2017 ANNUAL NUNAVUT WATER BOARD

REPORT FOR CAM-M

FOR THE

North Warning System

Contract # W8485-100224/001/NX
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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 When the revised document is issued, the previous issue is automatically superseded.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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EXECUTIVE SUMMARY IN ENGLISH FOLLOWS

ᐅᑯᐊ 2017-ᒧᑦ ᐊᕐᕌᒍᑕᒫᖅᓯᐅᑏᑦ ᐅᓂᒃᑳᑦ ᓄᓇᕗᒻᒥ ᐃᒪᓕᕆᔨᒃᑯᓐᓄᑦ ᑲᑎᒪᔨᖏᓐᓄᑦ (NWB) ᐸᕐᓇᐃᔭᐅᓯᒪᔪᑦ Raytheon Canada Limited (RCL) ᒥᓂᒃ ᑕᐅᕕᖕᖑᓄᑦ ᐅᓇᑕᖅᑐᒃ ᓴᒃᑯᑦ ᑎᑭᐅᑎᒍᓐᓇᕆᐊᖃᖅᓯᑎᒃ ᓄᓇᕗᒻᒥ ᐃᒪᓕᕆᓂᕐᒧᑦ ᑲᑎᒪᔨᖏᑕ ᓚᐃᓴᓐᓯᖕᓂᑦ ᑐᓂᔭᐅᓯᒪᔪᒧᑦ 10 ᓯᑦᑕᕝᕙ 2009 3BC-CAM0919 – ᖃᓄᐃᑦ ᑑᓂᖓ“B”, ᐃᓚᖓB “ᐃᓘᓐᓈᒍᑦ ᒪᓕᒐᖏᑦ”, ᑎᑎᕋᖅᓯᒪᔪᖅ 1. ᐅᑯᐊ ᐅᓂᒃᑳᑦ ᐱᒋᐊᖅᓯᑎᒃ 01 ᔮᓐᓄᐊᕆ - ᔮᓐᓄᐊᕆ 31 – ᑏᓯᕝᕙ 2017.

RCL ᐊᐅᓚᓂᐅᕗᖅ ᒪᑭᒪᑦᓯᔨᐅᑦᓱᑎᓪᓗ (O&M) ᑳᑦ ᑐᓛᑦ ᑎᒋᔭᐅᓪᓗᑎᒃ ᐅᑭᐅᖅᑕᖅᑐᒥ ᖃᐅᔨᒃᑲᐃᔾᔪᑎᓕᕆᔨᓄᑦ (NWS), ᐱᖃᓯᐅᑎᑦᓱᑎᒃ CAM-M, ᓇᔫᑎᔪᑦ (ᐃᓄᖃᖅᓯᖅ) NWS ᓈᓚᕝᕕᖃᕐᕖᑦ ᐃᓂᖃᖅᑐᑦ ᐃᖃᓗᒃᑑᑦᓯᐊᕐᒥ, ᓄᓇᕗᒻᒥ.

ᐃᒪᕐᒥᒃ ᐊᑐᕐᓂᖅ CAM-M–ᒥ 2017–ᒥ ᐊᖏᓂᖃᔪᔪᖅ 1297.2 ᑭᑉᐹᓇᑦᑐᑦ ᒦᑕᐃᑦ. ᑕᐃᒪ ᓕᐃᖓᔪᑦᑐᖅ 3.6 ᑭᑉᐹᓇᑦᑐᑦ ᖃᐅᑕᒫᑦ, ᐊᑖᓃᑦᑐᑦ ᐅᖔᓅᕈᑕᐅᒍᓐᓇᖏᑦᑐᑦ 10 ᑭᑉᐹᓇᑦᑐᑦ ᒦᑕᐃᑦ ᖃᐅᑕᒫᑦ ᐱᕕᖃᖅᑎᑕᐅᔪᑦ ᓚᐃᓴᓐᓯᒧᑦ. ᐃᓚᖓᓂ, ᐅᖔᓄᑦ ᐅᓪᓗᕐᒥ ᐊᐅᓚᓂᐅᒍᓐᓇᖅᑐᖅ ᓴᖅᑭᖅᑕᐅᖃᑦᑕᔪᔪᖅ ᐱᔾᔪᑕᐅᓗᓐᓂ ᖃᓇᑕᐅᔭᒃᑯᑦ ᐊᐅᓚᓂᐅᓕᐅᖅᓯᒪᔪᖅ.

