



2016 ANNUAL NUNAVUT WATER BOARD REPORT FOR CAM-3 FOR THE North Warning System

Contract # W8485-100224/001/NX
SOW Ref: 16.F.5.d

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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 When the revised document is issued, the previous issue is automatically superseded.

Revision	Date	Author	Pages Changed	Reason for Change
1	16-Mar-2017	W. Wyman	All	Initial Document Release
2	29-Mar-2017	W. Wyman	All	Updated as per NWSO comments



EXECUTIVE SUMMARY

This 2016 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-SHE0919 – Type “B”, Part B “General Conditions”, paragraph 1. This report covers the period from 01 January to 31 December 2016.

RCL is the Operations and Maintenance (O&M) Contractor for the North Warning System (NWS) including CAM-3. CAM-3 is the unattended (unmanned) NWS radar site located at Shepherd Bay, Nunavut. The site is visited quarterly by RCL staff from CAM-M, Cambridge Bay, Nunavut to complete preventive maintenance and as required for other work.

In 2016, a total of 99.7 cubic meters was drawn from the water supply lake at CAM-3. This is below the annual maximum of 1,440 cubic meters allowed by the licence.

Samples of 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-CAM0919, Part D, item 10 before the water was pumped out of the berms.

Hazardous waste and waste oil from CAM-3 were sent to an approved hazardous waste disposal facility outside of Nunavut as required by the licence. The waste was sent to Clean Harbors, P.O. Box 390, Ryley, AB, T0B 4A0. The waste receiver number for Clean Harbors is ABR1092. The hazardous waste consisted of 14 drums of assorted waste (oil, glycol, etc.) and out-of-use fire carts with dangerous goods materials removed.

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

One outdoor spill occurred at CAM-3 in 2016. The spill was:

NT-NU Spill Report # 16-226. On 17-Jun-2016, staff discovered oil impacted snow and ice under the module containing Diesel Electric Generator (DEG) 3. Technicians estimated that the impacted area contained less than 8 L of oil. Absorbent pads were used to mop up oil on the surface and booms were placed around the impacted area. Impacted soil was placed in a drum for disposal in a licenced disposal outside of Nunavut.

The Spill Contingency Plan was successfully implemented.



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1.0 INTRODUCTION

This 2016 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-SHE0919 – Type “B”, Part B “General Conditions”, paragraph 1. This report covers the period from 01 January to 31 December 2016.

RCL is the Operations and Maintenance (O&M) Contractor for the North Warning System (NWS) including CAM-3. CAM-3 is an unattended (unmanned) North Warning System radar site located at Shepherd Bay, Nunavut. The site is visited quarterly for preventive maintenance inspections and as required for other work by RCL staff from CAM-M, Cambridge Bay, Nunavut.

1.1 Report Details

Licensee: Department of National Defence, Government of Canada
Licence: 3BC-SHE0919 – Type “B”
Location: CAM-3 North Warning System Site, Shepherd Bay, Kitikmeot Region, Nunavut
Report Prepared by: Raytheon Canada Limited, 29-Mar-2017
Time period covered: 01 January to 31 December 2016

2.0 WATER USE

A total of 99.7 cubic meters (m³) was drawn from the water supply lake. This is below the annual maximum of 1,440 m³ allowed by the licence. See Table 2-1 for the volume of raw water drawn at CAM-3 in 2016.

Table 2-1: Monthly Raw Water Usage at CAM-3 in 2016

Month	Raw water usage (m ³)
January	0
February	0
March	0
April	0
May	8.9
June	12.3
July	0
August	14.1
September	63.4
October	0
November	0
December	0
TOTAL	99.7

3.0 HAZARDOUS WASTE AND WASTE OIL DISPOSAL

Hazardous waste and waste oil were sent to an approved hazardous waste disposal facility outside of Nunavut as required by the licence. The waste was sent to Clean Harbors, P.O. Box 390, Ryley, AB, T0B 4A0. The waste receiver number for Clean Harbors is ABR1092.

See Table 3-1 for the list of items sent for disposal.



See Annex A for the shipping documents including the completed movement documents for waste regulated under the Transportation of Dangerous Goods Regulations (TDGR) and NWS Manifests for non-regulated waste. The hazardous waste shipped from CAM-3 in 2016 consisted of 14 drums of assorted waste (oil, glycol, etc.) and out-of-use fire carts with dangerous goods materials removed.

