WATER LICENCE INSPECTION FORM

☒ **Original**
☐ **Follow-Up Report**

Licensee	**Licensee Representative**
Hamlet of Igloolik	Bhabesh Roy
Licence No. / Expiry	**Representative's Title**
3BM-ILG1520	Municipal Engineer
Land / Other Authorizations	**Land / Other Authorizations**
Date of Inspection	**Inspector**
August 12, 2020	Joseph Monteith

Activities Inspected

☐ Camp ☐ Drilling ☐ Mining ☐ Construction ☐ Reclamation ☐ Fuel Storage
☐ Roads/Hauling ☒ Other: Potable Water Source, Solid Waste Facility, Sewage Disposal Facility ☐ Other:

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

PART:	**Condition**	**Observation No.***
A: SCOPE, DEFINITIONS AND ENFORCEMENT	A	
B: GENERAL CONDITIONS	C	
C: CONDITIONS APPLYING TO SECURITY	NI	
D: CONDITIONS APPLYING TO WATER USE	A	1-13 +24 & 25
E: CONDITIONS APPLYING TO WASTE DISPOSAL AND MANAGEMENT	A	14-23
F: CONDITIONS APPLYING TO MODIFICATIONS	NA	
G: CONDITIONS APPLYING TO CONSTRUCTION	A	
H: CONDITIONS APPLYING TO EMERGENCY RESPONSE AND CONTINGENCY PLANNING	A	
I: CONDITIONS APPLYING TO ABANDONMENT, RECLAMATION AND CLOSURE PLANNING	NI	
J: CONDITIONS APPLYING TO MONITORING	A	
SCHEDULES	A	

**The observation number corresponds with specific comments provided below.*

Samples taken by Inspector:	Location(s): Latitude: 69°23'N and Longitude: 81°46'W
☐ Yes ☒ No	

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

BACKGROUND

On February 16, 2016 the Nunavut Water Board (NWB) approved an Amendment to expand and rehabilitation of the Sewage Lagoon Facility.

On September 1, 2017 the NWB approved a second Amendment to allow for the expansion of an existing potable water supply reservoir, replacement of an intake line that transmits water from the South Lake source to the Hamlet's water supply reservoir, the construction of a new truck-fill station, and the inclusion of Fish Lake as an alternative water source to the scope of the Existing Licence. Details included in the Application to amend the Existing Licence indicate that in 2015 the Hamlet experienced a shortage in the reservoir's over-winter water storage due to anoxic conditions at the South Lake water source. To protect the public's safety, the Government of Nunavut – Department of Health (GN-DOH) advised that use of the South Lake water source should be temporarily discontinued. The Hamlet accepted the GN-DOH advice, and it decided to use Fish Lake as its water supply source until the integrity of the South Lake source was restored.

The Hamlet indicated in its Application to minimize the possibility of similar shortages in the future, it is proposing, to expand the reservoir's annual over-winter storage capacity from 79,000 m3 to 102,800 m3 as well as upgrade some of the other structures/equipment associated with the Water Supply Facilities. This aspect of the amendment application was decided to keep the existing authorized amount of 81,208 cubic metres.

Relevant infrastructure for the Water Use and Waste Disposal Facilities include a freshwater intake pump, reservoir, truck fill station, and a three cell sewage exfiltration lagoon system with a wetland, an older fourth sewage cell constructed prior to the three cell lagoon systems, domestic landfill, and metallic waste landfill.

Inspector Statement

A Water Licence Inspection was conducted on August 12, 2020 in the Hamlet of Igloolik, Nunavut, Qikiqtani Region, to verify compliance with Water Licence 3BM-IGL1520. Sites inspected included the freshwater lake (South Lake), Water Treatment Plant, Water Storage Reservoir, Sewage Lagoon, Hazardous Materials Storage Area and the Solid Waste

Disposal Facility.

General Condition

On May 28, 2019 Richard Dwyer, Nunavut Water Board, Manager of Licencing emailed Water Resource Officer(WRO) Monteith a copy of the Hamlet of Igloolik's 2018 Annual Report. Titled 3BM-IGL1520.

Water Use and Related Structures

South Lake Pump House (photo 4)

1. A hose with a fish mesh screen is attached to the pump house with a water pump during transfer to trucks (photo 2).
2. Trucks recharge at the South Lake pump house. Trucks drive to the Water Storage Reservoir at the Water Treatment Facility. It takes 1 month to fill the man-made reservoir. (Photo 3).
3. A new pipe that meanders inland from Fish Lake to the Water Storage Facility has the capability to attach a water pump to the pipe, and transfers water to the Water Storage Facility. At the time of the inspection it was out of commission.
4. Bypass hose at Global Position System (GPS) Coordinates: Latitude 69° 21.248'N, Longitude 81° 50.439'W that leads to a water course, which eventually leads to the ocean. The bypass is used to release any left over water in the pipes, so they don't freeze and break the pipe.

