



# **2019 ANNUAL NUNAVUT WATER BOARD REPORT FOR FOX-M**

FOR THE

## **North Warning System**

Contract # W8485-100224/001/NX  
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## EXECUTIVE SUMMARY

This 2019 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-FOH0919 was in effect from 01 January until it was replaced with licence 8BC-FOH1929 on 01-Sep-2019. This report covers 01 January to 31 December 2019.

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 2019 was 938.1 cubic meters, which is an average of 2.6 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 2019.

Samples of the water contained in the berms of fuel storage facilities was tested on-site using hydrocarbon test strips and confirmed to be within effluent quality limits of the NWB licence before the water was pumped out of the berms.

Hazardous waste, including waste oil, was sent 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. The hazardous waste consisted of 155 drums of assorted waste (oil, fuel, glycol, etc.), 11 crates of waste batteries, and 18 pails of waste oil.

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.

Three outdoors spills occurred at FOX-M in 2019:

4. NT-NU Spill Line Report Number 19-223. A failed flexline was discovered. A portable berm was placed under the drip stopping the release to the environment. A small amount of impacted gravel was removed. The flexline was put back in place to prevent other material from entering the line while awaiting the replacement flexline.
5. NT-NU Spill Line Report Number 19-227. Staff found the flexline from spill 19-223 leaking once again. The impacted soil was removed, the piping down slope was drained, and the failed flexline was replaced with blind flanges until a new flexline could be installed
6. NT-NU Spill Line Report Number 19-287. The auto stop handle failed the shut off the flow of fuel once the vehicle was full, which resulted in a Jet A1 release of approximately 5 L. The impacted soil was collected and transferred to a drum for off site disposal.

The Spill Contingency Plan was successfully implemented.

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## 1.0 INTRODUCTION

This 2019 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-FOH0919 was in effect from 01 January until it was replaced with licence 8BC-FOH1929 on 01-Sep-2019. This report covers 01 January to 31 December 2019.

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” from 01-Jan-2019 until it was replaced on 01-Sep-2019 with 8BC-FOH1929 – Type “B”  
Location: FOX-M North Warning System Site, Hall Beach, Qikiqtani Region, Nunavut  
Report Prepared by: Raytheon Canada Limited, 18-Mar-2020  
Time period covered: 01 January to 31 December 2019

## 2.0 WATER USE

The water usage at FOX-M in 2019 was 938.1 cubic meters, which is an average of 2.6 cubic meters per day. See Table 2-1 for the volume of water drawn at FOX-M each month in 2019.

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.

Table 2-1: Monthly Raw Water Usage at FOX-M in 2019

Month	Raw water usage (m <sup>3</sup> )
January	82.5
February	89
March	73
April	68.5
May	71
June	79
July	90.5
August	93
September	89.5
October	86.1
November	53.5
December	62.5
<b>TOTAL</b>	<b>938.1</b>



### 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 – Monitoring Program** for details on sewage effluent monitoring.

Table 3-1: Monthly and Annual Volume of Sewage and Grey Water Treated at FOX-M in 2019

Month	Volume of sewage and greywater treated then discharged or recycled (m³)
January	81.3
February	89.0
March	73.0
April	68.5
May	71.0
June	79.0
July	85.5
August	93.0
September	89.5
October	86.1
November	53.5
December	62.5
<b>TOTAL</b>	<b>931.9</b>

### 4.0 HAZARDOUS WASTE AND WASTE OIL DISPOSAL

Hazardous waste, including waste oil, was sent 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. The hazardous waste consisted of 155 drums of assorted waste (oil, fuel, glycol, etc.), 11 crates of waste batteries, and 18 pails of waste oil.

See Table 4-1 for the list of items sent for disposal.

See **Annex A: Hazardous Waste and Waste Oil Disposal in 2019** 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.

Table 4-1: Hazardous Waste and Waste Oil Sent for Disposal from FOX-M in 2019

Description, TDG shipping name	Quantity	Movement Document or Manifest #
Waste Jet A1 fuel and water mixture		
Waste fuel, aviation, turbine engine mixture	48 Drums	Movement Document 2464178-9
Waste aerosols (flammable)	1 Drum	Movement Document 2464178-9
Waste paint, flammable	4 Drums	Movement Document 2464178-9
Waste paint		

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Description, TDG shipping name	Quantity	Movement Document or Manifest #
Waste Jet A1 fuel	24 Drums	Movement Document 2464179-7
Waste fuel, aviation, turbine engine		
Waste Jet A1 fuel fuel filters	4 Drums	Movement Document 2464179-7
Waste solids containing flammable liquids, n.o.s (fuel, aviation, turbine engine)		
Waste fuel contaminated soil	14 Drums	Movement Document 2464179-7
Waste solids containing flammable liquids, n.o.s (fuel, aviation, turbine engine)		
Waste POL soaked absorbent	2 Drums	Movement Document 2464179-7
Waste solids containing flammable liquids, n.o.s (fuel, aviation, turbine engine)		
Waste oily rags	7 Drums	Movement Document 2464179-7
Waste solids containing flammable liquids, n.o.s (fuel, aviation, turbine engine)		
Waste Jet A1 fuel soaked sorbent	4 Drums	Movement Document 2464179-7
Waste solids containing flammable liquids, n.o.s (fuel, aviation, turbine engine)		
Waste batteries, wet, filled with acid	6 Crates	Movement Document 2581507-7
Waste batteries, wet, non-spillable	5 Crates	Movement Document 2581507-7
Waste petroleum distillates n.o.s.	1 Drum	Movement Document 2581507-7
Waste oil	39 Drums	NWS Manifest TCN40035, TCN40036, TCN40037, TCN40038, TCN40039, TCN40040, TCN40041, TCN40042, TCN40138, TCN40145, TCN40147
Not TDG regulated		
Waste oil	18 Pails	NWS Manifest TCN40173
Not TDG regulated		
Waste Activated Carbon Filter	7 Drums	NWS Manifest TCN40071, TCN40078, TCN40139
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 2019

Month	Waste Generated (kg)
January	1222
February	1184
March	1184
April	864
May	1095
June	864
July	5393
August	1291
September	1238
October	1145
November	860
December	1064
<b>TOTAL</b>	<b>17,404</b>

## 6.0 MONITORING PROGRAM

In 2019, a monitoring program was implemented at FOX-M as required by the water licence. 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: Treated Sewage Effluent Outfall (CDL-2) Location with Coordinates**, 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 using hydrocarbon test strips 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 Bermed Fuel Storage Facilities and Analysis of Berm Water**. All samples met the effluent requirements of the water licence, Part D.
4. Final Discharge Point from the Landfarm (FOH-4). No landfarm has been established at FOX-M, so this monitoring station remains inactive.



