



2017 ANNUAL NUNAVUT WATER BOARD REPORT FOR FOX-M

FOR THE
North Warning System

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

Document Number
FM-EHS-13, Rev 2, 12-Feb-2018

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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 When the revised document is issued, the previous issue is automatically superseded.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	21-Jan-2015	W. Wyman	All	Initial Document Release
2	12-Feb-2018	W. Wyman	All	Updated formatting



SOW Ref: 16.F.5.d

EXECUTIVE SUMMARY IN ENGLISH FOLLOWS

$$d \Delta^{\epsilon_b \epsilon_b} <^c \supset \Delta \Delta^{\epsilon} \text{ e } \supset \text{c} \text{ n } \sigma^{\epsilon} \text{ J }^c <^{\epsilon} \text{ e } \supset \text{ n } \text{ b } \text{ r } \text{ J }^c \text{ J } \Delta^{\epsilon} \text{ r } \epsilon_b \Delta \supset \text{c } \epsilon_b \text{ n } \supset \sigma^{\epsilon_b}$$

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EXECUTIVE SUMMARY

This 2017 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-FOH0919 – Type “B”, Part B “General Conditions”, paragraph 1. This report covers the period from 01 January to 31 December 2017.

RCL is the Operation and Maintenance Contractor for the North Warning System (NWS), including FOX-M, the attended (manned) NWS radar site located at Hall Beach, Nunavut.

The water usage at FOX-M in 2017 was 1105 cubic meters, which is an average of 3.0 cubic meters per day. There is no water usage limit in the licence for FOX-M because water is drawn from an artificial (man-made) reservoir and not from a natural source.

Sewage at FOX-M was 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 2017 with the exception of June.

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-FOH0919, Part D, item 10 before the water was pumped out of the berms.

Hazardous waste was removed from FOX-M for disposal outside of Nunavut in 2017. The hazardous waste was shipped to Safety Kleen, 2730 Boulevard Industriel, Chambly, QC, J3L 4V2. The hazardous waste consisted of 45 drums of assorted waste (oil, fuel, glycol, etc.) and 6 bags of unused urea.

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

One outdoor spill occurred at FOX-M in 2017:

NT-NU Spill Line Report Number 17-412. On 08Nov2017, the loader was outside of the garage and failed to start. While attempting to start the loader a small amount of fuel spilled from a hose on the loader outside of the drip tray that was in place during this work. Once started, the loader was moved into the garage to complete the repairs and the impacted snow was cleaned up.

The Spill Contingency Plan was successfully implemented.



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1.0 INTRODUCTION

This 2017 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-FOH0919 – Type “B”, Part B “General Conditions”, paragraph 1. This report covers the period of 01 January to 31 December 2017.

RCL is the Operation and Maintenance Contractor for the North Warning System (NWS), including FOX-M. FOX-M is an attended (manned) North Warning System radar site located at Hall Beach, Nunavut.

1.1 Report Details

Licensee: Department of National Defence, Government of Canada
Licence: 3BC-FOH0919 – Type “B”
Location: FOX-M North Warning System Site, Hall Beach, Qikiqtani Region, Nunavut
Report Prepared by: Raytheon Canada Limited, 15-Mar-2017
Time period covered: 01 January to 31 December 2017

2.0 WATER USE

The water usage at FOX-M in 2017 was 1,105 cubic meters, which is an average of 3.0 cubic meters per day. See Table 2-1 for raw water usage.

There is no water usage limit in the licence for FOX-M because water is drawn from an artificial (man-made) reservoir and not from a natural source. The quantity drawn is greater than what is actually used on-site because the water is recirculated to prevent the water line from freezing.

Table 2-1: Monthly Raw Water Usage at FOX-M in 2017

Month	Raw water usage (m ³)
January	57
February	37
March	29
April	41
May	92
June	91
July	147
August	125
September	131
October	116
November	87.5
December	151.5
TOTAL	1,105



3.0 TREATED SEWAGE DISCHARGE

At FOX-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 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 for details on sewage effluent monitoring.



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Table 3-1: Monthly and Annual Volume of Sewage and Grey Water Treated at FOX-M in 2017

Month	Volume of sewage and greywater treated then discharged or recycled (m³)
January	57
February	39
March	42
April	41
May	90
June	91
July	147
August	125
September	131
October	111
November	87.5
December	151.5
TOTAL	1,113

4.0 HAZARDOUS WASTE AND WASTE OIL DISPOSAL

Hazardous waste and waste oil were sent to an approved hazardous waste disposal site outside of Nunavut as required by the licence. The hazardous waste was shipped to Safety Kleen, 2730 Boulevard Industriel, Chambly, QC, J3L 4V2. The hazardous waste consisted of 45 drums of assorted waste (oil, fuel, glycol, etc.) and 6 bags of unused urea.

See

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Table 4-1 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.



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Table 4-1: Hazardous Waste and Waste Oil Sent for Disposal from FOX-M in 2017

Description, TDG shipping name	Quantity	Movement Document or Manifest #
Waste Jet A1 fuel and water mixture	1 Drum	Movement Document 2581551-5
Waste fuel, aviation, turbine engine mixture		
Waste Jet A1 fuel and water mixture	1 Drum	Movement Document 2581551-5
Waste fuel, aviation, turbine engine mixture		
Waste fuel contaminated soil	7 Drums	Movement Document 2581551-5
Waste solids containing flammable liquids, not otherwise specified (n.o.s) (fuel, aviation, turbine engine)		
Waste Jet A1 fuel fuel filters	1 Drum	Movement Document 2581551-5
Waste solids containing flammable liquids, n.o.s (fuel, aviation, turbine engine)		
Waste oily rags	2 Drums	Movement Document 2581551-5
Waste solids containing flammable liquids, n.o.s (fuel, aviation, turbine engine)		
Urea	6 Bags	NWS Manifest 37052
Not TDG Regulated		
Waste activated carbon filter	2 Drums	NWS Manifest 37057
Not TDG Regulated		
Waste glycol (drum)	1 Drum	NWS Manifest 37070
Not TDG Regulated		
Waste oil	29 Drums	NWS Manifest 37070, 37131
Not TDG regulated		
Waste oil filters	1 Drum	NWS Manifest 37069
Not TDG regulated		

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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 Hall Beach. RCL has documented authorization from the community for receiving the waste. See Table 5-1 for the quantity of non-hazardous waste generated.