Water Treatment Facility & Water Storage Reservoir (photo 7)

5. At the time of the inspection, the Water Treatment Facility was operational. A photo of the water meter (Photo 11).
6. The Water Treatment Facility has two intake pipes that extend 9 metres into the Water Storage Reservoir.
7. The Water Treatment Facility has an auto-chlorine injector, and 3 types of filters and strainer (photo 8 & 9.
8. Water is dispersed to the public by trucked service from the Water Treatment Facility (Photo 7).
9. The chlorine injection requires 20 minutes in the truck to properly treat the water, as per Health Regulations
10. The old Water Treatment Facility has auto-chlorine injectors.
11. The Water Storage Reservoir goes to a depth of 10 metres, and can contain a total of 100,000 cubic metres of freshwater (See photo 11). Concerns have been raised by the hamlet council in regards to the water quality. They suspect that the high turbidity is a result of high water pressure, and high drop from the pipes.
12. The fencing appears to have collapsed on one side. (Photo 12).

Solid Waste Facility (See photo 14)

13. The Solid Waste Facility manages their waste by segregating the Bulk Metals, Woods, Open Pit Burning and Capping, and Hazardous Waste. The site doesn't have any fencing. One section of the Bulk Metal and Hazardous Waste section are merged together and not segregated.
14. Open Pit Burning at the Solid Waste Facility has no fencing. Does not appear to do any capping of the ash, but has created a berm using a mix of gravel and the ash from the burning of garbage. (Photo's 15 &16).
15. Hazardous Waste Facility has a couple of sea cans, full, open, and numerous amounts of hazardous waste such as batteries, paint cans, waste oil drums exposed to the elements laying across the landscape outside. (Photo's 17, 18, & 19). Bulk Metal Storage Facility (Photo's20 &21).
16. Bulk Wood Storage (Photo 22).
17. Hazardous Waste and contaminated soil in contact with Fresh Water (Photo 23).
18. Windblown garbage has migrated off site into a fresh water pond (Photo 15).
19. No mitigation measures for the deposit of waste at the back of the combustible waste section of the Solid waste facility. During a dump fire, the firefighters were dousing the flames, which caused water to mix with the wastes, and migrate it off site. The water course behind the combustible waste was observed to have sedimentation (Photo 13 & 14).

Sewage Disposal Facility (Photo 24)

20. The Sewage Disposal Facility is a 4 cell facility, Cells 1, 2, & 3 each have an HDPE Liner. Fencing appears to be in good condition (Photo 25).
21. Cell #1 Decanting at the time of inspection. High power water pump, with separate fuel storage tank. Water pump held up by forklift heavy equipment. Possible structural compromised on inner wall due to heavy weighted water pump.
22. Freeboard 3-4 metres, spill way, and fencing appear to be in good condition (Photo 25).
23. Newly built sewage lagoon (Photo 26).
24. On October 3, a telephone notification from the Igloolik foreman of a decant that would be occurring over the long weekend. WRO Monteith requested that in future all decant notification be notified by way of email. 10 days in advance of decant as required by the license.

Water Consumption Reports

25. Due to the GN Malware Virus no reports were submitted in regards to the water consumption reports. Those

documents might be lost.

SECTION 2	☐ Comments	☐ Non-Compliance with Act or Licence	☒ Action Required

The following information is a summary of the Actions Required by the licensee to promote and ensure compliance:

-Maintain fencing at Water Storage Reservoir.

-Segregate the Bulk Metals, and Hazardous Waste.

-Consolidate all Hazardous Waste and store in such a way as to protect water from mixing with the hazardous waste.

-Articulate how you calculate water consumption

-Keep Annual Reports accurate, and take into consideration all withdrawal of fresh water obtained from at the Water Supply Facilities using a water meter.

-Install sediment control measures at the back of open pit burning section of the solid waste facility.

SECTION 3	☐ Comments	☒ Non-Compliance with Act or Licence	☐ Action Required

PART B: GENERAL CONDITIONS

1. The Licensee shall file an Annual Report on the Appurtenant Undertaking with the Board no later than March 31 of the year following the calendar year being reported, containing the following information:

a. an executive summary as required by Part B, Item 8;

b. tabular summaries of all data generated under the "Monitoring Program";

c. **the daily, monthly and annual quantities in cubic metres of fresh water obtained at the Water Supply Facilities;**

Part C:Conditions Applying to Water Use

2. The annual quantity of water used for all purposes shall not exceed 81,208 cubic metres annually or a daily quantity of water for all purposes shall not exceed 299 cubic metres.

5. The Licensee shall not cause erosion to the banks of any body of water and shall provide necessary controls to prevent such erosion.

6. Sediment and erosion control measures shall be implemented prior to and maintained during the operation to prevent entry of sediment into water.

Part D: Conditions Applying to Waste Disposal

7. The Licensee shall segregate and store all hazardous materials and/or hazardous waste within the Modified Solid Waste Disposal Facilities in such a manner as to prevent the deposit of deleterious substances into any water, until such a time that the materials have been removed for proper disposal at an approved facility.

Part E: Conditions Applying to Modification and Construction

6. The Licensee shall implement and maintain sediment and erosion control measures prior to and during activities carried out under this Part, to prevent the release of sediment and minimize erosion.