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## 7.0 SPILLS (UNAUTHORIZED DISCHARGES)

Table 7-1: Unauthorized Discharges at FOX-M in 2019

Date, NT-NU Spill #	Product	Quantity	Cause and follow-up action	On-site location
29-May-2019, Spill # 19-223	Jet A1	10 L	<p>On 29-May-2019, a technician completing preventive maintenance discovered fuel dripping from a flexline. There was no obvious damage to the flexline. A portable berm was placed under the drip stopping the release to the environment. The piping to the flexline was isolated, drained, and temporarily withdrawn from service.</p> <p>Approximately 0.5 m<sup>3</sup> of impacted gravel was removed.</p> <p>The flexline was put back in place to prevent other material from entering the line while awaiting the replacement flexline.</p>	Beach Pumphouse (68°46'23.55"N, 81°12'47.52"W)
03-Jun-2019, Spill # 19-227	Jet A1	10 L	<p>Following the leak found on 29-May-2019 (19-223), the failed flexline was removed, but had to be put back into place or else the system would have been left open. On 02-Jun-2019, the flexline was inspected with no sign of leak. On 03-Jun-2019 the flexline was inspected and was found leaking. It was determined that fuel down slope of the flexline expanded into the failed flexline. Impacted gravel was removed and catch containment placed under flex line at this time.</p> <p>The piping down slope of the flexline was drained and the failed flexline was replaced with blind flanges.</p> <p>On 22Jun2018, a new flexline was installed.</p>	Beach Pumphouse (68°46'23.55"N, 81°12'47.52"W)
11-Jul-2019, Spill # 19-278	Jet A1	3 L	<p>On 11Aug2019 site personnel were refuelling one of the site pickup trucks at vehicle refueller tank W21E. The auto stop handle failed the shut off the flow of fuel once the vehicle was full, which resulted in a Jet A1 release of approximately 5 L. The impacted soil was collected and transferred to a drum for off site disposal.</p>	Vehicle Refueler Tank W21E (68°45'41"N, 81°13'31"W)

The Spill Contingency Plan was successfully implemented.

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## 8.0 REVISIONS TO THE SPILL CONTINGENCY PLAN

The Spill Contingency Plan was updated on 29-Mar-2019. An updated copy of the Spill Contingency Plan has been submitted to the NWB with this annual report.

## 9.0 PROGRESSIVE RECLAMATION WORK UNDERTAKEN

No progressive reclamation work was undertaken in 2019.

## 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



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## ANNEX A: HAZARDOUS WASTE AND WASTE OIL DISPOSAL IN 2019

The 2019 Movement Document for TDG Regulated waste and NWS Manifests for non-TDG Regulated waste described in 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.

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

2464178-9

<b>A Generator / consigneur</b> 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 C/O RCL Mailing address / Adresse postale 22 WING BLDG 104 HORNELL HEIGHTS ON M4H 1P3 City / Ville Hornell Heights Province ON Postal code / Code postal M4H 1P3 E-mail / Courriel électronique 705 494-2011 EXT 2861 Tel. No. / N° de tél. 705 494-2011 EXT 2861 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 0K0		<b>B Carrier</b> Transporteur Registration No. / Provincial ID No. N° d'immatriculation - d'ID provincial NEAS INC Company name / Nom de l'entreprise Mailing address / Adresse postale 2100 PIERRE DUMAY, wing no. 3 Suite 2300 H3C 3K5 City / Ville Montreal Province QC Postal code / Code postal H3C 3K5 E-mail / Courriel électronique SALES@NEAS.CA Tel. No. / N° de tél. ( ) Vehicle / Véhicule Trailer - Roll car No. 1 1" remorque - wagon Trailer - Roll car No. 2 2" remorque - wagon Port of entry / Point d'entrée International use only Port of exit / Point de sortie International use only Carrier Certification: I 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 récepteur / 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'imprimerie) M. Mani - Zia Albert Year / Année Month / Mois Day / Jour 19 08 27 Signature M. Mani - Zia Albert		<b>C Receiver / consignee</b> Réceptionnaire / destinataire Registration No. / Provincial ID No. N° d'immatriculation - d'ID provincial Receiver / consignee information same as in Part A Les renseignements du récepteur / destinataire est la même qu'à la Partie A <input type="checkbox"/> Yes / Oui <input type="checkbox"/> No, complete the box below / Non, remplir la case ci-dessous 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 to be transferred, specify intended 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 Comments / Commentaires Handling / Code de manipulation Shipment / Envoi Accepted / Reçu Refused / Refusé Decom. / Décom. Pack. / Emb. Veh. / Veh.																									
Prov. code / Code prov. 3		Shipping name / Appellation réglementaire 4		Class / Classe Sub. division / Sous-division 5		UN No. / N° UN 6		Packing / Risk gr. / Gr. d'emballage de risque 7		Quantity shipped / Quantité expédiée 8		Units / Unités L or / ou Kg 9		Packaging / Conteneur No. / N° 10		Codes Int. - ext. 11		Phys. state État phys. 12		If handling code "Other" (specify) Si code de manipulation « autre » (spécifier) 13		Receiver / consignee certification: I certify that the information contained in Part C is correct and complete. Attestation du récepteur / destinataire: J'atteste que tous les renseignements à la partie C sont exacts et complets. Signature Tel. No. / N° de tél. ( ) Special handling / Manipulation spéciale <input type="checkbox"/> Attached / Ci-joint <input type="checkbox"/> As follows / Comme: 22							
Notice No. / N° de notification (1)		Notice Line No. / N° de ligne de la notification (2)		Shipment / Envoi (3)		Q / R code (4)		D or R code (5)		C code (6)		Based Annex VII or OECD Code (7)		Annexe VIII de la Bâle ou Code OCDE (8)		H code (9)		Y code (10)		Export (11)		Import (12)		Customs code(s) (13)		Name of authorized person (print) Nom de l'agent autorisé (caractères d'imprimerie) (14)			
* WASTE, PAINT (1)		WASTE, AEROSOLS (2)		WASTE, FUEL, AVIATION (3)		TURBINE, ENGINE (4)		WASTE, FUEL, AVIATION (5)		TURBINE, ENGINE, MIXTURE (6)		3		UN 1263 (7)		III (8)		370 (9)		KG (10)		2 (11)		01 (12)		L (13)		M. Mani - Zia Albert (14)	
** FLASH POINT 40°C (1)		** FLASH POINT 21°C (2)		** FLASH POINT 38°C (3)																						CRAIG RIVARD (14)			
EMERGENCY CONTACT # 24-HOUR CANUTEC (1)		1 (613) 996-6666 (2)		RON DUREAU 2nd (3)		705-494-2011 EXT 2861 (4)																							

