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SOW Ref: 16.F.5.d

# 2018 ANNUAL NUNAVUT WATER BOARD

## REPORT FOR FOX-3

FOR THE

### North Warning System

Contract # W8485-100224/001/NX

SOW Ref: 16.F.5.d

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FM-EHS-13, Rev 2, 5-Feb-2019

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## **EXECUTIVE SUMMARY IN ENGLISH FOLLOWS**



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## EXECUTIVE SUMMARY

This 2018 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 Part B "General Conditions", paragraph 1 of its licence. Water licence 3BC-FOD0919 was in effect from 01 January until it was replaced with licence 8BC-FOD1828 on 08 June 2018. This report covers 01 January to 31 December 2018.

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

A total of 62.6 cubic meters was drawn from the water supply lake. This is below the annual maximum of 1,440 cubic meters allowed by the licence.

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

As FOX-3 is a landlocked site, all Hazardous Waste and Waste Oil is transported to FOX-M before being shipped to an approved hazardous waste disposal site outside of Nunavut as required by the licence. The hazardous waste was shipped to Qikiqtaaluk Environmental, through their subcontractor Veolia, 2630, boul. Industriel, Chambly, QC J3L 4V2. A total of 3 crates and 18 drums of waste HAZMAT were shipped from FOX-3 in 2018.

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

No unauthorized discharges to the environment at FOX-3 in 2018

The Spill Contingency Plan was updated on 29-Mar-2018.

Impacted soil from two spills, a pipeline leak in 2009 and a helicopter crash in 2013, was excavated and placed in a landfarm in 2018.

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## 1.0 INTRODUCTION

This 2018 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 Part B "General Conditions", paragraph 1 of its licence. Water licence 3BC-FOD0919 was in effect from 01 January until it was replaced with licence 8BC-FOD1828 on 08 June 2018. This report covers 01 January to 31 December 2018.

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

### 1.1 Report Details

Licensee: Department of National Defence, Government of Canada  
Licence: 3BC-FOD0919 – Type "B" from 01-Jan-2018 until it was replaced on 08-Jun-2018 with 8BC-FOD1828 – Type "B"  
Location: FOX-3 North Warning System Site, Dewar Lakes, Qikiqtani Region, Nunavut  
Report Prepared by: Raytheon Canada Limited, 05-Feb-2019  
Time period covered: 01 January to 31 December 2018

## 2.0 WATER USE

A total of 62.6 cubic meters ( $m^3$ ) was drawn from the water supply lake. This is below the annual maximum of 1,440  $m^3$  allowed by the licence. See Table 2-1 for the volume of raw water drawn at FOX-3 in 2018.

Table 2-1: Monthly Raw Water Usage at FOX-3 in 2018

Month	Raw water usage ( $m^3$ )
January	0
February	0
March	0
April	0
May	0
June	45.8
July	0
August	0
September	16.8
October	0
November	0
December	0
<b>TOTAL</b>	<b>62.6</b>

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### 3.0 HAZARDOUS WASTE AND WASTE OIL DISPOSAL

As FOX-3 is a landlocked site, all Hazardous Waste and Waste Oil is transported to FOX-M before being shipped to an approved hazardous waste disposal site outside of Nunavut as required by the licence. The hazardous waste was shipped to Qikiqtaaluk Environmental, through their subcontractor Veolia, 2630, boul. Industriel, Chambly, QC J3L 4V2.

See Annex A for the shipping document including the completed movement documents for waste regulated under the Transportation of Dangerous Goods Regulations (TDGR) and NWS Manifests for non-regulated waste. A total of 3 crates and 18 drums of waste HAZMAT were shipped from FOX-3 in 2018.