Table 5-1: Non-hazardous Domestic Solid Waste Sent for Disposal from FOX-M in 2017

Month	Waste Generated (kg)
January	1,506
February	1,583
March	1,458
April	1,126
May	914
June	1,256
July	1,306
August	1,608
September	1,873
October	1,642
November	1,329
December	1,279
TOTAL	16,880

6.0 MONITORING PROGRAM

In 2017, a monitoring program was implemented at FOX-M as required by the water licence, Part I. The monitoring program included the following:

1. Volume of raw water drawn from the reservoir (FOH-1). The raw water monitoring information is shown in **Section 2.0 Water Use**.
2. Quality of sewage discharged from the final discharge point of the sewage treatment facility (FOH-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: Analysis of Treated Sewage Effluent**.
3. Quality of the water contained in the berms of fuel storage facilities prior to discharge (FOH-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. No berm water was discharged at FOX-M in 2017.

**7.0 SPILLS (UNAUTHORIZED DISCHARGES)**

Date, NT-NU Spill #	Product	Quantity	Cause and follow-up action	On-site location
08-Nov-2017, Spill # 17-412	Jet A1	1 L	On 08-Nov-2017, the loader was outside of the garage and failed to start. In the process of getting the loader going a small amount of fuel spilled from a hose outside of the drip tray that was in place during this work. Once started, the loader was moved into the garage to complete the repairs and the impacted snow was cleaned up.	Outside Garage (68°45'43.93"N, 81°13'36.23"W)

The Spill Contingency Plan was successfully implemented.

8.0 REVISIONS TO THE SPILL CONTINGENCY PLAN

There were no revisions to the Spill Contingency Plan in 2017.

9.0 PROGRESSIVE RECLAMATION WORK UNDERTAKEN

No progressive reclamation work was undertaken in 2017.

10.0 ACRONYMS

Table 10-1: Acronyms

Acronym	Definition
n.o.s	Not Otherwise Specified
NWB	Nunavut Water Board
NWS	North Warning System
PCB	Polychlorinated Biphenyl
RCL	Raytheon Canada Limited
TDGR	Transportation of Dangerous Goods Regulations



ANNEX A: HAZARDOUS WASTE AND WASTE OIL DISPOSAL IN 2017

The 2017 Movement Documents for TDG Regulated waste and NWS Manifests for non-TDG Regulated waste described in



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Table 4-1 are below.

MOVEMENT DOCUMENT / MANIFEST
DOCUMENT DE MOUVEMENT / MANIFESTE

This Movement document/manifest conforms to all federal and provincial transport and environmental legislation.
Ce document de mouvement/manifeste est conforme aux législations fédérale et provinciale sur l'environnement et le transport.

2581551-5

Movement Document / Manifest Reference No.
N° de référence du document de mouvement/manifeste