MOE 04-1917 (07/07)

Instructions for completion and distribution on reverse / Instructions pour compléter et distribuer au verso

Copy / Copie 1 (white / blanche)

Figure 1: Movement Document 2464178-9

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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.

2464179-7

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

<b>A Generator / consigneur</b> Producteur / expéditeur Registration No. / Provincial ID No. N° d'immatriculation - d'id. provincial NUG 100003		<b>B Carrier</b> Transporteur Registration No. / Provincial ID No. N° d'immatriculation - d'id. provincial		<b>C Receiver / consignee</b> Réceptionnaire / destinataire Registration No. / Provincial ID No. N° d'immatriculation - d'id. provincial			
Company name / Nom de l'entreprise DEPARTMENT OF NATIONAL DEFENCE Cb RCL Mailing address / Adresse postale 22 KING BLVD 109 HORNELL HEIGHTS ON POH IP3 City / Ville HORNELL Province ON Postal code / Code postal L7Y 4G6 E-mail / Courriel électronique 705 494-2011 EXT 1861		Company name / Nom de l'entreprise NEAS INC Mailing address / Adresse postale 2100 PIERRE DUBUY City / Ville LAWSON Province ON Postal code / Code postal M1L 4C3 E-mail / Courriel électronique LAWSON@NEAS.COM Tel. No. / N° de tél. 416 333-3333		Receiver / consignee information same as in Part A Les renseignements du réceptionnaire / destinataire est le même qu'à la Partie A <input type="checkbox"/> Yes / Oui <input type="checkbox"/> No, complete the box below / Non, remplir la case ci-dessous 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 AM / PM			
Shipping site address / Adresse du lieu de l'expédition NWS 155 HALL BEACH PO Box 46 City / Ville HALL BEACH Province NU Postal code / Code postal X0A 0K0		Vehicle / Véhicule Trailer - Rail car No. 1 1 <sup>re</sup> remorque - wagon Trailer - Rail car No. 2 2 <sup>e</sup> remorque - wagon Registration No. / N° d'immatriculation Port of entry / Point d'entrée Port of exit / Point de sortie		Intended Receiver / consignee Réceptionnaire / destinataire prévu KIKIQTAAUK ENVIRONMENTAL Mailing address / Adresse postale 9935 DECHATEAUX ENTRANCE 1 SUITE 200 City / Ville BROSSARD Province QC Postal code / Code postal J4Y 3V4 E-mail / Courriel électronique 1-866-634-6367 Receiving site address / Adresse du lieu de l'expédition VEOLIA 2630 BOUL INDUSTRIAL City / Ville CHAMBLY Province QC Postal code / Code postal J3L 4V2			
Intended Receiver / consignee Réceptionnaire / destinataire prévu KIKIQTAAUK ENVIRONMENTAL Mailing address / Adresse postale 9935 DECHATEAUX ENTRANCE 1 SUITE 200 City / Ville BROSSARD Province QC Postal code / Code postal J4Y 3V4 E-mail / Courriel électronique 1-866-634-6367 Receiving site address / Adresse du lieu de l'expédition VEOLIA 2630 BOUL INDUSTRIAL City / Ville CHAMBLY Province QC Postal code / Code postal J3L 4V2		Carrier Certification / I 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'imprimerie) MARIE-ICCI ALBERT Year / Année Month / Mois Day / Jour Signature Marie-ICCI ALBERT		If waste or recyclable material to be transferred, specify intended company name / Si les déchets ou matières recyclables doivent être transférés, préciser le nom du destinataire Registration No. / Provincial ID No. N° d'immatriculation / d'id. provincial Quantity received / Quantité reçue Units / Unités Comments / Commentaires Handling Code / Code de manutention Accepted / Refused Pack / Veh. Cont. / Veh.			
Prox. code Code proc.		Shipping name Appellation réglementaire WASTE, FUEL, AVIATION TURBINE, ENGINE WASTE SOLIDS, CONTAINING FLAMMABLE, LIQUID N.O.S (FUEL, AVIATION, TURBINE ENGINE)		Class / Classe Sub. class / Sub. UN No. N° UN Packing / emballage Or. / emballage de risque Quantity shipped Quantité expédiée Units / Unités L or / ou Kg Units Packing / emballage Codes Int. - ext. Phys. state État phys.			
Notice No. N° de notification		Notice Line No. N° de ligne de la notification		Shipment Envoi Or / De D or R code Code E ou R C code Code C Based Annex VIII or OECD Code Annexe VIII de Bâle ou Code OCDE H code Code H Y code Code Y Export Exportation Import Importation Customs code(s) Code(s) de douanes		If handling code "Other" (specify) Si code de manutention « autre » (spécifier) Receiver / consignee certification / I 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. Signature Tel. No. / N° de tél.	
EMERGENCY CONTACT # 24-HOUR CANUTEC 1 (613) 996-6666 Generator / consigneur certification / I certify that the information contained in Part A is correct and complete. Attestation du producteur / expéditeur : J'atteste que tous les renseignements à la partie A sont exacts et complets.		Name of authorized person (print) Nom de l'agent autorisé (caractères d'imprimerie) RON DUBEAU Ron D Signature 705 494-2011 EXT 1861		Special handling / Manutention spéciale <input type="checkbox"/> Attached / Ci-joint : <input type="checkbox"/> As follows / Ci-contre : Date shipped / Date d'expédition Year / Année Month / Mois Day / Jour Time / Heure AM / PM Scheduled arrival date / Date d'arrivée prévue Year / Année Month / Mois Day / Jour			