**Table 3-1: Hazardous Waste and Waste Oil Sent for Disposal from FOX-3 in 2018**

Description, TDG shipping name	Quantity	Movement Document or Manifest #
Waste Jet A1 fuel filters	1 Drum	
Waste solids containing flammable liquids, n.o.s (fuel, aviation, turbine engine)	1 Drum	
Waste oil filters	1 Drum	
Not TDG regulated		NWS Manifest TCN38388
Waste oil soaked sorbent	1 Drum	
Not TDG regulated		
Waste oil contaminated soil	1 Drum	
Not TDG regulated		
Waste oil	13 Drums	NWS Manifest TCN38388, TCN38304
Not TDG regulated		
Waste Jet A1 fuel and water mixture	1 Drum	
Waste fuel, aviation, turbine engine mixture		NWS Manifest TCN38391
Waste batteries, wet, filled with acid <sup>1</sup>	3 Crates	

### 4.0 NON-HAZARDOUS SOLID WASTE DISPOSAL

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

See **Table 4-1** for the quantity of waste generated.

The FOX-3 landfill still exists, but no new materials have been landfilled in the reporting period. See **Annex B** for the location of the landfill with co-ordinates.

<sup>1</sup> These waste batteries were stored at FOX-M in 2018. They will be sent for disposal from FOX-M in 2019.

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Table 4-1: Non-hazardous Domestic Solid Waste Sent for Disposal from FOX-3 in 2018

Month	Waste Generated (kg)
January	0
February	113
March	0
April	238
May	78
June	0
July	2336
August	126
September	0
October	0
November	0
December	0
<b>TOTAL</b>	<b>2,891</b>

## 5.0 MONITORING PROGRAM

In 2018, a monitoring program was implemented at FOX-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 (FOD-1). The information from monitoring water use is shown in **Section 2.0 Water Use**. The 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 (FOD-2). The location of the sewage effluent outfall is shown in **Annex C**, including coordinates. A sump for the sewage outfall was constructed in 2010. The sewage outfall sump was sampled once in 2018. Monitoring Station FOD-2 was discontinued in water licence 8BC-FOD1828.

The results are shown in **Annex D: Analysis of Discharged Sewage Effluent**.

3. Quality of the water contained in the berms of fuel storage facilities prior to discharge (FOD-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 E: Analysis of Berm Water**. All samples met the effluent requirements of water licence 8BC-FOD1828, Part D.

## 6.0 SPILLS (UNAUTHORIZED DISCHARGES)

Date, NT-NU Spill #	Product	Quantity	Cause and follow-up action	On-site location
No unauthorized discharges to the environment at FOX-3 in 2018.				

## 7.0 REVISIONS TO THE SPILL CONTINGENCY PLAN

The Spill Contingency Plan was updated on 29-Mar-2018. An updated copy of the Spill Contingency Plan was submitted to the NWB on 09-Jul-2018 in accordance with condition G2 to water licence 8BC-FOD1828. The Spill Contingency Plan was accepted by the NWB on 23-Jul-2018.

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## 8.0 PROGRESSIVE RECLAMATION WORK UNDERTAKEN

In December 2017, Canada assumed liability from the previous NWS O&M contractor for the spills resulting from a pipeline leak discovered in 2009 and a helicopter crash which occurred in 2013. Prior to that, pending resolution of this issue with the previous O&M contractor, Canada engaged the Environmental Sciences Group (ESG) in summer 2016 to complete a delineation of both spills and prepare an assessment report. The report indicates both spills combined represent approximately 438 m<sup>3</sup> of impacted soil requiring excavation and treatment.

In summer 2018, Canada procured the services of Defence Construction Canada (DCC) to contract an environmental engineering firm to excavate both spill areas and treat the impacted soil in a land farm on site. The contractor mobilized to the site in late August 2018 and successfully excavated, backfilled, and compacted the spill areas and landfarmed the impacted soil. Confirmatory sampling from September 2018 shows that further tilling of the land farm is required.

## 9.0 ACRONYMS

Table 9-1: Acronyms

Acronym	Definition
DCC	Defence Construction Canada
ESG	Environmental Sciences Group
FCSI	Federal Contaminated Sites Inventory
n.o.s.	Not Otherwise Specified
NWB	Nunavut Water Board
NWS	North Warning System
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 2018

The 2018 Movement Documents for TDG Regulated waste and NWS Manifests for non-TDG Regulated waste described in Table 3-1 are below.