ᑭᓈᓗᒃ CAM-M–ᒥ ᑲᒪᒋᔭᐅᕙᑦᑐᖅ ᐃᒪᕐᓗᒻᒥᒃ ᓴᓗᒻᒪᖅᓴᐃᔾᔪᑎᑎᒎᖅᑎᑕᐅᑦᓱᓂ. ᐃᓚᖓᓴ ᓗᒪᖅᑭᔭᐅᓯᒪᔪᖅ ᐃᒪᖅ ᐊᑐᖅᑕᐅᒃ ᑲᓂᓲᖅ ᐃᓂᖁᕐᕕᒻᒧᑦ ᐃᒪᓇᔭᑦᓯᓂ. ᐊᓂᑕᐅᔪᖅ ᓴᓗᒪᖅᑭᓯᒪᔪᖅ ᐃᒪᖅ ᓴᓗᒻᒪᖅᓯᒪᔪᖅ. ᖃᐅᔨᓴᖅᑕᐅᔪᑦᓴᖅ ᑕᒪᓐᓇ ᐃᒪᖅ ᖃᐅᔨᓴᖅᑕᐅᕙᑦᑐᖅ ᑕᖅᑭᑕᒫᑦ ᖃᐅᔨᓴᕐᕕᒻᒧᑦ ᐊᐅᓚᖅᑎᑕᐅᕙᑦᓯᓂ 2017–ᖑᑎᓪᓗᒍ.

ᖃᐅᔨᓴᕋᑦᓴᐃᑦ ᐃᒪᑦ ᐊᕙᓗᖕᒥ ᑕᐃᓗᓐᓂ ᐅᖅᓯ ᐊᓗᖃᐅᑎᐊᓗᐃᑦ ᐊᐅᓚᖅᑎᑕᐅᔪᔪᖅ ᖃᐅᔨᓴᕐᕕᒻᒧᑦ ᖃᐅᔨᓴᖅᑕᐅᓂᐊᖅᑎᓪᓗᒍ ᓇᓗᓇᐃᖅᑕᐅᔪᑦᓯᓂᓗ ᐃᓗᐊᓃᒥ ᐊᖓᑭᓪᓕᒥ ᐊᖃᖅᑎᑕᐅᔪᑦ ᓄᓇᕗᒻᒥ ᐃᒪᓕᕆᔨᒃᑯᑦ ᑲᑎᒪᔨᖏᓐᓄᑦ ᓚᐃᓴᓐᓯᖃᖅᑎᑦᓯᒍᑎᖑᑕ 3BC-CAM0919, ᐃᓚᖓD, ᓈᓴᐅᑎᓕᒃ 10 ᐃᒪᖅ ᒥᓪᓗᐊᖅᑕᐅᓚᐅᖏᓐᓂᖓ ᑕᕝᕙᓐᖑ ᐊᕙᓗᓕᐊᖑᓯᒪᔪᒥᒃ.

ᓱᕈᓐᓇᖅᑐᖅ ᓅᑕᐅᔪᔪᖅ CAM-M–ᒥᒃ ᐊᓂᑕᐅᓂᐊᖅᑐᑦ ᓯᓚᑖᓂ ᓄᓇᕗᑦ. ᑕᒪᓐᓇ ᓱᕈᒃ ᐊᐅᓚᖅᑎᑕᐅᔪᒧᖅ Safety Kleen, 2730 Boulevard Industriel, Chambly, QC, J3L 4V2. ᓱᕈᓐᓇᖅᑐᑦ ᐃᒋᑕᑦᓴᐃᑦ 127 ᖃᑦᑕᐅᔭᐃᑦ ᖃᓄᐃᑦ ᑐᑐᐃᓐᓇᐃᑦ ᓱᕈᐃᑦ (ᐅᖅᓯᐊᓗᒃ, ᐅᖅᓯᖅᑎᕈᑏᑦ, ᐃᒪᖅ ᐅᖅᓯᐊᓗᒻᒥᒃ ᐃᓚᓯᒪᔪᖅ, ᐊᓯᖏᓗ) ᐊᒻᒪᓗ ᑕᓪᓕᒪᑦ ᐃᑦᓯᕐᕖᑦ ᐃᒋᑦᓴᐃᑦ ᐊᑐᕈᓐᓃᖅᑐᖅ ᕿᑖᓕᒥᓃᑦ.

ᓱᕈᓐᓇᖅᑐᖃᒻᒥᒃ ᑐᓕᓴᓃᑦ ᑕᖏᓕᑦ ᐃᒋᑕᐅᔪᑦ ᑕᐃᑲᓂ ᐊᑦᑕᕐᕕᖕᖑᓄᑦ ᑳᑦᑐᓛᑦᓯᒪᑦᓯᑎᒃ Hᐋᒻ ᒪᓚᒃ ᑯᙵᓄᒃ ᐃᖃᓗᒃᑑᑦᑎᐊᕐ. RCL ᑎᑎᖅᑲᐅᑎᓪᓗᒋᑦ ᐱᔭᓐᓇᐅᑎᖃᖅᑎᑕᐅᔪᑦ ᓄᓇᓕᓕᓐᓂᒃ ᐃᒋᑦᓯᖃᑦᑕᕈᓐᓇᖅᓯᑎᒃ ᓴᓐᓂᓐᓂᒃ.