MOE 04-1917 (07/07)

Instructions for completion and distribution on reverse / Instructions pour compléter et distribuer au verso

Copy / Copie 1 (white / blanche)

Figure 2: Movement Document 2464179-7

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SOW Ref: 16.F.5.d

SHIPPING MANIFEST						
Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8					NON NEGOTIABLE	
Filled By: JPIALLAQ		Date: Aug 5, 2019, 2:44 PM		TCN-40071		
Ship To: QIKIQTAAALUK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367		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 <b>12</b>		
Attention:		Attention:				
Carrier: NEAS		Routing:		Waybill #: L 48" X W 48" X H 41"	Total Pcs. 1	Total Weight: 1400 LBS
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N
4			2002351	WASTE - ACTIVATED CARBON FILTE	XL-2019-001	ASSET = 359601, 352359, 359361, 352501
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- 40071

SHIPPING MANIFEST						
Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8					NON NEGOTIABLE	
Filled By: BGRANDY		Date: Aug 6, 2019, 4:25 PM		TCN-40078		
Ship To: QIKIQTAAALUK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367		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 <b>12</b>		
Attention:		Attention:				
Carrier: NEAS		Routing:		Waybill #:	Total Pcs. 1	Total Weight: 1050 LBS
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N
1		1050 LBS	2002351	WASTE - ACTIVATED CARBON FILTE		ASSET 352505
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- 40078

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SOW Ref: 16.F.5.d



## SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: BGRANDY		Date: Aug 17, 2019, 11:23 AM		TCN-40139			
Ship To: QIKIQTAAALUK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367		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 <b>12</b>			
Attention:		Attention:					
Carrier: NEAS		Routing:		Waybill #: L48"XW40"XH42"	Total Pcs. 1		
				Total Weight: 500 LBS			
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
2		500 LBS	2002351	WASTE - ACTIVATED CARBON FILTE	XL-2019-041		ASSETS 352867, 352868
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- 40139



## SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: JPIALLAQ		Date: Aug 2, 2019, 4:09 PM		TCN-40035			
Ship To: QIKIQTAAALUK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367		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 <b>12</b>			
Attention:		Attention:					
Carrier: NEAS		Routing:		Waybill #: L 48" W 48" X 41"	Total Pcs. 1		
				Total Weight: 1700 LBS			
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
4		2.81 M3	2002406	WASTE - OIL, 45 GAL	XL-2019-006		ASSET # 350549, 351996, 351997, 351998
NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.							
				Received By:		Date	
				Received By:		Date	

Figure 7: NWS Shipping Manifest TCN- 40035

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## SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: JPIALLAQ		Date: Aug 5, 2019, 9:03 AM		TCN-40036	
Ship To: QIKIQTAAALUK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367		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 <b>12</b>	
Attention:		Attention:			
Carrier: NEAS		Routing:		Waybill #: L 48" W 48" X H 41"	Total Pcs. 1
				Total Weight: 1650 LBS	
QTY Order	Type	Line Weight	Item	Description	WO or PO B/Code or S/N
4		2.81 M3	2002406	WASTE - OIL, 45 GAL	XL-2019-007
					ASSET # 352388, 352387, 352389, 382391
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 8: NWS Shipping Manifest TCN- 40036



## SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: JPIALLAQ		Date: Aug 5, 2019, 9:10 AM		TCN-40037	
Ship To: QIKIQTAAALUK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367		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 <b>12</b>	
Attention:		Attention:			
Carrier: NEAS		Routing:		Waybill #: L 48" W 48" X H 41"	Total Pcs. 1
				Total Weight: 1500 LBS	
QTY Order	Type	Line Weight	Item	Description	WO or PO B/Code or S/N
4		2.81 M3	2002406	WASTE - OIL, 45 GAL	XL-2019-008
					ASSET # 343878, 382392, 339428, 349106
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 9: NWS Shipping Manifest TCN- 40037

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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

Filled By: JPIALLAQ		Date: Aug 5, 2019, 9:23 AM		TCN-40038			
Ship To: QIKIQTAAALUK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367		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 <b>12</b>			
Attention:		Attention:					
Carrier: NEAS		Routing:		Waybill #: L 48" W 48" X H 41"	Total Pcs. 1		
				Total Weight: 1600 LBS			
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
4			2002406	WASTE - OIL, 45 GAL	XL-2019-009		ASSET # 382390, 352379, 352380, 382393
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 10: NWS Shipping Manifest TCN- 40038

**SHIPPING MANIFEST**

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

NON NEGOTIABLE

Filled By: JPIALLAQ		Date: Aug 5, 2019, 9:28 AM		TCN-40039			
Ship To: QIKIQTAAALUK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367		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 <b>12</b>			
Attention:		Attention:					
Carrier: NEAS		Routing:		Waybill #: L 48" W 48" X H 41"	Total Pcs. 1		
				Total Weight: 1800 LBS			
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
4		2.81 M3	2002406	WASTE - OIL, 45 GAL	XL-2019-019		ASSET # 352378, 351135, 352053, 351134
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 11: NWS Shipping Manifest TCN- 40039

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## SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: JPIALLAQ		Date: Aug 5, 2019, 9:31 AM		TCN-40040			
Ship To: QIKIQTAAALUK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367		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 <b>12</b>			
Attention:		Attention:					
Carrier: NEAS		Routing:		Waybill #: L 48" W 48" X H 43"	Total Pcs. 1		
				Total Weight: 1950 LBS			
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
4		2.81 M3	2002406	WASTE - OIL, 45 GAL	XL-2019-020		ASSET # 347302, 350548, 350547, 348861
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 12: NWS Shipping Manifest TCN- 40040



## SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: JPIALLAQ		Date: Aug 5, 2019, 9:34 AM		TCN-40041			
Ship To: QIKIQTAAALUK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367		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 <b>12</b>			
Attention:		Attention:					
Carrier: NEAS		Routing:		Waybill #: L 48" W 48" X H 41"	Total Pcs. 1		
				Total Weight: 2000 LBS			
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
4		2.81 M3	2002406	WASTE - OIL, 45 GAL	XL-2019-021		ASSET # 339432, 334866, 352349, 348290
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 13: NWS Shipping Manifest TCN- 40041

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## SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: JPIALLAQ		Date: Aug 5, 2019, 9:36 AM		TCN-40042			
Ship To: QIKIQTAAALUK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367		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 <b>12</b>			
Attention:		Attention:					
Carrier: NEAS		Routing:		Waybill #: L 48" W 48" X H 43"			
				Total Pcs. 1			
				Total Weight: 1700 LBS			
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
4		2.81 M3	2002406	WASTE - OIL, 45 GAL	XL-2019-022		ASSET # 352500, 352498, 352499, 349016
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 14: NWS Shipping Manifest TCN- 40042



## SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: BGRANDY		Date: Aug 17, 2019, 11:07 AM		TCN-40138			
Ship To: QIKIQTAAALUK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367		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 <b>12</b>			
Attention:		Attention:					
Carrier: NEAS		Routing:		Waybill #: L48"XW40"XH41"			
				Total Pcs. 1			
				Total Weight: 940 LBS			
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
2		940 LBS	2002406	WASTE - OIL, 45 GAL	XL-2019-040		ASSETS 345736, 349837
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 15: NWS Shipping Manifest TCN- 40138

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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

Filled By: BGRANDY		Date: Aug 17, 2019, 1:25 PM		TCN-40145			
Ship To: QIKIQTAALUK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367		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 <b>12</b>			
Attention:		Attention:					
Carrier: NEAS		Routing:		Waybill #: L48"XW48"XH41"	Total Pcs. 1		
				Total Weight: 1800 LBS			
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
4		1800 LBS	2002406	WASTE - OIL, 45 GAL	XL-2019-038		ASSETS 352354,345854,350004,352650
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 16: NWS Shipping Manifest TCN-40145

Filled By: BGRANDY		Date: Aug 17, 2019, 2:28 PM		TCN-40147			
Ship To: QIKIQTAALUK ENVIRONMENTAL (QE) C/O VEOLIA 2630, BOUL. INDUSTRIEL CHAMBLY, QC, J3L 4V2 1-866-634-6367		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 <b>12</b>			
Attention:		Attention:					
Carrier: NEAS		Routing:		Waybill #: L47"XW39"XH41"	Total Pcs. 1		
				Total Weight: 470 LBS			
QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
1		470 LBS	2002406	WASTE - OIL, 45 GAL	XL-2019-049		ASSET 350546
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 17: NWS Shipping Manifest TCN- 40147

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SOW Ref: 16.F.5.d



## SHIPPING MANIFEST

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

NON NEGOTIABLE

<b>Filled By:</b> BGRANDY		<b>Date:</b> Aug 19, 2019, 9:35 AM		<b>TCN-40173</b>	
<b>Ship To:</b> QIKIQTAAALUK ENVIRONMENTAL (QE) C/O VEOLIA  2630, BOUL. INDUSTRIEL  CHAMBLY, QC, J3L 4V2  1-866-634-6367		<b>From:</b> 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		<b>Priority</b>  <b>12</b>	
<b>Attention:</b>		<b>Attention:</b>			
<b>Carrier:</b> NEAS		<b>Routing:</b>		<b>Waybill #:</b> L34"XW34"XH33"	
				<b>Total Pcs.</b> 1	
				<b>Total Weight:</b> 300 LBS	
<b>QTY</b>	<b>Type</b>	<b>Line</b>	<b>Item</b>	<b>Description</b>	<b>WO or PO</b>
18		300	2003658	WASTE - OIL (5 GALLON PAIL)	XL-2019-065
		LBS			
				<b>B/Code or S/N</b>	<b>Remarks</b>
					ASSET 352904
<b>NOTE: All claims related to this shipment have to be filled with Raytheon within 45 hours of receipt.</b>					
				<b>Received By:</b>	<b>Date</b>
				<b>Received By:</b>	<b>Date</b>

Figure 18: NWS Shipping Manifest TCN- 40173

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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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SOW Ref: 16.F.5.d

## ANNEX C: ANALYSIS OF TREATED SEWAGE EFFLUENT

Table C-0-1: Summary of Analysis of Treated Sewage Effluent at FOX-M in 2019

Sample Date	Parameter				
	pH	Oil and Grease (Present - P / Absent - A)	Biological Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)	Faecal Coliforms <sup>1</sup>
Maximum Concentration	6.0 to 9.0 (pH units)	No visible sheen	120 mg/L	180 mg/L	10,000 CFU/100 mL
28-Jan-19	8.06	A	<1	<2	14
4-Feb-19	8.08	A	2	<2	0
4-Mar-19	7.64	A	1	<2	25
4-Apr-19	7.71	A	<1	<2	165
2-May-19	7.89	A	<1	3	0
10-Jun-19	7.68	A	20	<2	10
1-Jul-19	7.33	A	16	<2	152
8-Aug-19	7.52	A	5	8	<10
30-Sep-19	7.76	A	88	7	73
7-Oct-19	6.6	A	4	<2	14
15-Nov-19	7.89	A	7	3	42
4-Dec-19	7.51	A	<1	<2	21



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: 1901573  
Date Submitted: 2019-02-01  
Date Reported: 2019-02-07  
Project:  
COC #: 840155

Group		Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
General Chemistry		BOD5	1	mg/L	<1	1409609 Sewage
		pH	1.00		8.06	2019-01-28 FOX-MAIN CYCLE-LET
		Total Suspended Solids	2	mg/L	<2	
Oil and Grease		Oil & Grease - Mineral	1	mg/L	<1	
		Oil & Grease - Non-mineral	1	mg/L	2	
		Oil & Grease - Total	1	mg/L	2	
		Visible Sheen		P/A	A	

Figure 19: January 2019, sewage effluent laboratory results page 1 of 2

<sup>1</sup> This column contains the average of the Cyclet 1A, Cyclet 1B, and Cyclet 1C

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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: 1901594  
Date Submitted: 2019-02-01  
Date Reported: 2019-02-03  
Project: NWS-SCM-03039  
COC #: 840155

