

# 2022 CAM-M ANNUAL NUNAVUT WATER BOARD REPORT

## FOR THE NORTH WARNING SYSTEM

Contract # W8485-157352/001/NX  
SOW Ref: 17.7

**Document Number**  
17.7 NWB-ML-2022 , 30-Mar-2023

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## EXECUTIVE SUMMARY

This 2022 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 Part B “General Conditions”, paragraph 1 of its licence 8BC-CAM1929. This report covers 01 January to 31 December 2022.

As of 1-Aug-2022, Nasittuq is the Operations and Maintenance (O&M) Contractor for the North Warning System (NWS), including CAM-M, the attended (manned) NWS radar site located at Cambridge Bay, Nunavut.

The water usage for CAM-M in 2022 was 1114.1 m<sup>3</sup>, below the annual limit of 3650 m<sup>3</sup>. The maximum water drawn per day was 11.49 m<sup>3</sup>, which is below the daily limit of 300 m<sup>3</sup>.

Sewage at CAM-M is processed by the tertiary wastewater treatment system. Some of the treated effluent is recycled as on-site urinal/toilet flush water. The discharged treated effluent is of potable water quality. A sample of the treated effluent was sent for laboratory analysis each month in 2022 with the exception of June-August and October.

No hazardous waste and waste oil were shipped off-site in 2022 due to the NWS contract transition. In 2023 hazardous waste and waste oil will be sent to an approved hazardous waste disposal site outside of Nunavut as required by the licence.

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

Prior to discharge, water contained in the berms of the fuel storage facilities (CDL-3) was assessed using hydrocarbon test strips. The test strips confirmed the water was within the effluent quality limits listed in the water licence, Part D. The coordinates and the photo log of the test strips after analysis are shown in **Annex D**

No spills to the environment occurred at CAM-M in 2022.

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## 1.0 INTRODUCTION

This 2022 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 Part B “General Conditions”, paragraph 1 of its licence 8BC-CAM1929 issued 01 September 2019. This report covers 01 January to 31 December 2022.

As of 1-Aug-2022, Nasittuq is the Operations and Maintenance (O&M) Contractor for the North Warning System (NWS), including CAM-M. An O&M contract transition occurred over the summer of 2022.

CAM-M is the attended (manned) NWS radar site located at Cambridge Bay, Nunavut.

### 1.1 Report Details

Licensee:	Department of National Defence, Government of Canada
Licence:	8BC-CAM1929 – Type “B”
Location:	CAM-M North Warning System Site, Cambridge Bay, Kitikmeot Region, Nunavut
Report Prepared by:	Alaina Leslie and reviewed by Don Beattie Nasittuq Corporation, 21-Mar-2023
Time period covered:	01 January to 31 December 2022

## 2.0 WATER USE

The water usage for CAM-M in 2022 was **1114.1 m<sup>3</sup>**, below the annual limit of 3650 m<sup>3</sup>. The maximum water drawn per day was **11.49 m<sup>3</sup>**, which is below the daily limit of 300 m<sup>3</sup>.

See Table 2-1 for the volume of water drawn at CAM-M each month in 2022.

**Table 2-1: Monthly Raw Water Usage at CAM-M in 2022**

Month	Raw water usage (m <sup>3</sup> )
January	79.7
February	81.9
March	81.9
April	65.5
May	65.5
June	110.4
July	77.6
August	127.5
September	123.4
October	117.3
November	93.8
December	89.6
<b>TOTAL</b>	<b>1114.1</b>

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### 3.0 TREATED SEWAGE DISCHARGE

At CAM-M, the sewage and grey water were both processed through a Cycle-let® advanced tertiary wastewater treatment system. Some of the treated water is recycled as urinal/toilet flush water; the remainder is discharged at the designated outfall and is of potable water quality. See Table 3-1 for the volume of sewage and grey water treated by the Cycle-let® system. See **Section 6.0 – Monitoring Program** for details on sewage effluent monitoring.

The location and coordinates of treated sewage effluent outfall location (CDL-2) is contained in **Annex B**. Sewage sample analytical results and certificates of analysis are contained in **Annex C**.

**Table 3-1: Monthly and Annual Volume of Sewage and Grey Water Treated at CAM-M in 2022**

Month	Volume of sewage and greywater treated then discharged or recycled (m <sup>3</sup> )
January	79.7
February	81.9
March	81.9
April	65.5
May	65.5
June	110.4
July	77.6
August	127.5
September	123.4
October	117.3
November	93.8
December	89.6
<b>TOTAL</b>	<b>1114.1</b>

### 4.0 HAZARDOUS WASTE AND WASTE OIL DISPOSAL

No hazardous waste and waste oil were shipped off-site in 2022 due to the NWS contract transition. In 2023 hazardous waste and waste oil will be sent to an approved hazardous waste disposal site outside of Nunavut as required by the licence.

### 5.0 NON-HAZARDOUS SOLID WASTE DISPOSAL

Non-hazardous domestic solid waste was disposed of at the local landfill through a contract with the Municipality of Cambridge Bay. Nasittuq has documented authorization from the community for receiving the waste. See Table 5-1, below, for the quantity of non-hazardous waste generated.

**Table 5-1: Non-hazardous Domestic Solid Waste Sent for Disposal from CAM-M in 2022**

Month	Waste Generated (kg)
January	516
February	1204
March	1751

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Month	Waste Generated (kg)
April	1220
May	1305
June	1702
July	1375
August	1767
September	1359
October	1247
November	968
December	1057*
<b>TOTAL</b>	<b>15,471</b>

**Notes:**

\* Waste generation for December was estimated based on generation of 2.26 kg per person per day as tracking sheets were completed, but misplaced for these months. These estimates are generally consistent with the average waste generated for 2020-2022.

