WATER LICENCE INSPECTION FORM

☒ Original
☐ Follow-Up Report

Licensee	Licensee Representative
Hamlet of Igloolik	Bhabesh Roy
Licence No. / Expiry	**Representative's Title**
3AM-ILG2131	Regional Engineer
Land / Other Authorizations	**Land / Other Authorizations**
Date of Inspection	**Inspector**
October 26, 2021	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	1-12
E: CONDITIONS APPLYING TO WASTE DISPOSAL AND MANAGEMENT	A	13-22
F: CONDITIONS APPLYING TO MODIFICATIONS	NA	
G: CONDITIONS APPLYING TO CONSTRUCTION	A	
H: CONDITIONS APPLYING TO EMERGENCY RESPONSE AND CONTINGENCY PLANNING	C	24
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 19, 2021 the Nunavut Water Board (NWB) approved a class "A" Water License titled 3AM-IGL2131 for the Hamlet of Igloolik. The new license authorizes the use of 102,800m^3 per annum at a maximum rate of 299 m^3 per day.

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 October 26,2021 by Water Resources Officer (WRO) Joseph Monteith of the Crown Indigenous Relations and Northern Affairs Canada in the Hamlet of Igloolik, Nunavut, The purpose of the inspection was to verify compliance with Water Licence 3AM-IGL2131. Sites inspected included the freshwater lake (South Lake), Water Treatment Plant, Water Storage Reservoir, Sewage Lagoons, Hazardous Materials Storage Areas and the Solid Waste Disposal Facility.

General Condition

On July 29, 2021 Richard Dwyer, Nunavut Water Board (NWB), Manager of Licencing emailed Water Resource Officer(WRO) Monteith a copy of the Hamlet of Igloolik's 2020 Annual Report Technical Review and the comments from Environment and Climate Change Canada(ECCC), and Crown Indigenous Relations and Northern Affairs Canada(CIRNAC)of the 2020 Annual Report, and a copy of the 2020 inspection report.

On February 8, 2021 Robert Ikkutisluk, Administrative Coordinator, NWB, acknowledged receipt of Igloolik 2021

Annual report.

Water Use and Related Structures

South Lake Pump House (photo1)

1. A hose with a fish mesh screen is attached to the fresh water intake pump location at South Lake with a water pump during transfer to the Water Storage Facility (photo 1).
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 5).
3. A new pipe that meanders inland from South 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 in commission, and recharging the water storage facility (photo 2).
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(photo 3).

Water Treatment Facility & Water Storage Reservoir (photo 4 & 6)

5. At the time of the inspection, the Water Treatment Facility was operational. A photo of the water meter Photo 10).
6. The Water Treatment Facility has two intake pipes that extend 9 metres into the Water Storage Reservoir (photo 4).
7. The Water Treatment Facility has an auto-chlorine injector, and 3 types of filters of various sizes(photo 8), and a strainer (photo 7). The filters tend to clog up and cost the hamlet a lot of money to replace. (photo 9).
8. Water is dispersed to the public by trucked service from the Water Treatment Facility (Photo 6).
9. The chlorine injection requires 20 minutes in the truck to properly treat the water, as per Health Regulations
10. 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 6). 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. At the time of the inspection, the reservoir was almost filled, and the amount of pressure from the recharge wasn't hitting the bottom.
11. The fencing appears to have collapsed on multiple parts of the top (Photo 4).
12. The daily monitoring Report dated September 9, 2021, reads Before Filter: 254886.9m³ and 311473.2m³ after filter during first truck fill. Another set of flow meter readings shows before filter reading of 254882.0m³ before filter and 311466.8m³(photo 9).

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 storage spread out between 3 locations. 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 11 &12).
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 14,15,16,17. A new site has been identified as the Hamlet Garage as storage for hazardous waste (Photo's 18,19,20). Bulk Metal Storage Facility (Photo's 21 &22).
16. Hazardous Waste and contaminated soils path of migration downgrade of historic Hazardous Waste Storage Facility (Photo 15).
17. Windblown garbage has migrated off site into a fresh water pond. (photo).

