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SOW Ref: 16.F.5.d

2017 ANNUAL NUNAVUT WATER BOARD

REPORT FOR DYE-M

FOR THE

North Warning System

Contract # W8485-100224/001/NX

SOW Ref: 16.F.5.d

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CHANGE HISTORY

This sheet is a record of each issue of this document. When the revised document is issued, the previous issue is automatically superseded.

Revision	Date	Author	Pages Changed	Reason for Change
1	21-Jan-2015	W. Wyman	All	Initial Document Release
2	12-Feb-2018	W. Wyman	All	Updated formatting

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ENGLISH EXECUTIVE SUMMARY FOLLOWS



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-DYE0919 – 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 DYE-M, the unattended (unmanned) North Warning System radar site located at Cape Dyer, Nunavut. The site is visited quarterly by RCL staff based in Iqaluit for preventive maintenance inspections and as required for other work.

A total of 29.4 cubic meters was drawn from the raw water sources. In 2017, all water was taken from the melt-water water source, DYE-1(b). This is below the annual maximum of 1,440 cubic meters allowed by the licence.

The water contained in the berms of fuel storage facilities was sent for laboratory analysis and confirmed to be within effluent quality limits before the water was pumped out of the berms.

Hazardous waste was removed from DYE-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 40 drums of assorted waste (oil, fuel, glycol, etc.) and 2 crates of waste batteries.

Non-hazardous domestic solid waste was flown out to the Logistics Support Site in Iqaluit and disposed of at Iqaluit's landfill. RCL has documented authorization from the community for receiving the waste.

There were no spills into the environment at DYE-M in 2017.

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TABLE OF CONTENTS

Change History	2
Executive Summary	4
Table of Contents	5
List of Tables	5
List of Figures	5
1.0 Introduction	6
1.1 Report Details	6
2.0 Water Use	6
3.0 Hazardous Waste and Waste Oil Disposal	6
4.0 Non-Hazardous Solid Waste Disposal	8
5.0 Monitoring Program	8
6.0 Spills (Unauthorized Discharges)	8
7.0 Revisions to the Spill Contingency Plan	9
8.0 Progressive Reclamation Work UnderTaken	9
9.0 Acronyms	9
Annex A: Hazardous Waste and Waste Oil Disposal in 2017	10
Annex B: Sewage Outfall Location (DYE-2) with Co-ordinates	15
Annex C: Analysis of Discharged Sewage Effluent	16
Annex D: Location of Bermed Fuel Storage Facilities and Analysis of Berm Water	18

LIST OF TABLES

Table 2-1: Monthly Raw Water Usage at DYE-M in 2017	6
Table 3-1: Hazardous Waste and Waste Oil Sent for Disposal from DYE-M in 2017	7
Table 4-1: Non-hazardous Domestic Solid Waste Sent for Disposal from DYE-M in 2017	8
Table 9-1: Acronyms	9
Table D-1: Analysis of Berm Water at DYE-M in 2017	18

LIST OF FIGURES

Figure 1: Movement Document 2539175-6	10
Figure 2: Movement Document 2539176-4	11
Figure 3: NWS Shipping Manifest TCN-35705	12
Figure 4: NWS Shipping Manifest TCN-35713	12
Figure 5: NWS Shipping Manifest TCN-35714	13
Figure 6: NWS Shipping Manifest TCN-35716	13
Figure 7: NWS Shipping Manifest TCN-35717	14
Figure 8: NWS Shipping Manifest TCN-35721	14
Figure 9: DYE W20A berm water laboratory results, page 1 of 2	19
Figure 10: DYE W20A berm water laboratory results, page 2 of 2	19

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SOW Ref: 16.F.5.d

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-DYE0919 – 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 DYE-M, the unattended (unmanned) North Warning System radar site located at Cape Dyer, Nunavut. The site is visited quarterly by RCL staff based in Iqaluit for preventive maintenance inspections and as required for other work.