SHIPPER'S DECLARATION FOR DANGEROUS GOODS DÉCLARATION DE L'EXPÉDITEUR POUR MARCHANDES DANGEREUSES							
Shipper Expéditeur RAYTHEON NWS LRR DEWAR LAKES NU		Air Waybill No. No de L.T.A. Page   of   Pages Page   de   pages Shipper's Reference Number (optional) N° de référence de l'expéditeur ( facultatif ) TCN-11898					
Consignee Destinataire RAYTHEON NWS LSS NALL BEACH NU							
<p>Two completed and signed copies of this Declaration must be handed to the operator. Deux copies de cette déclaration doivent être remises à l'exploitant.</p> <p><b>TRANSPORT DETAILS</b> RENSEIGNEMENTS SUR LE TRANSPORT</p> <p>This shipment is within the limitations prescribed for: (delete non-applicable) Cette expédition est dans les limites autorisées pour: (biffer la mention inutile)</p> <table border="1"><tr><td>PASSENGER AND CARGO AIRCRAFT AÉROUVE PASSAGERS ET CARGO</td><td>CARGO AIRCRAFT AÉROUVE CARGO SEULEMENT</td></tr></table> <p>Airport of Departure: Aéroport de départ: DEWAR LAKES</p> <p>Airport of Destination: Aéroport de destination: NALL BEACH.</p> <p>Shipment type: (delete non-applicable) Type d'envoi: (biffer la mention inutile) <input type="checkbox"/> NON-RADIOACTIVE NON-RADIOACTIF <input checked="" type="checkbox"/> RADIOACTIVE RADIACTIF</p>						PASSENGER AND CARGO AIRCRAFT AÉROUVE PASSAGERS ET CARGO	CARGO AIRCRAFT AÉROUVE CARGO SEULEMENT
PASSENGER AND CARGO AIRCRAFT AÉROUVE PASSAGERS ET CARGO	CARGO AIRCRAFT AÉROUVE CARGO SEULEMENT						
<p><b>WARNING</b> Failure to comply in all respects with the applicable Dangerous Goods Regulations may be in breach of the applicable law, subject to legal penalties.</p> <p><b>AVERTISSEMENT</b> Le non-respect sur quelque point que ce soit de la Réglementation sur le transport des marchandises dangereuses peut constituer une infraction aux lois en vigueur, punissable par la loi.</p>							
NATURE AND QUANTITY OF DANGEROUS GOODS / NATURE ET QUANTITÉ DE MARCHANDES DANGEREUSES							
UN or ID No. N° UN ou ID.	Proper Shipping Name Désignation exacte d'expédition	Class or Division (Subsidiary Risk) Classe ou division (risque subsidiaire)	Packing Group Groupe d'emballage	Quantity and type of packing Quantité et type d'emballage	Packing Inst. Instructions d'emballage Autorisation		
UN 3175	WASTE SOLIDS CONTAINING FLAMMABLE LIQUID N.O.S (FUEL, AVIATION TURBINE ENGINE)	4.1	II	1 STEEL DRUM X 50 kg	448		
UN 1863	WASTE * FUEL, AVIATION TURBINE ENGINE	3	III	1 STEEL DRUM X 120 L	355		
<p>Additional Handling Information/ Renseignements complémentaires concernant la manutention * FLASH POINT 38°C</p> <p>For emergency contact: 24-hour No.: Pour urgence: Numéro 24 heures: CONTACT EMERGENCY 24 HR CANUTEC 1613 996-6666</p>							
I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. I declare that all of the applicable air transport requirements have been met.			Name/Title of Signatory / Nom/Titre du Signataire RON DUBEAU SHIPPER DEWAR LAKES				
Par la présente, je déclare que les renseignements relatifs à la description du contenu du chargement et à la désignation exacte d'expédition du produit expédié sont complets et exacts; et que le contenu est correctement classé, emballé, identifié, étiqueté/placardé et qu'il est conforme à tous égards aux règlements gouvernementaux, nationaux et internationaux en matière de transport.			Place and Date / Lieu et Date 01-JULY-2018				
Je déclare que toutes les prescriptions requises pour le transport aérien ont été respectées.			Signature (See warning above) <i>R. Dubé</i> (Voir avertissement ci-dessus)				
FM-USF83B Centre de Conformité ICC Inc. Dorval, Québec - Mississauga, Ontario www.thecompliancecenter.com 1-888-977-4834 Imprimé au Canada/printed in Canada 01/08							