A Generator / consigneur Producteur / expéditeur Registration No. / Provincial ID No. N° d'immatriculation - d'id. provincial NUG 100003 Company name / Nom de l'entreprise DEPARTMENT OF NATIONAL DEFENCE / RCL Mailing address / Adresse postale 72 WING BLDG 109 HORNBY HILLS ONTARIO City / Ville HORNBY Province ON Postal code / Code postal M9A 6K0 E-mail / Courriel électronique Tel. No. / N° de tél. Shipping site address / Adresse du lieu de l'expédition NWS LSS HALL BEACH PO BOX 46 City / Ville HALL BEACH Province NU Postal code / Code postal X0A 6K0		B Carrier Transporteur Registration No. / Provincial ID No. N° d'immatriculation - d'id. provincial Company name / Nom de l'entreprise NEAS Montreal QC Mailing address / Adresse postale 2100 Ave Dieme-Dupuy City / Ville Montreal Province QC Postal code / Code postal H3C 3R6 E-mail / Courriel électronique Sales@NEAS.ca Tel. No. / N° de tél. Vehicle / Véhicule Trailer - Rail car No. 1 1 ^{re} remorque - wagon Trailer - Rail car No. 2 2 ^e remorque - wagon Port of entry / Port d'entrée Point de sortie Port of exit / Point de sortie Point de destination Carrier Certification / certify that I have received waste or recyclable material from the generator / consigneur for delivery to the receiver / consignee as set out in Part A and that the information contained in Part B is complete and correct. Attestation du transporteur : J'atteste avoir reçu les déchets ou matières recyclables du producteur / expéditeur en vue de leur livraison au réceptionnaire / destinataire, tels qu'ils figurent à la partie A et que les renseignements inscrits à la partie B sont exacts et complets. Name of authorized person (print) Nom de l'agent autorisé (caractères d'impression) Mathieu Dupuis Year / Année Month / Mois Day / Jour 1872 2015 4327 1708103		C Receiver / consignee Réceptionnaire / destinataire Registration No. / Provincial ID No. N° d'immatriculation - d'id. provincial Company name / Nom de l'entreprise Mailing address / Adresse postale City / Ville Province Postal code / Code postal E-mail / Courriel électronique Tel. No. / N° de tél. Receiving site address / Adresse du lieu de destination Date received / Date de réception Year / Année Month / Mois Day / Jour Time / Heure If waste or recyclable material is to be transferred, specify extended company name / Si les déchets ou matières recyclables doivent être transférées, préciser le nom du destinataire Registration No. / Provincial ID No. N° d'immatriculation - d'id. provincial Quantity received / Quantité reçue Units / Unités L or / ou KG Comments / Commentaires Handling / Code de manipulation Shipment / Envoi Accepted / Reçu Refused / Refusé Decommissioned / Décommissionné Phys. state / État phys. If handling code "Other" (specify) Si code de manipulation "autre" (spécifier) Receiver / consignee certification / certify that the information contained in Part C is correct and complete / Attestation du réceptionnaire / destinataire : J'atteste que tous les renseignements à la partie C sont exacts et complets. Name of authorized person (print) Nom de l'agent autorisé (caractères d'impression) Signature Tel. No. / N° de tél. Special handling / Manipulation spéciale Attached / Joins As follows / Conformément à Date shipped / Date d'expédition Year / Année Month / Mois Day / Jour Time / Heure Scheduled arrival date / Date d'arrivée prévue Year / Année Month / Mois Day / Jour	
Prox. code / Code prox. Shipping name / Appellation réglementaire WASTE, SOLIDS, CONTAINING FLAMMABLE LIQUID, NOS (FUEL, AVIATION, TURBINE ENGINE) WASTE, FUEL, AVIATION TURBINE ENGINE *		Class / Classe Sub-class / Sous-classe UN 3135 4.1 II 6008 KG 9 07 S UN 1863 3 III 589 L 2 07 L			
Notice No. / N° de notification Notice Line No. / N° de ligne de la notification Shipment / Envoi Of / De D or R code / Code D ou R C code / Code C Basic Annex VIII or OECD Code / Annexe VIII de la Base ou Code OCDE H code / Code H Y code / Code Y Export / Exportation Import / Importation Customs code(s) / Code(s) de douanes * FLASH POINT 38°C EMERGENCY CONTACT 24 HOURS 1-800-966-6666		National code in country of / Code du pays If handling code "Other" (specify) Si code de manipulation "autre" (spécifier) Receiver / consignee certification / certify that the information contained in Part C is correct and complete / Attestation du réceptionnaire / destinataire : J'atteste que tous les renseignements à la partie C sont exacts et complets. Name of authorized person (print) Nom de l'agent autorisé (caractères d'impression) Signature Tel. No. / N° de tél. Special handling / Manipulation spéciale Attached / Joins As follows / Conformément à Date shipped / Date d'expédition Year / Année Month / Mois Day / Jour Time / Heure Scheduled arrival date / Date d'arrivée prévue Year / Année Month / Mois Day / Jour			

Figure 1: Movement Document 2581551-5

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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: RDUBEAU		Date: Jul 26, 2017 3:59 PM		TCN-37052	
Ship To: SAFETY-KLEEN SERVICES LTD. 7305 BOUL. MARIE-VICTORIN SUITE 200 BROSSARD, QC, J4W 1A6 CA 450-923-9999			From: LSS-F/FOX-M, HALL BEACH, DND Storeroom Raytheon Canada Limited, LSS Hall Beach: P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987		Priority 0
Attention:		Attention:			
Carrier:		Routing:		Waybill #:	Total Pcs.
NEAS		HALL BEACH NU / VALLEYFIELD QC		DR-C16074	6 PCS
				Total Weight:	11,723 LBS

QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
1	WOOD 2635 CRATELBS	3008881	CHEMICAL, UREA, GRANULAR	CRATE # 8			CRATE# 8 60" X 60" X 54" UREA NON-REGULATED
1	WOOD 1777 CRATELBS	3008881	CHEMICAL, UREA, GRANULAR	CRATE # 9			CRATE# 9 60" X 60" X 54" UREA NON-REGULATED
1	WOOD 1355 CRATELBS	3008881	CHEMICAL, UREA, GRANULAR	CRATE # 10			CRATE# 10 60" X 60" X 34" UREA NON-REGULATED
1	WOOD 2020 CRATELBS	3008881	CHEMICAL, UREA, GRANULAR	CRATE # 11			CRATE# 11 60" X 60" X 45" UREA NON-REGULATED
1	WOOD 2417 CRATELBS	3008881	CHEMICAL, UREA, GRANULAR	CRATE # 12			CRATE# 12 60" X 60" X 59" UREA NON-REGULATED
1	WOOD 1549 CRATELBS	3008881	CHEMICAL, UREA, GRANULAR	CRATE # 13			CRATE# 13 60" X 60" X 39" UREA NON-REGULATED

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-37052

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SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: RDUBEAU		Date: Jul 28, 2017 9:14 AM		TCN-37057	
Ship To: SAFETY-KLEEN SERVICES LTD. 7305 BOUL. MARIE-VICTORIN SUITE 200 BROSSARD, QC, J4W 1A6 CA 450-923-9999			From: LSS-F/FOX-M, HALL BEACH, DND Storeroom Raytheon Canada Limited, LSS Hall Beach: P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987		Priority 0
Attention:		Attention:			
Carrier:		Routing:		Waybill #:	
NEAS		HALL BEACH NU / VALLEYFIELD QC		DR-C16082	
				Total Pcs.	
				2 PCS	
				Total Weight:	
				2484 LBS	

QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
1	STEEL 1601 DRUMS LBS	2002351	WASTE - ACTIVATED CARBON FILTE	PALLET# 10			PALLET# 10 48" X 48" X 42" WASTE CARBON FILTER NON-REGULATED EIN 345464,345465,345466,345467,345468,345469
1	STEEL 883 DRUM LBS	2002351	WASTE - ACTIVATED CARBON FILTE	PALLET# 11			PALLET# 11 40" X 47" X 41" WASTE CARBON FILTER NON-REGULATED EIN 345468,345469

