



UNCLASSIFIED



SOW REF: 16.F.5.d

# 2014 ANNUAL NUNAVUT WATER BOARD REPORT FOR FOX-3

FOR THE

## North Warning System

Contract # W8485-100224/001/NX  
CDRL 16.F.5.d

Document Number  
FM-EHS-13, Rev 1, 16-Mar-2015

### Prepared for

**North Warning System & Assoc. Projects**  
Aerospace Equipment Program Directorate  
455 Blvd de la Carrière  
11th floor  
Gatineau, Québec  
K1A 0K2

### Prepared by

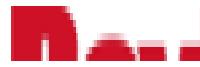
**Raytheon**  
**Canada Limited**  
400 Cooper Street  
Suite 3000  
Ottawa, ON, K2P 2H8

**Warning: Information Subject to Export Control Laws** — This document (and/or software, if applicable) may contain export-restricted data whose export/transfer/disclosure is restricted by U.S. and Canadian law. Dissemination to non U.S. persons whether in United States or abroad requires an export license or other authorizations from the United States and Canadian Governments.

UNCONTROLLED WHEN PRINTED



UNCLASSIFIED



SOW REF: 16.F.5.d

## CHANGE HISTORY

This sheet is a record of each issue of this document. When the revised document is issued, the previous issue is automatically superseded.

Version	Date	Configuration Management	Pages Changed	Reason for Change
1	16-Mar-2015	-	-	Initial Document Release.
<b>Document Title:</b> 2014 Annual Nunavut Water Board Report for FOX-3				<b>Document Number:</b> FM-EHS-13

UNCONTROLLED WHEN PRINTED

Document Number: FM-EHS-13

Revision No. 1

Effective Date: 16-Mar-2015

Page: ii - vii

Copyright © Her Majesty the Queen in right of Canada (2014)



UNCLASSIFIED



SOW REF: 16.F.5.d

## EXECUTIVE SUMMARY

This 2014 Annual Report for the Nunavut Water Board (NWB) has been prepared by Raytheon Canada Limited (RCL) for the Department of National Defence in order to meet the requirements of the licence issued 10 September 2009 3BC-FOD0919 – Type “B”, Part B. General Conditions, paragraph 1. This report covers 01 January to 31 December 2014.

The Operation and Maintenance (O&M) Contractor for the North Warning System (NWS) changed in 2014. Nasittuq was the O&M contractor of the NWS from 01 January to 31 July 2014 and had Care, Custody, and Control (CC&C) of the site. On 01 August 2014, RCL became the O&M Contractor and took over CC&C of the site.

FOX-3 is an unattended (unmanned) North Warning System radar site at Dewar Lakes, Nunavut. The site is visited quarterly for preventive maintenance inspections and as required for other work by RCL staff from FOX-M, Hall Beach, Nunavut.

A total of 79.3 cubic meters was drawn from the water supply lake. This is below the annual maximum of 1,440 cubic meters allowed by the licence.

The water contained in the berms of fuel storage facilities was sent for laboratory analysis and confirmed to be within effluent quality limits of the NWB licence 3BC-FOD0919, Part D, item 10 before the water was pumped out of the berms.

No hazardous waste and waste oil were disposed of in 2014.

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

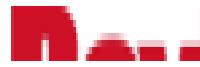
Four outdoor spills occurred at FOX-3 in 2014. The spills were:

- a. NT-NU Spill Line Report # 14-029. On 01 Feb 2014 (Zulu), a glycol leak was suspected because of a low level alarm on the heating system make-up tank received from the unattended site. Nasittuq personnel arrived on-site the evening of 31 Jan 2014 (01 Feb 2014 Z). Approximately 40 litres of glycol solution was cleaned up indoors and the remaining 140 liters was cleaned up outdoors.
- b. NT-NU Spill Line Report # 14-065. On 05 Mar 2014, A glycol leak was suspected because of a low level alarm on the heating system make-up tank received from the unattended site on 05 Mar 2014. Nasittuq personnel arrived on-site on 06 Mar 2014. 140 liters of glycol solution leaked from an air vent solder joint. Approximately 120 litres of glycol solution was cleaned up indoors and the remaining 20 liters was cleaned up outdoors.
- c. NT-NU Spill Line Report # 14-105. On 11 Apr 2014, Canadian Rangers reported a minor leak. A leak was suspected due to discoloured frost on the ground. The Rangers were unable to find any fuel on the valve or tank. Nasittuq staff arrived on-site 14 Apr 2014. The impacted snow was removed, the valve packing was tightened, the valve was monitored to confirm that the leak had stopped, and the seal on the valve was replaced.
- d. NT-NU Spill Line Report #14-359. On 04 October 2014, an alarm was received from FOX-3 indicating that the glycol in the site's heating system was low, technicians arrived on site later that

