

3.03 Generator Fuel Storage Containment

General Conditions

The containment structure has not varied from its use since our 2010 annual inspection. At that time our recommendation was to limit the fuel contained in this containment facility to 77,376 litres.

There is currently one bladder in this containment facility that has a capacity when full of 120,000 litres. This bladder contains 77,376 litres when the bladder is 32" high. The guideline for Baffinland Iron Mines is to fill this bladder to no more than 76 cm (30") which represents 70,097 litres.

There is a sign posted to limit the bladder height at 30".

At the time of our visit on August 1, 2013, the bladder height was measured at 21". There was water ponding in the bottom of the containment at the time of our review. At the time of our second review on Sept 26, 2014 the bladder height was measured at 20" and there was ice just above the gravel in the bottom of the containment.

Stability

The structure was visually inspected for any signs of subsidence or cracking and no such indications were noted. There was no sign of seepage at the base of the structure noted. The soil structure is considered to be stable in its present condition and is in conformance with our design principles.

Recommendation

We recommended that the water ponding above the bottom of the containment gravel cover be removed regularly by creating a sump in the gravel and pumping out the water to below the gravel surface.

We recommend that Baffinland Iron Mines continue to control the fuel in the bladder at a height of 30".

3.04 Polishing/Waste Stabilization Pond No. 1

General Conditions

PWSP No. 1 continues to be utilized as a holding facility for sewage plant effluent that does not meet water effluent quality criteria.

Currently the pond is being used primarily as a repository for sewage sludge that is periodically removed from the RBC.

The supernatant from PWSP No. 1 is periodically decanted to PWSPs Nos. 2 and 3 where it is tested and treated as required to meet Water Licence effluent requirements.

At the time of our first visit there was approximately 4' of freeboard to accommodate further sewage and the structure readily conforms to its design intent. At the time of our second visit, there was approximately 6' of freeboard.

Stability

Our review of the area around the pond at the base of the slopes showed no sign of seepage and hence we conclude that the liner has been effective in containing sewage and there are no tears or ruptures in the membrane, excepting some minor tears from past activity at the top of the dyke well above the allowable effluent level in the structure in the horizontal portion of the membrane.

A review of the top of the dyke showed no indication of cracking or settlement which would indicate stresses within the structure.

Many of the tears that had occurred in the liner on the top of the dyke have been patched during the period between reviews in 2008 and 2009 and are holding well. As well, there are no signs of weather related deterioration of the liner where it is exposed.

Monitoring points have been set up on the top of the dyke and have been monitored since 2009. Settlements have occurred since that time. These settlements have not led to any stress cracks in the structure. These settlements are an indication of consolidation in the berm structure and the active layer beneath the dyke and are not considered to be of any concern.

It now can be seen where the structure has settled slightly relative to the soils away from the structure.

There appears to be no sign of erosion of the dykes, even with the large amount of precipitation that occurred this current summer season.

The settlements have had little effect on the integrity of the structure.

Recommendations

We see no reason to continue the monitoring of the top of the berm on an annual basis. With the excellent condition of the dyke construction, we see no reason to continue this function.

3.05 Polishing Ponds/Waste Stabilization Ponds #2 and #3

General Conditions

This structure was designed and constructed as a 2 cell structure.

The supernatant from PWSP #1 is currently discharged to PWSPs Nos. 2 and 3. The treated effluent is tested for Water Licence effluent requirements, treated if necessary, and discharged to the environment.

At the time of our visits there was considerable freeboard to accommodate further sewage and the structure readily conforms to its design intent. There was 5' of freeboard in one cell and the second cell was empty at the time of our second inspection.

Stability

Our review of the area around the pond at the base of the slopes showed no sign of seepage and hence we conclude that the liner has been effective in containing the sewage and there are no tears or ruptures in the membrane.