Figure 1: Shipper's Declaration for Dangerous Goods removed from FOX-3

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SHIPPER'S DECLARATION FOR DANGEROUS GOODS DÉCLARATION DE L'EXPÉDITEUR POUR MARCHANDISES DANGEREUSES						
Shipper Expéditeur RAYTHEON NWS LRR DEWAR LAKES NU			Air Waybill No. No de L.T.A. Page 1 of 1 Pages Page 1 de 1 pages Shipper's Reference Number (optional) N° de référence de l'expéditeur (facultatif) TCN-11878			
Consignee Destinataire RAYTHEON NWS LSS HALL BEACH NU						
<p>Two completed and signed copies of this Declaration must be handed to the operator. Deux copies de cette déclaration doivent être remises à l'exploitant.</p>						
<b>TRANSPORT DETAILS</b> RENSEIGNEMENTS SUR LE TRANSPORT						
This shipment is within the limitations prescribed for (delete non-applicable) Cette expédition est dans les limites autorisées pour: (effacer la mention inutile)		Airport of Departure: Aéroport de départ: DEWAR LAKES				
PASSENGER AND CARGO AIRCRAFT AÉRONEF PASSAGERS ET CARGO		CARGO AIRCRAFT ONLY AÉRONEF CARGO SEULEMENT		Shipment type: (delete non-applicable) Type d'envoi: (effacer la mention inutile)		
Airport of Destination: Aéroport de destination:		HALIBEACH		NON-RADIOACTIVE NON-RADIOACTIF <input checked="" type="checkbox"/> RADIATIVE RADIOACTIF <input checked="" type="checkbox"/>		
NATURE AND QUANTITY OF DANGEROUS GOODS / NATURE ET QUANTITÉ DE MARCHANDISES DANGEREUSES						
Dangerous Goods Identification / Identification des marchandises dangereuses						
UN or ID No. N° UN ou ID.	Proper Shipping Name Désignation exacte d'expédition	Class or Division (Subsidiary Risk) Classe ou division (risque subsidiaire)	Packing Group Groupe d'emballage	Quantity and type of packing Quantité et type d'emballage	Packing Inst. Instructions d'emballage	Authorization Autorisation
4N 1013	CARBON DIOXIDE	2.2		11 CYLINDER X 75kg	700	
UN 1044	FIRE EXTINGUISHERS	2.2		1 WOOD CRATE X 75kg	213	
UN 2794	WASTE, BATTERIES, WET FILLED WITH ACID	8		3 WOOD CRATE X 40kg	870	
Additional Handling Information/ Renseignements complémentaires concernant la manutention						
For emergency contact: 24-hour No.: Pour urgence: Numéro 24 heures: CONTACT EMERGENCY 24 HR CANUTEC 1613 996-6666						
I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labelled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations. I declare that all of the applicable air transport requirements have been met.				Name/Title of Signatory / Nom/Titre du Signataire RON DUBEAU SHIPPER DEWAR LAKES		
Par la présente, je déclare que les renseignements relatifs à la description du contenu du chargement et à la désignation exacte d'expédition du produit expédié sont complets et exacts; et que le contenu est correctement classé, emballé, identifié, étiqueté/placardé et qu'il est conforme à tous égards aux règlements gouvernementaux, nationaux et internationaux en matière de transport. Je déclare que toutes les prescriptions requises pour le transport aérien ont été respectées.				Place and Date / Lieu et Date 01-JULY-2018 Signature (See warning above) <i>Ron D. Dubbeau</i> (Signature)		
FM-USF83B Centre de Conformité ICC Inc. Dorval, Québec - Mississauga, Ontario www.thecompliancecenter.com 1-888-977-4834 Imprimé au Canada/printed in Canada 01/08						