ᒪᕐᕉᓐᓂᒃ ᑯᕕᔪᖃᖅᓯᒪᔪᖅ CAM-M 2017–ᒥ :

1. NT-NU ᑯᕕᓂᕐᒧᑦ ᐅᓂᒃᑳᑦ # 17-196. ᔫᓂ 5, 2017-ᖑᑎᓪᓗᒍ, ᐊᐅᓪᓛᑎᑦᓯᒍᑎ ᓱᓪᓗᓕᒃ ᑲᔪᓯᔪᙱᒪᑦ ᐅᖅᓯᐊᓗᒻᒥᒃ ᐊᐅᓪᓛᑎᑦᓯᔪᖃᖅᓯᐊᖅᓯᓂ, ᑯᕕᑦᓯᓂ 1295 ᖃᓪᓗᑎᖃᓛᑦ ᓛᑕᐃᑦ. ᐊᐅᓪᓛᖅᑎᑕᐅᓂᙵᓂᒃ ᓄᖅᑲᖅᑎᑕᐅᔪᔪᖅ ᑯᕕᔪᖅᐸᓪᓗ ᐊᐅᓚᔾᔭᒋᐊᕈᑕᐅᒋᐊᓖᑦ ᑲᔪᓯᑎᑕᐅᑦᓯᑎᒃ ᓴᓗᒻᒪᖅᓴᐃᓂᕐᓗ ᐊᐅᓚᔭᑦᑕᐅᓕᖅᓯᓂ. ᑲᑎᑦᓯᑎᒃ 47 ᑲᑦᑕᐅᔭᐃᑦ ᐅᖅᓯᐊᓗᒃ ᐃᒪᕐᒥᒃ ᐃᓚᓯᒪᑦᓯᓂ ᐊᒻᒪᓗ 220 m³ ᒥᑦᓵᓃᑦᑐᖅ ᐃᔾᔪ ᓱᕈᓐᓇᖅᑐᓕᖅᓯᒪᔪᖅ ᔫᖅᑕᐅᑦᓯᓂ.
2. NT-NU ᑯᕕᓂᕐᒧᑦ ᐅᓂᒃᑳᑦ # 17-238. ᔪᓚᐃ 4, 2017–ᖑᑎᓪᓗᒍ, 6 ᓛᑕᐃᑦ ᖃᓪᓗᑎᖃᓛᑦ ᐅᖅᓯᐊᓗᒃ ᑯᕕᔪᔪᖅ ᓯᓪᓕᖓᑲᓲᒪᒍᓐᓃᖅᑎᑕᐅᓐᓂᖏᒻᒪᑦ ᐅᖁᒪᐃᑦᑐᖅ ᓂᐅᒥᒃ ᐲᖅᓯᑦᓯᑎᒃ ᐋᖅᑭᑦᑕᐅᓯᒪᔪᒥᒃ. ᐅᖁᒪᐃᑦᑐᖅ ᓂᐅᑎ ᐃᓂᖅᑲᖅᑎᑕᓕᔪᔪᖅ ᓄᓇᓯᐅᑎᒃ ᑯᕕᒻᒥ ᓴᓇᔭᐅᑦᓯᓂ ᐊᑦᑐᖅᑕᐅᔪᖅ ᓗ ᑐᐊᐸ ᔫᖅᑕᐅᑦᓯᓂ ᓅᑕᐅᑦᓯᓂᓗ ᐃᓂᖓᓂᒃ.

ᑯᕕᔪᖃᐸᑦ ᑐᐊᕕᕐᓇᖅᑐᓂᕐᒧᑦ ᐸᕐᓇᐅᑎ ᑲᔪᓯᑦᓯᐊᔪᔪᖅ ᐊᑐᓕᖅᑎᑕᐅᓂᖓ

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 Nunavut Water Board licence issued 10 September 2009 3BC-CAM0919 – 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 (O&M) Contractor for the North Warning System (NWS), including CAM-M, the attended (manned) NWS radar site located at Cambridge Bay, Nunavut.

The water usage for CAM-M in 2017 was 1297.2 cubic meters. This is an average of 3.6 cubic meters per day, below the maximum of 10 cubic meters per day allowed by the licence. On occasion, more than the daily maximum was drawn due to increased site activity.

Sewage at CAM-M is processed by the tertiary wastewater treatment system. Some of the treated effluent is recycled as on site urinal/toilet flush water. The discharged treated effluent is of potable water quality. A sample of the treated effluent was sent for laboratory analysis each month in 2017.

Samples of the water contained in the berms of fuel storage facilities was sent for laboratory analysis and confirmed to be within effluent quality limits of the NWB licence 3BC-CAM0919, Part D, item 10 before the water was pumped out of the berms.

Hazardous waste was removed from CAM-M for disposal outside of Nunavut. The waste went to Safety Kleen, 2730 Boulevard Industriel, Chambly, QC, J3L 4V2. The hazardous waste consisted of 127 drums of assorted waste (oil, fuel, fuel water mixture, etc.) and 5 crates of waste batteries.

