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SOW REF: 16.F.5.d



# 2014 ANNUAL NUNAVUT WATER BOARD REPORT FOR DYE-M

FOR THE

## North Warning System

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

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**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

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## 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 When the revised document is issued, the previous issue is automatically superseded.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 DYE-M				<b>Document Number:</b> FM-EHS-13

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## 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-DYE0919 – Type “B”, Part B. General Conditions, paragraph 1. This report covers the period of 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 the DYE-M Long Range Radar site.

DYE-M is an unattended (unmanned) North Warning System radar site located at Cape Dyer, Nunavut. The site is visited quarterly for preventive maintenance inspections and as required for other work by O&M Contractor staff based out of the Logistics Support Site – Iqaluit (LSS-Q), Iqaluit, Nunavut.

A total of 86.8 cubic meters was drawn from the raw water sources. 32.7 cubic meters were from the water lake, DYE-1(a), and 54.7 cubic meters were from the melt-water water source, DYE-1(b). 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 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 flown out to the Logistics Support Site – Iqaluit and disposed of at Iqaluit’s landfill. RCL has documented authorization from the community for receiving the waste.

One outdoor spill occurred. The spill was:

- a. NT-NU Spill Line Report # 14-295. On 10 August 2014, 4 litres of Jet A1 fuel leaked from a valve with loose packing into the berm around tank W20A. The technicians tightened the valve packing, stopping the leak. The fuel sheen was soaked up using absorbent pads. The sorbent pads were placed in drums for disposal at a registered hazardous waste facility outside of Nunavut.

The Spill Contingency Plan was successfully implemented.





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## 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-DYE0919 – Type “B”, Part B. General Conditions, paragraph 1. This report covers the period from 01 January to 31 December 2014.

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DYE-M is an unattended (unmanned) North Warning System radar site located at Cape Dyer, Nunavut. The site is visited quarterly for preventive maintenance inspections and as required for other work by O&M Contractor staff based out of the Logistics Support Site – Iqaluit (LSS-Q), Iqaluit, Nunavut.

### 1.1 REPORT DETAILS

Licensee:	Department of National Defence, Government of Canada
Licence:	3BC-DYE0919 – Type “B”
Location:	DYE-M North Warning System Site, Cape Dyer, 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 86.8 cubic meters was drawn from the raw water sources. 32.7 cubic meters were from the water lake, DYE-1(a), and 54.1 cubic meters were from the melt-water water source, DYE-1(b). 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.

**Table 2-1 Monthly Raw Water Usage at DYE-M in 2014**

Month	Raw water drawn in cubic meters (m <sup>3</sup> ) from the water lake, DYE-1(a)	Raw water drawn in cubic meters (m <sup>3</sup> ) from the melt-water water source, DYE-1(b)	Company with CC&C of the site
January	0	0	Nasittuq Corporation
February	0	0	Nasittuq Corporation
March	0	0	Nasittuq Corporation
April	0	0	Nasittuq Corporation
May	32.7	0	Nasittuq Corporation
June	0	17.0	Nasittuq Corporation
July	0	19.0	Nasittuq Corporation
August	0	18.1	RCL
September	0	0	RCL
October	0	0	RCL
November	0	0	RCL
December	0	0	RCL
<b>TOTAL per source</b>	<b>32.7</b>	<b>54.1</b>	N/A
<b>SITE TOTAL</b>	<b>86.8</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 DYE-M in 2014**

Site	Description, TDG shipping name	Quantity	Movement Document or Manifest #
DYE-M	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 flown out to the Logistics Support Site – Iqaluit and disposed of at Iqaluit's landfill. RCL has documented authorization from the community for receiving the waste. See Table 4-1 for the quantity of waste generated.

**Table 4-1 Non-hazardous Domestic Solid Waste Sent for Disposal from DYE-M 2014**

Month	Waste Generated (kg)	Company with CC&C of the site
January	187	Nasittuq Corporation
February	416	Nasittuq Corporation
March	639	Nasittuq Corporation
April	140	Nasittuq Corporation
May	150	Nasittuq Corporation
June	534	Nasittuq Corporation
July	136	Nasittuq Corporation
August	454	RCL
September	0	RCL
October	0	RCL
November	0	RCL
December	635	RCL
<b>Total</b>	<b>3,291</b>	

## 5.0 MONITORING PROGRAM

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

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

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

See **Annex E** 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-DYE0919, Part D, item 10 before the water was pumped out of the berms.



## 6.0 SPILLS (UNAUTHORIZED DISCHARGES)

One outdoor spill occurred. See Table 6-1 for details.

**Table 6-1 Outdoor Spills Reported at DYE-M in 2014**

Date, Spill #	Product	Quantity	Cause and follow-up action	Location at DYE-M
10 Aug 2014  Spill # 14-295	Jet A1 Fuel	4 liters	Technicians were on-site doing preventive maintenance and had transferred fuel from tank W20A days before with no sign of a leak. On 10 August, the technicians noticed a fuel sheen on the water in the berm around tank W20A and determined that the source of the spill was fuel dripping from a valve directly into the water in the berm. The technicians tightened the valve packing, stopping the leak. The fuel sheen was soaked up using absorbent pads. The sorbent pads were placed in drums for disposal at a registered hazardous waste facility outside of Nunavut.	Berm of Tank W20A.