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1409677 Sewage  2019-01-28 Fox-Main Cycle-Let A	1409678 Sewage  2019-01-28 Fox-Main Cycle-Let B	1409679 Sewage  2019-01-28 Fox-Main Cycle-Let C
Microbiology	Faecal Coliforms	0	ct/100mL			11	1	31

Figure 20: January 2019, sewage effluent laboratory results page 2 of 2



**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: 1901910  
Date Submitted: 2019-02-08  
Date Reported: 2019-02-13  
Project:  
COC #: 840323

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1410473 Sewage 2019-02-02 FOX-MAIN CYCLE-LET
General Chemistry	BOD5	1	mg/L		2
	pH	1.00			8.08
	Total Suspended Solids	2	mg/L		<2
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
	Visible Sheen		P/A		A

Figure 21: February 2019, sewage effluent laboratory 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: 1901917  
Date Submitted: 2019-02-08  
Date Reported: 2019-02-10  
Project:  
COC #: 840323

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1410496 Sewage - 2019-02-04 FOX-MAIN CYCLE-LET A	1410497 Sewage - 2019-02-04 FOX-MAIN CYCLE-LET B	1410498 Sewage - 2019-02-04 FOX-MAIN CYCLE-LET C
Group	Analyte	MRL	Units	Guideline				
Microbiology	Faecal Coliforms	0	ct/100mL			0	0	0

Figure 22: February 2019, sewage effluent laboratory results page 2 of 2



**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: 1903298  
Date Submitted: 2019-03-08  
Date Reported: 2019-03-18  
Project:  
COC #: 841064

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1414369 WW 2019-03-04 Fox-Main Cyclet
Group	Analyte	MRL	Units	Guideline		
General Chemistry	BOD5	1	mg/L			1
	pH	1.00				7.64
	Total Suspended Solids	2	mg/L			<2
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
	Visible Sheen		P/A			A

Figure 23: March 2019, sewage effluent laboratory 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: 1903311  
Date Submitted: 2019-03-08  
Date Reported: 2019-03-10  
Project: NWS-SCM-03039  
COC #: 841064

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1414390 Sewage  2019-03-04 FOX-MAIN CYCLE-LET - A	1414391 Sewage  2019-03-04 FOX-MAIN CYCLE-LET - B	1414392 Sewage  2019-03-04 FOX-MAIN CYCLE-LET - C
Microbiology	Faecal Coliforms	0	ct/100mL			46	20	9

Figure 24: March 2019, sewage effluent laboratory results page 2 of 2



**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: 1905546  
Date Submitted: 2019-04-16  
Date Reported: 2019-04-25  
Project: 842330  
COC #:

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
General Chemistry	BOD5	1	mg/L		1420784 Sewage  2019-04-04 Fox-Main Cycle-Let
	pH	1.00			
	Total Suspended Solids	2	mg/L		
Oil and Grease	Oil & Grease - Mineral	1	mg/L		
	Oil & Grease - Non-mineral	1	mg/L		
	Oil & Grease - Total	1	mg/L		
	Visible Sheen				

Figure 25: April 2019, sewage effluent laboratory 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: 1905568  
Date Submitted: 2019-04-16  
Date Reported: 2019-04-17  
Project:  
COC #: 842330

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1420877 Sewage  2019-04-04 Fox-Main Cycle-Let 1A	1420878 Sewage  2019-04-04 Fox-Main Cycle-Let 1B	1420879 Sewage  2019-04-04 Fox-Main Cycle-Let 1C
Microbiology	Faecal Coliforms	0	ct/100mL			161	180	154

Figure 26: April 2019, sewage effluent laboratory results page 2 of 2



**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: 1907127  
Date Submitted: 2019-05-09  
Date Reported: 2019-05-16  
Project:  
COC #: 843232

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
General Chemistry	BOD5	1	mg/L		1425394 Sewage  2019-05-02 FOX-MAIN CYCLE-LET
	pH	1.00			<1
	Total Suspended Solids	2	mg/L		7.89
Oil and Grease	Oil & Grease - Mineral	1	mg/L		3
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		<1
	Visible Sheen		P/A		A

Figure 27: May 2019, sewage effluent laboratory 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: 1907144  
Date Submitted: 2019-05-09  
Date Reported: 2019-05-10  
Project:  
COC #: 843232

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1425463 Sewage 2019-05-02 Fox-Main Cyclelet A	1425464 Sewage 2019-05-02 Fox-Main Cyclelet B	1425465 Sewage 2019-05-02 Fox-Main Cyclelet C
Group	Analyte	MRL	Units	Guideline				
Microbiology	Faecal Coliforms	0	ct/100mL			0	0	0

Figure 28: May 2019, sewage effluent laboratory results page 2 of 2



**Environment Testing**

**Certificate of Analysis**

Client: Raytheon Canada Limited Ottawa  
400 Cooper St.  
Ottawa, ON  
K2P 2H8  
Attention: Mr. Will Wyman  
PO#: 004438-OT  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1909946  
Date Submitted: 2019-06-18  
Date Reported: 2019-06-26  
Project:  
COC #: 844872

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1433662 Sewage 2019-06-10 Fox-Main Cycle-let
Group	Analyte	MRL	Units	Guideline		
General Chemistry	BOD5	1	mg/L			20
	pH	1.00				7.68
	Total Suspended Solids	2	mg/L			<2
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
	Visible Sheen	0	A/P			A

Figure 29: June 2019, sewage effluent laboratory 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: 1909955  
Date Submitted: 2019-06-18  
Date Reported: 2019-06-19  
Project:  
COC #: 844872

Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.					1433685 Sewage 2019-06-10 Fox-Main Cycle-let A	1433686 Sewage 2019-06-10 Fox-Main Cycle-let B	1433687 Sewage 2019-06-10 Fox-Main Cycle-let C
Group	Analyte	MRL	Units	Guideline			
Microbiology	Faecal Coliforms	0	ct/100mL		11	8	10