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

Two outdoor spills occurred at CAM-M in 2017:

3. NT-NU Spill Report # 17-196. On 05-Jun-2017, a flexline failed on a pipeline during a fuel transfer, spilling 1295 L. The transfer was stopped and spill response actions were executed and remediation activities were initiated. In total 47 drums of fuel water mixture and approximately 220 m³ of impacted soil was containerized.
4. NT-NU Spill Report # 17-238. On 04-Jul-2017, 6 L of hydraulic fluid was spilled when a hose was not disconnected on a loader when separating an attachment. The loader was placed in the site's garage to complete repairs and the impacted gravel was containerized for removal from site.

The Spill Contingency Plan was successfully implemented.

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1.0 INTRODUCTION

This 2017 Annual Report for the Nunavut Water Board (NWB) has been prepared by Raytheon Canada Limited (RCL) for the Department of National Defence in order to meet the requirements of the licence issued 10 September 2009 3BC-CAM0919 – 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 (O&M) Contractor for the North Warning System (NWS), including CAM-M. CAM-M is the attended (manned) NWS radar site located at Cambridge Bay, Nunavut.

1.1 Report Details

Licensee:	Department of National Defence, Government of Canada
Licence:	3BC-CAM0919 – Type "B"
Location:	CAM-M North Warning System Site, Cambridge Bay, Kitikmeot Region, Nunavut
Report Prepared by:	Raytheon Canada Limited, 15-Mar-2018
Time period covered:	01 January to 31 December 2017

2.0 WATER USE

The water usage from January to December averaged 3.6 cubic meters (m^3) per day which is below the maximum of 10 m^3 per day allowed by the licence. See Table 2-1 for raw water usage.

On occasion, more than the daily maximum was drawn due to increased site activity. For example, the daily maximum could be exceeded due to the maintenance activities on the waste water system and a subsequent re-filling of the raw water tank.

In 2017, the daily maximum limit was exceeded on the following dates:

- 01-Feb-2017: 11.2 m^3 of water was taken. The limit was exceeded to fill both the tanks in the site's building train by pipeline as well as fill other buildings on-site by truck;
- 08-Feb-2017: 11.4 m^3 of water was taken. The limit was exceeded to fill all of the tanks in the site's building train by pipeline. No water had been taken the previous day.
- 11-May-2017: 14.1 m^3 of water was taken. The limit was exceeded to fill both the tanks in the site's building train by pipeline as well as fill other buildings on-site by truck;
- 08-Jun-2017: 13.5 m^3 of water was taken. The limit was exceeded to fill both the tanks in the site's building train by pipeline as well as fill other buildings on-site by truck; and
- 30-Jun-2017: 13.4 m^3 of water was taken. The limit was exceeded to fill both the tanks in the site's building train by pipeline as well as fill other buildings on-site by truck.

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

Month	Raw water usage (m^3)
January	61.5
February	129.8
March	116.6
April	122.7
May	121.4
June	136.3
July	107.1
August	107.1
September	94.7
October	92.0
November	102.0
December	106.0
TOTAL	**1297.2**

3.0 TREATED SEWAGE DISCHARGE

At CAM-M, the sewage and grey water were both processed through a Cycle-let® advanced tertiary wastewater treatment system. Some of the treated water is recycled as urinal/toilet flush water; the remainder is discharged at the designated outfall and is potable water quality. See Table 3-1, for the volume of sewage and grey water treated by the Cycle-let® system. See Section 6.0 for details on sewage effluent monitoring.

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

Month	Volume of sewage and greywater treated then discharged or recycled (m^3)
January	61.5
February	129.8
March	123.4
April	122.7
May	121.4
June	127.3
July	107.1
August	107.1
September	94.7
October	92.0
November	102.0
December	106.0
TOTAL	**1295.3**

4.0 HAZARDOUS WASTE AND WASTE OIL DISPOSAL

Hazardous waste and waste oil were sent to an approved hazardous waste disposal site outside of Nunavut as required by the licence. The hazardous waste was shipped to Safety Kleen, 2730 Boulevard Industriel, Chambly, QC, J3L 4V2.

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

See Annex A for the shipping documents including the completed movement documents for waste regulated under the Transportation of Dangerous Goods Regulations (TDGR) and NWS Manifests for non-regulated waste.