Sewage Disposal Facility (Photo 24)

18. The Sewage Disposal Facility is a 3 cell facility, Cells 1, 2, & 3 each have an HDPE Liner. Fencing appears to be in good condition (Photo 25).
19. Cell #1 Decanting at the time of inspection. High power water pump, with separate fuel storage tank. Possible structural compromised as signs of slumping has been identified (photo 29).
20. Freeboard 3-4 metres, spill way, and fencing appear to be in good condition (Photo 25).
21. Newly built sewage lagoon observed in 2020 with no sign of leak (Photo 26).
22. 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.

Spill Report 2021-372

23. On August 28, 2021 an email from officemanager@igloolik.ca indicated a breach lagoon 1, and interior walls were shifting. Estimated amount "seeping was 1 cubic metre per day". A request to decant was submitted, with sample results, but the Hamlet of Igloolik didn't provide the right sample analysis. Due to the unauthorized

discharge a spill report was required as it was suspected the walls would breach into a greater spill than what was observed(photo 25, 27, 28, &29).

Water Consumption Report

24. On August 8, 2021 Phillip Avingaq, Accounts Receivable, Hamlet of Igloolik, NU emailed the inspector a copy of January 1, to October 31, 2021 Quantity of Water Obtained from all sources in litres, Annual Total is 51, 053, 4427.00 Litres withdrawn equals 510534.43 m^3 (photo 31)

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;

-Provide the inspector with a copy of or the location(s) of the modified Solid Waste Disposal Facility.

-Submit an update to the spill line as per Part H:5(c). on spill report 2021-372.

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

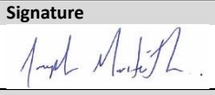
7. The Licensee shall segregate and store all hazardous materials and/or hazardous waste within the Modified Solid Waste Disposal Facilities in such a manner as to prevent the deposit of deleterious substances into any water, until such a time that the materials have been removed for proper disposal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

Part H:Conditions Applying to Spill Contingency Planning

5.c. for each occurrence, submit to the Inspector, within thirty (30) days after initially reporting the event, a detailed report that provides the necessary information on the location (including the GPS coordinates), initial response action, remediation/clean up, status of response (ongoing, complete), proposed disposal options for dealing with contaminated materials and any preventative measures to be implemented.

Licensee or Representative	Inspector's Name
Bhabesh Roy	Joseph Monteith
Signature	**Signature**
	
Date	**Date**
	November 8, 2021

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

PHOTO LOG

Date	Camera	Inspector	
October 26, 2021	Nikon Coolpix	Joseph Monteith	

Photo Log #1	Location
Photo 1	Igloolik, NU South Lake Water Source

Description: South Lake Water Source. Water pump pipe end submerged held up by buoy. No indication of fish mesh screen. The 909 Litre storage tank, connected in non engineered secondary containment as well as the high pressure water pump.

Photo Log #	Location
Photo 2	Igloolik, NU

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 3	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 4	N69° 21.248',	W81° 50.439'

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). Water Reservoir recharging at the time of inspection.