Licensee or Representative	Inspector's Name
Bhabesh Roy	Joseph Monteith
Signature	**Signature**
	
Date	**Date**
	August 25, 2020

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

PHOTO LOG

Date	Camera	Inspector	
August 13, 2020	Nikon Coolpix	Joseph Monteith	
Photo Log #1		**Location**	
Photo 1		Igloolik , Qikiqtani Region, Nunavut	

Description: South Lake Water Source. Water pump pipe end submerged held up by buoy. No indication of fish mesh screen.

Photo Log #	**Location**
Photo 2	Igloolik , Qikiqtani Region, Nunavut

Description: Water pump connected to recharge intake pipe, and pushes water uphill to a second water pump(mobile which pushes the water to the reservoir.

Photo Log #	Location
Photo 3	Igloolik , Qikiqtani Region, Nunavut

Description: Second water pump (mobile), connects half way from water source to water reservoir to aid in the recharging of the water reservoir. A berm was installed to house the fuel tank when operating.

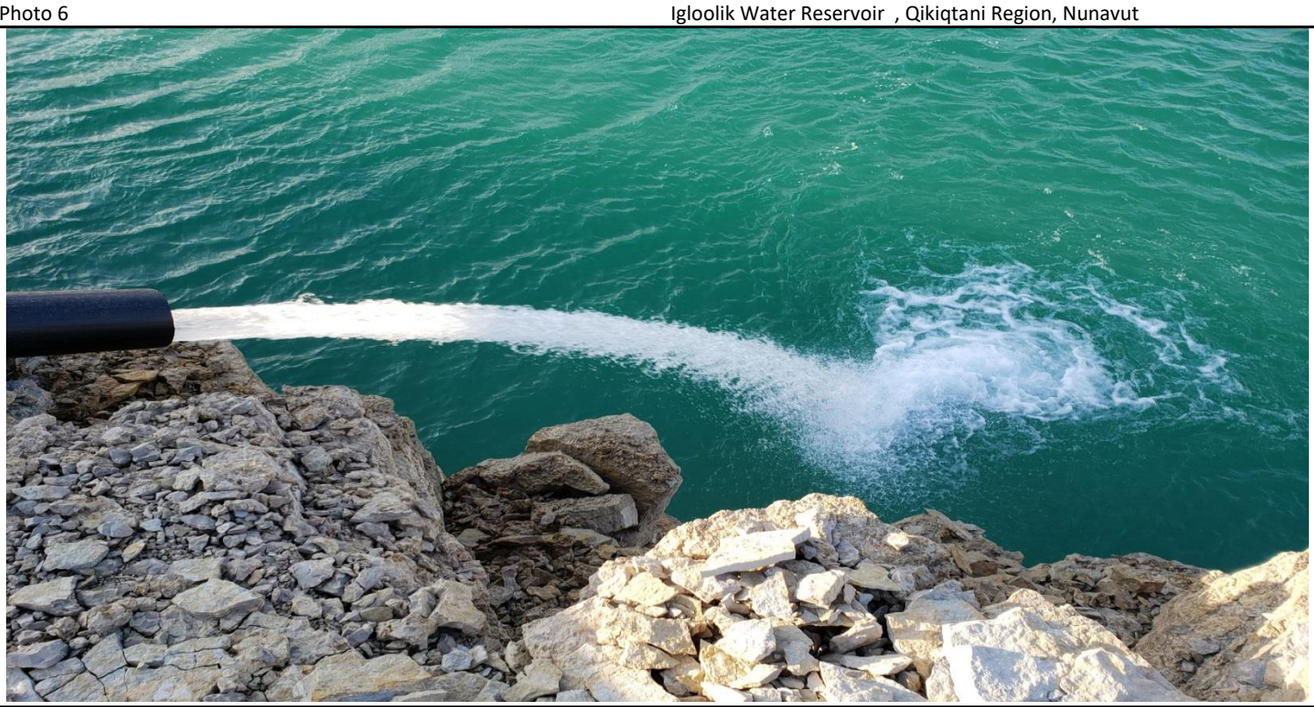
Photo Log #	Location
Photo 4	N69° 21.248' W81° 50.439'

Description: The bypass hose installed at the low point, to bleed out any still water from freezing when not in use. GPS Coordinates: Latitude 69° 21.248'N, Longitude 81° 50.439'W.

Photo Log #	Location
Photo 5	Igloolik Water Reservoir , Qikiqtani Region, Nunavut

Description: Water Reservoir, recharge pipe in the foreground. Old pump house (left) in the background, decommissioned, but still operational in case of emergency. New Water Treatment/Pump Station/(right).