UNCONTROLLED WHEN PRINTED



UNCLASSIFIED



SOW REF: 16.F.5.d

day. Approximately 20 litres of glycol solution was cleaned up indoors and the remaining 60 liters was cleaned up outdoors.

The Spill Contingency Plan was revised. The table of fuel tanks (Appendix 8) was updated.

UNCONTROLLED WHEN PRINTED



ΔL<sup>4b</sup> bU<sup>4b</sup>/r<sup>4b</sup>/L<sup>4b</sup> Lσ<sup>4b</sup>bL<sup>4b</sup>Δ<sup>4b</sup>dU<sup>4b</sup> Δ<sup>4b</sup>rΔ<sup>4b</sup>bD<sup>4b</sup>r<sup>4b</sup>Δ<sup>4b</sup> 4Δ<sup>4b</sup>U<sup>4b</sup>L<sup>4b</sup> 4Δ<sup>4b</sup>C<sup>4b</sup>U<sup>4b</sup>C<sup>4b</sup>  
r<sup>4b</sup>Δ<sup>4b</sup>C<sup>4b</sup>D<sup>4b</sup>σ<sup>4b</sup>d<sup>4b</sup> bD<sup>4b</sup>Δ<sup>4b</sup>C<sup>4b</sup>σ<sup>4b</sup>b<sup>4b</sup>U<sup>4b</sup>C<sup>4b</sup>D<sup>4b</sup>σ<sup>4b</sup>><sup>4b</sup> Δ<sup>4b</sup>L dΔ<sup>4b</sup>C<sup>4b</sup>Δ<sup>4b</sup>σ<sup>4b</sup>C<sup>4b</sup>Δ<sup>4b</sup>σ<sup>4b</sup>Δ<sup>4b</sup>Δ<sup>4b</sup>C<sup>4b</sup>  
Δ<sup>4b</sup>σ<sup>4b</sup>b<sup>4b</sup>D<sup>4b</sup>U<sup>4b</sup>C<sup>4b</sup>σ<sup>4b</sup> 3BC-FOD0919, ΔC<sup>4b</sup> D, σ<sup>4b</sup>σ<sup>4b</sup> 10 Lσ<sup>4b</sup>bL<sup>4b</sup>Δ<sup>4b</sup>dU<sup>4b</sup>  
C<sup>4b</sup>Δ<sup>4b</sup>C<sup>4b</sup>Δ<sup>4b</sup>U<sup>4b</sup>σ<sup>4b</sup>

051 σ<sup>6</sup> ρ<sup>6</sup> Σ<sup>6</sup> Δσ<sup>6</sup>Σ<sup>6</sup>bc Δ<sup>6</sup>><sup>6</sup> 88 Σ<sup>6</sup>Δ<sup>6</sup> FOX-3Σ 2014%10<sup>6</sup> 24 ΔΔ<sup>6</sup>c ΔΔ<sup>6</sup>Δ<sup>6</sup>c Δ<sup>6</sup>><sup>6</sup>