## 7.0 REVISIONS TO THE SPILL CONTINGENCY PLAN

The Spill Contingency Plan was successfully implemented.

## 8.0 PROGRESSIVE RECLAMATION WORK UNDERTAKEN

None undertaken.



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## 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

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## **ANNEX A - DYE-M - 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.



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## ANNEX B - DYE-M - SEWAGE OUTFALL LOCATION (DYE-2) WITH CO-ORDINATES



Coordinates of Sewage Outfall Location (DYE-2): 66° 39' 51.26"N, 61° 21' 16.54"W

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## ANNEX D - DYE-M - 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.

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## ANNEX E - DYE-M - 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- DYE0919 Type "B"	DYE-M North Warning System Site, Cape Dyer, Qikiqtani Region, Nunavut	DYE-3	Summit (behind PGS building), berm of tank W20A	68° 40' 00" N 61° 21' 27" W
			Summit (behind B- Train), berm of tanks W22K, W22J, W22I and W20B	68° 39' 54" N 61° 21' 25" W

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

Table E-1 Analysis of Berm Water at DYE-M in 2014

Site  Berm Date	Maximum Concentration of any Grab Sample (µg/L)	DYE-M W20A  2-Jul-14	DYE-M W22K, W22J, W22I and W20B 2-Jul-14
pH	6 to 9	6.29	6.63
Oil and Grease (ug/L)	5000	1000	<1000
Arsenic (total) (ug/L)	100	<20	<20
Cadmium (dissolved) (ug/L)	10	0.3	<0.1
Chromium (dissolved) (ug/L)	100	<1	<1
Cobalt (dissolved) (ug/L)	50	0.3	<0.2
Copper (dissolved) (ug/L)	200	7	3
Lead (dissolved) (ug/L)	50	<1	<1
Mercury (total) (ug/L)	0.6	<0.1	<0.1
Nickel (dissolved) (ug/L)	200	<5	<5
PCB (total) (ug/L)	1000	<0.1	<0.1
Phenols (ug/L)	20	<1	<1
Zinc (total) (ug/L)	500	220	<40
Benzene (ug/L)	370	<0.5	<0.5
Toluene (ug/L)	2	0.7	<0.5
Ethyl benzene (ug/L)	90	<0.5	<0.5

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Summit (behind PGS building), Berm of Tank W20A

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## EXOVA OTTAWA

## Certificate of Analysis



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

Report Number: 1414151  
Date Submitted: 2014-07-10  
Date Reported: 2014-07-11  
Project:   
COC #: 176108

Group		Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
Metals		Cd	0.0001	mg/L	0.0003	1118248 Wastewater - 2014-07-02 W20A
		Co	0.0002	mg/L	0.0003	
		Cr	0.001	mg/L	<0.001	
		Cu	0.001	mg/L	0.007	
		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, 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

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Summit (behind PGS building), Berm of Tank W20A

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## EXOVA OTTAWA

## Certificate of Analysis



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: 1414149  
Date Submitted: 2014-07-10  
Date Reported: 2014-07-14  
Project:   
COC #: 176108

Group		Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
General Chemistry		pH	1.00		6.29	1118246 Wastewater - 2014-07-02 W20A
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	0.22	
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	0.7	
VOCs Surrogates (%)		Toluene-d8	0	%	99	

Guideline = \* = Guideline Exceedence  
\*\* = Analysis completed at Mississauga, Ontario.  
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Methods references and/or additional QA/QC information available on request.

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Concentration, STD = Standard, PWQO = Provincial Water Quality Guidelines, IPWQO  
= Interim Provincial Water Quality Objective, TDR = Typical Desired Range

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02 July 2014

Summit (behind B-Train), berm of tanks W22K, W22J, W22I and W20B

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## EXOVA OTTAWA

## Certificate of Analysis



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

Report Number: 1414150  
Date Submitted: 2014-07-10  
Date Reported: 2014-07-11  
Project:   
COC #: 176107

Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.				
1118247 Wastewater - 2014-07-02 W22K				
Group	Analyte	MRL	Units	Guideline
Metals	Cd	0.0001	mg/L	<0.0001
	Co	0.0002	mg/L	<0.0002
	Cr	0.001	mg/L	<0.001
	Cu	0.001	mg/L	0.003
	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.  
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Summit (behind B-Train), berm of tanks W22K, W22J, W22I and W20B

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

Report Number: 1414148  
Date Submitted: 2014-07-10  
Date Reported: 2014-07-15  
Project:   
COC #: 176107

Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.				
1118245 Wastewater - 2014-07-02 W22K				
Group	Analyte	MRL	Units	Guideline
General Chemistry	pH	1.00		6.83
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	<0.04
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	%	95

Guideline = \* = Guideline Exceedence  
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