

2023 FOX-3 ANNUAL NUNAVUT WATER BOARD REPORT

FOR THE
NORTH WARNING SYSTEM

Contract # W8485-157352/001/NX
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EXECUTIVE SUMMARY IN ENGLISH FOLLOWS

2023-Годиннадцатый класс



EXECUTIVE SUMMARY

This 2023 Annual Report for the Nunavut Water Board (NWB) has been prepared by Nasittuq for the Department of National Defence (DND) in order to meet the requirements of the licence issued 08 June 2018, 8BC-FOD1828 – Type “B”, Part B “General Conditions”, paragraph 1 of its licence. This report covers 01 January to 31 December 2023.

Nasittuq is the Operations and Maintenance (O&M) Contractor for the North Warning System (NWS) including FOX-3, the North Warning System radar site at Dewar Lakes, Nunavut. The site is attended year-round and visited by additional staff from FOX-M, Sanirajak (Hall Beach), Nunavut for preventive maintenance inspections and as required for other work.

A total of 335 cubic meters was drawn from the water lake. This is below the annual maximum of 3,000 cubic meters allowed by the licence.

As FOX-3 is a landlocked site, all hazardous waste, including waste oil, is transported to FOX-M (Sanirajak) before being shipped to an approved hazardous waste disposal site outside of Nunavut as required by the licence. A total of 26 drums of waste HAZMAT were shipped from FOX-3 in 2023.

Non-hazardous domestic solid waste was disposed of through a contract with the Hamlet of Sanirajak at the local landfill. Nasittuq has documented authorization from the community for receiving the waste.

In 2023, a monitoring program was implemented at FOX-3 as required by the water licence, Part I. Rain and melt water that accumulated in the berms of fuel storage facilities was tested with hydrocarbon test strips and confirmed to be within effluent quality limits before the water was pumped out of the berms.

Four spills to the environment occurred at FOX-3 in 2023.

- 25-Jul-2023, NTN Spill # 2023-318: A leaking connection on heavy equipment caused a spill of hydraulic fluid on to a gravel pad. Impacted gravel was removed and containerized for off-site disposal. The connection was repaired and the leak was stopped.
- 12-Nov-2023, NTN Spill # 2023-477: A leaking connection on heavy equipment caused a spill of hydraulic fluid on to a gravel pad. Impacted gravel was removed and containerized for off-site disposal. The connection was repaired and the leak was stopped.
- 13-Feb-2023, NTN Spill # 2023-050: A failed component on the sewage system caused a spill on to a gravel pad. The leak was stopped and the component is undergoing repair.
- 19-Apr-2023, NTN Spill # 2023-155: A failed component on the sewage system caused a spill on to a gravel pad. The leak was stopped and the component is undergoing repair.

The Spill Contingency Plan was successfully implemented, and updated on 12-Jun-2023.

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1.0 INTRODUCTION

This 2023 Annual Report for the Nunavut Water Board (NWB) has been prepared by Nasittuq for the Department of National Defence (DND) in order to meet the requirements of the licence, 8BC-FOD1828 – Type “B”, Part B “General Conditions”, paragraph 1 of its licence, issued 08 June 2018 and amended effective 14 April 2022. The amendment now allows for 3,000 cubic metres per year.

This report covers 01 January to 31 December 2023.

Nasittuq is the Operations and Maintenance (O&M) Contractor for the North Warning System (NWS), including FOX-3.

FOX-3 is a North Warning System radar site located at Dewar Lakes, Nunavut. In 2023 the site was attended (staffed) full time throughout the year. The site is also visited quarterly by Nasittuq staff from FOX-M, Hall Beach, Nunavut for preventive maintenance inspections and as required for other work.