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-37057

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**SHIPPING MANIFEST**

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

NON NEGOTIABLE

Filled By: RDUBEAU		Date: Jul 29, 2017 9:18 AM		TCN-37070			
Ship To: SAFETY-KLEEN SERVICES LTD. 7305 BOUL. MARIE-VICTORIN SUITE 200 BROSSARD, QC, J4W 1A6 CA 450-923-9999			From: LSS-F/FOX-M, HALL BEACH, DND Storeroom Raytheon Canada Limited, LSS Hall Beach: P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987		Priority 0		
Attention:		Attention:					
Carrier: NEAS	Routing: HALL BEACH NU / VALLEYFIELD QC	Waybill #: DR-C16082, DR- C160898	Total Pcs. 7 PCS	Total Weight: 12,600 LBS			
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
1	DRUM	1800 LBS	2002344	WASTE - GLYCOL (DRUM)	PALLET# 12		PALLET# 12 48" X 47" X42 EIN 342620,340633 NON- REGULATED
2	DRUM		2002406	WASTE - OIL, 45 GAL	PALLET# 12		PALLET# 12 48" X 47" X 42" EIN 345474,345475 NON-REGULATED
4	DRUM	1800 LBS	2002406	WASTE - OIL, 45 GAL	PALLET# 13		PALLET# 13 48" X 46" X 43" EIN 344305,339435,342617,34 NON-REGULATED
4	DRUM	1800 LBS	2002406	WASTE - OIL, 45 GAL	PALLET# 14		PALLET# 14 48" X 47" X 44" EIN 341298,341301,340634,34 NON-REGULATED
4	DRUM	1800 LBS	2002406	WASTE - OIL, 45 GAL	PALLET# 15		PALLET# 15 48" X 48" X 43" EIN 342619,342618,342864,34 NON-REGULATED
4	DRUM	1800 LBS	2002406	WASTE - OIL, 45 GAL	PALLET# 16		PALLET# 16 48" X 48" X 43" EIN 341304,341303,341302,34 NON-REGULATED
4	DRUM	1800 LBS	2002406	WASTE - OIL, 45 GAL	PALLET# 17		PALLET# 17 48" X 48" X 43" EIN 344607,341299,339625,34 NON-REGULATED
4	DRUM	1800 LBS	2002406	WASTE - OIL, 45 GAL	PALLET# 25		PALLET# 25 48" X 48" X 43" EIN 343876,339441,342680,34 NON-REGULATED
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-37070

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SOW Ref: 16.F.5.d



SHIPPING MANIFEST

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

NON NEGOTIABLE

Filed By: RDUBEAU		Date: Aug 12, 2017 11:34 AM		TCN-37131	
Ship To: SAFETY-KLEEN SERVICES LTD. 7305 BOUL. MARIE-VICTORIN SUITE 200 BROSSARD, QC, J4W 1A6 CA 450-923-9999			From: LSS-F/FOX-M, HALL BEACH, DND Storeroom Raytheon Canada Limited, LSS Hall Beach: P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987		Priority 0

Attention:		Attention:		
Carrier: NEAS	Routing: HALL BEACH NU / VALLEY FIELD QC	Waybill #: DR-C16082, DR- C16098	Total Pcs. 3 PCS	Total Weight: 5400 LBS

QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
1	DRUMS1800 ON LBS PALLET	2002406	WASTE - OIL, 45 GAL		PALLET # 26		PALLET # 26 48" X 48" X 44" EIN. 340887,339425,342815,34 NON-REGULATED
1	DRUMS1800 ON LBS PALLET	2002406	WASTE - OIL, 45 GAL		PALLET # 27		PALLET # 27 48" X 48" X 42" EIN. 340886,340880,340888,34 NON-REGULATED
1	DRUMS1800 ON LBS PALLET	2002406	WASTE - OIL, 45 GAL		PALLET # 28		PALLET # 28 48" X 48" X 44" EIN 345775,339423,340891,34 NON-REGULATED

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-37131

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Raytheon
Canada Limited

SOW Ref: 16.F.5.d

**SHIPPING MANIFEST**

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

NON NEGOTIABLE

Filed By: RDUBEAU		Date: Jul 28, 2017 4:29 PM		TCN-37069	
Ship To: SAFETY-KLEEN SERVICES LTD. 7305 BOUL. MARIE-VICTORIN SUITE 200 BROSSARD, QC, J4W 1A6 CA 450-923-9999			From: LSS-F/FOX-M, HALL BEACH, DND Storeroom Raytheon Canada Limited, LSS Hall Beach: P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987		Priority 0
Attention:		Attention:			
Carrier: NEAS	Routing: HALL BEACH NU/ VALLEYFIELD QC	Waybill #: DR-C16074, DR- C16098	Total Pcs. 3 PCS	Total Weight: 2077 LBS	

QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
1	STEEL 551 DRUM LBS		2002356	WASTE - OIL FILTERS	PALLET# 18		PALLET# 18 57" X 28" X 47" EIN 340630 NON- REGULATED
1	STEEL DRUM		2002505	WASTE - OILY RAGS	PALLET# 18		PALLET# 18 57" X 28" X 47" EIN 340632
1	STEEL 437 DRUM LBS		2003635	WASTE - FUEL FILTERS (DRUM)	PALLET# 19		PALLET# 19 57" X 28" X 47" EIN 340629,344165
1	STEEL 1089 DRUM LBS		2002505	WASTE - OILY RAGS	PALLET# 20		PALLET# 20 57" X 57" X 47" EIN 340046,342485,340631,34

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-37069

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SOW Ref: 16.F.5.d

ANNEX B: TREATED SEWAGE EFFLUENT OUTFALL (FOH-2) LOCATION WITH CO-ORDINATES



Coordinates of sewage treatment outfall: 63° 45'39.50"N, 81°13'28.40"W.