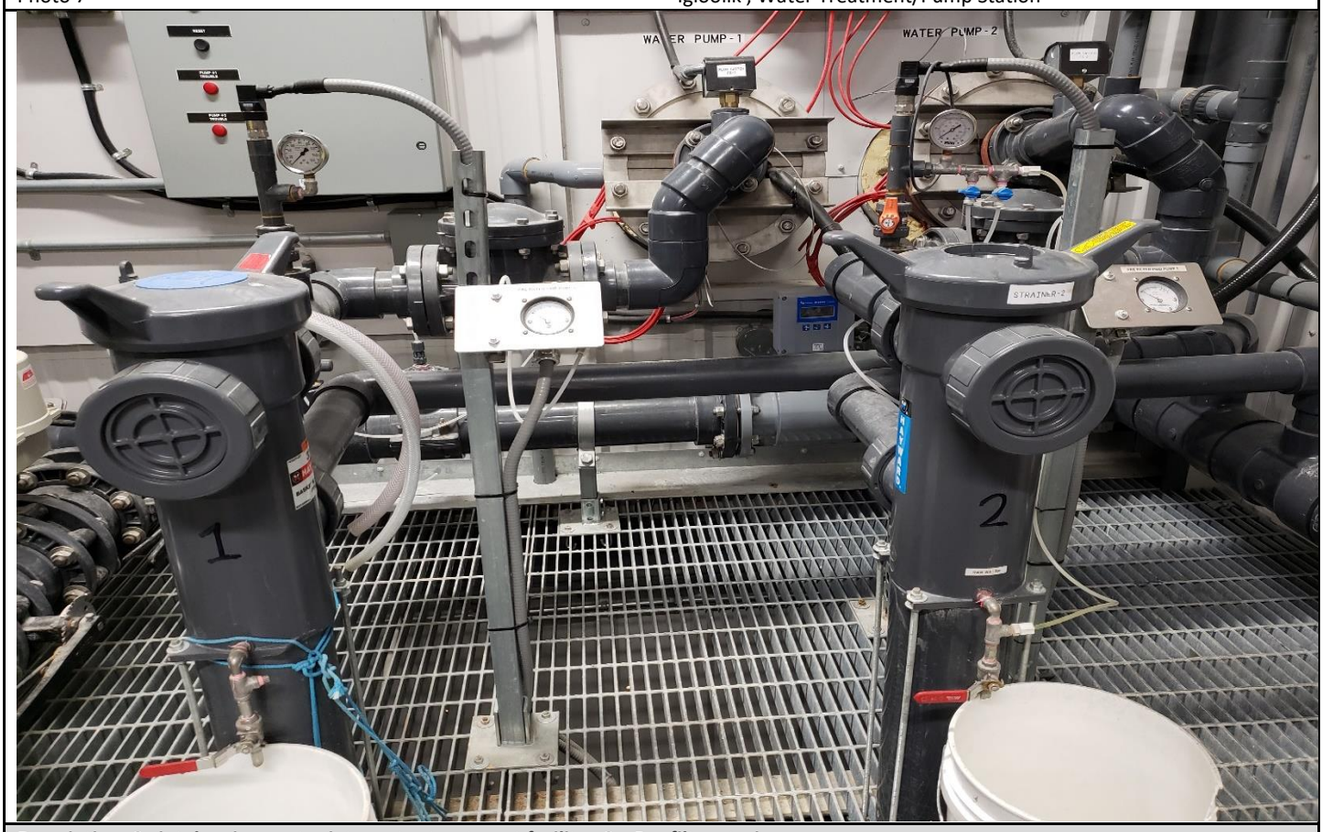
Photo Log #	Location
Photo 5	Igloolik , NU, Water Reservoir

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

Photo Log #	Location
Photo 6	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 7	Igloolik , Water Treatment/Pump Station