Longitudinal cracking which appeared in the dykes of PWSP#3 due to the melt of permafrost wedges in 2009 has not reoccurred and we consider this structure to be stable in its present condition.

Monitoring points have been set upon the top of the dyke and have been monitored since 2009. Settlements have occurred since that time. These settlements have not led to any stress cracks in the structure.

There appears to be no sign of erosion of the dykes and plants are continuing to seed themselves on the dykes. This growth is minimal however.

Recommendations

We see no reason to continue the monitoring of the top of the berm on an annual basis. With the excellent condition of the dyke construction, we see no reason to continue this function.

3.06 Helicopter Fuel Tank Containment

General Conditions

The structure was designed and constructed as a single cell structure that contains a 1000 gal fuel storage tank.

The structure currently conforms to its design intent,

In the past, a liner clad wood curb had been added to the top of the berm to prevent the erosion of gravel off the berm, caused by pulling the fuel hose from within the dyke out to the helicopters to provide them with fuel.

Stability

Our review of the area around the pond at the base of the slopes showed no sign of seepage. There is a minor amount of water ponding in the bottom of the containment indicating the integrity of the liner.

A review of the exterior and the top of the berms showed no sign of cracking or settlement which would indicate stress within the structure.

The structure is considered to be stable in its present condition.

Recommendation

We have no recommendations with respect to this structure.

3.07 Barrel Fuel Containment

General Conditions

This particular structure which we called “Barrel Fuel Containment” in our previous inspection reports is a two cell structure which is currently used to accommodate cubes of lubricant and barrels in the east cell and cubes of lubricant and antifreeze in the west cell.

Stability

Our review of the area around this containment structure showed no sign of seepage. This shows that there is reasonably little chance of tearing or rupture of the membrane having taken place.

A review of the exterior and top of the dyke showed no sign of cracking or settlement which would indicate stresses within the structure.

The structure is considered to be stable in its present condition.

Recommendations

We have no recommendations with respect to this structure.

3.08 Hazardous Waste Storage

General Conditions

This particular cell was constructed contiguous with an existing cell, which is referred to on site as the “Enviro Tank Storage”, from drawings by our office in 2010 and conforms to our drawings. It is also contiguous with the Stove Oil Storage cell.

This structure contains barrels and bags of hazardous waste.

Stability

Our review of the area around this cell at the base of the slopes, showed no sign of seepage.

The structure appears stable in its present condition.

Recommendation

There are no recommendations at this time.

3.09 Enviro Tank Storage

General Conditions

This particular structure is constructed contiguous with the Hazardous Waste Storage constructed in 2010 and the Stove Oil Storage cell. It is now utilized as a wash down cell.

There was concern for the integrity of this cell as the cell was dry and the geotextile is exposed from heavy traffic during our initial inspection. During our second inspection, the cell was holding a small amount of water confirming the integrity of the liner.

Recommendations

We recommend that the geotextile over the liner and the granular cover be made good prior to continuing use of this cell as a wash down cell.

3.10 Stove Oil Storage

General Conditions

This particular structure had been used to store barrels of stove fuel in 2011

The structure again contains barrels of stove oil and some Jet "A" fuel.

This structure was constructed in accordance with a standardized drawing provided by this office utilizing a one piece liner.

Stability

Our review of the area around the containment structure shows no sign of seepage. This shows that there is reasonably little chance of tearing or rupture of the membrane having taken place.

A review of the exterior and the top of the dyke showed no sign of cracking or settlement which would indicate stresses with the structure.

The structure is considered to be stable in its present condition.

3.11 Jet Fuel Tank and Pump Containment

This particular structure was reconstructed based on our recommendation of the 2012 Geotechnical Inspection.

The construction was completed in accordance with our recommendations for such structures and the liner was constructed as a one piece liner with geotextile protection on both sides and gravel over the geotextile as protection.

The construction appears proper and the structure is in good condition.

Minor water ponding confirms the integrity of the liner.