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**ANNEX C: ANALYSIS OF TREATED SEWAGE EFFLUENT**

Table C-1: Summary of Analysis of Treated Sewage Effluent at FOX-M in 2017

Sample Date ¹	Parameter				
	pH	Oil and Grease (Present - P / Absent - A)	Biological Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)	Faecal Coliforms ²
Maximum Concentration	6.0 to 9.0 (pH units)	No visible sheen	120 mg/L	180 mg/L	10,000 CFU/100 mL
9-Jan-17	7.54	A	<1	<2	0
8-Feb-17	7.63	A	7	<2	0.7
6-Mar-17	7.55	A	<1	<2	Not available ³
6-Apr-17	6.91	A	<1	<2	0
4-May-17	7.04	A	1	<2	12
5-Jun-17	6.98	A	<1	<2	2
29-Jul-17	6.24	A	<1	<2	4
25-Aug-17	7.1	A	5	<2	0
9-Sep-17	7.26	A	<1	<2	3
4-Oct-17	6.56	A	<1	<2	66
3-Nov-17	6.49	A	<1	<2	4
4-Dec-17	7.41	A	<1	<2	0

¹ Given that for multiple months in 2017 samples were missed in one month and made up early in the following month, the requirement for this sampling was moved to early in the month. This should ensure that the sampling is completed in each calendar month.

² This column contains the average of the Cyclet 1A, Cyclet 1B, and Cyclet 1C

³ Samples frozen solid when arrived at Lab and could not be analyzed for Faecal Coliforms.

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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#: 15-00344-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1600997
Date Submitted: 2016-01-21
Date Reported: 2016-01-29
Project: Fox-Main
COC #: 505625

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1223203 Sewage 2016-01-12 Fox-M Cycled
Group	Analyte	MRL	Units	Guideline	
General Chemistry	pH	1.00			7.24
	Total Suspended Solids	1	mg/L		<1
Subcontract	BOD5	1	mg/L		<1
	Oil & Grease - Mineral	1	mg/L		<1
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		<1
Visible Sheen	Visible Sheen		P/A		A

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

Page 2 of 3

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

Figure 7: January 2017, sewage effluent laboratory results page 1 of 2

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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#: 15-00344-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1600996
Date Submitted: 2016-01-21
Date Reported: 2016-01-22
Project: Fox-Main
COC #: 505625

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1223200 Sewage	1223201 Sewage	1223202 Sewage
						2016-01-16 Fox-M Cyclelet - 1A	2016-01-16 Fox-M Cyclelet - 1B	2016-01-16 Fox-M Cyclelet - 1C
Group	Analyte	MRL	Units	Guideline				
Others	Faecal Coliforms	0	cf/100mL		0	0	0	

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.
Analytical Method: AMBCOLM1
additional QAVQC 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 2

Figure 8: January 2017, sewage effluent laboratory results page 2 of 2

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Canada Limited

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#: 15-00344-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1603840
Date Submitted: 2016-03-16
Date Reported: 2016-03-23
Project: Fox Main
COC #: 178107

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1231282 Wastewater 2016-03-07 Fox-M-Cyclot Jet 1
Group	Analyte	MRL	Units	Guideline	
General Chemistry	pH	1.00			7.76
	Total Suspended Solids	1	mg/L		<2
Subcontract	BOD5	1	mg/L		<1
	Oil & Grease - Mineral	1	mg/L		<1
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		<1
Visible Sheen	Visible Sheen		P/A		A

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: February 2017, sewage effluent laboratory results page 1 of 2

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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#: 15-00344-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1603841
Date Submitted: 2016-03-16
Date Reported: 2016-03-17
Project: Fox Main
COC #: 178107

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1231283 Wastewater 2016-03-07 Fox-M Cyclet Jet 1 A	1231284 Wastewater 2016-03-07 Fox-M Cyclet Jet 1 B	1231285 Wastewater 2016-03-07 Fox-M Cyclet Jet 1 C
Group	Analyte	MRL	Units	Guideline				
Others	Faecal Coliforms	0	cf/100mL	Water		18	6	0

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.
Analytical Method: AMBCOLM1
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 2

Figure 10: February 2017, sewage effluent laboratory results page 2 of 2

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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#: 15-00344-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1605796
Date Submitted: 2016-04-20
Date Reported: 2016-04-27
Project: 140340
COC #: 177781

Group		Analyte	MRL	Units	Guideline
General Chemistry		pH	1.00		7.80
		Total Suspended Solids	1	mg/L	<1
PHC (Hydrocarbons)		Visible Sheen	0	A/P	A
Subcontract		BOD5	1	mg/L	<1
		Oil & Grease - Mineral	1	mg/L	<1
		Oil & Grease - Non-mineral	1	mg/L	<1
		Oil & Grease - Total	1	mg/L	<1

Lab I.D.
Sample Matrix
Sample Type
Sampling Date
Sample I.D.

