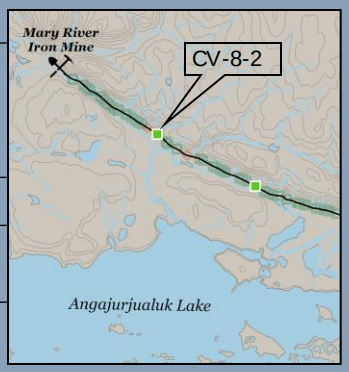

Predicted Environmental Impact	Proposed Mitigation
Direct loss of fish habitat from structure installation.	• No fish habitat at this proposed crossing location.
Potential for fish stranding or mortality during construction	• No fish habitat at this proposed crossing location.
Potential for barriers to fish passage	• Fish passage impeded downstream of crossing location, meet DFO requirements for fish passage in culvert design as required.
Potential for loss of riparian habitat within the footprint	• Restoration of riparian habitat as required.
Sediment effects and degradation of habitat (water quality) due to sediment or other contaminants both at the crossing and downstream	• Construction will follow practices outlined in the Section 9.6 and Project EMS (DEIS, Vol. 10). • Timing of works in and adjacent to watercourses during winter window to avoid potential impacts to water quality and potential fish habitat downstream of the crossing .
Damage to stream banks from construction equipment increases the potential for erosion	• Operate machinery on land (above the HWM) and in a manner that minimizes disturbance to the banks of the watercourse. • Install effective sediment and erosion control measures before starting work to prevent the entry of sediment into the watercourse. Inspect them regularly during the course of construction and make all necessary repairs if any damage occurs.
Direct or indirect impact from blasting.	• If blasting is required near watercourse DFO Blasting Guideline (Wright and Hopky) will be followed where possible
Potential for spills of fuel or other fluid from construction vehicles	• Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks. • Wash, refuel and service machinery and store fuel and other materials for the machinery away from the water to prevent any deleterious substance from entering the water. • Keep an emergency spill kit on site in case of fluid leaks or spills from machinery. • Use measures to prevent deleterious substances such as new concrete (i.e., it is pre-cast, cured and dried before use near the watercourse), grout, paint, ditch sediment and preservatives from entering the watercourse.
Solid waste could foul the local environment and attract scavengers (i.e. polar bears)	• Solid waste generated at the crossing site will be removed from the site and disposed of in accordance with applicable Nunavut regulations.