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

Description, TDG shipping name	Quantity	Movement Document or Manifest #
Waste aerosols	2 Drums	Movement Document 2581513-5
Waste batteries, wet, filled with acid	5 Crates	Movement Document 2581513-5
Waste paint flammable Waste paint	4 Drum	Movement Document 2581513-5
Waste Paint related materials, flammable Waste paint related materials	1 Drum	Movement Document 2581513-5
Waste Jet A1 fuel Waste fuel, aviation, turbine engine	6 Drums	Movement Document 2581514-3
Waste Jet A1 fuel and oil mixture Waste fuel, aviation, turbine engine mixture	3 Drums	Movement Document 2581514-3
Waste Jet A1 fuel and water mixture Waste fuel, aviation, turbine engine mixture	48 Drums	Movement Document 2581514-3
Waste Jet A1 fuel soaked rags Waste solids containing flammable liquids, not otherwise specified (n.o.s) (fuel, aviation, turbine engine)	1 Drum	Movement Document 2581514-3
Waste Jet A1 fuel filters Waste solids containing flammable liquids, n.o.s (fuel, aviation, turbine engine)	4 Drums	Movement Document 2581514-3
Waste Jet A1 fuel soaked sorbent Waste solids containing flammable liquids, n.o.s (fuel, aviation, turbine engine)	1 Drum	Movement Document 2581514-3
Waste POL soaked absorbent Waste solids containing flammable liquids, n.o.s (fuel, aviation, turbine engine)	1 Drum	Movement Document 2581514-3

Description, TDG shipping name	Quantity	Movement Document or Manifest #
Waste oily rags Waste solids containing flammable liquids, n.o.s (fuel, aviation, turbine engine)	4 Drums	Movement Document 2581514-3
Waste varsol, dry cleaning solvent Waste Petroleum Distillates n.o.s.	1 Drum	Movement Document 2581514-3
Waste oil Not TDG regulated	36 Drums	NWS Manifest 37019, 37020, 37021, 37022, 37023, 37024, 37093, 37186, 37188
Waste oil filters Not TDG regulated	6 Drums	NWS Manifest 37250
Waste oil soaked sorbent Not TDG regulated	6 Drums	NWS Manifest 37250, 37190

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 Cambridge Bay. 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 CAM-M in 2017

Month	Waste Generated (kg)
January	1779
February	1245
March	2381
April	841
May	1326
June	1868
July	2275
August	1937
September	1720
October	1656
November	1220
December	1758
TOTAL	**20,006**

6.0 MONITORING PROGRAM

In 2017, a monitoring program was implemented at CAM-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 (CDL-1). The information from this monitoring is shown in **Section 2.0 Water Use**.
2. Quality of sewage discharged from the final discharge point of the sewage treatment facility (CDL-2). The location of the sewage effluent outfall is shown in **Annex B**, including coordinates. The treated sewage was sampled monthly. The results of the analyses are shown in **Annex C: Analysis of Treated Sewage Effluent**.
3. Quality of the water contained in the berms of fuel storage facilities prior to discharge (CDL-3) was analyzed and confirmed as being 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.

7.0 SPILLS (UNAUTHORIZED DISCHARGES)

Date, NT-NU Spill #	Product	Quantity	Cause and follow-up action	On-site location
05-Jun-2017, Spill # 17-196	Jet A1	1295 L	On 05 June 2017, bulk fuel technicians walked and inspected the subject pipeline at CAM-M, Cambridge Bay, Nunavut. Having found everything to be in order, the technicians began conducting fuel transfer operations. Pressure could not be built in the system so all pumping operations ceased and the bulk fuel technicians walked the pipeline again. The technicians found that a flexline had ruptured approximately 200 metres north of the beach pump house at CAM-M. Released fuel flowed into a depression where it was recaptured during the initial response to the spill. During the initial response and the subsequent remediation, 47 drums of impacted water an approximately 200 m³ of impacted soil were recovered for disposal off-site. Soil samples collected from the impacted area have confirmed that the remediation efforts were successful.	200 m from beach pump house (69° 6'16.22"N, 105° 5'58.46"W)
04-Jul-2017, Spill # 17-238	Hydraulic fluid	6 L	On 04Jul2017, while separating the excavator attachment from the loader, the Heavy Equipment Operator did not release the quick disconnect fitting. The pipe nipple was damaged and approximately 6 L of hydraulic fluid escaped. The loader was placed in the site's garage to complete repairs and the impacted gravel was containerized for removal from site.	East Side of Garage (69˚06'59"N, 105˚07'22"W)

The Spill Contingency Plan was successfully implemented.

8.0 REVISIONS TO THE SPILL CONTINGENCY PLAN

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

9.0 PROGRESSIVE RECLAMATION WORK UNDERTAKEN

Fuel from 05-Jun-2017 spill (NTNU Spill Report # 17-196) flowed east and then south into a natural depression where it was contained.