1.1 Report Details

Licensee: Department of National Defence, Government of Canada
Licence: 3BC-DYE0919 – Type “B”
Location: DYE-M North Warning System Site, Cape Dyer, Qikiqtani Region, Nunavut
Report Prepared by: Raytheon Canada Limited, 15-Mar-2017
Time period covered: 01 January to 31 December 2017

2.0 WATER USE

A total of 29.4 cubic meters was drawn from the raw water sources. In 2017, all water was taken from the melt-water water source, listed in the licence as “DYE-1(b)”. This is below the annual maximum of 1,440 cubic meters allowed by the licence. See Table 2-1 for the volume of raw water drawn at DYE-M in 2017.

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

Month	Raw water usage (m ³)
January	0
February	0
March	0
April	0
May	0
June	8
July	10.9
August	7.1
September	1.1
October	0
November	2.3
December	0
TOTAL	29.4

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

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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. The hazardous waste consisted of 40 drums of assorted waste (oil, fuel, glycol, etc.) and 2 crates of waste batteries.

Table 3-1: Hazardous Waste and Waste Oil Sent for Disposal from DYE-M in 2017

Description, TDG shipping name	Quantity	Movement Document or Manifest #
Waste batteries, wet, filled with acid	1 Crate	Movement Document 2539500-5
Waste batteries, wet, non-spillable	1 Crate	Movement Document 2539500-5
Waste Jet A1 fuel	1 Drum	Movement Document 2539500-5
Waste fuel, aviation, turbine engine		
Waste Jet A1 fuel soaked sorbent	1 Drum	Movement Document 2539500-5
Waste solids containing flammable liquids, n.o.s (fuel, aviation, turbine engine)		
Waste tank bottom water/ tank cleaning effluent	17 Drums	Movement Document 2539500-5
Waste fuel, aviation, turbine engine mixture		
Waste oily rags	2 Drums	Movement Document 2539501-3
Waste solids containing flammable liquids, n.o.s (fuel, aviation, turbine engine)		
Waste Paint related materials, flammable	1 Drum	Movement Document 2581513-5
Waste paint related materials		
Waste glycol (drum)	3 Drums	NWS Manifest 36908, 36903
Not TDG Regulated		
Waste oil	14 Drums	NWS Manifest 36904, 36908, 36909, 36914, 36918
Not TDG regulated		
Waste oil filters	1 Drum	NWS Manifest 36909
Not TDG regulated		

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4.0 NON-HAZARDOUS SOLID WASTE DISPOSAL

Non-hazardous domestic solid waste was flown out to the Logistics Support Site in Iqaluit and was disposed of at Iqaluit's landfill. RCL has documented authorization from the community for receiving the waste.

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

Table 4-1: Non-hazardous Domestic Solid Waste Sent for Disposal from DYE-M in 2017

Month	Waste Generated (kg)
January	0
February	125
March	0
April	68
May	136
June	816
July	91
August	0
September	0
October	227
November	136
December	34
TOTAL	1,633

5.0 MONITORING PROGRAM

In 2017, a monitoring program was implemented at DYE-M 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 (DYE-1a) and the melt water source (DYE-1b). The information from this monitoring program 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 (DYE-2). The location of the sewage effluent outfall is shown in **Annex B**, including coordinates. A sump for the sewage outfall was constructed in 2010. The sewage outfall sump was sampled once in 2017. The results are shown in **Annex C: Analysis of Discharged Sewage Effluent**.
3. Quality of the water contained in the berms of fuel storage facilities prior to discharge (DYE-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 Bermed Fuel Storage Facilities and Analysis of Berm Water**. All samples met the effluent requirements of the water licence, Part D.

6.0 SPILLS (UNAUTHORIZED DISCHARGES)

Date, NT-NU Spill #	Product	Quantity	Cause and follow-up action	On-site location
No spills to the environment at DYE-M in 2017.				

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7.0 REVISIONS TO THE SPILL CONTINGENCY PLAN

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

8.0 PROGRESSIVE RECLAMATION WORK UNDERTAKEN

No progressive reclamation work was undertaken in 2017.