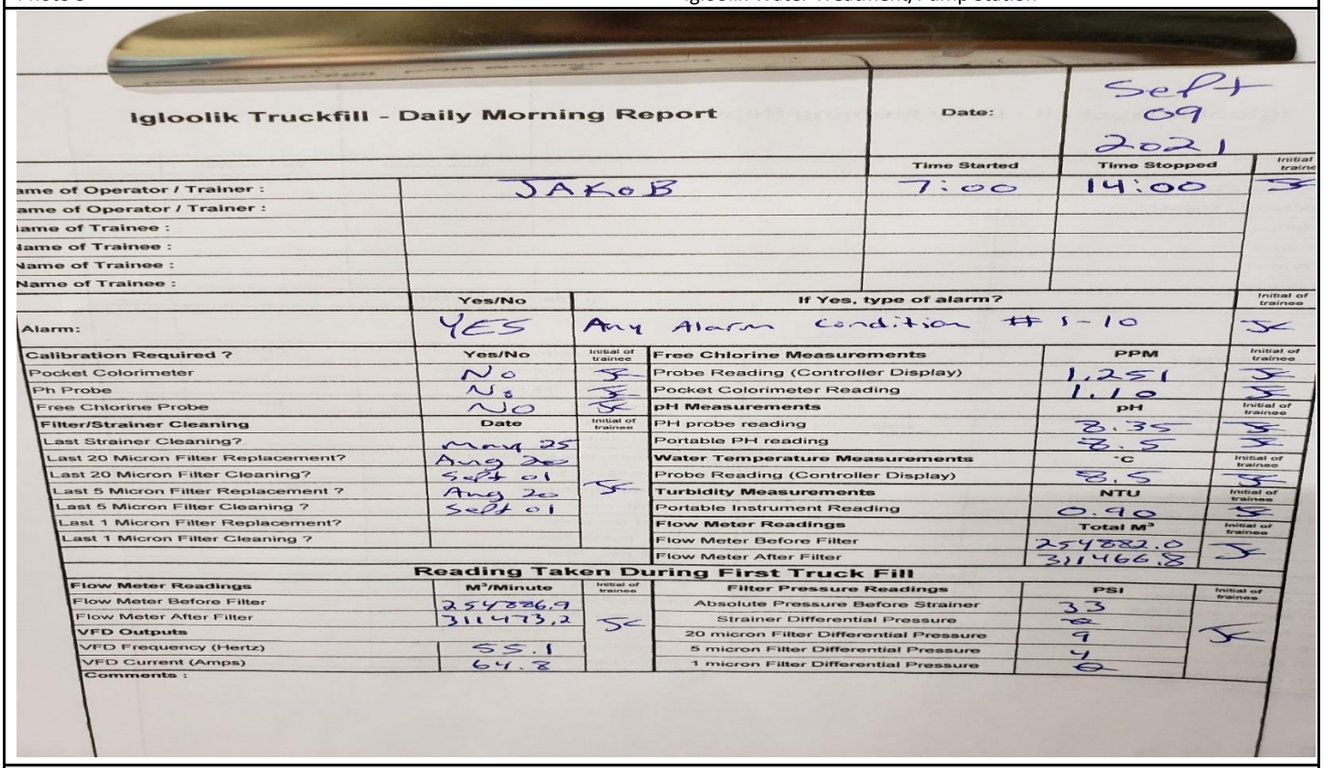


Description: 2x intake pipes entry into water treatment facility. 2 x Pre filter strainer

Photo Log #	Location
Photo 8	Igloolik Water Treatment/Pump Station

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

Photo Log #	Location
Photo 9	Igloolik Water Treatment/Pump Station



Igloolik Truckfill - Daily Morning Report

Date: Sept 09 2021

	Time Started	Time Stopped	Initial trainee
Name of Operator / Trainer :	JAKOB	7:00	14:00	JK
Name of Operator / Trainer :				
Name of Trainee :				
Name of Trainee :				
Name of Trainee :				

	Yes/No	If Yes, type of alarm?	Initial of trainee
Alarm:	YES	Any Alarm Condition # 1-10	JK

Calibration Required ?	Yes/No	Initial of trainee
Pocket Colorimeter	No	JK
Ph Probe	No	JK
Free Chlorine Probe	NO	JK
Filter/Strainer Cleaning	**Date**	Initial of trainee
Last Strainer Cleaning?	May 25	
Last 20 Micron Filter Replacement?	Aug 20	
Last 20 Micron Filter Cleaning?	Sept 01	
Last 5 Micron Filter Replacement ?	Aug 20	JK
Last 5 Micron Filter Cleaning ?	Sept 01	
Last 1 Micron Filter Replacement?		
Last 1 Micron Filter Cleaning ?		

Free Chlorine Measurements	PPM	Initial of trainee
Probe Reading (Controller Display)	1.251	JK
Pocket Colorimeter Reading	1.10	JK
pH Measurements	**pH**	Initial of trainee
PH probe reading	8.35	JK
Portable PH reading	8.5	JK
Water Temperature Measurements	**°C**	Initial of trainee
Probe Reading (Controller Display)	8.5	JK
Turbidity Measurements	**NTU**	Initial of trainee
Portable Instrument Reading	0.90	JK
Flow Meter Readings	**Total M³**	Initial of trainee
Flow Meter Before Filter	254882.0	JK
Flow Meter After Filter	311466.8	