A spill response was immediately initiated using resources and personnel available on-site, including:

- Absorbent booms and pads were immediately deployed on all standing water;
- Interceptor trenches were excavated around the impacted area to redirect and limit the flow of fresh water into the impacted area and prevent further migration of fuel;
- Once all visible hydrocarbon sheen was removed by absorbents a dozer was used to scrape up and consolidate soils to the south east of the release that may have been impacted by the spill. The area was then considered secure;
- A mini excavator was used in the impacted area to excavate impacted soils;
- Excavated soils were consolidated into soil bags, each with a volume of one cubic metre (1 m³ per bag);
- A total of 220 soil bags were filled with impacted soils;
- Both the heavily impacted area in the immediate vicinity of the spill and the more lightly contaminated area to the south east of the spill were sampled and analysed;
- Soil analysis confirmed that the impacted areas were below the criteria listed in the Canadian Council of Ministers of the Environment (CCME), Canada-Wide Standards for Petroleum Hydrocarbons (PHC) in Soil for agriculture; and
- The excavated area in the immediate vicinity of the release was backfilled and the pipeline reconnected.

Some material was sent for disposal in 2017:

- 47 drums of water impacted with Jet-A1 were collected and shipped off site 2017; and
- 5 drums of fuel soaked absorbents were collected and shipped off site 2017.

Some material from the spill remains on-site for disposal in 2018:

- Approximately 220 m³ of bagged impacted soil remain on site; and; and
- Approximately 60 m³ of consolidated impacted soils remain on site.

10.0 ACRONYMS

Table 10-1: Acronyms

Acronym	Definition
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

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 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: **2581513-5**

A Generator / consignor — Producteur / expéditeur

- Company name / Nom de l'entreprise: DND C/O Raytheon Canada Limited
- Mailing address / Adresse postale: 22 Wing, Bldg 109, Hornell Heights, ON P0h 1P0
- Tel. No. / N° de tél.: (705)494-2011 ext 2861
- Shipping site address / Adresse du lieu de l'expédition: NWS LSS Cambridge Bay, PO Box 1239
- City / Ville: Cambridge Bay — Province: NU — Postal code / Code postal: X0B 0C0
- Intended Receiver / consignee — Réceptionnaire / destinataire prévu: Safety Clean — Registration No. / Provincial ID No.: 27011824-1
- Mailing address: Clean Harbors, 6785 route 132 Ville-Ste-Catherine, QC J5C 1B6
- E-mail / Courrier électronique: — Tel. No. / N° de tél.: ( )
- Receiving site address / Adresse du lieu de destination: 2730, boulevard industriel,
- City / Ville: CHAMBLY — Province: QC — Postal code / Code postal: J3L 4V2

B Carrier — Transporteur

- Registration No. / Provincial ID No.: NUC 200001
- Company name / Nom de l'entreprise: Nunavut Eastern Arctic Shipping
- Mailing address / Adresse postale: 2100 Pierre Dupuy Montreal Quebec H3C-3R5
- E-mail / Courrier électronique: Sales@neas.ca — Tel. No.: (514) 275-6377
- Vehicle / Véhicule: Trailer - Rail car No. 1 / 1re remorque - wagon; Trailer - Rail car No. 2 / 2e 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 / consignor 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): Curtis Fagen [illegible] — Tel. No.: 877-275-6377
- Year / Month / Day: 17 / 09 / 05 — Signature: [signature]

C Receiver / consignee — Réceptionnaire / destinataire

Receiver / consignee information same as in Part A: ☐ Yes/Oui ☐ No, complete the box below / Non, remplir la case ci-dessous (remaining Part C fields blank)

Prov. code	Shipping name / Appellation réglementaire	Class / Sub. class(es)	UN No.	Packing / risk gr.	Quantity shipped	Units L or Kg	Packaging No.	Codes	Phys. state
(i)	waste batteries, wet filled with acid	8	UN 2794		3480	KG	5	07	S
(ii)	waste Aerosols	2.2	UN1950		74	KG	2	01	G
(iii)	waste Paint	3	UN1263	III	120	L	4	01	L
(iv)	waste Paint Related material	3	UN1263	III	50	L	1	01	L

Notice No. / Notice Line No / Shipment / Of / D or R code / C code / Basel Annex VIII or OECD Code / H code / Y code / National code in country of (Export / Import) / Customs code(s): International use only

24 Hour Number: CANUTEC: 613-996-6666 (use in case of a Dangerous Goods Emergency)

Generator / consignor certification: I certify that the information contained in Part A is correct and complete. 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.
Attestation du producteur / expéditeur: J'atteste que tous les renseignements à la partie A sont exacts et complets. Je déclare que le contenu de ce chargement est décrit ci-dessus de façon complète et exacte par la désignation officielle de transport et qu'il est convenablement classé, emballé, marqué, étiqueté, muni de plaques-étiquettes et à tous égards bien conditionné pour être transporté conformément aux réglementations internationales et nationales applicables.