1.1 Report Details

Licensee: Department of National Defence, Government of Canada
Licence: 8BC-FOD1828 – Type “B”
Location: FOX-3 North Warning System Site, Dewar Lakes, Qikiqtani Region, Nunavut
Report Prepared by: Alaina Leslie and reviewed by Don Beattie
Nasittuq Corporation, 26-Mar-2024
Time period covered: 01 January to 31 December 2023

2.0 WATER USE

A total of **335 m³** of water was drawn from the supply lake in 2023, with a daily maximum of **50 m³**. This is below the annual maximum of 3,000 m³ allowed by the licence.

See Table 2-1 for the volume of water usage at FOX-3 each month in 2023.

Table 2-1: Monthly Raw Water Usage at FOX-3 in 2023

Month	Raw water usage (m ³)
January	0
February	0
March	0
April	9.9
May	22.8
June	37.3
July	51.3
August	97
September	22.8
October	14.9
November	42
December	36.7
TOTAL	334.7

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3.0 HAZARDOUS WASTE AND WASTE OIL DISPOSAL

As FOX-3 is a landlocked site, all hazardous waste, including waste oil, is transported to FOX-M (Sanirajak) before being shipped to an approved hazardous waste disposal site outside of Nunavut as required by the licence.

See **Annex A** for the shipping documents including the NWS Manifests. A total of 26 drums of waste HAZMAT were shipped from FOX-3 in 2023.

Table 3-1: Hazardous Waste and Waste Oil Sent for Disposal from FOX-3 in 2023

TDG shipping name	Description	Manifest # (TCN)	Quantity
Waste Fuel, Aviation, Turbine Engine	Waste Fuel, Aviation, Turbine Engine	46594, 46598	3 Drums
Waste Fuel, Aviation, Turbine Engine Mixture	Waste Fuel, Aviation, Turbine Engine Mixture	46594	1 Drums
Waste Solids Containing Flammable Liquid, N.O.S. (Fuel, Aviation, Turbine Engine)	Waste fuel filters	46593	1 Drums
Waste Solids Containing Flammable Liquid, N.O.S. (Fuel, Aviation, Turbine Engine)	Waste oily rags	46593	1 Drums
<i>Not TDG Regulated</i>	Waste fuel contaminated soil	46599	2 Drums
<i>Not TDG Regulated</i>	Waste glycol (drum)	46594	1 Drums
<i>Not TDG Regulated</i>	Waste oil filters	46593	2 Drums
<i>Not TDG Regulated</i>	Waste oil	46594, 46592, 46601, 46590, 46600	15 Drums

4.0 NON-HAZARDOUS SOLID WASTE DISPOSAL

Non-hazardous domestic solid waste was disposed of through a contract with the Hamlet of Sanirajak at the local landfill. Nasittuq has documented authorization from the community for receiving the waste.

See **Table 4-1**, below, for the quantity of waste generated.

The FOX-3 landfill still exists, but no new materials have been landfilled in the reporting period. See **Annex B** for its location on-site.

Table 4-1: Non-hazardous Domestic Solid Waste Sent for Disposal from FOX-3 in 2023

Month	Waste Generated (kg)
January	0
February	0
March	0
April	0
May	767
June	567
July	261
August	522

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Month	Waste Generated (kg)
September	329
October	304
November	0
December	0
TOTAL	2,750

5.0 MONITORING PROGRAM

In 2023, a monitoring program was implemented at FOX-3 as required by the water licence, Part I. The monitoring program included the following:

1. Volume of raw water drawn from the Water Supply Lake (FOD-1). The information from monitoring water use is shown in **Section 2.0 Water Use**. The water drawn was within the limit stated in the water licence.
2. Quality of sewage discharged from the final discharge point of the sewage disposal facility. The location of the sewage effluent outfall is shown in **Annex B**. A sump for the sewage outfall was constructed in 2010. The sewage outfall sump was not discharged in 2023 and therefore **Annex C** is left blank.

Monitoring Station FOD-2 was discontinued in water licence 8BC-FOD1828.