Photo Log #	Location
Photo 6	Igloolik Water Reservoir , Qikiqtani Region, Nunavut

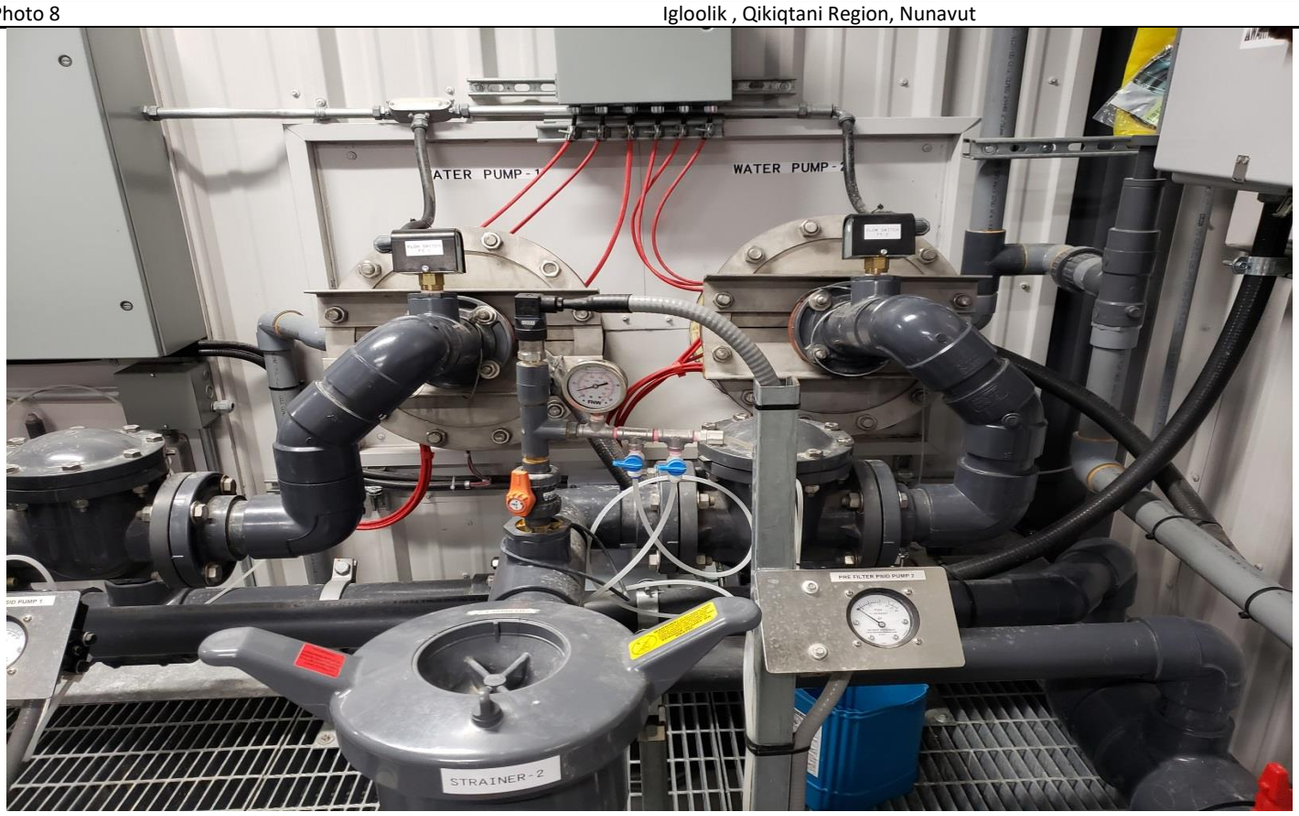


Description: High Water Pressure during the recharge of the Igloolik Water Reservoir is suspected by the hamlet of causing high turbidity.

Photo Log #	Location
Photo 7	Igloolik, Water Treatment/Pump Station

Description: Truck Refill station, and Water Treatment Facility. Truck being refilled at the time of inspection.