Figure 30: June 2019, sewage effluent laboratory results page 2 of 2



**Environment Testing**

**Certificate of Analysis**

Client: Raytheon Canada Limited Ottawa  
400 Cooper St.  
Ottawa, ON  
K2P 2H8  
Attention: Mr. Will Wyman  
PO#: 004438-OT  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1911989  
Date Submitted: 2019-07-10  
Date Reported: 2019-07-17  
Project:  
COC #: 845959

Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.					1440133 Sewage 2019-07-02 Fox-Main Cycle-Let
Group	Analyte	MRL	Units	Guideline	
General Chemistry	BOD5	1	mg/L		16
	pH	1.00			7.33
	Total Suspended Solids	2	mg/L		<2
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
	Visible Sheen	0	P/A		A

Figure 31: July 2019, sewage effluent laboratory 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#: 004438-OT  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1912021  
Date Submitted: 2019-07-10  
Date Reported: 2019-07-11  
Project:  
COC #: 845959

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1440248 Sewage 2019-07-02 Fox-Main Cycle A	1440249 Sewage 2019-07-02 Fox-Main Cycle B	1440250 Sewage 2019-07-02 Fox-Main Cycle C
Microbiology	Faecal Coliforms	0	ct/100mL			139	151	167

Figure 32: July 2019, sewage effluent laboratory results page 2 of 2



**Environment Testing**

**Certificate of Analysis**

Client: Raytheon Canada Limited Ottawa  
400 Cooper St.  
Ottawa, ON  
K2P 2H8  
Attention: Mr. Will Wyman  
PO#: 004438-OT  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1914715  
Date Submitted: 2019-08-15  
Date Reported: 2019-08-21  
Project:  
COC #: 847658

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
General Chemistry	BOD5	1	mg/L		1447359 WW 2019-08-09 FOX-Main Cycle
	pH	1.00			
	Total Suspended Solids	2	mg/L		
Oil and Grease	Oil & Grease - Mineral	1	mg/L		
	Oil & Grease - Non-mineral	1	mg/L		
	Oil & Grease - Total	1	mg/L		
	Visible Sheen		P/A		

Figure 33: August 2019, sewage effluent laboratory 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#: 004438-OT  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1914726  
Date Submitted: 2019-08-15  
Date Reported: 2019-08-16  
Project:  
COC #: 847658

					Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1447458 Sewage  2019-08-09 FOX-Main Cyclet A	1447459 Sewage  2019-08-09 FOX-Main Cyclet B	1447460 Sewage  2019-08-09 FOX-Main Cyclet C
Group	Analyte	MRL	Units	Guideline				
Microbiology	Faecal Coliforms	010	ct/100mL		<10	<10		
		10	ct/100mL				<10	

Figure 34: August 2019, sewage effluent laboratory results page 2 of 2



**Environment Testing**

**Certificate of Analysis**

Client: Raytheon Canada Limited Ottawa  
400 Cooper St.  
Ottawa, ON  
K2P 2H8  
Attention: Mr. Will Wyman  
PO#: 004438-OT  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1918199  
Date Submitted: 2019-10-04  
Date Reported: 2019-10-11  
Project:  
COC #: 207955

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
					1457661 Sewage  2019-09-30 Fox-Main Cyclelet
General Chemistry	BOD5	1	mg/L		88
	pH	1.00			7.76
	Total Suspended Solids	2	mg/L		7
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
	Visible Sheen		P/A		A

Figure 35: September 2019, sewage effluent laboratory 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-PO  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1918196  
Date Submitted: 2019-10-04  
Date Reported: 2019-10-07  
Project: NW SCMO3039  
COC #: 207955

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1457655 WW 2019-09-30 Fox-Main Cycelet - A	1457656 WW 2019-09-30 Fox-Main Cycelet - B	1457657 WW 2019-09-30 Fox-Main Cycelet - C
Microbiology	Faecal Coliforms	0	ct/100mL			30	80	110

Figure 36: September 2019, sewage effluent laboratory results page 2 of 2



**Environment Testing**

**Certificate of Analysis**

Client: Raytheon Canada Limited Ottawa  
400 Cooper St.  
Ottawa, ON  
K2P 2H8  
Attention: Mr. Will Wyman  
PO#: 004438-OT  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1918966  
Date Submitted: 2019-10-16  
Date Reported: 2019-10-30  
Project:  
COC #: 97128

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
General Chemistry	BOD5	1	mg/L		1460007 Water 2019-10-07 Fox-Main Cycle-let
	pH	1.00		6.5-8.5	
	Total Suspended Solids	2	mg/L		
Microbiology	Faecal Coliforms	0	ct/100mL		
Oil and Grease	Oil & Grease - Mineral	1	mg/L		
	Oil & Grease - Non-mineral	1	mg/L		
	Oil & Grease - Total	1	mg/L		
	Visible Sheen				A

Figure 37: October 2019, sewage effluent laboratory results

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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#: 004438-OT  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1921554  
Date Submitted: 2019-11-26  
Date Reported: 2019-12-03  
Project:  
COC #: 851739

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
General Chemistry	BOD5	1	mg/L		1468645 Sewage
	pH	1.00			2019-11-15 Fox-Main Cycle-let
	Total Suspended Solids	2	mg/L		
Oil and Grease	Oil & Grease - Mineral	1	mg/L		
	Oil & Grease - Non-mineral	1	mg/L		
	Oil & Grease - Total	1	mg/L		
	Visible Sheen		P/A		

Figure 38: November 2019, sewage effluent laboratory results page 1 of 2



**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: 1921577  
Date Submitted: 2019-11-26  
Date Reported: 2019-11-27  
Project:  
COC #: 851739

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
Microbiology	Faecal Coliforms	0	ct/100mL		1468725 Sewage
					2019-11-15 Fox-Main Cycle-let A
					1468726 Sewage
					2019-11-15 Fox-Main Cycle-let B
					1468727 Sewage
					2019-11-15 Fox-Main Cycle-let C

Figure 39: November 2019, sewage effluent laboratory results page 2 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#: 004438-OT  
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1922696  
Date Submitted: 2019-12-13  
Date Reported: 2019-12-20  
Project:  
COC #: 207959

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
General Chemistry	BOD5	1	mg/L		1472105 Sewage
	pH	1.00			2019-12-04 Fox-Main Cycle-Let
	Total Suspended Solids	2	mg/L		
Oil and Grease	Oil & Grease - Mineral	1	mg/L		
	Oil & Grease - Non-mineral	1	mg/L		
	Oil & Grease - Total	1	mg/L		
	Visible Sheen		P/A		