9.0 ACRONYMS

Table 9-1: Acronyms

Acronym	Definition
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 2017

The 2017 Movement Documents for TDG Regulated waste and NWS Manifests for non-TDG Regulated waste described in Table 3-1 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 DOCUMENT DE MOUVEMENT / MANIFESTE												2539500-5				
<p>Generator / consignor Producteur / expéditeur</p> <p>Registration No. / Provincial ID No. N° d'immatriculation - id provincial</p> <p>Company name / Nom de l'entreprise Department of National Defence So RCL</p> <p>Mailing address / Adresse postale City / Ville Province Postal code / Code postal 22 Wing Rd 109 Hornet Highway Port Hope E-mail / Courriel électronique Tel. No. / N° de tél. ex 705 494 2011 2861</p> <p>Shipping site address / Adresse du lieu de l'expédition NWS LRR DYE-M City / Ville Province Postal code / Code postal CAPE DYER NU</p> <p>Intended Receiver / consignee Récepteur / destinataire prévu</p> <p>Registration No. / Provincial ID No. N° d'immatriculation - id provincial SAFETY-KLEEN</p> <p>Mailing address / Adresse postale City / Ville Province Postal code / Code postal Clean Harbors, 6785 route 12 Ville Ste Catherine QC E-mail / Courriel électronique Tel. No. / N° de tél. ex 514 351 8241</p> <p>Receiving site address / Adresse du lieu de destination 2730 Boulevard Industriel Chambly QC Postal code / Code postal J3L 4V2</p> <p>Prov code Code prov</p> <p>Shipping name Appellation réglementaire</p> <p>Class Sous-classe(s) Code(s) sub</p> <p>UN No N° UNI</p> <p>Packing risk gr. Gr d'embalage de risque</p> <p>Quantity shipped Quantité expédiée</p> <p>Units L or t ou Kg Unité</p> <p>No / H N° C-est</p> <p>Packaging/Content Code(s) Code(s) de contenue</p> <p>Phys. state Etat phys.</p>													Reference No. of other movement documents/manifests used/ N° de référence des autres documents de mouvement/manifestes utilisés			
<p>Carrier / Transporteur</p> <p>Registration No. / Provincial ID No. N° d'immatriculation - id provincial</p> <p>Company name / Nom de l'entreprise</p> <p>Mailing address / Adresse postale City / Ville Province Postal code / Code postal</p> <p>E-mail / Courriel électronique Tel. No. / N° de tél. ex _____</p> <p>Vehicle / Véhicule Trailer - Remorq. No. 1 1^{re} remorque - remorq. Trailer - Remorq. No. 2 2^{de} remorque - wagon</p> <p>Point of entry Point d'entrée</p> <p>Point of exit Point de sortie</p> <p>Point of entry Point d'entrée</p> <p>Point of exit Point de sortie</p>													Receiver / consignee Récepteur / destinataire	Registration No. / Provincial ID No. N° d'immatriculation - id provincial		
<p>Carrier Certification : I certify that I have received written or verbal instructions from the generator / consignor to deliver to the receiver / consignee as set out in Part A and that the information contained in Part B is complete and correct.</p> <p>Attestation du transporteur : J'atteste avoir reçu les déchets ou matières recyclables du producteur / expéditeur en vue de leur livraison au récepteur/destinataire, telles qu'il figurent à la partie A et que les renseignements inscrits à la partie B sont exacts et complets.</p> <p>Name of authorized person (print) Nom de l'agent autorisé (caractères d'impression)</p> <p>Tel. No. / N° de tél. ()</p> <p>Year / Année Month / Mois Day / Jour Signature</p>													Receiving site address / Adresse du lieu de destination		Date received / Date de réception Year / Année Month / Mois Day / Jour	Time / Heure Time / Heure Year / Année Month / Mois Day / Jour
<p>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</p>													Registration No./Provincial ID No. N° d'immatriculation / id provincial			
<p>Quantity received Quantité reçue</p> <p>Units L or t ou Kg Unité</p> <p>Comments Commentaires</p> <p>Handling Code / Code de manutention</p> <p>Shipment / Env. Accepted Rejected Refused</p> <p>Decont. Pack. Cont. Vid.</p>																
<p>Notice No. N° de notification</p> <p>Notice Line No. N° de ligne de la notification</p> <p>Shipment Env.</p> <p>Or / De</p> <p>D or R code Code E ou R</p> <p>C code Code C</p> <p>Basel Annex VIII or OECD Code Annexe VIII ou Code OECD</p> <p>H code Code H</p> <p>Y code Code Y</p> <p>National code in country of / Code du pays</p> <p>Export Expédition</p> <p>Import Importation</p> <p>Customs code(s) Code(s) de douanes</p>													<p>If handling code "Other" (specify) Si code de manutention « autre » (spécifier)</p> <p>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</p> <p>Name of authorized person (print) Nom de l'agent autorisé (caractères d'impression)</p> <p>Signature ()</p>			
<p>International use only</p> <p>24 hour Number: 1613 996 6666 USE IN CASE OF DASSAR GOOD EMERGENCY</p> <p>Generator / consignor 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.</p> <p>Signature PS Shepard</p>																
<p>MOE 04-1917 (07/07)</p> <p>Instructions for completion and distribution on reverse / Instructions pour compléter et distribuer au verso</p>													Copy / Copie 1 (white / blanc)			