UNCONTROLLED WHEN PRINTED



UNCLASSIFIED

**SOW REF: 16.F.5.d**

UNCONTROLLED WHEN PRINTED



UNCLASSIFIED



SOW REF: 16.F.5.d

## TABLE OF CONTENTS

1.0	Introduction .....	1
1.1	Report Details.....	1
2.0	Water Use .....	1
3.0	Hazardous Waste and Waste Oil Disposal .....	2
4.0	Non-hazardous Solid Waste Disposal.....	2
5.0	Monitoring Program.....	4
6.0	Spills (Unauthorized Discharges).....	5
7.0	Revisions to the Spill Contingency Plan.....	6
8.0	Progressive Reclamation Work Undertaken .....	6
9.0	Acronyms .....	7
	Annex A - FOX-3 - Hazardous Waste and Waste Oil Disposal in 2014 .....	8
	Annex B - FOX-3 - Location of Landfill with Co-ordinates.....	9
	Annex C - FOX-3 - Sewage Outfall Location (FOD-2) with co-ordinates.....	10
	Annex D - FOX-3 - Analysis of Sewage Effluent.....	11
	Annex E - FOX-3 - Location of Bermed Fuel Storage Facilities with Co-ordinates.....	12
	Annex F - FOX-3 - Analysis of Berm Water (Effluent from Bermed Fuel Storage Facilities) .....	13

## TABLES

Table 2-1 Monthly Raw Water Usage at FOX-3 in 2014.....	2
Table 3-1 Hazardous Waste and Waste Oil Sent for Disposal from FOX-3 in 2014.....	2
Table 4-1 Non-hazardous Domestic Solid Waste Sent for Disposal from FOX-3 2014.....	4
Table 7-1 Outdoor Spills Reported at FOX-3 in 2014 .....	5
Table E-1 Analysis of Berm Water at FOX-3 in 2014.....	13

UNCONTROLLED WHEN PRINTED



UNCLASSIFIED



SOW REF: 16.F.5.d

## 1.0 INTRODUCTION

This 2014 Annual Report for the Nunavut Water Board (NWB) has been prepared by Raytheon Canada Limited (RCL) for the Department of National Defence in order to meet the requirements of the licence issued 10 September 2009 3BC-FOD0919 – Type “B”, Part B. General Conditions, paragraph 1. This report covers the period from 01 January to 31 December 2014.

The Operation and Maintenance (O&M) Contractor for the North Warning System (NWS) changed in 2014. Nasittuq was the O&M Contractor of the NWS from 01 January to 31 July 2014 and had Care, Custody, and Control (CC&C) of the site. On 01 August 2014, RCL became the O&M Contractor and took over CC&C of the NWS sites, including FOX-3 Long Range Radar site.

FOX-3 is an unattended (unmanned) North Warning System radar site located at Dewar Lakes, Nunavut. The site is visited quarterly for preventive maintenance inspections and as required for other work by RCL staff from FOX-M, Hall Beach, Nunavut.

### 1.1 REPORT DETAILS

Licensee: Department of National Defence, Government of Canada  
Licence: 3BC-FOD0919 – Type “B”  
Location: FOX-3 North Warning System Site,  
Dewar Lakes, Qikiqtani Region, Nunavut  
Report prepared by: Raytheon Canada Limited, 16-Mar-2015  
Time Period Covered: 01 January to 31 December 2014

## 2.0 WATER USE

A total of 79.3 cubic meters was drawn from the water supply lake. This is below the annual maximum of 1,440 cubic meters allowed by the licence. See Table 2-1 for the volume of raw water drawn.

UNCONTROLLED WHEN PRINTED



UNCLASSIFIED



SOW REF: 16.F.5.d

**Table 2-1 Monthly Raw Water Usage at FOX-3 in 2014**

Month	Raw water usage in cubic metres (m <sup>3</sup> )	Company with CC&C of the site
January	0	Nasittuq Corporation
February	0	Nasittuq Corporation
March	0	Nasittuq Corporation
April	5.9	Nasittuq Corporation
May	0	Nasittuq Corporation
June	0	Nasittuq Corporation
July	0	Nasittuq Corporation
August	0	RCL
September	26.8	RCL
October	46.6	RCL
November	0	RCL
December	0	RCL
<b>TOTAL</b>	<b>79.3</b>	

### 3.0 HAZARDOUS WASTE AND WASTE OIL DISPOSAL

No hazardous waste and waste oil were disposed of in 2014. Therefore Table 3-1 is blank and Annex A for the shipping documents is blank. (Shipping documents include the completed movement documents for waste regulated under the Transportation of Dangerous Goods Regulations (TDGR) and Manifests for non-regulated waste).