Stability

Our review of the area around this cell at the base of the slopes showed no sign of seepage.

The structure is stable in its present condition.

Recommendations.

There are no recommendations at this time.

3.12 Solid Waste Disposal Site

Berms appear stable and no erosion appears to have taken place on the back and both sides of the site.

Solid waste was being placed at the front edge of the site and was awaiting salvage of wood and lumber prior to the placing of cover at the time of our first site review in August. There was considerably more waste covered during the time of our second review on September 25th.

The disposal was being done in exact conformity with plans prepared and guidelines set out for the disposal of solid waste.

The current footprint as established by the existing covered material and the “blow control” fence at the front of the immediate site shall soon be filled and the site footprint shall have to be expanded within the plans and guidelines set out for this solid waste disposal site.

Surveying for the expansion of the site was taking place at the time of our second review in September.

3.13 Waste Oil Storage Containment

This facility has been decommissioned and removed from the site.

3.14 Minesite Steel Fuel Tank Farm Containment

This fuel tank farm has been constructed since the last annual inspection in 2013 in accordance with drawings and specifications prepared by Hatch Engineering under their supervision. Drawings setting out the construction details are attached to this report.

All work appears to be complete excepting the installation of the sump pits that are on site awaiting installation and which shall be utilized to facilitate the removal of water that collects from precipitation.

Stability

All work appears to have been completed in accordance with drawings and we have no concerns with the stability of this containment structure.

Recommendations

We have no recommendations to make with respect to this containment once the sump is installed.

3.15 Quarry

General Conditions

The quarry has well defined benches. The quarry faces at the benches shall be scaled when quarry operations cease and the benches shall be cleaned and berms placed at the edges of the bench to control the movement of weather induced loose in the long term.

Currently overburden from the top surface is being cleaned and pushed as thawing permits, to serve as long term protection against moving aggregate and the establishment of long term stability.

It is expected that the quarry shall be closed on a permanent basis by next year in 2015.

Stability

The quarry shall be closed in a manner as set out to maintain long term stability.

3.16 Overview

This report is the 7th annual Geotechnical Inspection at Mary River and Milne Inlet completed by this author on behalf of Baffinland Iron Mines Corporation and the first report covering two inspections in one shipping season.

As set out in our past reports, there has been little or no erosion take place from wind or rain and the dykes constructed of the sand/gravel soil have remained stable at slopes of 3:1 and 4:1.

There are only just now, signs of settlement appearing at PSWP's 1, 2 and 3. The settlements are not differential settlements of the dykes but are minor overall settlements of the total structures with respect to the surrounding area.

These settlements appear to be settlements within the one metre \pm active layer above the permafrost and are of little concern as the PWSP's are temporary structures and the settlements have no effect on the dyke stability.

It is expected that many of the structures that form the basis for the inspections set out in the biannual Geotechnical inspections shall be decommissioned as the mine facilities are finalized.

PHOTOS

Mary River August Inspection



Minesite Steel Fuel Tank Farm Containment



Generator Fuel Storage Facility Containment



Polishing/Waste Stabilization Pond #1.



Polishing/Waste Stabilization Ponds #2 and #3.



Helicopter Fuel Tank Containment.



Bulk Fuel Storage Containment.



Barrel Fuel Containment.



Jet Fuel Containment.



Solid Waste Disposal Site.



Enviro Tank Storage



Hazardous Waste Storage.



Stove Oil Storage.



Quarry at Mary River.

PHOTOS

Mary River September Inspection



Mary River Steel Fuel Tanks Containment



Quarry



Solid Waste Disposal Site



Bulk Fuel Storage Containment



Generator Fuel Containment



PWSP No 1



PWSP No 2 and 3



Helicopter Fuel Containment



Barrel Fuel Storage Containment



Hazardous Waste Containment



Stove Oil Barrel Containment



Enviro Tank Storage (Wash Bay)



Jet Fuel Containment