3. Accumulated rain and melt water contained in the berms of fuel storage facilities was analyzed using hydrocarbon test strips and confirmed within the effluent quality limits listed in the water licence, Part D prior to discharge (FOD-3). The coordinates and the results of the analysis are shown in **Annex D** and **Annex E**. All samples met the effluent requirements of the water licence, Part D.
4. Final Discharge Point from the Landfarm (FOD-4). The water accumulated in the landfarm was not discharged in 2023 and therefore no samples were collected.

6.0 SPILLS (UNAUTHORIZED DISCHARGES)

Four spills to the environment occurred at FOX-3 in 2023. Table 7-1, below, describes the spill (unauthorized discharge) details.

The Spill Contingency Plan was successfully implemented.

Table 6-1: Unauthorized Discharges at FOX-3 in 2023

Date, NT-NU Spill #	Product	Quantity	Cause and follow-up action	On-site location
25-Jul-2023, Spill # 2023-318	Hydraulic fluid	70 L	A leaking connection on heavy equipment caused a spill of hydraulic fluid on to a gravel pad. Impacted gravel was removed and containerized for off-site disposal. The connection was repaired and the leak was stopped.	Fox-3 Roadway (South of Main Building) (68° 38' 48"N, 71° 13' 35"W)
12-Nov-2023, Spill # 2023-477	Hydraulic fluid	4 L	A leaking connection on heavy equipment caused a spill of hydraulic fluid on to a gravel pad. Impacted gravel was removed and containerized for off-site disposal. The	Summit to Lower Site Roadway (68°37'33"N, 71°09'46."W)

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Date, NT-NU Spill #	Product	Quantity	Cause and follow-up action	On-site location
			connection was repaired and the leak was stopped.	
13-Feb-2023, Spill # 2023-050	Sewage	100 L	A failed component on the sewage system caused a spill on to a gravel pad. The leak was stopped and the component is undergoing repair.	Outside Main Building Train (68°39'01"N, 71°13'57"W)
19-Apr-2023, Spill # 2023-155	Sewage	1500 L	A failed component on the sewage system caused a spill on to a gravel pad. The leak was stopped and the component is undergoing repair.	Outside Main Building Train (68°39'01"N, 71°13'57"W)

7.0 REVISIONS TO THE SPILL CONTINGENCY PLAN

The Spill Contingency Plan was updated on **12-Jun-2023**. An updated copy of the Spill Contingency Plan has been submitted to the NWB with this annual report.

8.0 PROGRESSIVE RECLAMATION WORK UNDERTAKEN

No reclamation work was undertaken.

9.0 ACRONYMS

Table 9-1: Acronyms

Acronym	Definition
BTEX	benzene toluene ethylbenzene xylene
CCME	Canadian Council of Ministers of the Environment
DCC	Defence Construction Canada
DND	Department of National Defence
n.o.s.	not otherwise specified
NWB	Nunavut Water Board
NWS	North Warning System
O&M	Operations and Maintenance
PCB	Polychlorinated Biphenyl
PHC CWS	Canada-Wide Standards for Petroleum Hydrocarbons
SQG	Soil Quality Guidelines
TDGR	Transportation of Dangerous Goods Regulations
QA/QC	Quality Assurance/Quality Control

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ANNEX A. HAZARDOUS WASTE AND WASTE OIL DISPOSAL

The 2023 NWS Manifests for waste shipments (as previously described Table 4-1) are included in the following pages.

The following documents are enclosed:

1. NWS Manifest 46590
2. NWS Manifest 46592
3. NWS Manifest 46593
4. NWS Manifest 46594
5. NWS Manifest 46598
6. NWS Manifest 46599
7. NWS Manifest 46600
8. NWS Manifest 46601

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SHIPPING MANIFEST

Suite 1600, 275 Slater Street, Ottawa, ON K1P 5H9

NON NEGOTIABLE

Filled By: 00007603	Date: Jul 13, 2023, 3:33 PM	Project ID:	Task ID:
			TCN-46590