**Table 3-1 Hazardous Waste and Waste Oil Sent for Disposal from FOX-3 in 2014**

Site	Description, TDG shipping name	Quantity	Movement Document or Manifest #
FOX-3	No hazardous waste or waste oil was disposed of in 2014.	0	N/A

### 4.0 NON-HAZARDOUS SOLID WASTE DISPOSAL

Non-hazardous domestic solid waste was disposed of through a contract with the Hamlet of Hall Beach and at the local dump. RCL has documented authorization from the community for receiving the waste. See

UNCONTROLLED WHEN PRINTED



UNCLASSIFIED

---

SOW REF: 16.F.5.d

Table 4-1 for the quantity of waste generated.

The FOX-3 landfill still exists. See **Annex B** for the location of the landfill with co-ordinates.

UNCONTROLLED WHEN PRINTED



UNCLASSIFIED



SOW REF: 16.F.5.d

**Table 4-1 Non-hazardous Domestic Solid Waste Sent for Disposal from FOX-3 2014**

Month	Waste Generated (kg)	Company with CC&C of the site
January	0	Nasittuq Corporation
February	70	Nasittuq Corporation
March	44	Nasittuq Corporation
April	769	Nasittuq Corporation
May	68	Nasittuq Corporation
June	552	Nasittuq Corporation
July	353	Nasittuq Corporation
August	32	RCL
September	746	RCL
October	325	RCL
November	181	RCL
December	0	RCL
<b>Total</b>	<b>3,140</b>	

## 5.0 MONITORING PROGRAM

See **Annex C** for the location of the sewage effluent outfall, FOD-2, with co-ordinates. A sump for the sewage outfall was built in 2010.

See **Annex D** is blank. The sump for the sewage outfall was not pumped out therefore no samples were taken for laboratory analysis.

See **Annex E** for the list of bermed fuel storage facilities, FOD-3, with co-ordinates.

See **Annex F** for analysis of berm water (water contained in the berms of fuel storage facilities). The results were confirmed to be within effluent quality limits of the NWB licence 3BC-FOD0919, Part D, item 10 before the water was pumped out of the berms.

**UNCONTROLLED WHEN PRINTED**



UNCLASSIFIED



SOW REF: 16.F.5.d

## 6.0 SPILLS (UNAUTHORIZED DISCHARGES)

Four outdoor spills occurred. See Table 6-1 for details.

**Table 6-1 Outdoor Spills Reported at FOX-3 in 2014**

Date, Spill #	Product	Quantity	Cause and follow-up action	Location at FOX-3
01 Feb 2014 Zulu, Spill # 14-029	50% ethylene glycol solution	180 liters	A glycol leak was suspected because of a low level alarm on the heating system make-up tank received from the unattended site. Nasittuq personnel arrived on-site the evening of 31 Jan 2014 (01 Feb 2014 Z). Staff cleaned up approximately 40 liters of glycol solution indoors. Staff determined the source of the spill was a failed soldered joint. From 01 to 05 Feb 2014, staff removed glycol impacted snow from under the main building, placed it into salvage drums, allowed it to melt indoors, and transferred the glycol/water mixture to drums for future disposal at a hazardous waste disposal facility outside of Nunavut. After the clean-up, the area under the building was lined with plastic and sorbent sheets and was surrounded by booms to catch any drips from the building (from saturated floor boards or glycol impacted snow/ice in cable trays). The leaking section of piping was replaced, stopping the leak.	Module 3 of the main building.
05 Mar 2014, Spill # 14-065	50% ethylene glycol solution	140 litres	A glycol leak was suspected because of a low level alarm on the heating system make-up tank received from the unattended site on 05 Mar 2014. Nasittuq personnel arrived on-site on 06 Mar 2014. 140 liters of glycol solution leaked from an air vent solder joint. Glycol inside the building was cleaned up. The solder joint was fixed. Snow was hard packed against the building preventing clean up under the building. Estimated 20 liters reached outdoors. Booms were placed around the spill area outside. Outdoor spill was cleaned up as of July. Sorbent sheets remain in place to catch any drips from the building. Clean up materials will be sent to a hazardous waste disposal facility outside of Nunavut.	Module 3 of the main building.