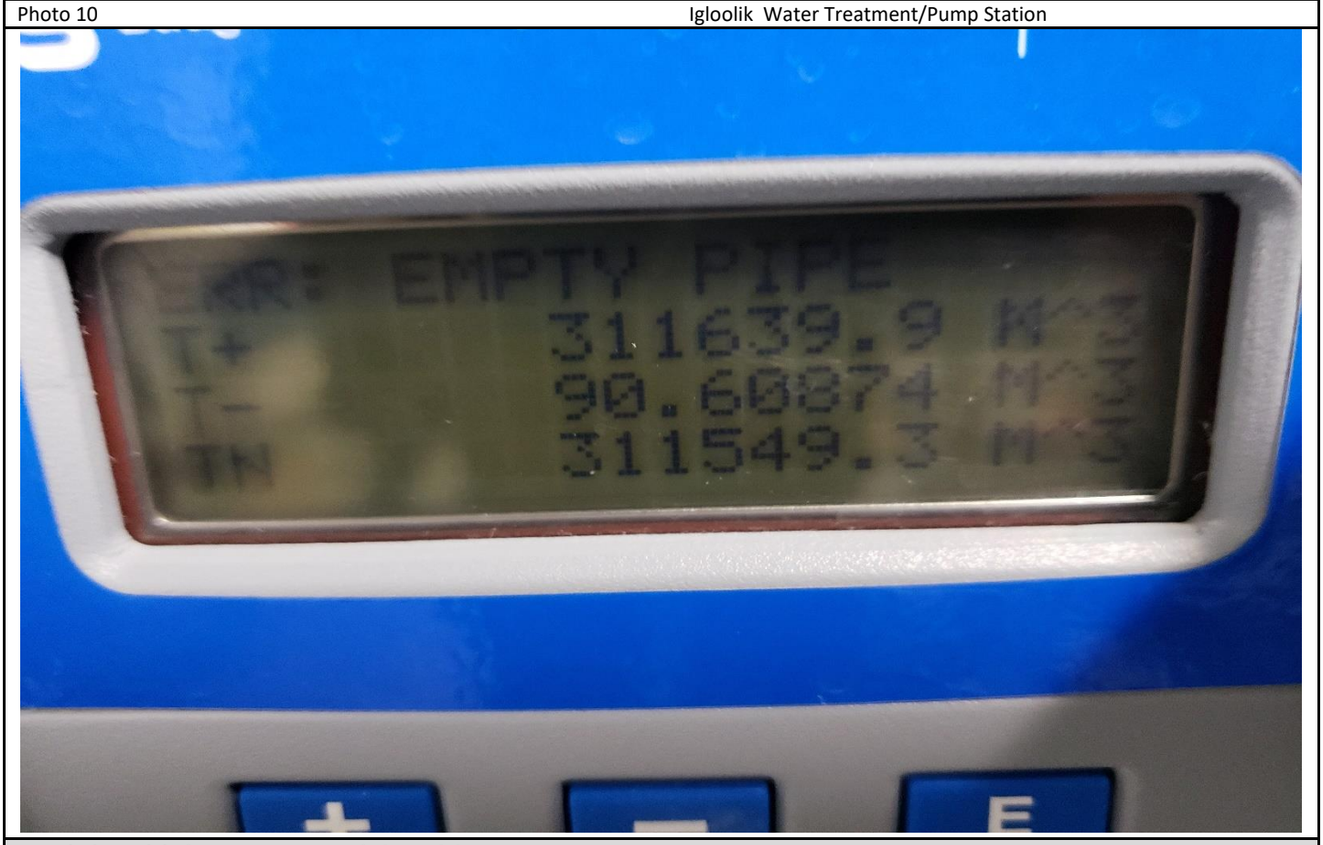
Reading Taken During First Truck Fill

Flow Meter Readings	M³/Minute	Initial of trainee
Flow Meter Before Filter	254886.9	JK
Flow Meter After Filter	311473.2	
VFD Outputs		
VFD Frequency (Hertz)	55.1	
VFD Current (Amps)	64.8	
Comments :		

Filter Pressure Readings	PSI	Initial of trainee
Absolute Pressure Before Strainer	33	JK
Strainer Differential Pressure	8	
20 micron Filter Differential Pressure	9	
5 micron Filter Differential Pressure	4	
1 micron Filter Differential Pressure	0	

Description: Water meter recording listed in Igloolik – Daily Morning Report. Reads Before Filter: 254886.9m³ and 311473.2m³ after filter during first truck fill. Another set of flow meter readings shows before filter reading of 254882.0m³ before filter and 311466.8m³.