Ship To:	LSS-F/FOX-M, HALL BEACH, DND Storeroom Nasittuq, LSS Hall Beach: P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987	From:	FOX-3, DEWAR LAKES, DND Storeroom Nasittuq, NWS LSS Hall Beach, P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987	Priority 0
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Attention:	DION AKEAROK	Attention:	
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Carrier:	Routing:	Waybill #:	Total Pcs.	Total Weight:
	F3-XL		4	1600 LBS

QTY Order	Type	Line Weigh	Item	Description	WO or PO	B/Code or S/N	Remarks
1	PALLET		2002406	WASTE - OIL, 45 GAL			ASSET 361346
1			2002406	WASTE - OIL, 45 GAL			ASSET 361345
1			2002406	WASTE - OIL, 45 GAL			ASSET 361376
1			2002406	WASTE - OIL, 45 GAL			ASSET 361347

NOTE: All claims related to this shipment have to be filled with Nasittuq within 45 hours of receipt.

Received By:	Date
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Received By:	Date
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SHIPPING MANIFEST

Suite 1600, 275 Slater Street, Ottawa, ON K1P 5H9

NON NEGOTIABLE

Filled By: 00007603	Date: Jul 13, 2023, 4:43 PM	Project ID:	Task ID:
			TCN-46592

Ship To:	LSS-F/FOX-M, HALL BEACH, DND Storeroom Nasittuq, LSS Hall Beach: P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987	From:	FOX-3, DEWAR LAKES, DND Storeroom Nasittuq, NWS LSS Hall Beach, P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987	Priority 0
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Attention:	Attention:
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Carrier:	Routing:	Waybill #:	Total Pcs.	Total Weight:
	F3-XL		4	1800 LBS

QTY Order	Type Line Weigh	Item Item	Description	WO or PO B/Code or S/N	Remarks
1		2002406	WASTE - OIL, 45 GAL		ASSET 361370
1		2002406	WASTE - OIL, 45 GAL		ASSET 362374
1		2002406	WASTE - OIL, 45 GAL		ASSET 362375
1		2002406	WASTE - OIL, 45 GAL		ASSET 361375

NOTE: All claims related to this shipment have to be filled with Nasittuq within 45 hours of receipt.

Received By:	Date
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Received By:	Date
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SHIPPING MANIFEST

Suite 1600, 275 Slater Street, Ottawa, ON K1P 5H9

NON NEGOTIABLE

Filled By: 00007603	Date: Jul 13, 2023, 4:46 PM	Project ID:	Task ID:
			TCN-46593

Ship To:	LSS-F/FOX-M, HALL BEACH, DND Storeroom Nasittuq, LSS Hall Beach: P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987	From:	FOX-3, DEWAR LAKES, DND Storeroom Nasittuq, NWS LSS Hall Beach, P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987	Priority 0
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Attention:	Attention:
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Carrier:	Routing:	Waybill #:	Total Pcs.	Total Weight:
	F3-XL		4	1000 LBS

QTY Order	Type Line Weigh	Item Item	Description	WO or PO B/Code or S/N	Remarks
1		2002356	WASTE - OIL FILTERS		ASSET 361343
1		2002356	WASTE - OIL FILTERS		ASSET 322588
1		2003635	WASTE - FUEL FILTERS (DRUM)		ASSET 339893
1		2002505	WASTE - OILY RAGS		ASSET 363002

NOTE: All claims related to this shipment have to be filled with Nasittuq within 45 hours of receipt.