Figure 2: Shipper's Declaration for Dangerous Goods removed from FOX-3

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		<b>SHIPPING MANIFEST</b>					
Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8		NON NEGOTIABLE					
Filled By: RDUBEAU		Date: Jul 26, 2018, 4:38 PM		TCN-38388			
Ship To: 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			From: FOX-3, DEWAR LAKES, DND Storeroom Raytheon Canada Limited, NWS LSS Hall Beach, P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987		Priority <b>1</b>		
Attention:		Attention:					
Carrier:		Routing: YUW/YUX		Waybill #:	Total Pcs. 11 PCS	Total Weight: 14,500 LBS	
QTY Order	Type	Line Weight	Item	Description	WD or PO F318-20	B/Code or S/N	Remarks
1	WOOD	800	4002748	WASTE-DRY MATERIAL-NON CONTROL CRATE LBS	F318-20	L 72" X W 48" X H 57"	
1	PALLET	1100	2002406	WASTE - OIL, 45 GAL LBS	F318-9	L 56" X W 30" X H 45" ASSETS 347764,347830	
1	PALLET	1200	2002356	WASTE - OIL FILTERS LBS	F318-7	L 54" X W 54" X H 44" ASSET 344585	
1	PALLET	3006639		WASTE - OIL SOAKED ABSORBENT	F318-7	ASSET 344584	
1	PALLET	2008310		WASTE - OIL CONTAMINATED SOIL	F318-7	ASSET 370876	
1	PALLET	2003635		WASTE - FUEL FILTERS (DRUM)	F318-7	ASSET 343297 (UN 3175)	
1	WOOD	1100	4002749	WASTE-UNTREATED WOOD CRATE LBS	F318-22	L 72" X W 48" X H 55"	
1	WOOD	1100	4002749	WASTE-UNTREATED WOOD CRATE LBS	F318-22	L 96" X W 50" X H 57"	
1	STEEL	2000			F318-23	STAINLESS STEEL WATER TANK   125" X W 88" X H 45"	
1	PALLET	700	1065511	LUMBER,4" WD,8' LG,2" THK,SOFT LBS	F318-24	L 96" X W 36" X H 21"	
1	PALLET	2200	1018694	BUCKET,SNOW & ICE,3.5 CU YD,LO LBS	F318-25	S/N. 9625 L 104" X W 64" X H 56"	
1	PALLET	2200	1018694	BUCKET,SNOW & ICE,3.5 CU YD,LO LBS	F318-26	S/N. 8351 L 104" X W 64" X H 56"	
1	PALLET	2100	1018696	BUCKET,ROCK,2.25 CU YD,LOADER LBS	F318-27	S/N. 10237 L 101" X W 51" X H 52"	
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-39388

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## SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: RDUBEAU		Date: Jul 10, 2018, 1:43 PM	TCN-38304			
Ship To: 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		From: FOX-3, DEWAR LAKES, DND Storeroom Raytheon Canada Limited, NWS LSS Hall Beach, P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987	Priority 2			
Attention:		Attention:				
Carrier:		Routing: YUW/YUX	Waybill #:	Total Pcs. 11 PCS	Total Weight: 11,622 LBS	
QTY Order	Type	Line Weight	Item	Description	WO or PO B/Code or S/N	Remarks
1	CRATE	500 LBS	4002748	WASTE-DRY MATERIAL-NON CONTROL	F318-1	L 72" X W 48" X H 57"
1	CRATE	450 LBS	4002748	WASTE-DRY MATERIAL-NON CONTROL	F318-2	L 72" X W 48" X H 57"
1	CRATE	500 LBS	4002748	WASTE-DRY MATERIAL-NON CONTROL	F318-3	L 72" X W 48" X H 57"
1	CRATE	700 LBS	4002748	WASTE-DRY MATERIAL-NON CONTROL	F318-4	L 72" X W 48" X H 57"
1	CRATE	1900 LBS	1082018	SHORT BLOCK GROUP; U/O CATERPI	F318-15	L 72" X W 48" X H 57"
1	CRATE	1900 LBS	1082018	SHORT BLOCK GROUP; U/O CATERPI	F318-16	L 72" X W 48" X H 57"
1	CRATE	822 LBS	2001823	HEAD,CYLINDER,CORE EXCHANGE	F318-17	L 50" X W 40" X H 17" TWO CRATED HEADS ON PALLET
1	PALLET	1800 LBS	2002406	WASTE - OIL, 45 GAL	F318-5	L 48" X W 48" X H 43" ASSETS 347762,339989,345519,347760
1	PALLET	1800 LBS	2002406	WASTE - OIL, 45 GAL	F318-6	L 48" X W 48" X H 43" ASSETS 347761,347763,347765,347829
1	PALLET	900 LBS	2002406	WASTE - OIL, 45 GAL	F318-8	L 48" X W 24" X H 43" ASSETS 345521,345520
1	PALLET	350 LBS	2002406	WASTE - OIL, 45 GAL	F318-19	L 36" X W 24" X H 40" ASSET 347831
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-38304