Table 3-1: Hazardous Waste and Waste Oil Sent for Disposal from CAM-3 in 2016

Description, TDG shipping name	Quantity	Movement Document or Manifest #
Fire extinguisher (wheeled) Not TDG Regulated	2 units	NWS Manifest 35581, 35582
Nitrogen cylinder Not TDG Regulated	1 cylinder	NWS Manifest 35583
Waste Glycol Contaminated Rags Not TDG Regulated	1 drum	NWS Manifest 35580
Waste Glycol Filters Not TDG Regulated	1 drum	NWS Manifest 35580
Waste oil (drum) Not TDG Regulated	10 drums	NWS Manifest 35577, 35578, 35579
Waste oil filters Not TDG Regulated	2 drums	NWS Manifest 35580

4.0 NON-HAZARDOUS SOLID WASTE DISPOSAL

Non-hazardous domestic solid waste was flown from CAM-3 to CAM-M and disposed of through a contract with the Municipality of Cambridge Bay at the local 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 CAM-3 in 2016

Month	Waste Generated (kg)
January	0
February	0
March	145.6
April	445.9
May	319.8
June	244.0
July	1,338.1
August	0
September	0
October	0
November	0
December	0
TOTAL	2,493.4

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5.0 MONITORING PROGRAM

In 2016, a monitoring program was implemented at CAM-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 (SHE-1). The information from this monitoring is shown in **Section 2.0 Water Use**. The volume of 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 (SHE-2). The location of the sewage effluent outfall is shown in **Annex B**, including coordinates. A sump for the sewage outfall was constructed in 2010.

A misinterpretation of sampling requirements led field staff to believe that samples were only required when the sump was pumped out, as opposed to sampling monthly during periods of flow (i.e. a sample every month the sewage holding tank is discharged). Corrective action will be taken to ensure this does not recur. As such, **Annex C: Analysis of Discharged Sewage Effluent** has been left blank.

3. Quality of the water contained in the berms of fuel storage facilities prior to discharge (SHE-3) was analyzed and confirmed within the effluent quality limits listed in the water licence, Part D. The coordinates and the results of the analysis are shown in **Annex D: Location of Bermmed Fuel Storage Facilities and Analysis of Berm Water**. All samples met the effluent requirements of the water licence, Part D.

6.0 SPILLS (UNAUTHORIZED DISCHARGES)

Date, NT-NU Spill #	Product	Quantity	Cause and follow-up action	On-site location
17-Jul-2016, Spill # 16-226	Oil	8 L	<p>On 17-Jun-2016, staff discovered an area approximately 0.37 m² of oil impacted snow and ice under the module containing DEG 3. Technicians estimated that the impacted area contained less than 8 L of oil. Technicians determined that the source of the oil was a weep from the emissions absorber. Maintenance has been performed on the engine, stopping the weep.</p> <p>Absorbent pads were used to mop up oil on the surface and booms were placed around the impacted area. Absorbent pads were laid out over area to continue removal of oil from the melt water.</p> <p>Approximately 85 L of impacted soil was containerized for disposal in a licenced disposal outside of Nunavut.</p>	Under building train (68°47'34.20"N, 93°26'22.41"W)

The Spill Contingency Plan was successfully implemented.



7.0 REVISIONS TO THE SPILL CONTINGENCY PLAN

There were no revisions to the Spill Contingency Plan in 2016.

8.0 PROGRESSIVE RECLAMATION WORK UNDERTAKEN

No progressive reclamation work was undertaken in 2016.

9.0 ACRONYMS

Table 9-1: Acronyms

Acronym	Definition
CC&C	Care, Custody, and Control
DEG	Diesel Electric 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: HAZARDOUS WASTE AND WASTE OIL DISPOSAL IN 2016

The 2016 Movement Documents for TDG Regulated waste and NWS Manifests for non-TDG Regulated waste described in Table 3-1 are below.