Photo Log #	Location
Photo 10	Igloolik Water Treatment/Pump Station



Description: Digital Water Meter Reads 311549.3m³

Photo Log #	Location
Photo 11	Igloolik

Description: The back side of the open pit burning. Non engineered walls. Fresh Gravel laid over migrating sludge first observed in 2020 inspection report.

Photo Log #	Location
Photo 12	Igloolik

Description: Back side of open pit burning. No walls to contain waste. Ocean visible downgrade from exposed wall of burn and cap. Fresh gravel was place down on top to mitigate the spread of any windblown debris.

Photo Log #	Location
Photo 13	Igloolik

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 pond downgrade of this site before reaching the ocean visible in the background of photo..

Photo Log #	Location
Photo 14	Igloolik

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 15	Igloolik

Description: Fresh Water pond downgrade of Historic Hazardous Waste Disposal Facility. Wind Blown Garbage also litter the pond.

Photo Log #	Location
Photo 16	Igloolik

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

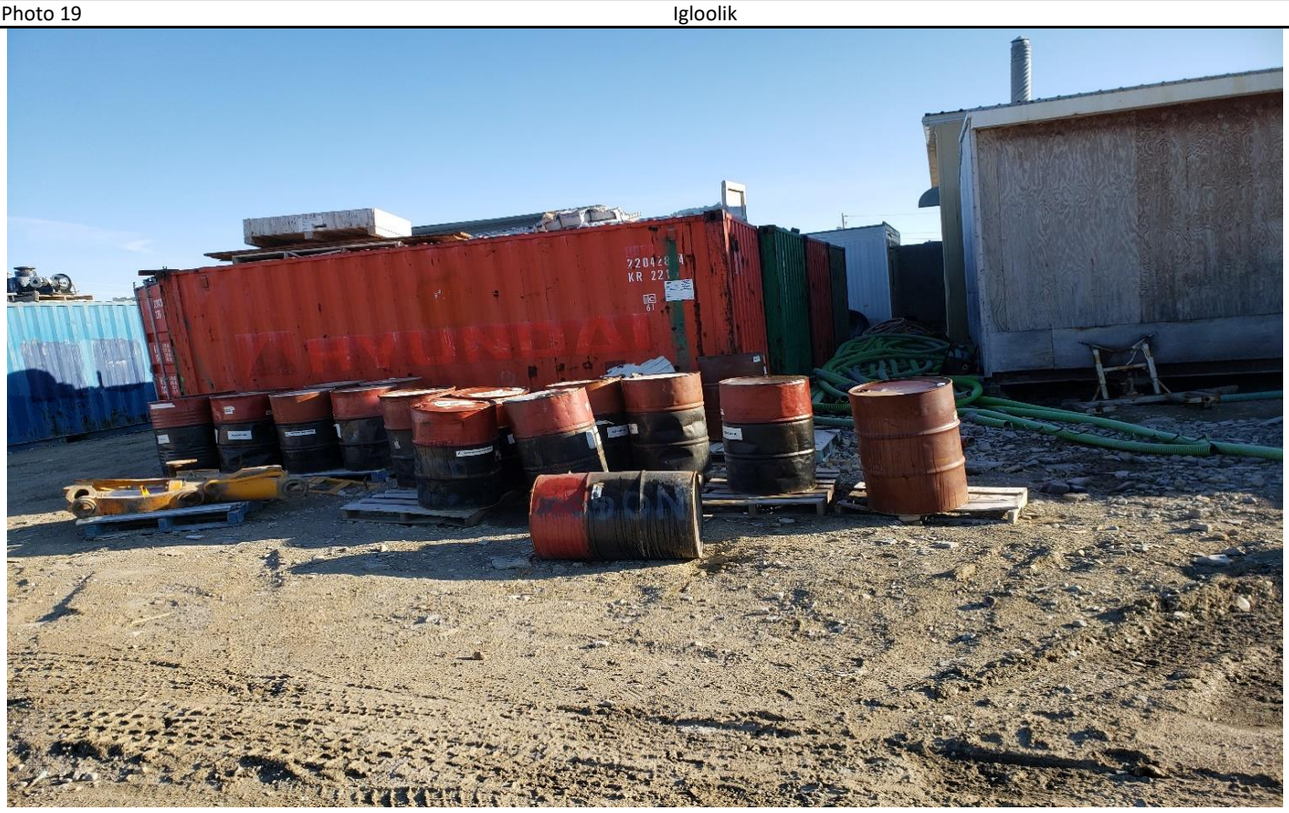
Photo Log #	Location
Photo 17	

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

Photo Log #	Location
Photo 18	Igloolik

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

Photo Log #	Location
Photo 19	Igloolik



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 20	Igloolik

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 21	Igloolik

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

Photo Log #	Location
Photo 22	Igloolik

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

Photo Log #	Location
Photo 23	Igloolik Sewage Lagoon Cell # 1

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 24	Igloolik

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