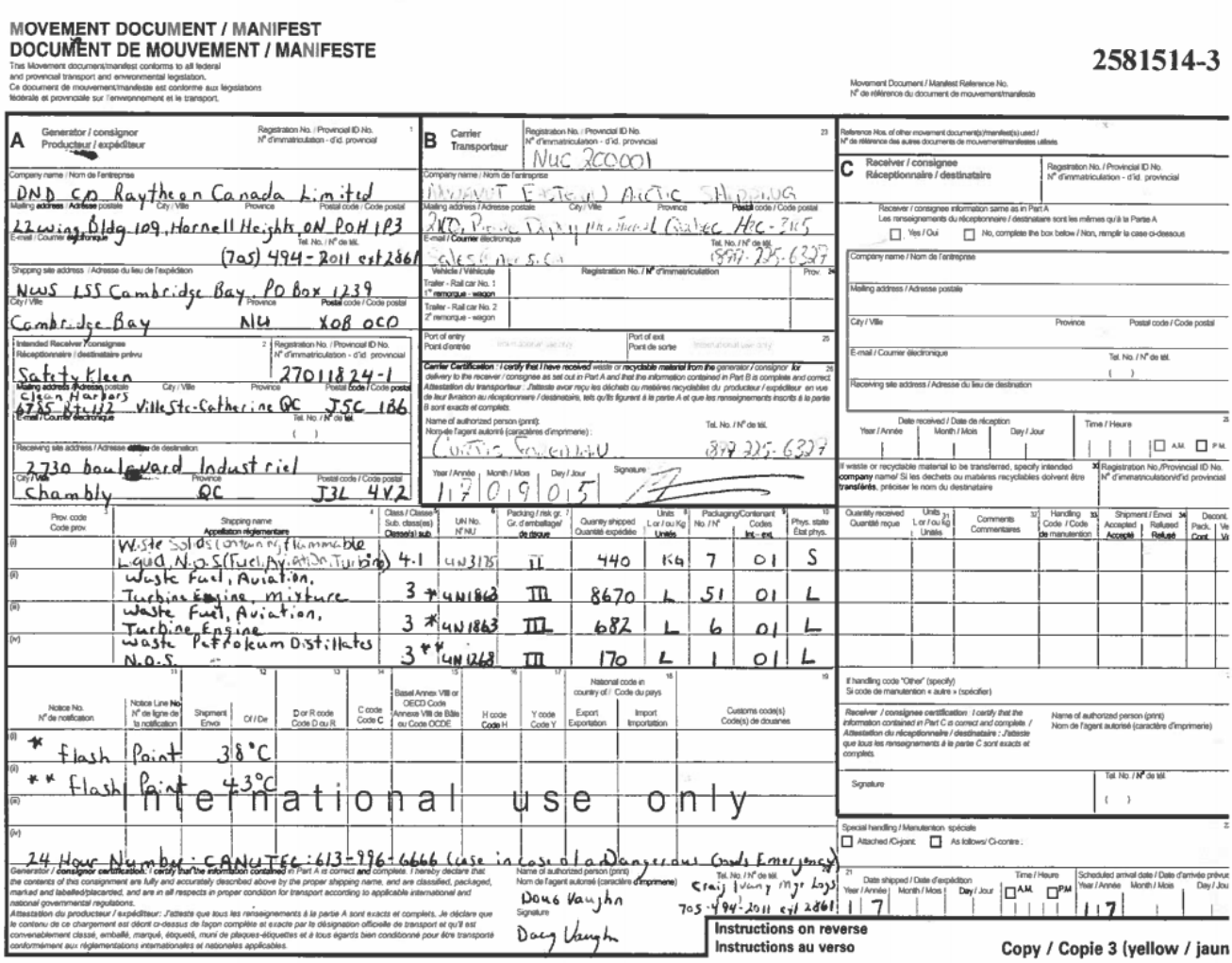
- Name of authorized person (print): Doug Vaughn — Tel. No.: 705-494-2011 ext 2861 (Craig Ivany MGR LOG)
- Signature: Doug Vaughn
- Date shipped / Date d'expédition: Year 17 — Scheduled arrival date: Year 17

Special handling / Manutention spéciale: ☐ Attached / Ci-joint ☐ As follows / Ci-contre

Instructions on reverse / Instructions au verso

Copy / Copie 3 (yellow / jaune

Figure 1: Movement Document 2581513-5



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.

2581514-3

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

A Generator / consignor
Producteur / expéditeur

Company name / Nom de l'entreprise: DND c/o Raytheon Canada Limited
Mailing address / Adresse postale: 22 wing Bldg 109, Hornell Heights, ON P0H 1P3
Tel. No. / N° de tél.: (705) 494-2011 ext 2861
Shipping site address / Adresse du lieu de l'expédition: NWS LSS Cambridge Bay, PO Box 1239
City / Ville: Cambridge Bay
Province: NU
Postal code / Code postal: X0B 0C0

Intended Receiver / consignee
Réceptionnaire / destinataire prévu: Safety Kleen
Registration No. / Provincial ID No. / N° d'immatriculation - d'id. provincial: 270118 24-1
Mailing address / Adresse postale: Clean Harbors 6735 Kitchener
City / Ville: Ville Ste-Catherine
Province: QC
Postal code / Code postal: J5C 1B6
Receiving site address / Adresse du lieu de destination: 2730 boulevard Industriel
City / Ville: Chambly
Province: QC
Postal code / Code postal: J3L 4V2