Received By:	Date
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Received By:	Date
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SHIPPING MANIFEST

Suite 1600, 275 Slater Street, Ottawa, ON K1P 5H9

NON NEGOTIABLE

Filled By: 00007603	Date: Jul 13, 2023, 4:50 PM	Project ID:	Task ID:
			TCN-46594

Ship To:	LSS-F/FOX-M, HALL BEACH, DND Storeroom Nasittuq, LSS Hall Beach: P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987	From:	FOX-3, DEWAR LAKES, DND Storeroom Nasittuq, NWS LSS Hall Beach, P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987	Priority 0
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Attention:	Attention:
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Carrier:	Routing:	Waybill #:	Total Pcs.	Total Weight:
			4	1400 LBS

QTY Order	Type Line Weigh	Item Item	Description	WO or PO B/Code or S/N	Remarks
1		2002344	WASTE - GLYCOL (DRUM)		ASSET 339894
1		2002406	WASTE - OIL, 45 GAL		ASSET 360225
1		2002343	WASTE - FUEL		ASSET 361366
1		2006405	WASTE - FUEL AND WATER MIXTURE		ASSET 363201

NOTE: All claims related to this shipment have to be filled with Nasittuq within 45 hours of receipt.

Received By:	Date
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Received By:	Date
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SHIPPING MANIFEST

Suite 1600, 275 Slater Street, Ottawa, ON K1P 5H9

NON NEGOTIABLE

Filled By: 00007603	Date: Jul 14, 2023, 8:11 AM	Project ID:	Task ID:
			TCN-46598

Ship To:	LSS-F/FOX-M, HALL BEACH, DND Storeroom Nasittuq, LSS Hall Beach: P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987	From:	FOX-3, DEWAR LAKES, DND Storeroom Nasittuq, NWS LSS Hall Beach, P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987	Priority 0
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Attention:	Attention:
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Carrier:	Routing:	Waybill #:	Total Pcs.	Total Weight:
	F3-XL		2	600 LBS

QTY Order	Type Line Weigh	Item Item	Description	WO or PO B/Code or S/N	Remarks
1		2002343	WASTE - FUEL		ASSET 363004
1		2002343	WASTE - FUEL		ASSET 360224

**NOTE: All claims related to this shipment have to be filled with Nasittuq
within 45 hours of receipt.**

Received By:	Date
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Received By:	Date
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SHIPPING MANIFEST

Suite 1600, 275 Slater Street, Ottawa, ON K1P 5H9

NON NEGOTIABLE

Filled By: 00007603	Date: Jul 14, 2023, 8:13 AM	Project ID:	Task ID:
			TCN-46599

Ship To:	LSS-F/FOX-M, HALL BEACH, DND Storeroom Nasittuq, LSS Hall Beach: P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987	From:	FOX-3, DEWAR LAKES, DND Storeroom Nasittuq, NWS LSS Hall Beach, P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987	Priority 0
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Attention:	Attention:
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Carrier:	Routing:	Waybill #:	Total Pcs.	Total Weight:
	F3-XL		2	1400 LBS

QTY Order	Type Line Weigh	Item Item	Description	WO or PO B/Code or S/N	Remarks
1		2002357	WASTE - FUEL CONTAMINATED SOIL		ASSET 361364 JETA1
1		2002357	WASTE - FUEL CONTAMINATED SOIL		ASSET 363001 JETA1

**NOTE: All claims related to this shipment have to be filled with Nasittuq
within 45 hours of receipt.**

Received By:	Date
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Received By:	Date
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SHIPPING MANIFEST

Suite 1600, 275 Slater Street, Ottawa, ON K1P 5H9

NON NEGOTIABLE

Filled By: 00007603	Date: Jul 14, 2023, 8:24 AM	Project ID:	Task ID:
			TCN-46600

Ship To:	LSS-F/FOX-M, HALL BEACH, DND Storeroom Nasittuq, LSS Hall Beach: P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987	From:	FOX-3, DEWAR LAKES, DND Storeroom Nasittuq, NWS LSS Hall Beach, P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987	Priority 0
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Attention:	Attention:
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Carrier:	Routing:	Waybill #:	Total Pcs.	Total Weight:
	F3-XL		2	800 LBS

QTY Order	Type Line Weigh	Item Item	Description	WO or PO B/Code or S/N	Remarks
1		2002406	WASTE - OIL, 45 GAL		ASSET 361369
1		2002406	WASTE - OIL, 45 GAL		ASSET 361372