1235747
Sewage
2016-03-23
FOX-M-CYCLET

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 11: March 2017, sewage effluent laboratory results page 1 of 2

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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#: 15-00344-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1605823
Date Submitted: 2016-04-20
Date Reported: 2016-04-21
Project: 140340
COC #: 177781

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1235839 Wastewater 2016-03-23 Fox-M Cyclot 1A	1235840 Wastewater 2016-03-23 Fox-M Cydet 1B	1235841 Wastewater 2016-03-23 Fox-M Cyclot 1C
Group	Analyte	MRL	Units	Guideline				
Others	Faecal Coliforms	0	ct/100mL			0	0	0

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.
Analytical Method: AMBCOLM1
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 2

Figure 12: March 2017, sewage effluent laboratory results page 2 of 2

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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#: 15-00344-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1607070
Date Submitted: 2016-05-09
Date Reported: 2016-05-16
Project: 140340 Fox Main
COC #: 177719

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1238865 Sewage 2016-04-26 Fox M Cyclot 1
Group	Analyte	MRL	Units	Guideline	
General Chemistry	pH	1.00			7.95
Subcontract	Total Suspended Solids	1	mg/L		<1
	BOD5	1	mg/L		<1
	Oil & Grease - Mineral	1	mg/L		<1
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		<1
Visible Sheen	Visible Sheen	0	P/A		A

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 13: April 2017, sewage effluent laboratory results page 1 of 2

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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: 1607068
Date Submitted: 2016-05-09
Date Reported: 2016-05-10
Project: 140340 Fox-Main
COC #: 177719

Group	Analyte	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sampling Date	Sample I.D.
					1238861	Sewage	-	2016-04-26	2016-04-26
Others	Faecal Coliforms	0	ct/100mL		1238862	Sewage	-	2016-04-26	2016-04-26
					1238863	Sewage	-	2016-04-26	2016-04-26

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.
Analytical Method: AMB/COLM1
additional QAVOC 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 2

Figure 14: April 2017, sewage effluent laboratory results page 2 of 2

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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#:
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1609354
Date Submitted: 2016-06-09
Date Reported: 2016-06-16
Project: 140340 Main
COC #: 178108

					Lab I.D.	1244441
					Sample Matrix	Wastewater
					Sample Type	
					Sampling Date	2016-05-31
					Sample I.D.	Fox-M Cycled 1
Group	Analyte	MRL	Units	Guideline		
General Chemistry	pH	1.00			8.07	
	Total Suspended Solids	1	mg/L		<2	
Subcontract	BOD5	1	mg/L		<1	
	Oil & Grease - Mineral	1	mg/L		<1	
	Oil & Grease - Non-mineral	1	mg/L		<1	
	Oil & Grease - Total	1	mg/L		<1	
Visible Sheen	Visible Sheen		P/A		A	

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 15: May 2017, sewage effluent laboratory results page 1 of 2

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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#:
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1609346
Date Submitted: 2016-06-09
Date Reported: 2016-06-10
Project: Fox-Main
COC #: 178108

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1244418 Sewage 2016-05-31 Fox-M Cyclot 1A	1244419 Sewage 2016-05-31 Fox-M Cyclot 1B	1244420 Sewage 2016-05-31 Fox-M Cyclot 1C
Group	Analyte	MRL	Units	Guideline				
Others	Faecal Coliforms	0	cf/100mL			0	0	0

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.
Analytical Method: AMBCOLM1
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 2

Figure 16: May 2017, sewage effluent laboratory results page 2 of 2

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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#: 15-00344-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1612514
Date Submitted: 2016-07-19
Date Reported: 2016-07-27
Project:
COC #: 505601

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1251629 Wastewater 2016-07-14 Fox-M Cycle1
Group	Analyte	MRL	Units	Guideline	
General Chemistry	BOD5	4	mg/L		<4
	pH	1.00			6.69
	Total Suspended Solids	1	mg/L		<1
Subcontract	Oil & Grease - Mineral	1	mg/L		1
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		1
Visible Sheen	Visible Sheen		P/A		A

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 17: July 2017, sewage effluent laboratory results page 1 of 2

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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#:
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1612512
Date Submitted: 2016-07-19
Date Reported: 2016-07-20
Project: 140340
COC #: 505601

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1251625 Wastewater 2016-07-14 FOX-M Cyclelet 1A	1251626 Wastewater 2016-07-14 FOX-M Cyclelet 1B	1251627 Wastewater 2016-07-14 FOX-M Cyclelet 1C
Group	Analyte	MRL	Units	Guideline				
Others	Faecal Coliforms	0	ct/100mL			103	77	61

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.
Analytical Method: AMBCOLM1
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 2

Figure 18: July 2017, sewage effluent laboratory results page 2 of 2

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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. Gabe Landry
PO#: 15-00344-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1616551
Date Submitted: 2016-09-16
Date Reported: 2016-09-23
Project:
COC #: 183412

Group		Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
General Chemistry		pH	1.00			1260730 Sewage
		Total Suspended Solids	2	mg/L		2016-09-07 FOX-M-Cylet 1
Subcontract		BOD5	1	mg/L		
		Oil & Grease - Mineral	1	mg/L		
		Oil & Grease - Non-mineral	1	mg/L		
		Oil & Grease - Total	1	mg/L		
Visible Sheen		Visible Sheen		P/A		A

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 19: August 2017, sewage effluent laboratory results page 1 of 2

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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#:
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1618016
Date Submitted: 2016-10-07
Date Reported: 2016-10-09
Project: 140340 FOX-MAIN
COC #: 183422

Group	Analyte	MRL	Units	Guideline	1264076	1264077	1264078
					Sample Matrix Sample Type Sampling Date Sample I.D.	Sample Matrix Sample Type Sampling Date Sample I.D.	Sample Matrix Sample Type Sampling Date Sample I.D.
Others	Faecal Coliforms	0	ct/100mL		Wastewater 2016-10-01 FOX-M Cycle-Let 1A	Wastewater 2016-10-01 FOX-M Cycle-Let 1B	Wastewater 2016-10-01 FOX-M Cycle-Let 1C
					0	2	5

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.
Analytical Method: AMBCOLM1
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 2

Figure 20: August 2017, sewage effluent laboratory results page 2 of 2

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Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 15-00344-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1618019
Date Submitted: 2016-10-07
Date Reported: 2016-10-17
Project: 140340 Fox-Main
COC #: 183422