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## SHIPPING MANIFEST

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

Filled By: RDUBEAU	Date: Jul 27, 2018, 10:58 AM	TCN-38391		
Ship To: 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		From: FOX-3, DEWAR LAKES, DND Storeroom Raytheon Canada Limited, NWS LSS Hall Beach, P.O. Box 46 Hall Beach, NU, X0A 0K0 867-928-8987 Priority <b>1</b>		
Attention:	Attention:			
Carrier:	Routing: YUW/YUX	Waybill #: 6 PCS Total Weight: 6196 LBS		
QTY Order	Type Line Weight	Item Description	WO or PO B/Code or S/N	Remarks
1	PALLET 150 LBS	2006405 WASTE - FUEL AND WATER MIXTURE	F318-11	ASSET 344580 (UN 1863) L 38" X W 24" H 41"
1	WOOD 2900 CRATE LBS	2007535 GAS, 100 LB CYL, CO2, PYRENE 9	F318-18	L 50" X W 42" X H 72" (UN 1013) ASSET 160837,160838,,160835,117580
1	WOOD 500 CRATE LBS		F318-14	EXTINGUISHER FIRE (UN 1044) L 50" X W 49" X H 35"
1	WOOD 820 CRATE LBS	2002347 WASTE - BATTERIES, WET, FILLED	F318-10	(UN 2794) L 48" X W 40" X H 42"
1	WOOD 830 PALLET LBS	2002347 WASTE - BATTERIES, WET, FILLED	F318-12	(UN 2794) L 49" X W 22" X H 20"
1	WOOD 1000 CRATE LBS	2002347 WASTE - BATTERIES, WET, FILLED	F318-14	(UN 2794) L 52" X W 52" X H 19"
NOTE: All claims related to this shipment have to be filed with Raytheon within 45 hours of receipt.				Received By: _____ Date: _____
				Received By: _____ Date: _____

Figure 5: NWS Shipping Manifest TCN-38391

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## ANNEX B: LOCATION OF LANDFILL WITH COORDINATES



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

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### ANNEX C: SEWAGE EFFLUENT OUTFALL (FOD-2) LOCATION WITH COORDINATES



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

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## ANNEX D: ANALYSIS OF DISCHARGED SEWAGE EFFLUENT

The sewage outfall sump was sampled on 03-Aug-2018. The sample was analysed for the parameters listed in water licence 3BC-FOD0919 Part I, Item 3. Monitoring Station FOD-2 was discontinued in water licence 8BC-FOD1828.

Table D-1: Summary of Analysis of Discharged Sewage Effluent at FOX-3 in 2018

Sample Date	Parameter				
	pH	Oil and Grease (Present - P / Absent - A)	Biological Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)	Faecal Coliforms
3-Aug-18	7.98	A	213	374	180



Environment Testing

### 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: 1814289

Date Submitted: 2018-08-13

Date Reported: 2018-08-20

Project: COC #:

188711

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
General Chemistry	BOD5	1	mg/L	213	1380108 WW 2018-08-03 FOX-3 Sewage Sump
	pH	1.00		7.98	
	Total Suspended Solids	2	mg/L	374	
Oil and Grease	Oil & Grease - Mineral	1	mg/L	7	
	Oil & Grease - Non-mineral	1	mg/L	42	
	Oil & Grease - Total	1	mg/L	49	
	Visible Sheen		P/A	A	

Guideline = \* = Guideline Exceedence

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 6: 03-Aug-2018 sewage effluent results, Page 1 of 2