UNCONTROLLED WHEN PRINTED



UNCLASSIFIED



SOW REF: 16.F.5.d

Date, Spill #	Product	Quantity	Cause and follow-up action	Location at FOX-3
11 Apr 2014, Spill # 14-105	Jet A1 fuel	Less than 5 liters	On 11 Apr 2014, Canadian Rangers reported a minor leak. A leak was suspected due to discoloured frost on the ground. The Rangers were unable to find any fuel on the valve or tank. Nasittuq staff arrived on-site 14 Apr 2014 and found the valve was not leaking at the time of inspection. A drip tray was placed under the valve pending further inspection. On 15 Apr 2014, all impacted snow down to the bottom of the berm was removed and placed in a salvage drum. Sorbent materials were placed around the base of the cribbing. The drip tray was left in place under the valve. The valve's stem packing retainer nuts were tightened. The leak appeared to have stopped. Staff began monitoring the valve. On 21 Apr 2014, staff confirmed that tightening the valve had stopped the weeping. On 23 Apr 2014, staff on-site reported that the valve's seal had been replaced and the valve was not leaking. Clean up materials will be sent to a hazardous waste disposal facility outside of Nunavut.	Valve near summit fuel tank W22B within the berm of W22B
04 Oct 2014 Spill # 14-359	50% Ethylene glycol solution	80 litres	On 04 October 2014, an alarm was received from FOX-3 indicating that the glycol in the site's heating system was low. A site trip was organized and technicians arrived on site later that day. Once on the site the technicians verified that a spill had occurred. The technicians determined that 80 L of glycol solution had spilled and that approximately 60 L had leaked outside. The technicians placed sorbent pads under the building and replaced the bad section of pipe. On 05 October 2014, the sorbent pads from under the building were removed along with the impacted snow. Fresh sorbent pads were put down and weighted so that they could catch any drips.	Module 2 of the main building.

## 7.0 REVISIONS TO THE SPILL CONTINGENCY PLAN

The Spill Contingency Plan was revised. The table of fuel tanks (Appendix 8) was updated.

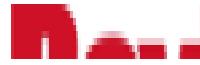
## 8.0 PROGRESSIVE RECLAMATION WORK UNDERTAKEN

None undertaken.

UNCONTROLLED WHEN PRINTED



UNCLASSIFIED



SOW REF: 16.F.5.d

## 9.0 ACRONYMS

Acronym	Definition
CC&C	Care, Custody, and Control
DEG	Diesel Engine Generator
DND	Department of National Defence
NWB	Nunavut Water Board
NWS	North Warning System
NWSO	North Warning System Office
O&M	Operations and Maintenance
PCB	Polychlorinated Biphenyl
RCL	Raytheon Canada Limited
TDGR	Transportation of Dangerous Goods Regulations

UNCONTROLLED WHEN PRINTED

Document Number: FM-EHS-13

Revision No. 1

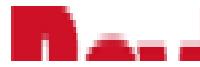
Effective Date: 16-Mar-2015

Page: 7 - 19

Copyright © Her Majesty the Queen in right of Canada (2014)



UNCLASSIFIED



SOW REF: 16.F.5.d

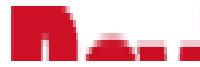
## ANNEX A - FOX-3 - HAZARDOUS WASTE AND WASTE OIL DISPOSAL IN 2014

This annex has been left blank as no hazardous waste or waste oil were disposed of in 2014. Therefore there are no shipping documents for Annex A.

UNCONTROLLED WHEN PRINTED



UNCLASSIFIED



SOW REF: 16.F.5.d

## ANNEX B - FOX-3 - LOCATION OF LANDFILL WITH CO-ORDINATES



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

UNCONTROLLED WHEN PRINTED

Document Number: FM-EHS-13

Revision No. 1

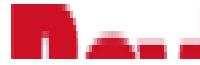
Effective Date: 16-Mar-2015

Page: 9 - 19

Copyright © Her Majesty the Queen in right of Canada (2014)



UNCLASSIFIED



SOW REF: 16.F.5.d

## ANNEX C - FOX-3 - SEWAGE OUTFALL LOCATION (FOD-2) WITH CO-ORDINATES



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

UNCONTROLLED WHEN PRINTED



UNCLASSIFIED

SOW REF: 16.F.5.d

## ANNEX D - FOX-3 - ANALYSIS OF SEWAGE EFFLUENT

The sump of the sewage outfall was not pumped out therefore no samples were taken for laboratory analysis. This Annex has been left blank because there are no results to report.