Photo Log #	Location
Photo 8	Igloolik , Qikiqtani Region, Nunavut

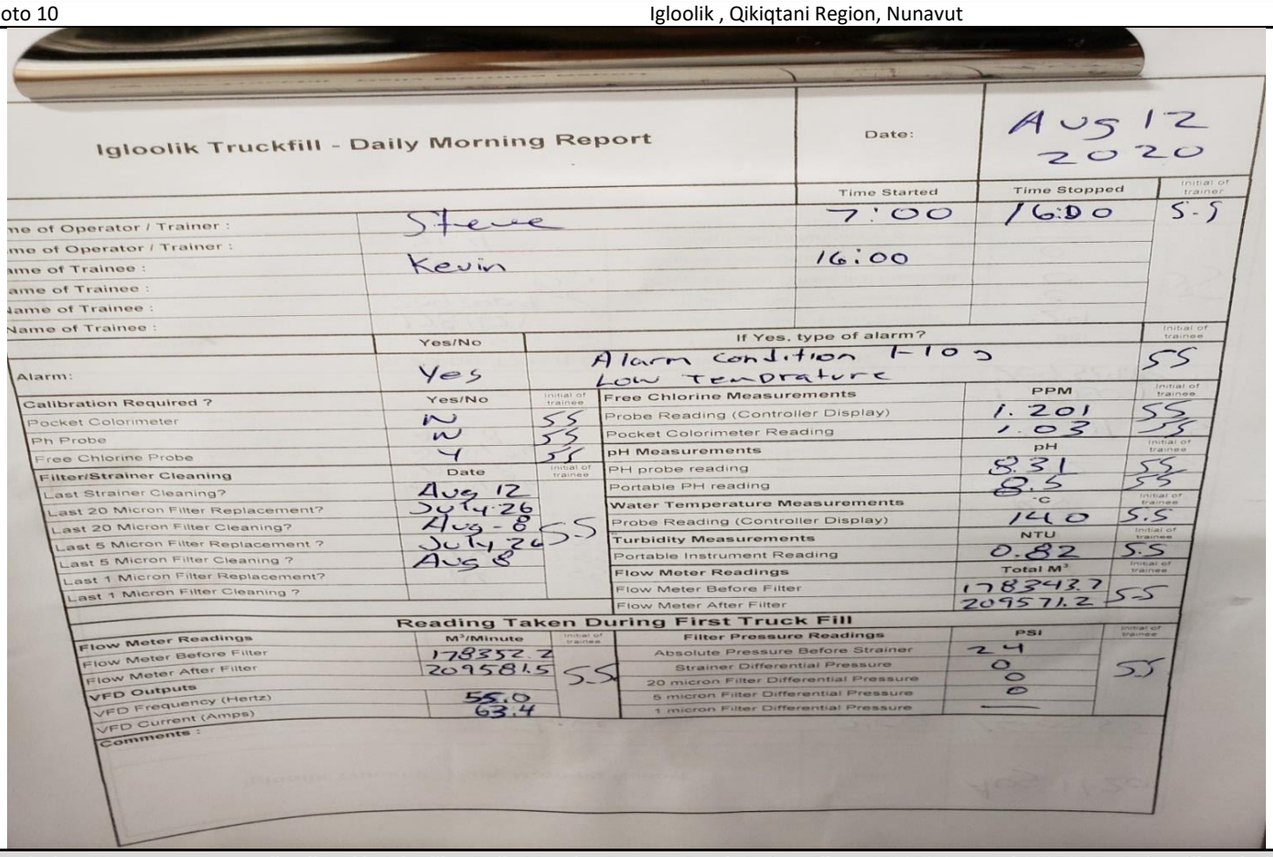


Description: 2x intake pipes entry into water treatment facility. 2 x Pre filter strainer

Photo Log #	Location
Photo 9	Igloolik , Qikiqtani Region, Nunavut

Description: 3 x water filtres. Liquid Chlorine injector after the filtration. Water Meter in the background against the wall pipe.

Photo Log #	Location
Photo 10	Igloolik , Qikiqtani Region, Nunavut



Igloolik Truckfill - Daily Morning Report

Date: Aug 12 2020

		Time Started	Time Stopped	Initial of trainee
Name of Operator / Trainer :	Steve	7:00	16:00	S-S
Name of Operator / Trainer :	Kevin	16:00		
Name of Trainee :				
Name of Trainee :				
Name of Trainee :				

	Yes/No	If Yes, type of alarm?	Initial of trainee
Alarm:	Yes	Alarm Condition T-103 Low Temprature	SS

	Yes/No	Initial of trainee
Calibration Required ?		
Pocket Colorimeter	N	SS
Ph Probe	N	SS
Free Chlorine Probe	Y	SS

Filter/Strainer Cleaning	Date	Initial of trainee
Last Strainer Cleaning?	Aug 12	SS
Last 20 Micron Filter Replacement?	July 26	
Last 20 Micron Filter Cleaning?	Aug-8	
Last 5 Micron Filter Replacement ?	July 26	
Last 5 Micron Filter Cleaning ?	Aug 8	
Last 1 Micron Filter Replacement?		
Last 1 Micron Filter Cleaning ?		

		Initial of trainee
Free Chlorine Measurements	PPM	
Probe Reading (Controller Display)	1.201	SS
Pocket Colorimeter Reading	1.03	SS
pH Measurements	pH	
PH probe reading	8.31	SS
Portable PH reading	8.5	SS
Water Temperature Measurements	C	
Probe Reading (Controller Display)	14.0	S.S
Turbidity Measurements	NTU	
Portable Instrument Reading	0.82	S.S
Flow Meter Readings	Total M³	
Flow Meter Before Filter	178343.7	SS
Flow Meter After Filter	209571.2	