Figure 1: Movement Document 2539500-5

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MOVEMENT DOCUMENT / MANIFEST DOCUMENT DE MOUVEMENT / MANIFESTE

This Movement document/manifest conformes 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.

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 le transport et le environnement.

2539501-3

Figure 2: Movement Document 2539501-3

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SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: RSTLOUIS		Date: Jul 10, 2017 2:32 PM	TCN-36903		
Ship To: CLEAN HARBORS CANADA INC. 6785 ROUTE 132 SAINTE-CATHERINE, QC, J5C 1B6 CA 450-632-6640		From: DYE-M, CAPE DYER, DND Storeroom Raytheon Canada Limited, NWS LSS Iqaluit, P.O. Box 1089 Iqaluit, NU, X0A 0H0 867-979-4818			Priority 0
Attention:		Attention:			
Carrier: NEAS		Routing:	Waybill #: DR-C15856	Total Pcs. 1 PALLET	Total Weight: 511 KGS
QTY Order	Type Line Weight	Item Description	WO or PO RETROGRAD	B/Code or S/N	Remarks ASSET'S: 344255, 341070.
2		2002344 WASTE - GLYCOL (DRUM)			
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-36903



SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By: RSTLOUIS		Date: Jul 10, 2017 2:39 PM	TCN-36904		
Ship To: CLEAN HARBORS CANADA INC. 6785 ROUTE 132 SAINTE-CATHERINE, QC, J5C 1B6 CA 450-632-6640		From: DYE-M, CAPE DYER, DND Storeroom Raytheon Canada Limited, NWS LSS Iqaluit, P.O. Box 1089 Iqaluit, NU, X0A 0H0 867-979-4818			Priority 0
Attention:		Attention:			
Carrier: NEAS		Routing:	Waybill #: DR-C15860	Total Pcs. 1 PALLET	Total Weight: 820 KGS
QTY Order	Type Line Weight	Item Description	WO or PO RETROGRAD	B/Code or S/N	Remarks ASSET'S: 342621, 342622, 342623, 343984.
4		2002406 WASTE - OIL, 45 GAL			
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-36904

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SHIPPING MANIFEST						
Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8			NON NEGOTIABLE			
Filled By: RSTLOUIS		Date: Jul 10, 2017 3:21 PM	TCN-36908			
Ship To: CLEAN HARBORS CANADA INC. 6785 ROUTE 132 SAINTE-CATHERINE, QC, J5C 1B6 CA 450-632-6640		From: DYE-M, CAPE DYER, DND Storeroom Raytheon Canada Limited, NWS LSS Iqaluit, P.O. Box 1089 Iqaluit, NU, X0A 0H0 867-979-4818		Priority 0		
Attention:		Attention:				
Carrier: NEAS		Routing:		Waybill #: DR-C15856	Total Pcs. 1 PALLET	
Total Weight: 820 KGS						
QTY Order	Type Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
3		2002406	WASTE - OIL, 45 GAL	RETROGRAD		ASSET'S: 343852, 339177, 341067.
1		2002344	WASTE - GLYCOL (DRUM)	RETROGRAD		ASSET: 341072.
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-36908