Figure 40: December 2019, sewage effluent laboratory results page 1 of 2



**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: 1922694  
Date Submitted: 2019-12-13  
Date Reported: 2019-12-18  
Project:  
COC #: 207959

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1472100 Sewage 2019-12-04 Fox-Main Cycle-Let A	1472101 Sewage 2019-12-04 Fox-Main Cycle-Let B	1472102 Sewage 2019-12-04 Fox-Main Cycle-Let C
Microbiology	Faecal Coliforms	0	ct/100mL			25	16	22

Figure 41: December 2019, sewage effluent laboratory results page 2 of 2

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## ANNEX D: LOCATION OF BERMED FUEL STORAGE FACILITIES AND ANALYSIS OF BERM WATER <sup>2</sup>

The berms at FOX-M were sampled using hydrocarbon test strips as per the approved QA/QC Plan for Berm Water Sampling as stated in the water licence 8BC-FOH1929, PART D, Item 11.

**Table D-1: Location of Bermmed Fuel Storage Facilities and Date Sampled in 2019**

Berm	Location on-site	Discharge Latitude <sup>3</sup>	Discharge Longitude	Date
HAL W20B	Beach	68°46'23.93"N	81°12'51.11"W	24-Jul-19
HAL W20D&E	Airstrip	68°46'15.85"N	81°13'58.33"W	26-Jul-19
HAL W20F	Beach	68°46'23.75"N	81°12'46.12"W	24-Jul-19
HAL W22A	Summit	68°45'42.24"N	81°13'25.04"W	24-Jul-19
HAL W22B	Summit	68°45'43.00"N	81°13'27.27"W	24-Jul-19



**Figure 42: Hydrocarbon test strips used in berm of tank W22A (24-Jul-2019)**

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

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





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Figure 43: Hydrocarbon test strips used in the berm of tank W22B (24-Jul-2019)



Figure 44: Hydrocarbon test strips used in the berm of tank W22F (24-Jul-2019)

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Figure 45: Hydrocarbon test strips used in the berm of tank W20B (24-Jul-2019)

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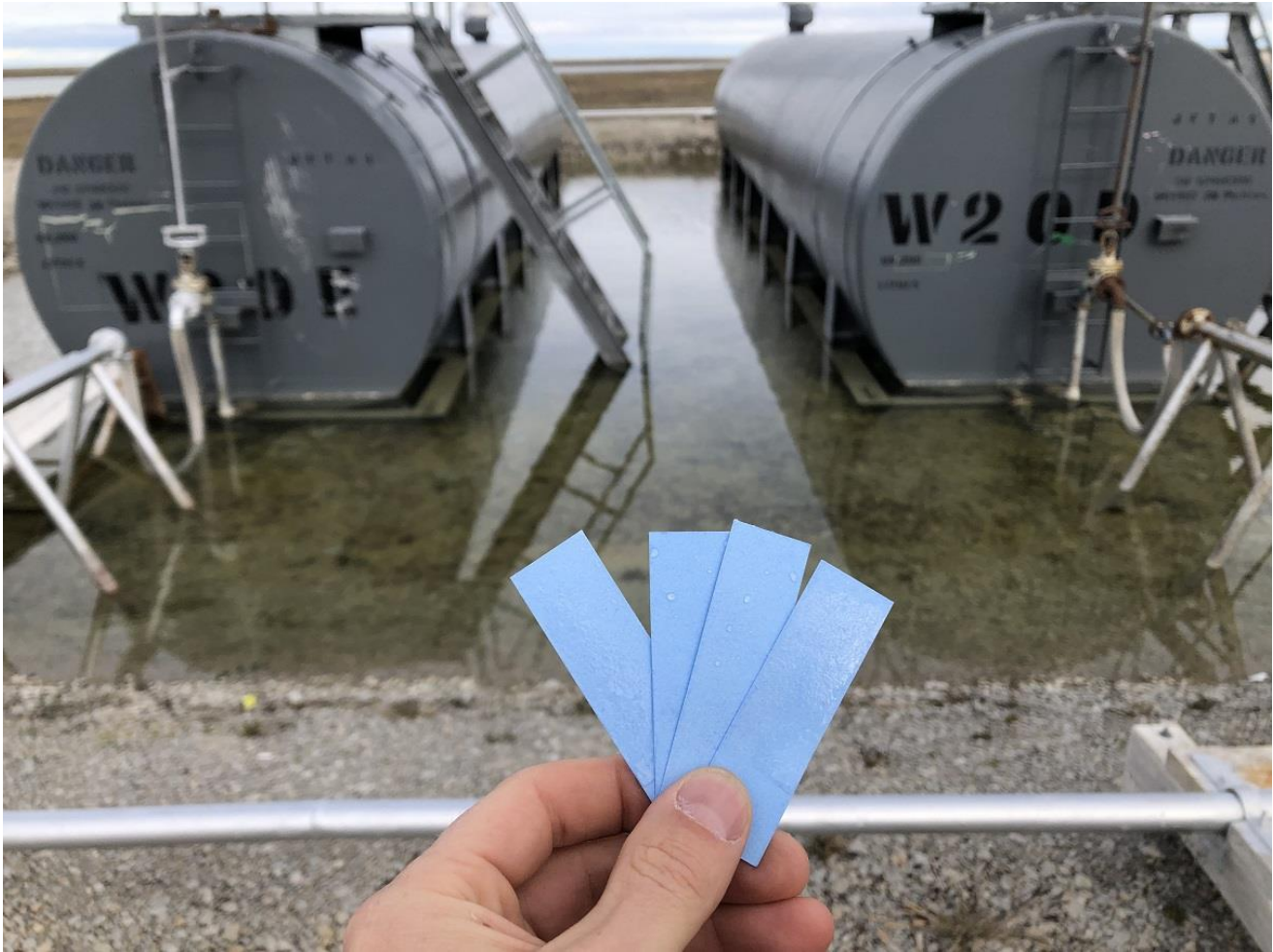


Figure 46: Hydrocarbon test strips used in the berm of tanks W20D&E (26-Jul-2019)

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