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Environment Testing

**Certificate of Analysis**

Client: Raytheon Canada Limited Ottawa  
400 Cooper St.  
Ottawa, ON  
K2P 2H8

Attention: Mr. Will Wyman  
PO#: 002160-OT  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1814296  
Date Submitted: 2018-08-13  
Date Reported: 2018-08-14  
Project:  
COC #: 188711

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

1380134  
WW  
-  
2018-08-03  
FOX-3 Sample  
Seepage

Group	Analyte	MRL	Units	Guideline	
Others	Faecal Coliforms	0	ct/100mL	180	

Figure 7: 03-Aug-2018 sewage effluent results, Page 2 of 2

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## ANNEX E: ANALYSIS OF BERM WATER<sup>2</sup>

The berm water was sampled on 28-Jun-2018. The sample was analysed for the parameters listed in water licence 8BC-FOD1828 Part D, Item 12.

Table E-1: Analysis of Berm Water at FOX-3 in 2018

Berm	Maximum concentration of any grab sample (ug/L)	DEW W22A&B	DEW W22C&D	DEW W20D&E
Location on-site		Summit	Summit	Airstrip
Discharge Latitude <sup>3</sup>		68°39'5.43"N	68°39'3.67"N	68°37'24.90"N
Discharge Longitude		71°14'3.23"W	71°13'49.97"W	71° 8'5.62"W
Date		28-Jun-18	28-Jun-18	28-Jun-18
Oil and Grease (ug/L)		5000	1000	<1000
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

<sup>2</sup> Effluent from bermed fuel storage facilities.

<sup>3</sup> Final discharge point of bermed fuel storage facility

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SOW Ref: 16.F.5.d



Environment Testing

Certificate of Analysis

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

Report Number: 1812364  
Date Submitted: 2018-07-16  
Date Reported: 2018-07-23  
Project:  
COC #: 833821

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
Oil and Grease	Oil & Grease - Mineral	1	mg/L	<1	1374147 Water
	Oil & Grease - Non-mineral	1	mg/L	1	2018-06-28 F3-W22 A B
	Oil & Grease - Total	1	mg/L	1	
VOCs Surrogates	Toluene-d8	0	%	92	
Volatile	Benzene	0.5	ug/L	<0.5	
	Ethylbenzene	0.5	ug/L	<0.5	
	m/p-xylene	0.4	ug/L	<0.4	
	o-xylene	0.4	ug/L	<0.4	
	Toluene	0.5	ug/L	<0.5	

Guideline =

\* = Guideline Exceedence

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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**Figure 8: DEW W22A&B berm water laboratory results**

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SOW Ref: 16.F.5.d



Environment Testing

Certificate of Analysis

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

Report Number: 1812363  
Date Submitted: 2018-07-16  
Date Reported: 2018-07-23  
Project:  
COC #: 833820

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
Oil and Grease	Oil & Grease - Mineral	1	mg/L	<1	
	Oil & Grease - Non-mineral	1	mg/L	<1	
	Oil & Grease - Total	1	mg/L	<1	
VOCs Surrogates	Toluene-d8	0	%	99	
Volatile	Benzene	0.5	ug/L	<0.5	
	Ethylbenzene	0.5	ug/L	<0.5	
	m/p-xylene	0.4	ug/L	<0.4	
	o-xylene	0.4	ug/L	<0.4	
	Toluene	0.5	ug/L	<0.5	

Guideline =

\* = Guideline Exceedence

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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**Figure 9: DEW W22C&D berm water laboratory results**

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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#: 002160-OT  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1812815  
Date Submitted: 2018-07-23  
Date Reported: 2018-07-30  
Project: COC #: 834018

Group	Analyte	MRL	Units	Guideline	
Oil and Grease	Oil & Grease - Mineral	1	mg/L		1
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		1
VOCs Surrogates	Toluene-d8	0	%		95
Volatile	Benzene	0.5	ug/L		<0.5
	Ethylbenzene	0.5	ug/L		<0.5
	m/p-xylene	0.4	ug/L		<0.4
	o-xylene	0.4	ug/L		<0.4
	Toluene	0.5	ug/L		<0.5

Guideline =

\* = Guideline Exceedence

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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**Figure 10: DEW W20D&E berm water laboratory results**

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