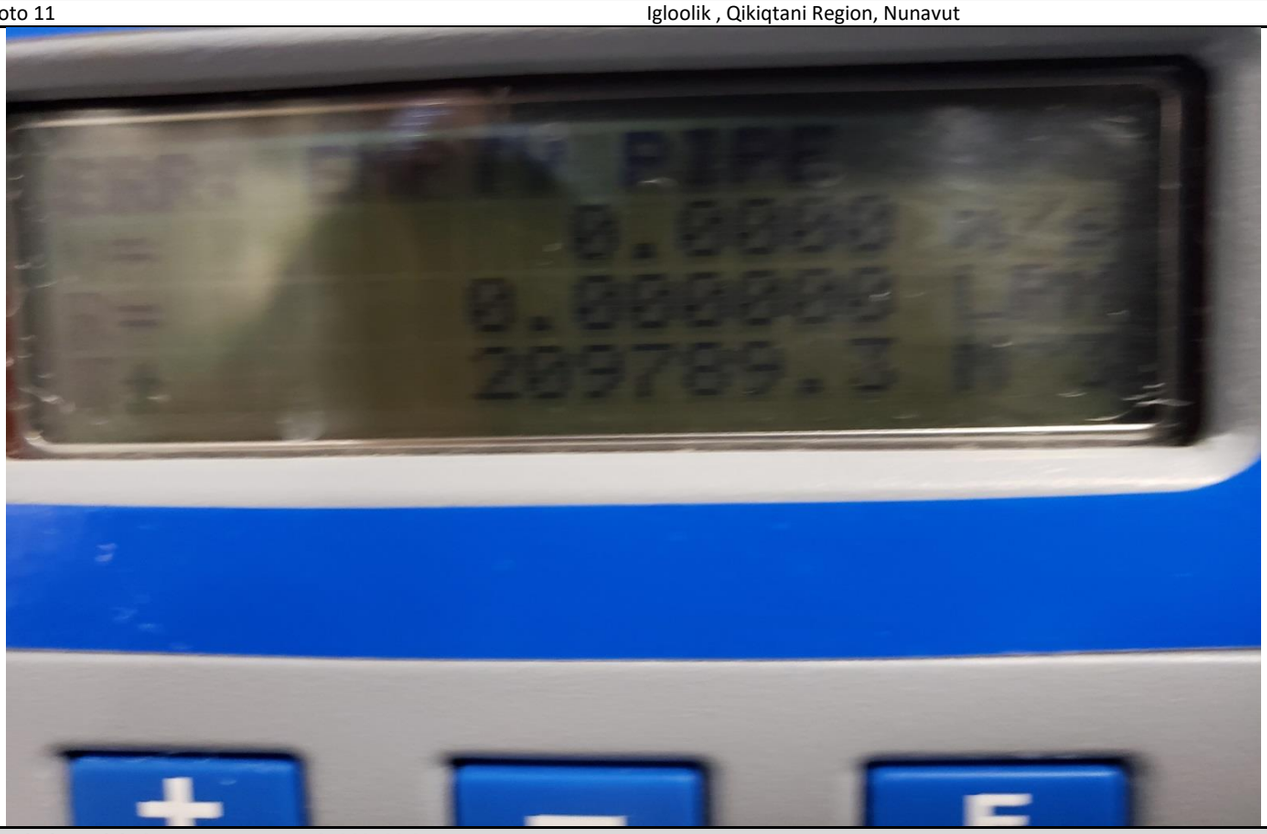
Reading Taken During First Truck Fill

Flow Meter Readings	M³/Minute	Initial of trainee
Flow Meter Before Filter	178352.2	SS
Flow Meter After Filter	209581.5	
VFD Outputs		
VFD Frequency (Hertz)	55.0	
VFD Current (Amps)	63.4	
Comments :		

Filter Pressure Readings	PSI	Initial of trainee
Absolute Pressure Before Strainer	24	SS
Strainer Differential Pressure	0	
20 micron Filter Differential Pressure	0	
5 micron Filter Differential Pressure	0	
1 micron Filter Differential Pressure		

Description: Water meter recording listed in Igloolik – Daily Morning Report. Reads Before Filter: 178352.2m³ and 209581.5m³ after filter during first truck fill. Another set of flow meter readings shows before filter reading of 178343.7m³ before filter and 209571.2m³.

Photo Log #	Location
Photo 11	Igloolik , Qikiqtani Region, Nunavut



Description: Digital Water Meter Reads 209789.3m³

Photo Log #	Location
Photo 12	Igloolik , Qikiqtani Region, Nunavut

Description: Solid Waste Facility with sign in both Official Languages of Nunavut

Photo Log #	Location
Photo 13	Igloolik , Qikiqtani Region, Nunavut

Description: The back side of the open pit burning. Non engineered walls. Migrating sludge toward back wall

Photo Log #	Location
Photo 14	Igloolik , Qikiqtani Region, Nunavut

Description: Back side of open pit burning. No walls to contain waste. Ocean visible downgrade from exposed wall of burn and cap.

Photo Log #	Location
Photo 15	Igloolik , Qikiqtani Region, Nunavut

Description: Hazardous Waste Area #1, Old Waste Oil Drums within a bermed area – berm is full. Wall was taken down to allow for access. Drums being deposited there are being deposited further and further away from the bermed area. Water puddles litter the area, and the natural contours of the areas allow for migration into the hazardous waste area, then drains to a small lake downgrade of this site.

Photo Log #	Location
Photo 16	Igloolik , Qikiqtani Region, Nunavut

Description: signs of Water around the hazardous waste disposal area. Surface water migrates from background of photo to within hazardous waste storage facility.