SHIPPING MANIFEST									
Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8									
NON NEGOTIABLE									
Filled By: TSHAW		Date: Jul 15, 2016 2:35 PM		TCN-35577					
Ship To: CLEAN HARBORS CANADA INC. PO BOX 390 RILEY, AB, T0B 4A0 CA 780-663-3828				From: CAM-3, SHEPHERD BAY, DND Storeroom Raytheon Canada Limited, NWS LSS Cambridge Bay, P.O. Bag 1050 Cambridge Bay, NU, X0B 0C0 867-983-2112				Priority 0	
Attention:				Attention:		PSHEPPARD			
Carrier: NTCL		Routing:		Waybill #:		Total Pcs. 1 Skid		Total Weight: 1600 LB	
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks		
1			2002406	WASTE - OIL, 45 GAL			1 DRUM ASSET# 335824		
1			2002406	WASTE - OIL, 45 GAL			1 DRUM ASSET# 339445		
1			2002406	WASTE - OIL, 45 GAL			1 DRUM ASSET# 335776		
1			2002406	WASTE - OIL, 45 GAL			1 DRUM ASSET# 339417		
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.					Received By:		Date		
					Received By:		Date		

Figure 1: NWS Shipping Manifest TCN-35577

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Canada Limited

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**SHIPPING MANIFEST**

Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8

NON NEGOTIABLE

Filled By: TSHAW		Date: Jul 15, 2016 2:53 PM		TCN-35578			
Ship To: CLEAN HARBORS CANADA INC. PO BOX 390 RILEY, AB, T0B 4A0 CA 780-663-3828		From: CAM-3, SHEPHERD BAY, DND Storeroom Raytheon Canada Limited, NWS LSS Cambridge Bay, P.O. Bag 1050 Cambridge Bay, NU, X0B 0C0 867-983-2112		Priority 0			
Attention:		Attention:		PSHEPPARD			
Carrier: NTCL	Routing:	Waybill #:	Total Pcs. 1	Total Weight: 750 LB			
QTY	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
1			2002406	WASTE - OIL, 45 GAL			1 DRUM ASSET# 339418
1			2002406	WASTE - OIL, 45 GAL			1 DRUM ASSET# 332554
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.							
Received By:				Date			
Received By:				Date			

Figure 2: NWS Shipping Manifest TCN-35578

**SHIPPING MANIFEST**

Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8

NON NEGOTIABLE

Filled By: TSHAW		Date: Jul 15, 2016 2:59 PM		TCN-35579			
Ship To: CLEAN HARBORS CANADA INC. PO BOX 390 RILEY, AB, T0B 4A0 CA 780-663-3828		From: CAM-3, SHEPHERD BAY, DND Storeroom Raytheon Canada Limited, NWS LSS Cambridge Bay, P.O. Bag 1050 Cambridge Bay, NU, X0B 0C0 867-983-2112		Priority 0			
Attention:		Attention:		PSHEPPARD			
Carrier: NTCL	Routing:	Waybill #:	Total Pcs. 1 Skid	Total Weight: 1650 LB			
QTY	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
1			2002406	WASTE - OIL, 45 GAL			1 DRUM ASSET# 332557
1			2002406	WASTE - OIL, 45 GAL			1 DRUM ASSET# 339446
1			2002406	WASTE - OIL, 45 GAL			1 DRUM ASSET# 339447
1			2002406	WASTE - OIL, 45 GAL			1 DRUM ASSET# 339419
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.							
Received By:				Date			
Received By:				Date			

Figure 3: NWS Shipping Manifest TCN-35579

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Canada Limited

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SHIPPING MANIFEST						
Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8					NON NEGOTIABLE	
Filled By: TSHAW		Date: Jul 15, 2016 3:05 PM		TCN-35580		
Ship To: CLEAN HARBORS CANADA INC. PO BOX 390 RILEY, AB, T0B 4A0 CA 780-663-3828		From: CAM-3, SHEPHERD BAY, DND Storeroom Raytheon Canada Limited, NWS LSS Cambridge Bay, P.O. Bag 1050 Cambridge Bay, NU, X0B 0C0 867-983-2112			Priority 0	
Attention:		PSHEPPARD				
Carrier: NTCL		Routing:		Waybill #:	Total Pcs. 1 Skid	Total Weight: 350 LB
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N
1		2002356	WASTE - OIL FILTERS			1 DRUM ASSET# 339444
1		2009565	WASTE - GLYCOL CONTAMINATED RA			1 DRUM ASSET# 332556
1		2002356	WASTE - OIL FILTERS			1 DRUM ASSET# 332521
1		2003634	WASTE - GLYCOL FILTERS (DRUM)			1 DRUM ASSET# 311099
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.						
Received By:				Date		
Received By:				Date		