**NOTE: All claims related to this shipment have to be filled with Nasittuq
within 45 hours of receipt.**

Received By:	Date
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Received By:	Date
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SHIPPING MANIFEST

Suite 1600, 275 Slater Street, Ottawa, ON K1P 5H9

NON NEGOTIABLE

Filled By: 00007603	Date: Jul 14, 2023, 8:25 AM	Project ID:	Task ID:
			TCN-46601

Ship To:	LSS-F/FOX-M, HALL BEACH, DND Storeroom Nasittuq, LSS Hall Beach: P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987	From:	FOX-3, DEWAR LAKES, DND Storeroom Nasittuq, NWS LSS Hall Beach, P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987	Priority 0
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Attention:	Attention:
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Carrier:	Routing:	Waybill #:	Total Pcs.	Total Weight:
	F3-XL		4	1600 LBS

QTY Order	Type Line Weigh	Item Item	Description	WO or PO B/Code or S/N	Remarks
1		2002406	WASTE - OIL, 45 GAL		ASSET 361371
1		2002406	WASTE - OIL, 45 GAL		ASSET 361373
1		2002406	WASTE - OIL, 45 GAL		ASSET 362939
1		2002406	WASTE - OIL, 45 GAL		ASSET 363003

NOTE: All claims related to this shipment have to be filled with Nasittuq within 45 hours of receipt.

Received By:	Date
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Received By:	Date
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ANNEX B. LOCATION OF EFFLUENT OUTFALL AND LANDFILL WITH COORDINATES