UNCONTROLLED WHEN PRINTED

Document Number: FM-EHS-13

Revision No. 1

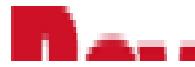
Effective Date: 16-Mar-2015

Page: 11 - 19

Copyright © Her Majesty the Queen in right of Canada (2014)



UNCLASSIFIED



SOW REF: 16.F.5.d

## ANNEX E - FOX-3 - LOCATION OF BERMED FUEL STORAGE FACILITIES WITH CO-ORDINATES

Licence	Location	Monitoring Station # (Final discharge point of bermed fuel storage facility)	Berm's location on-site	Berm's co-ordinates
3BC- FOD0919 Type "B"	FOX-3 North Warning System Site, Dewar Lakes, Qikiqtani Region, Nunavut	FOD-3	Summit (near helipad), berm of tanks W22A and W22B	68° 39' 05" N 71° 14' 03" W
			Summit (behind warehouse), berm of tanks W22C and W22D	68° 39' 04" N 71° 13' 50" W
			Airfield, berm of tanks W20D and W20E	68° 37' 25" N 71° 08' 06" W

UNCONTROLLED WHEN PRINTED



UNCLASSIFIED



SOW REF: 16.F.5.d

## ANNEX F - FOX-3 - ANALYSIS OF BERM WATER (EFFLUENT FROM BERMED FUEL STORAGE FACILITIES)

Table E-1 Analysis of Berm Water at FOX-3 in 2014

Site Berm Date	Maximum Concentration of any Grab Sample (µg/L)	FOX-3 W22A & W22B 1-Jul-14	FOX-3 W22C & W22D 1-Jul-14	FOX-3 W20D & W20E 1-Jul-14
pH	6 to 9	6.56	7.03	6.14
Oil and Grease (ug/L)	5000	<1000	<1000	<1000
Arsenic (total) (ug/L)	100	<20	<20	<20
Cadmium (dissolved) (ug/L)	10	<0.1	0.7	0.2
Chromium (dissolved) (ug/L)	100	<1	<1	<1
Cobalt (dissolved) (ug/L)	50	0.6	2	2
Copper (dissolved) (ug/L)	200	2	6	2
Lead (dissolved) (ug/L)	50	<1	<1	<1
Mercury (total) (ug/L)	0.6	<0.1	<0.1	<0.1
Nickel (dissolved) (ug/L)	200	<5	7	19
PCB (total) (ug/L)	1000	<0.1	<0.1	<0.1
Phenols (ug/L)	20	3	<1	<1
Zinc (total) (ug/L)	500	110	50	150
Benzene (ug/L)	370	<0.5	<0.5	<0.5
Toluene (ug/L)	2	<0.5	<0.5	<0.5
Ethyl benzene (ug/L)	90	<0.5	<0.5	<0.5

UNCONTROLLED WHEN PRINTED



UNCLASSIFIED



SOW REF: 16.F.5.d

01 July 2014

Summit (near helipad), berm of tanks W22A and W22B

Page 1 of 2

EXOVA OTTAWA

**Certificate of Analysis**

**Exova**

Client: Nasituq Corp. (Ottawa)  
160 Elgin Street, Suite 400  
Ottawa, ON  
K2P 2C4  
Attention: Ms. Barb Thomson  
PO#:  
Invoice to: Nasituq Corp. (Ottawa)

Report Number: 1312354  
Date Submitted: 2013-06-21  
Date Reported: 2013-06-25  
Project: FOX - 3  
COG #: 130518

Group	Analyte	MRL	Units	Guideline	
Metals	Cd	0.0001	mg/L		0.0001
	Co	0.0002	mg/L		0.0006
	Cr	0.001	mg/L		<0.001
	Cu	0.001	mg/L		0.002
	Ni	0.005	mg/L		<0.005
	Pb	0.001	mg/L		<0.001