## 6.0 MONITORING PROGRAM

In 2022, a monitoring program was implemented at CAM-M as required by the water licence. The monitoring program included the following:

1. Volume of raw water drawn from the water Supply Lake (CDL-1). The information from this monitoring is shown in **Section 2.0 Water Use**.
2. Quality of sewage discharged from the final discharge point of the sewage treatment facility (CDL-2). The location of the sewage effluent outfall is shown in **Annex B**, including coordinates. The treated sewage was sampled monthly. The results of the analyses are shown in **Annex C**.
3. Prior to discharge, water contained in the berms of the fuel storage facilities (CDL-3) was assessed using hydrocarbon test strips. The test strips confirmed the water was within the effluent quality limits listed in the water licence, Part D. The coordinates and the photo log of the test strips after analysis are shown in **Annex D**.
4. No landfarm has been built on-site, therefore, no samples were required at the final discharge point from the landfarm (CDL-4).

## 7.0 SPILLS (UNAUTHORIZED DISCHARGES)

No spills to the environment occurred at CAM-M in 2022.

## 8.0 REVISIONS TO THE SPILL CONTINGENCY PLAN

The Spill Contingency Plan was updated on **1-Aug-2022**. An updated copy of the Spill Contingency Plan has been submitted to the NWS with this annual report.

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## 9.0 PROGRESSIVE RECLAMATION WORK UNDERTAKEN

No reclamation work was undertaken.

## 10.0 ACRONYMS

**Table 10-1: Acronyms**

Acronym	Definition
CWS for PHC	Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil
CCME	Canadian Council of Ministers of the Environment
m <sup>3</sup>	Cubic metre
n.o.s.	Not Otherwise Specified
NWB	Nunavut Water Board
NWS	North Warning System
O&M	Operations and Maintenance
PHC	Petroleum Hydrocarbons
PID	Photo Ionizing Detector
POL	Petroleum, Oil & Lubricant
SQG	Soil Quality Guidelines
TDGR	Transportation of Dangerous Goods Regulations

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## ANNEX A. HAZARDOUS WASTE AND WASTE OIL DISPOSAL

n/a

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## ANNEX B. TREATED SEWAGE EFFLUENT OUTFALL (CDL-2) LOCATION WITH COORDINATES



Figure 1: Coordinates of sewage treatment outfall: 69°07'03.2"N, 105°07'11.3"W

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## ANNEX C. ANALYSIS OF TREATED SEWAGE EFFLUENT

Table C-1: Summary of Analysis of Treated Sewage Effluent at CAM-M in 2022

Sample Date	Parameter				
	pH	Oil and Grease (Present - P / Absent - A)	Biological Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)	Faecal Coliforms <sup>1</sup>
Maximum Concentration	6.0 to 9.0 (pH units)	No visible sheen	120 mg/L	180 mg/L	10,000 CFU/100 mL
24-Jan-22	6.32	A	2	<2	0.33
7-Feb-22	7.3	A	3	3	1.67
5-Mar-22	6.72	A	2	<2	0.67
11-Apr-22	6.83	A	<1	<2	0.00
2-May-22	6.94	A	2	<2	2.67
1-Jun-22*	n/a	n/a	n/a	n/a	n/a
1-Jul-22*	n/a	n/a	n/a	n/a	n/a
1-Aug-22*	n/a	n/a	n/a	n/a	n/a
21-Sep-22	7.63	A	<2.0	<3.0	30.33
1-Oct-22*	n/a	n/a	n/a	n/a	n/a
17-Nov-22	7.15	A	<2.0	10.8	115.67
5-Dec-22	7.03	A	<2.0	8.6	4.00

\* In June, July and August the sample was not sent to the laboratory due to the NWS contract transition. In October a lack of sampling supplies prevented sample collection.

The following documents are enclosed:

1. Eurofins Certificate of Analysis Jan-22
2. Eurofins Certificate of Analysis Feb-22
3. Eurofins Certificate of Analysis Mar-22
4. Eurofins Certificate of Analysis Apr-22
5. Eurofins Certificate of Analysis May-22
6. ALS Certificate of Analysis Sep-22
7. ALS Certificate of Analysis Nov-22
8. ALS Certificate of Analysis Dec-22

<sup>1</sup> This column contains the average of the Cyclet 1A, Cyclet 1B, and Cyclet 1C.



## ANNEX D. LOCATION OF BERMED FUEL STORAGE FACILITIES

Table D-2 contains the locations and sampling dates for the wastewater discharged from the bermed fuel storage facilities.

**Table D-2: Analysis of Berm Water at CAM-M in 2022**

Berm	Location on-site	Discharge Latitude <sup>2</sup>	Discharge Longitude	Date
CAM W22A	Summit	69° 07'02.76"N	105° 07'02.69"W	June-2022
CAM W20B & W20C	Airstrip	69° 06'12.01"N	105° 07'36.60"W	June-2022
CAM W22C & W20D	Beach	69° 06'11.41"N	105° 05'50.26"W	June-2022

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<sup>2</sup> Final discharge point of bermed fuel storage facility



## ANNEX E. ANALYSIS OF BERM WATER<sup>3</sup>

The berm water at CAM-M was tested using hydrocarbon test strips as per the approved QA/QC Plan for Berm Water Sampling as stated in the water licence 8BC-CAM1929, PART D, Item 11. The photo log of the hydrocarbon test strips is included below.

### Photo Log



June 20, 2022 - W22A



June 20, 2022 - W20B & W20C

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<sup>3</sup> Effluent from bermed fuel storage facilities.



June 20, 2022 - W22C



## ANNEX F. MONITORING ACTIVITIES

n/a