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1264082 Sewage 2016-10-07 Fox-M Cycle-Let
Group	Analyte	MRL	Units	Guideline	
General Chemistry	pH	1.00			7.13
	Total Suspended Solids	2	mg/L		<2
Oil & Grease	Oil & Grease - Mineral	1	mg/L		<1
	Oil & Grease - Non-mineral	1	mg/L		1
	Oil & Grease - Total	1	mg/L		<1
Subcontract	BOD5	1	mg/L		<1
Visible Sheen	Visible Sheen		P/A		A

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 21: September 2017, sewage effluent laboratory results page 1 of 2

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

Report Number: 1618016
Date Submitted: 2016-10-07
Date Reported: 2016-10-09
Project: 140340 FOX-MAIN
COC #: 183422

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1264076 Wastewater 2016-10-01 FOX-M Cycle-Let 1A	1264077 Wastewater 2016-10-01 FOX-M Cycle-Let 1B	1264078 Wastewater 2016-10-01 FOX-M Cycle-Let 1C
Group	Analyte	MRL	Units	Guideline				
Others	Faecal Coliforms	0	cf/100mL			0	2	5

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.
Analytical Method: AMBCOLM1
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 2

Figure 22: September 2017, sewage effluent laboratory results page 2 of 2

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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: 1618593
Date Submitted: 2016-10-18
Date Reported: 2016-10-27
Project: 140340 Fox Main
COC #: 183420

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1265409 Wastewater 2016-10-10 Fox-M Cycle 1
Group	Analyte	MRL	Units	Guideline	
General Chemistry	pH	1.00			7.56
	Total Suspended Solids	2	mg/L		<2
Oil & Grease	Oil & Grease - Mineral	1	mg/L		<1
	Oil & Grease - Non-mineral	1	mg/L		1
	Oil & Grease - Total	1	mg/L		1
Subcontract	BOD5	1	mg/L		1
Visible Sheen	Visible Sheen		P/A		A

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 23: October 2017, sewage effluent laboratory results page 1 of 2

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EXOVA ENVIRONMENTAL ONTARIO

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Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 15-00344-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1618589
Date Submitted: 2016-10-18
Date Reported: 2016-10-19
Project: 140340 Fox-Main
COC #: 183420

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1265403 Wastewater 2016-10-10 Fox-M-Cyclelet 1A	1265404 Wastewater 2016-10-10 Fox-M-Cyclelet 1B	1265405 Wastewater 2016-10-10 Fox-M-Cyclelet 1C
Others	Faecal Coliforms	0	cf/100mL	Water		2	2	3

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.
Analytical Method: AMBCOLM1
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 2

Figure 24: October 2017, sewage effluent laboratory results page 2 of 2

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EXOVA ENVIRONMENTAL ONTARIO

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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: 1620434
Date Submitted: 2016-11-15
Date Reported: 2016-11-22
Project: 140340 Fox-Main
COC #: 183425

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1270102 Wastewater 2016-11-01 Fox-M Cyclot 1
Group	Analyte	MRL	Units	Guideline	
General Chemistry	pH	1.00			6.80
	Total Suspended Solids	2	mg/L		<2
Oil & Grease	Oil & Grease - Mineral	1	mg/L		<1
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		<1
Subcontract	BOD5	1	mg/L		<1
Visible Sheen	Visible Sheen		P/A		A

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 25: November 2017, sewage effluent laboratory results page 1 of 2

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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: 1620435
Date Submitted: 2016-11-15
Date Reported: 2016-11-16
Project: 140340 Fox-Main
COC #: 183425

Group	Analyte	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sampling Date	Sample I.D.
					1270103	Wastewater	1270104	Wastewater	1270105
Others	Faecal Coliforms	0	ct/100mL		2016-11-01	Fox-M Cyclot 1A	2016-11-01	Fox-M Cyclot 1B	2016-11-01
					0		0		0

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.
Analytical Method: AMBCOLM1
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 2

Figure 26: November 2017, sewage effluent laboratory results page 2 of 2

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400 Cooper St.
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K2P 2H8
Attention: Mr. Will Wyman
PO#: 15-00344-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1621980
Date Submitted: 2016-12-09
Date Reported: 2016-12-16
Project: 140340 Fox-Main
COC #: 183406

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1273797 Sewage 2016-12-01 Fox-M Cycle-Let
Group	Analyte	MRL	Units	Guideline	
General Chemistry	pH	1.00			7.94
	Total Suspended Solids	2	mg/L		<2
Oil & Grease	Oil & Grease - Mineral	1	mg/L		<1
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		<1
Subcontract	BOD5	1	mg/L		<1
Visible Sheen	Visible Sheen		P/A		A

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 27: December 2017, sewage effluent laboratory results page 1 of 2

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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: 1621981
Date Submitted: 2016-12-09
Date Reported: 2016-12-11
Project: 140340 Fox-Main
COC #: 183406

Group	Analyte	MRL	Units	Guideline	Lab I.D.	Sample Matrix	Sample Type	Sampling Date	Sample I.D.
					1273798	Sewage	1273799	Sewage	1273800
Others	Faecal Coliforms	0	cf/100mL	Water	2016-12-01	Fox-M Cycle-Let 1A	2016-12-01	Fox-M Cycle-Let 1B	2016-12-01
					0		0		0

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.
Analytical Method: AMBCOLM1
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 2

Figure 28: December 2017, sewage effluent laboratory results page 2 of 2

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ANNEX D: LOCATION OF BERMED FUEL STORAGE FACILITIES AND ANALYSIS OF BERM WATER⁴