SHIPPING MANIFEST						
Suite 3000, 400 Cooper Street, Ottawa, ON K2P 2H8			NON NEGOTIABLE			
Filled By: RSTLOUIS		Date: Jul 10, 2017 3:32 PM	TCN-36909			
Ship To: CLEAN HARBORS CANADA INC. 6785 ROUTE 132 SAINTE-CATHERINE, QC, J5C 1B6 CA 450-632-6640		From: DYE-M, CAPE DYER, DND Storeroom Raytheon Canada Limited, NWS LSS Iqaluit, P.O. Box 1089 Iqaluit, NU, X0A 0H0 867-979-4818		Priority 0		
Attention:		Attention:				
Carrier: NEAS		Routing:		Waybill #: DR-C15856	Total Pcs. 1 PALLET	
Total Weight: 309 KGS						
QTY Order	Type Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
1		2002356	WASTE - OIL FILTERS	RETROGRAD		ASSET: 341069.
1		2002406	WASTE - OIL, 45 GAL	RETROGRAD		ASSET: 341073.
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-36909

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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: RSTLOUIS	Date: Jul 10, 2017 3:54 PM			
TCN-36914				
Ship To: CLEAN HARBORS CANADA INC. 6785 ROUTE 132 SAINTE-CATHERINE, QC, J5C 1B6 CA 450-632-6640	From: DYE-M, CAPE DYER, DND Storeroom Raytheon Canada Limited, NWS LSS Iqaluit, P.O. Box 1089 Iqaluit, NU, X0A 0H0 867-979-4818			
Priority 0				
Attention:	Attention:			
Carrier: NEAS	Routing:			
Waybill #: DR-C15960	Total Pcs.: 1 PALLET	Total Weight: 745 KGS		
QTY Order	Type Line Weight	Item Description	WO or PO B/Code or S/N	Remarks
3		2002406 WASTE - OIL, 45 GAL	RETROGRAD	ASSET'S: 343980, 343982, 328465*
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 7: NWS Shipping Manifest TCN-36914

Figure 8: NWS Shipping Manifest TCN-36918

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



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

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ANNEX C: ANALYSIS OF DISCHARGED SEWAGE EFFLUENT

The sewage outfall sump sampled on 8-Aug-2017. The sample was analysed for the parameters listed in the water licence Part I, Item 3.

Table C-1: Summary of Analysis of Discharged Sewage Effluent at DYE-M in 2017

Sample Date	Parameter				
	pH	Oil and Grease (Present - P / Absent - A)	Biological Oxygen Demand (mg/L)	Total Suspended Solids (mg/L)	Faecal Coliforms
8-Aug-17	7.95	A	947	3640	720000

eurofins | Certificate of Analysis
Environment Testing

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: 1715296
Date Submitted: 2017-08-11
Date Reported: 2017-08-17
Project: Dye Main West Lagoon
COC #: 164396

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
General Chemistry	pH	1.00		7.95	1313569 Sewage
Oil & Grease	Total Suspended Solids	2	mg/L	3640	2017-08-08 Dye Main West Lagoon
	Oil & Grease - Mineral	1	mg/L	2	
	Oil & Grease - Non-mineral	1	mg/L	68	
Subcontract	Oil & Grease - Total	1	mg/L	70	
	BOD5	1	mg/L	947	
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 Q/A/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

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

Page 2 of 3

Figure 9: 8-Aug-2017 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#:
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1715297
Date Submitted: 2017-08-11
Date Reported: 2017-08-13
Project: Dye Main West Lagoon
COC #: 164396