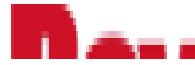
Guideline = \* = Guideline Exceedence  
\*\* = Analysis completed at Mississauga, Ontario.  
Results relate only to the parameters tested on the samples submitted.  
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, CG = Operational Guideline,  
MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable  
Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO  
= Interim Provincial Water Quality Objective, TDR = Typical Desired Range

**UNCONTROLLED WHEN PRINTED**



UNCLASSIFIED



SOW REF: 16.F.5.d

01 July 2014

Summit (near helipad), berm of tanks W22A and W22B

Page 2 of 2

**EXOVA OTTAWA**

**Certificate of Analysis**

**Exova**

Client: Nasituq Corp. (Ottawa)  
180 Elgin Street, Suite 400  
Ottawa, ON  
K2P 2C4  
Attention: Ms. Barb Thomson  
PO#:  
Invoice to: Nasituq Corp. (Ottawa)

Report Number: 1312353  
Date Submitted: 2013-06-21  
Date Reported: 2013-07-02  
Project: FOX - 3  
COC #: 130518

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
General Chemistry	pH	1.00			1035431 Water
Metals	Aqua-Regia Digest		mg/L		2013-06-14 FOX 3 W22A + W22B
	As	0.02	mg/L	<0.02	
	Zn	0.04	mg/L	0.11	
Nutrients	Phenols	0.001	mg/L	0.003	
Oil & Grease	Oil & Grease - Total	1	mg/L	<1	
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L	<0.1	
Subcontract	Hg	0.0001	mg/L	<0.0001	
VOCs	Benzene	0.5	ug/L	<0.5	
	Ethylbenzene	0.5	ug/L	<0.5	
	Toluene	0.5	ug/L	<0.5	
	Toluene-d8	1	%	103	

Guideline = \* = Guideline Exceedence

\*\* = Analysis completed at Mississauga, Ontario.

Results relate only to the parameters tested on the samples submitted.

Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline,  
MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable  
Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO  
= Interim Provincial Water Quality Objective, TDR = Typical Desired Range

**UNCONTROLLED WHEN PRINTED**



UNCLASSIFIED



SOW REF: 16.F.5.d

01 July 2014

Summit (behind warehouse), berm of tanks W22C and W22D

Page 1 of 2

EXOVA OTTAWA

Certificate of Analysis

Exova 

Client: Nasituq Corp. (Ottawa)  
160 Elgin Street, Suite 400  
Ottawa, ON  
K2P 2C4  
Attention: Ms. Barb Thomson  
PO#:  
Invoice to: Nasituq Corp. (Ottawa)

Report Number: 1413472  
Date Submitted: 2014-07-04  
Date Reported: 2014-07-07  
Project:  
COC #: 173685

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
Metals	Cd	0.0001	mg/L	0.0007	1116585 Water
	Co	0.0002	mg/L	0.0020	2014-07-01 F3-W22C+W22D
	Cr	0.001	mg/L	<0.001	
	Cu	0.001	mg/L	0.006	
	Ni	0.005	mg/L	0.007	
	Pb	0.001	mg/L	<0.001	

Guideline = \* = Guideline Exceedence

\*\* = Analysis completed at Mississauga, Ontario

Results relate only to the parameters tested on the samples submitted.

Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline,  
MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable  
Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO  
= Interim Provincial Water Quality Objective, TDR = Typical Desired Range

146 Colonnade Rd. Unit 8, Ottawa, ON K2B 7Y1

Page 2 of 3

UNCONTROLLED WHEN PRINTED

Document Number: FM-EHS-13

Revision No. 1

Effective Date: 16-Mar-2015

Page: 16 - 19

Copyright © Her Majesty the Queen in right of Canada (2014)



UNCLASSIFIED



SOW REF: 16.F.5.d

01 July 2014

Summit (behind warehouse), berm of tanks W22C and W22D

Page 2 of 2

EXOVA OTTAWA

Certificate of Analysis

Exova

Client: Nasituq Corp. (Ottawa)  
160 Elgin Street, Suite 400  
Ottawa, ON  
K2P 2C4  
Attention: Ms. Barb Thomson  
PO#:  
Invoice to: Nasituq Corp. (Ottawa)