Figure 4: NWS Shipping Manifest TCN-35580



SHIPPING MANIFEST						
Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8					NON NEGOTIABLE	
Filled By: TSHAW		Date: Jul 15, 2016 3:14 PM		TCN-35581		
Ship To: CLEAN HARBORS CANADA INC. PO BOX 390 RILEY, AB, T0B 4A0 CA 780-663-3828		From: CAM-3, SHEPHERD BAY, DND Storeroom Raytheon Canada Limited, NWS LSS Cambridge Bay, P.O. Bag 1050 Cambridge Bay, NU, X0B 0C0 867-983-2112			Priority 0	
Attention:		PSHEPPARD				
Carrier: NTCL		Routing:		Waybill #:	Total Pcs. 1	Total Weight: 350 LB
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N
1		1080711	EXTINGUISHER_FIRE_FOAM,33 GAL			1 SKID ASSET# 131612. ROS:C315-004.
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.						
Received By:				Date		
Received By:				Date		

Figure 5: NWS Shipping Manifest TCN-35581

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SHIPPING MANIFEST						
Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8					NON NEGOTIABLE	
Filled By: TSHAW		Date: Jul 15, 2016 3:16 PM		TCN-35582		
Ship To: CLEAN HARBORS CANADA INC. PO BOX 390 RILEY, AB, T0B 4A0 CA 780-663-3828		From: CAM-3, SHEPHERD BAY, DND Storeroom Raytheon Canada Limited, NWS LSS Cambridge Bay, P.O. Bag 1050 Cambridge Bay, NU, X0B 0C0 867-983-2112		Priority 0		
Attention:		PSHEPPARD				
Carrier: NTCL	Routing:	Waybill #:	Total Pcs. 1	Total Weight: 350 LB		
QTY	Type	Line	Item	Description	WO or PO	B/Code or S/N
1		1080711		EXTINGUISHER,FIRE,FOAM,33 GAL		
						1 SKID ASSET# 131613. ROS:C315-004.
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.						
				Received By:	Date	
				Received By:	Date	

Figure 6: NWS Shipping Manifest TCN-35582



SHIPPING MANIFEST						
Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8					NON NEGOTIABLE	
Filled By: TSHAW		Date: Jul 15, 2016 3:17 PM		TCN-35583		
Ship To: CLEAN HARBORS CANADA INC. PO BOX 390 RILEY, AB, T0B 4A0 CA 780-663-3828		From: CAM-3, SHEPHERD BAY, DND Storeroom Raytheon Canada Limited, NWS LSS Cambridge Bay, P.O. Bag 1050 Cambridge Bay, NU, X0B 0C0 867-983-2112		Priority 0		
Attention:		PSHEPPARD				
Carrier: NTCL	Routing:	Waybill #:	Total Pcs. 1	Total Weight: 75 LB		
QTY	Type	Line	Item	Description	WO or PO	B/Code or S/N
1		2002423		GAS,NITROGEN N2,23 CU FT		ASSET# 139578
1		2002423		GAS,NITROGEN N2,23 CU FT		ASSET# 139577
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.						
				Received By:	Date	
				Received By:	Date	

Figure 7: NWS Shipping Manifest TCN-35583

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ANNEX B: SEWAGE EFFLUENT OUTFALL (CDL-2) LOCATION WITH COORDINATES



Coordinates of sewage outfall: 68°47'40"N, 93°26'28.17"W

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ANNEX C: ANALYSIS OF DISCHARGED 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.