Figure B-1: Coordinates of landfill: 68° 39' 1.50"N, 71° 14' 35.00"W

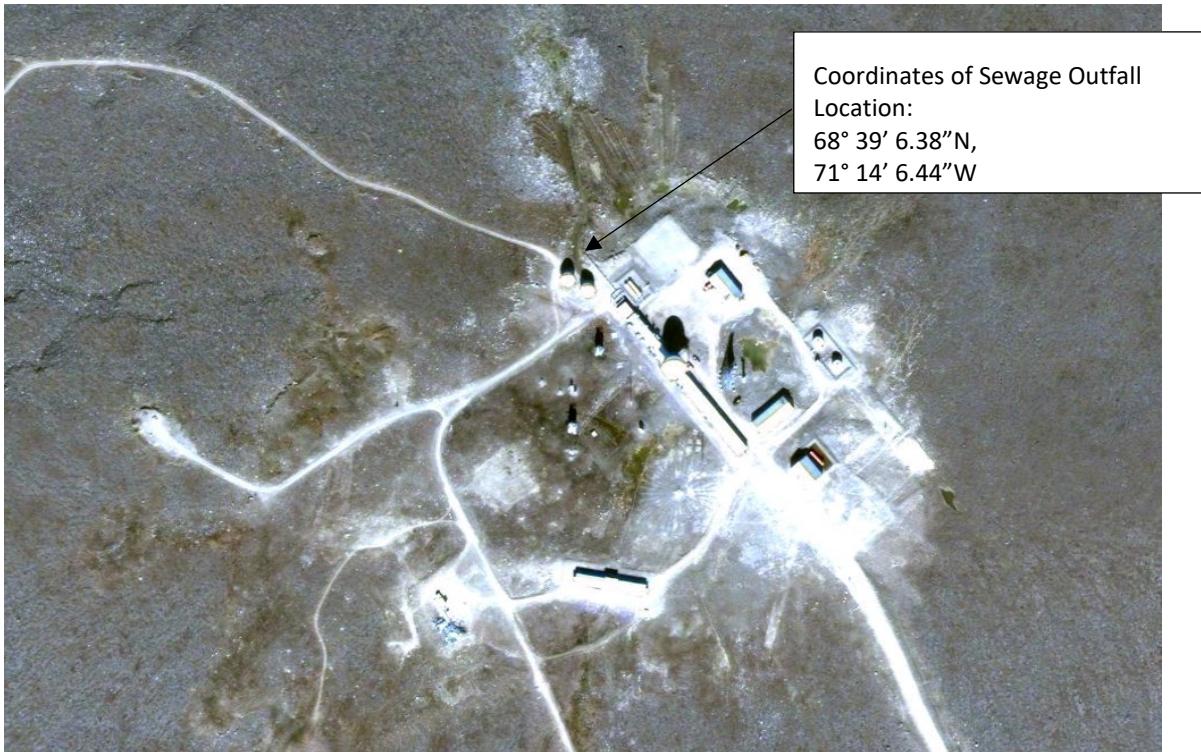


Figure B-2: Coordinates of Sewage Outfall Location: 68° 39' 6.38"N, 71° 14' 6.44"W

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ANNEX C. ANALYSIS OF DISCHARGED SEWAGE EFFLUENT

Monitoring Station FOD-2 was discontinued in water licence 8BC-FOD1828. The sewage outfall sump was not discharged in 2023 and therefore sampling was not required.

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ANNEX D. LOCATION OF BERMED FUEL STORAGE FACILITIES¹

Table D-1 contains the locations and sampling dates for the wastewater discharged from the bermed fuel storage facilities.

Table D-2: Location of Bermed Fuel Storage Facilities and Date Sampled in 2023

Berm	Location on-site	Discharge Latitude ²	Discharge Longitude	Date
DEW W22A&B	Summit	68°39'05.43"N	71°14'03.23"W	10-Jul-2023
DEW W22C&D	Summit	68°39'03.67"N	71°13'49.97"W	25-Jul-2023
DEW W20D&E	Airstrip	68°37'24.90"N	71°08'05.62"W	10-Jul-2023

¹ Effluent from bermed fuel storage facilities.

² Final discharge point of bermed fuel storage facility

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ANNEX E. ANALYSIS OF BERM WATER³

The berms at FOX-3 were sampled using hydrocarbon test strips as per the approved QA/QC Plan for Berm Water Sampling as stated in the water licence 8BC-FOD1929, PART D, Item 11. The photo log of the hydrocarbon test strips is included in pages, which follow.

Note: Photos of hydrocarbon test strips used in berm of tank W20D & W20E were not taken due to lack of camera on site.

Photo Log



Photo E 1: Hydrocarbon test strips used in berm of tanks W22A & W22B (10-Jul-2023)

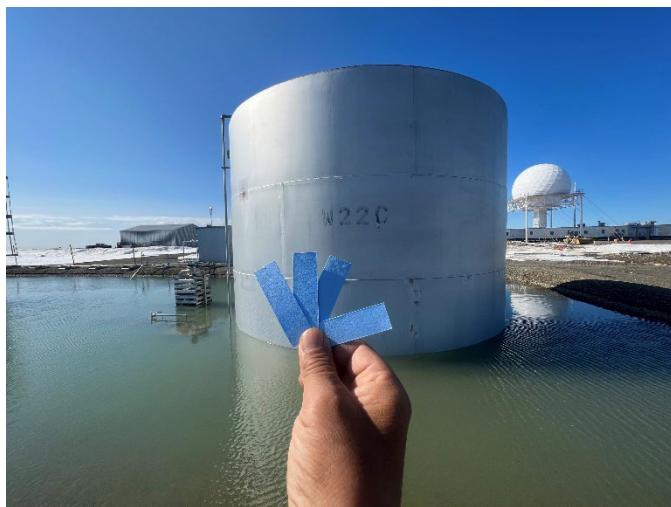


Photo E 2: Hydrocarbon test strips used in berm of tank W22C & D (25-Jul-2023)

³ Effluent from bermed fuel storage facilities.

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Document Number: 17.7 NWB-F3-2023 Rev. No: 2 Effective Date: 26-Mar-2024 Page: E-2 - 15



ANNEX F. MONITORING ACTIVITIES

n/a

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