Report Number: 1413475  
Date Submitted: 2014-07-04  
Date Reported: 2014-07-07  
Project: COC #: 173685

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
General Chemistry	pH	1.00			1116588
Mercury	Hg	0.0001	mg/L	<0.0001	Water
Metals	Aqua-Regia Digest			Y	
	As	0.02	mg/L	<0.02	
	Zn	0.04	mg/L	0.05	
Nutrients	Phenols	0.001	mg/L	<0.001	
Oil & Grease	Oil & Grease - Total	1	mg/L	<1	
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L	<0.1	
VOCs	Benzene	0.5	ug/L	<0.5	
	Ethylbenzene	0.5	ug/L	<0.5	
	Toluene	0.5	ug/L	<0.5	
VOCs Surrogates (%)	Toluene-d8	0	%	96	

Guideline = \* = Guideline Exceedence

\*\* = Analysis completed at Mississauga, Ontario.

Results relate only to the parameters tested on the samples submitted.

Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

UNCONTROLLED WHEN PRINTED



UNCLASSIFIED



SOW REF: 16.F.5.d

01 July 2014

Airfield, berm of tanks W20D and W20E

Page 1 of 2

EXOVA OTTAWA

Certificate of Analysis

Exova

Client: Nasituq Corp. (Ottawa)  
160 Elgin Street, Suite 400  
Ottawa, ON  
K2P 2C4  
Attention: Ms. Barb Thomson  
PO#:  
Invoice to: Nasituq Corp. (Ottawa)

Report Number: 1413473  
Date Submitted: 2014-07-04  
Date Reported: 2014-07-07  
Project:  
COC #: 173692

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
Metals	Cd	0.0001	mg/L		1115586 Water
	Co	0.0002	mg/L		2014-07-01
	Cr	0.001	mg/L		F3 W20D + W20E
	Cu	0.001	mg/L		<0.001
	Ni	0.005	mg/L		0.002
	Pb	0.001	mg/L		0.019

Guideline = \* = Guideline Exceedence

\*\* = Analysis completed at Mississauga, Ontario.

Results relate only to the parameters tested on the samples submitted.

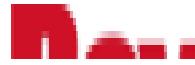
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

UNCONTROLLED WHEN PRINTED



UNCLASSIFIED



SOW REF: 16.F.5.d

01 July 2014

Airfield, berm of tanks W20D and W20E

Page 2 of 2

**EXOVA OTTAWA**

**Certificate of Analysis**

**Exova**

Client: Nasittuq Corp. (Ottawa)  
160 Elgin Street, Suite 400  
Ottawa, ON  
K2P 2C4  
Attention: Ms. Barb Thomson  
PO#:  
Invoice to: Nasittuq Corp. (Ottawa)

Report Number: 1413476  
Date Submitted: 2014-07-04  
Date Reported: 2014-07-07  
Project:  
COC #: 173692

Group	Analyte	MRL	Units	Guideline	Lab ID. Sample Matrix: Sample Type: Sampling Date: Sample I.D.
General Chemistry	pH	1.00		6.14	
Mercury	Hg	0.0001	mg/L	<0.0001	
Metals	Aqua-Regia Digest			Y	
	As	0.02	mg/L	<0.02	
	Zn	0.04	mg/L	0.15	
Nutrients	Phenols	0.001	mg/L	<0.001	
Oil & Grease	Oil & Grease - Total	1	mg/L	<1	
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L	<0.1	
VOCs	Benzene	0.5	ug/L	<0.5	
	Ethylbenzene	0.5	ug/L	<0.5	
	Toluene	0.5	ug/L	<0.5	
VOCs Surrogates (%)	Toluene-d8	0	%	100	

Guideline = \* = Guideline Exceedence

\*\* = Analysis completed at Mississauga, Ontario

Results relate only to the parameters tested on the samples submitted.

Methods references and/or additional QA/QC Information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

**UNCONTROLLED WHEN PRINTED**