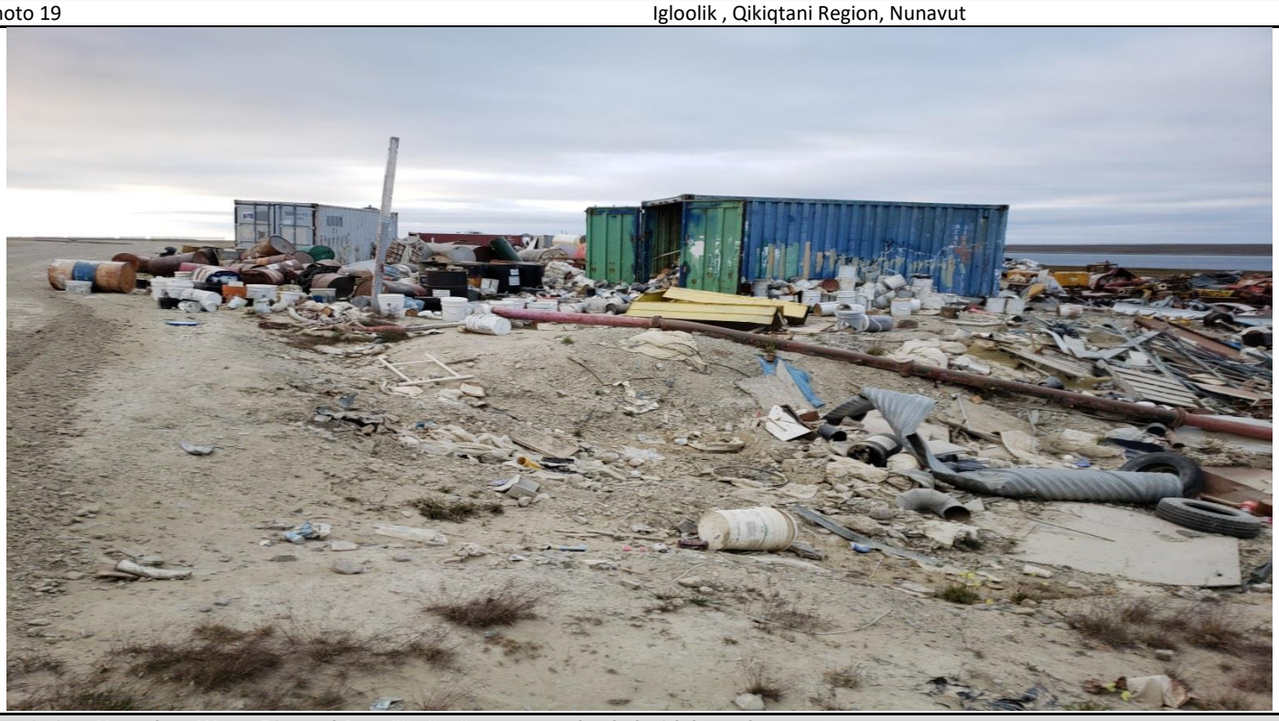
Photo Log #1	Location
Photo 17	Igloolik , Qikiqtani Region, Nunavut

Description: From the Hazardous Waste Berm. Water has the potential to migrate downgrade to the water lake, which eventually leads to the ocean?

Photo Log #	Location
Photo 18	Igloolik , Qikiqtani Region, Nunavut

Description: Mixing of solid waste and accumulated water within the burn and cap facility. This was suspected from a dump fire that happened over the winter of 2020.

Photo Log #	Location
Photo 19	Igloolik , Qikiqtani Region, Nunavut



Description: Hazardous Waste Disposal Area #2. 3 x Seacans overloaded with hazardous waste.

Photo Log #	Location
Photo 20	Igloolik , Qikiqtani Region, Nunavut

Description: Hazardous Waste Sea can # 1 – Overfilled Paint Cans exposed to the outside elements

Photo Log #	Location
Photo 21	Igloolik , Qikiqtani Region, Nunavut

Description: Hazardous Waste Sea can #2 Batteries exposed to the outside elements, this year covered with domestic waste.