Photo Log #1	Location
Photo 25	Igloolik, NU Cell 2, looking at Cell 1 East Wall

Background: Cell 1 East side of the sewage lagoon's wall. Source of suspected leak that prompted Spill Report 2021-372. Green streak down the side of the cell walls. October 26, 2021

Photo Log #1	Location
Photo 26	Igloolik, NU, Cell 2 looking at Cell 1 East wall

2020 photo of the East side walls of Cell 1. No sign of leak.

Photo Log #1	Location
Photo 27	Igloolik, NU , Cell 1 East Wall

Foreground: Suspected leak of Cell 1 Sewage Lagoon. The leak prompted Spill Report 2021-372. Green streak down the side of the cell wall.

Photo Log #1	Location
Photo 28	Igloolik

Map of the 3 sewage lagoon cells. Spill Report 2021-372 shows location, and proximity to ocean. A measure of distance from suspected source to ocean measured at 405.41 metres.

Photo Log #1	Location
Photo 29	Igloolik Cell 1, North wall

Signs of slumping of walls of Cell 1 sewage lagoon. As reported in an email sent by the hamlet on Aug. 28, 2021

Photo Log #1	Location
Photo 30	Igloolik , NU Cell 1, West wall

Cell # 2. Freeboard is good. No observable sludge. At the time of the inspection, a decant of the cell was being conducted to investigate the cause of a suspected leak.

Photo Log #1	Location
Photo 31	Igloolik

Delivery Summary By Month and Year

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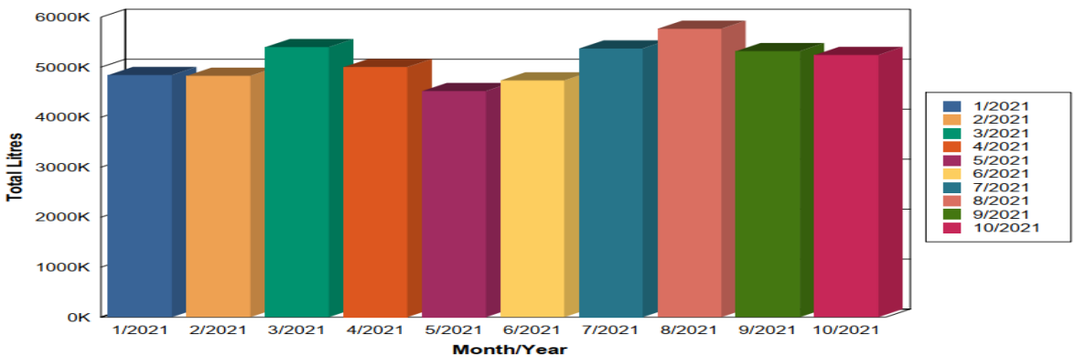

Month / Year	Litres Delivered
January 2021	4,844,121.10
February 2021	4,829,235.30
March 2021	5,403,465.20
April 2021	5,003,091.30
May 2021	4,524,598.90
June 2021	4,735,202.10
July 2021	5,375,973.20
August 2021	5,769,795.70
September 2021	5,322,750.70
October 2021	5,245,193.50
Grand Total:	**51,053,427.00**

Quantity of Water Obtained from all sources in litres, Annual Total is 51, 053, 4427.00 Litres withdrawn and delivered