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

1313570
Sewage
-
2017-08-08
Dye Main West
Lagoon

Group	Analyte	MRL	Units	Guideline	
Others	Faecal Coliforms	0	ct/100mL		720000

Figure 10: 8-Aug-2017 sewage effluent results, Page 2 of 2

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

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

Berm	Maximum concentration of any grab sample (ug/L)	DYE W20A	DYE W22K,J,I &W20B
Location on-site		Summit	Summit
Discharge Latitude ²		66°40'0.13"N	66°39'53.59"N
Discharge Longitude		61°21'25.76"W	61°21'23.78"W
Date		8-Aug-17	8-Aug-17
pH (pH Units)	6 to 9	7.67	6.7
Oil and Grease (ug/L)	5000	<1000	2000
Arsenic (total) (ug/L)	100	<20	<20
Cadmium (dissolved) (ug/L)	10	<0.1	0.1
Chromium (dissolved) (ug/L)	100	<1	<1
Cobalt (dissolved) (ug/L)	50	<0.2	0.2
Copper (dissolved) (ug/L)	200	<1	<1
Lead (dissolved) (ug/L)	50	<1	<1
Mercury (total) (ug/L)	0.6	<0.1	0.2
Nickel (dissolved) (ug/L)	200	<5	<5
PCB (total) (ug/L)	1000	<0.1	<0.1
Phenols (ug/L)	20	<1	<1
Zinc (total) (ug/L)	500	<40	200
Benzene (ug/L)	370	<0.5	<0.5
Toluene (ug/L)	2	<0.5	<0.5
Ethyl benzene (ug/L)	90	<0.5	<0.5

¹ Effluent from bermed fuel storage facilities.

² Final discharge point of bermed fuel storage facility

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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: 1715291
Date Submitted: 2017-08-11
Date Reported: 2017-08-18
Project: Dye Main W20A
COC #: 183366

Group	Analyte	MRL	Units	Guideline	
General Chemistry	pH	1.00		6.5-8.5	7.62
Mercury	Hg	0.0001	mg/L	MAC 0.001	<0.0001
Metals	Aqua-Regia Digest				Y
	As	0.02	mg/L	MAC 0.010	<0.02*
	Zn	0.04	mg/L	AO 5.0	<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	MAC 5	<0.5
	Ethylbenzene	0.5	ug/L	MAC 140	<0.5
	Toluene	0.5	ug/L	MAC 60	<0.5
VOCs Surrogates (%)	Toluene-d8	0	%		91

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

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Page 2 of 5

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 11: DYE W20A berm water laboratory results, page 1 of 2



Environment Testing

Certificate of Analysis

Client: Raytheon Canada Limited Ottawa
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Attention: Mr. Will Wyman
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Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1715292
Date Submitted: 2017-08-11
Date Reported: 2017-08-15
Project: Dye Main W20A
COC #: 183366

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 12: DYE W20A berm water laboratory results, page 2 of 2

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

Report Number: 1715294
Date Submitted: 2017-08-11
Date Reported: 2017-08-18
Project: Dye Main Berm W22K J I W20B
COC #: 183371

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
General Chemistry	pH	1.00		6.5-8.5	1313567 Water
Mercury	Hg	0.0001	mg/L	MAC 0.001	2017-08-08 Dye Main Berm W22 J K I W20A
Metals	Aqua-Regia Digest			Y	
	As	0.02	mg/L	MAC 0.010	<0.02*
	Zn	0.04	mg/L	AO 5.0	0.20
Oil & Grease	Oil & Grease - Total	1	mg/L		2
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L		<0.1
Phenols	Phenols	0.001	mg/L		<0.001
VOCs	Benzene	0.5	ug/L	MAC 5	<0.5
	Ethylbenzene	0.5	ug/L	MAC 140	<0.5
	Toluene	0.5	ug/L	MAC 60	<0.5
VOCs Surrogates (%)	Toluene-d8	0	%		91

Guideline = GCDWQ - Canadian Drinking Water * = 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 13: DYE W22K, J, I &W20B berm water laboratory results, page 1 of 2



Certificate of Analysis

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

Report Number: 1715293
Date Submitted: 2017-08-11
Date Reported: 2017-08-15
Project: Dye Main Berm W22K J I W20B
COC #: 183371

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.
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 14: DYE W22K, J, I &W20B berm water laboratory results, page 2 of 2

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