**ANNEX D: LOCATION OF BERMED FUEL STORAGE FACILITIES AND ANALYSIS OF BERM WATER¹**

Table D-1: Analysis of Berm Water at CAM-3 in 2016

Berm	Maximum concentration of any grab sample (ug/L)	SHE W22A	SHE W22C&D
Location on-site		Summit	Beach
Discharge Latitude²		68°47'42.00"N	68°48'7.82"N
Discharge Longitude		93°26'19.58"W	93°36'50.12"W
Date		17-Jun-2016	17-Jun-2016
pH (pH Units)	6 to 9	7.77	7.58
Oil and Grease (ug/L)	5000	<1000	<1000
Arsenic (total) (ug/L)	100	<20	<20
Cadmium (dissolved) (ug/L)	10	<0.1	<0.1
Chromium (dissolved) (ug/L)	100	2	<1
Cobalt (dissolved) (ug/L)	50	<0.2	<2
Copper (dissolved) (ug/L)	200	12	<1
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	<40	<40
Benzene (ug/L)	370	<0.5	<0.5
Toluene (ug/L)	2	<0.5	<0.5
Ethyl benzene (ug/L)	90	<0.5	<0.5

¹ Effluent from bermed fuel storage facilities.² Final discharge point of bermed fuel storage facility



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EXOVA ENVIRONMENTAL ONTARIO

Certificate of Analysis



Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 15-00345-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1610453
Date Submitted: 2016-06-24
Date Reported: 2016-06-28
Project: CAM-3
COC #: 170388

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1247040 Sewage
					2016-06-17 W22 A
Group	Analyte	MRL	Units	Guideline	
General Chemistry	pH	1.00			7.77
Mercury	Hg	0.0001	mg/L		<0.0001
Metals	As	0.02	mg/L		<0.02
	Zn	0.04	mg/L		<0.04
Oil & Grease	Oil & Grease - Total	1	mg/L		<1
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L		<0.1
Phenols-4AAP	Phenols	0.001	mg/L		<0.001
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**

All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario).

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

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

146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

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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Figure 8: SHE W22A berm water laboratory results page 1 of 2 (June 2016)

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EXOVA ENVIRONMENTAL ONTARIO

Certificate of Analysis



Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#:
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1610451
Date Submitted: 2016-06-24
Date Reported: 2016-06-27
Project: CAM-3
COC #: 176791

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	<0.001
		Ni	0.005	mg/L	<0.005
		Pb	0.001	mg/L	<0.001

Lab I.D. 1247038
Sample Matrix Sewage
Sample Type -
Sampling Date 2016-06-17
Sample I.D. W22C W22D -
Dissolved Metals

Guideline = * = **Guideline Exceedence**
All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario).
Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.
146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

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

Page 2 of 3

Figure 9: SHE W22A berm water laboratory results page 2 of 2 (June 2016)

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SOW Ref: 16.F.5.d

EXOVA ENVIRONMENTAL ONTARIO

Certificate of Analysis



Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 15-00345-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1610448
Date Submitted: 2016-06-24
Date Reported: 2016-06-28
Project: CAM-3
COC #: 170388

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1247035 Sewage 2016-06-17 W22C W22D
Group	Analyte	MRL	Units	Guideline	
General Chemistry	pH	1.00			7.58
Mercury	Hg	0.0001	mg/L		<0.0001
Metals	As	0.02	mg/L		<0.02
	Zn	0.04	mg/L		<0.04
Oil & Grease	Oil & Grease - Total	1	mg/L		<1
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L		<0.1
Phenols-4AAP	Phenols	0.001	mg/L		<0.001
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	%		99

Guideline = * = Guideline Exceedence

All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario).
Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

146 Colonnade Rd. Unit 8, Ottawa, ON K2E 7Y1

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

Page 2 of 5

Figure 10: SHE W22C&D berm water laboratory results page 1 of 2 (June 2016)

UNCONTROLLED WHEN PRINTED



EXOVA ENVIRONMENTAL ONTARIO

Certificate of Analysis



Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#:
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1610452
Date Submitted: 2016-06-24
Date Reported: 2016-06-27
Project: CAM-3
COC #: 170388

Group		Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
Metals		Cd	0.0001	mg/L		1247039 Sewage - 2016-06-17 W22A - Dissolved Metals
		Co	0.0002	mg/L		
		Cr	0.001	mg/L		
		Cu	0.001	mg/L		
		Ni	0.005	mg/L		
		Pb	0.001	mg/L		
						<0.0001
						<0.0002
						0.002
						0.012
						<0.005
						<0.001

Guideline = * = **Guideline Exceedence**
All analysis completed in Ottawa, Ontario (unless otherwise indicated by ** which indicates analysis was completed in Mississauga, Ontario).
Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.
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Figure 11: SHE W22C&D berm water laboratory results page 2 of 2 (June 2016)