Table D-1: Analysis of Berm Water at FOX-M in 2017

Berm	Maximum concentration of any grab sample (ug/L)	HAL W20B	HAL W20D&E	HAL W20F	HAL W22B	HAL W22A
Location on-site		Beach	Airstrip	Beach	Summit	Summit
Discharge Latitude ⁵		68°46'23.93 "N	68°46'15.85" N	68°46'23.75 "N	68°45'43.00" N	68°45'42.24 "N
Discharge Longitude		81°12'51.11 "W	81°13'58.33" W	81°12'46.12 "W	81°13'27.27" W	81°13'25.04 "W
Date			19-Sep-17		19-Sep-17	19-Sep-17
pH (pH Units)	6 to 9	No sample in 2017	8.19	No sample in 2017	8.25	8.12
Oil and Grease (ug/L)	5000		1000		<1000	<1000
Arsenic (total) (ug/L)	100		<20		<20	<20
Cadmium (dissolved) (ug/L)	10		<0.1		<0.1	<0.1
Chromium (dissolved) (ug/L)	100		<1		<1	<1
Cobalt (dissolved) (ug/L)	50		<0.2		<0.2	<0.2
Copper (dissolved) (ug/L)	200		4		1	1
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		<5	5
PCB (total) (ug/L)	1000		<0.1		<0.1	<0.1

⁴ Effluent from bermed fuel storage facilities.⁵ Final discharge point of bermed fuel storage facility

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Berm	Maximum concentration of any grab sample (ug/L)	HAL W20B	HAL W20D&E	HAL W20F	HAL W22B	HAL W22A
Location on-site		Beach	Airstrip	Beach	Summit	Summit
Discharge Latitude ⁵		68°46'23.93 "N	68°46'15.85" N	68°46'23.75 "N	68°45'43.00" N	68°45'42.24 "N
Discharge Longitude		81°12'51.11 "W	81°13'58.33" W	81°12'46.12 "W	81°13'27.27" W	81°13'25.04 "W
Date			19-Sep-17		19-Sep-17	19-Sep-17
Phenols (ug/L)	20		<1		<1	<1
Zinc (total) (ug/L)	500		80		<40	<40
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

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Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 17-00919-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1718528
Date Submitted: 2017-09-26
Date Reported: 2017-10-02
Project:
COC #: 192676

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1322645 Water 2017-09-19 W20 E/D Berm Water
Group	Analyte	MRL	Units	Guideline	
General Chemistry	pH	1.00			8.19
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		0.08
Oil & Grease	Oil & Grease - Total	1	mg/L		1
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L		<0.1
Phenols	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	%		77

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.

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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Page 2 of 5

Figure 29: HAL W20D&E berm water laboratory results, page 1 of 2



Environment Testing

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Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 17-00919-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1718529
Date Submitted: 2017-09-26
Date Reported: 2017-10-03
Project:
COC #: 192676

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1322646 Water 2017-09-19 W20 E/D Berm Water
Group	Analyte	MRL	Units	Guideline	
Metals	Cd	0.0001	mg/L	MAC 0.005	<0.0001
	Co	0.0002	mg/L		<0.0002
	Cr	0.001	mg/L	MAC 0.05	<0.001
	Cu	0.001	mg/L	AO 1.0	0.004
	Ni	0.005	mg/L		<0.005
	Pb	0.001	mg/L	MAC 0.010	<0.001

Figure 30: HAL W20D&E berm water laboratory results, page 2 of 2

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400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 17-00919-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1718530
Date Submitted: 2017-09-26
Date Reported: 2017-10-02
Project:
COC #: 192667

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1322647 Water 2017-09-19 XL-W22B
Group	Analyte	MRL	Units	Guideline	
General Chemistry	pH	1.00			8.25
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
Oil & Grease	Oil & Grease - Total	1	mg/L		<1
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L		<0.1
Phenols	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	%		96

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 4

Figure 31: HAL W22B berm water laboratory results, page 1 of 2



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Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 17-00919-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1718531
Date Submitted: 2017-09-26
Date Reported: 2017-09-28
Project:
COC #: 1922667

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1322648 Water 2017-09-19 XL-W22B
Group	Analyte	MRL	Units	Guideline	
Metals	Cd	0.0001	mg/L	MAC 0.005	<0.0001
	Co	0.0002	mg/L		<0.0002
	Cr	0.001	mg/L	MAC 0.05	<0.001
	Cu	0.001	mg/L	AO 1.0	0.001
	Ni	0.005	mg/L		<0.005
	Pb	0.001	mg/L	MAC 0.010	<0.001

Figure 32: HAL W22B berm water laboratory results, page 2 of 2

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Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 17-00919-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1718526
Date Submitted: 2017-09-26
Date Reported: 2017-10-02
Project:
COC #: 192668

Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.				
1322643 Water 2017-09-19 W22 A Berm Water				
Group	Analyte	MRL	Units	Guideline
General Chemistry	pH	1.00		8.12
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
Oil & Grease	Oil & Grease - Total	1	mg/L	<1
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L	<0.1
Phenols	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	%	92

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 33: HAL W22A berm water laboratory results, page 1 of 2

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SOW Ref: 16.F.5.d



Certificate of Analysis

Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 17-00919-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1718527
Date Submitted: 2017-09-26
Date Reported: 2017-09-28
Project:
COC #: 192668

Lab I.D. 1322644 Sample Matrix Water Sample Type 2017-09-19 Sampling Date W22 A Berm Water Sample I.D.				
Group	Analyte	MRL	Units	Guideline
Metals	Cd	0.0001	mg/L	MAC 0.005
	Co	0.0002	mg/L	
	Cr	0.001	mg/L	MAC 0.05
	Cu	0.001	mg/L	AO 1.0
	Ni	0.005	mg/L	
	Pb	0.001	mg/L	MAC 0.010
				<0.0001 <0.0002 <0.001 0.001 0.005 <0.001

Figure 34: HAL W22A berm water laboratory results, page 2 of 2

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