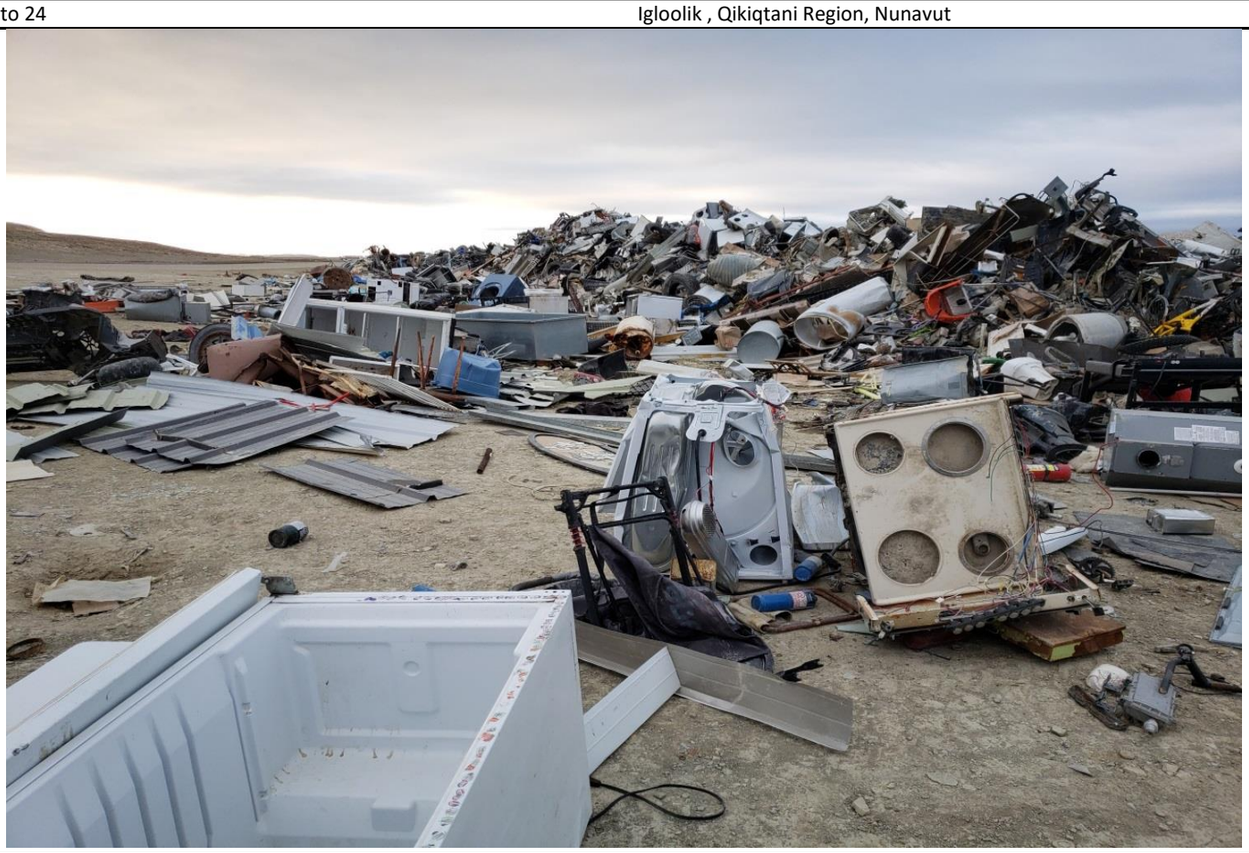
Photo Log #	Location
Photo 22	Igloolik , Qikiqtani Region, Nunavut

Description: Hazardous Waste Seacan #3, Partially empty, some waste batteries exposed to the outside elements. Some hazardous waste removed from last year, and new buckets added. Public access doesn't prohibit interaction with hazardous waste.

Photo Log #	Location
Photo 23	Igloolik , Qikiqtani Region, Nunavut

Description: Bulk Metal Seacan #4: with empty propane tanks overflowing. This seacan starts the merge from hazardous waste to bulk metal.

Photo Log #	Location
Photo 24	Igloolik , Qikiqtani Region, Nunavut



Description: Some empty camping fuel tins, and standing water in the bulk metals section of the Solid Waste Facility

Photo Log #	Location
Photo 25	Igloolik , Qikiqtani Region, Nunavut

Description: End of Bulk Metals. Sewage lagoon starts on left hand side of photo.

Photo Log #	Location
Photo 26	Igloolik , Qikiqtani Region, Nunavut

Description: Decanting at the Cell#1 Lagoon. Structural Integrity possibly compromised. Doubled walled storage tank to fuel a high intensity water pump.

Photo Log #1	Location
Photo 27	Igloolik , Qikiqtani Region, Nunavut

Description: New Discharge Location for cell #1. The discharged product runs along the base of the lagoon.

Photo Log #1	Location
Photo 28	Igloolik , Qikiqtani Region, Nunavut

Discharge Location. Half culvert diverting some of the discharge along the intended route. Most of the discharge goes directly to the receiving environment. What goes along the half culvert also leaks out and washes out the base of the sewage reservoir. Dicharge Location for Cell #2

Photo Log #1	**Location**
Photo 29	Igloolik , Qikiqtani Region, Nunavut

Discharge Location. Half culvert diverting some of the discharge along the intended route. What goes along the half culvert also leaks out and washes out the base of the sewage reservoir.

Photo Log #1	**Location**
Photo 30	Igloolik , Qikiqtani Region, Nunavut

Cell #1 Outer wall of Cell 1 appears to have some minor wheeping.

Photo Log #1	Location
Photo 31	Igloolik , Qikiqtani Region, Nunavut

A crack in the walls appears on the outside, top, and inside of sewage lagoon walls.

Photo Log #1	Location
Photo 32	Igloolik , Qikiqtani Region, Nunavut

Cell # 2. Freeboard is good. No observable sludge. Freeboard appears to have dropped.

Photo Log #1	Location
Photo 33	Igloolik , Qikiqtani Region, Nunavut

Cell # 2. 2019 signs of slumping may be a leak. Engineer Inspection on walls requested.