B Carrier
Transporteur

Registration No. / Provincial ID No. / N° d'immatriculation - d'id. provincial: NUC 2C0001
Company name / Nom de l'entreprise: [illegible] Arctic Shipping
Mailing address / Adresse postale: [illegible]
City / Ville:
Province:
Postal code / Code postal:
E-mail / Courrier électronique:
Tel. No. / N° de tél.: (867) 725-6327
Vehicle / Véhicule
Trailer - Rail car No. 1 / 1e remorque - wagon
Trailer - Rail car No. 2 / 2e remorque - wagon
Registration No. / N° d'immatriculation
Prov.
Port of entry / Point d'entrée
Port of exit / Point de sortie

Carrier Certification: I certify that I have received waste or recyclable material from the generator / consignor 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): Curtis Goudie
Tel. No. / N° de tél.: (867) 725-6327
Signature
Year / Année: 17
Month / Mois: 09
Day / Jour: 05

C Receiver / consignee
Réceptionnaire / destinataire

Registration No. / Provincial ID No. / N° d'immatriculation - d'id. provincial
Reference Nos. of other movement documents/manifest(s) used / N° de référence des autres documents de mouvement/manifestes utilisés
Receiver / consignee information same as in Part A / Les renseignements du réceptionnaire / destinataire sont les mêmes qu'à la Partie A: ☐ Yes / Oui ☐ 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 / Courrier 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: ☐ A.M. ☐ P.M.
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

Prov. code / Code prov.	Shipping name / Appellation réglementaire	Class / Classe: Sub. class(es) / Classe(s) sub.	UN No. / N° NU	Packing / risk gr. / Gr. d'emballage / de risque	Quantity shipped / Quantité expédiée	Units / L or / ou Kg / Unités	Packaging / Contenant: No. / N°	Codes	Phys. state / État phys.
(i)	Waste Solids (containing flammable Liquid, N.O.S. (Fuel, Aviation, Turbine)	4.1	UN3175	II	440	KG	7	01	S
(ii)	Waste Fuel, Aviation, Turbine Engine, Mixture	3 *	UN1863	III	8670	L	51	01	L
(iii)	Waste Fuel, Aviation, Turbine Engine	3 *	UN1863	III	682	L	6	01	L
(iv)	Waste Petroleum Distillates N.O.S.	3 **	UN1268	III	170	L	1	01	L

Notice No. / N° de notification	Notice Line No. / N° de ligne de la notification	Shipment / Envoi	Of / De	D or R code / Code D ou R	C code / Code C	Basel Annex VIII or OECD Code / Annexe VIII de Bâle ou Code OCDE	H code / Code H	Y code / Code Y	National code in country of / Code du pays: Export / Exportation	Import / Importation	Customs code(s) / Code(s) de douanes
(i)	* Flash Point 38°C										
(ii)	** Flash Point 43°C										
(iii)	International use only										
(iv)	24 Hour Number: CANUTEC: 613-996-6666 (use in case of a Dangerous Goods Emergency)										

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.
Name of authorized person (print) / Nom de l'agent autorisé (caractère d'imprimerie)
Signature
Tel. No. / N° de tél.

Special handling / Manutention spéciale: ☐ Attached / Ci-joint ☐ As follows / Ci-contre:

Generator / consignor certification: I certify that the information contained in Part A is correct and complete. 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.
Attestation du producteur / expéditeur: J'atteste que tous les renseignements à la partie A sont exacts et complets. Je déclare que le contenu de ce chargement est décrit ci-dessus de façon complète et exacte par la désignation officielle de transport et qu'il est convenablement classé, emballé, marqué, étiqueté, muni de plaques-étiquettes et à tous égards bien conditionné pour être transporté conformément aux réglementations internationales et nationales applicables.
Name of authorized person (print) / Nom de l'agent autorisé (caractère d'imprimerie): Doug Vaughn
Tel. No. / N° de tél.: 705-494-2011 ext 2861
Signature: Doug Vaughn

21 Date shipped / Date d'expédition: Year / Année: 17; Month / Mois; Day / Jour
Time / Heure: ☐ A.M. ☐ P.M.
Scheduled arrival date / Date d'arrivée prévue: Year / Année: 17; Month / Mois; Day / Jour

Instructions on reverse
Instructions au verso

Copy / Copie 3 (yellow / jaune)

Figure 2: Movement Document 2581514-3[1]

[1]There should have been 11 drums of UN3175, Waste solids containing flammable liquids n.o.s. (fuel, aviation, turbine engine) listed on this movement document. This was reviewed and confirmed with the shipper.

SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By:	Date:	
AELLIOTT	Jul 20, 2017 8:32 PM	TCN-37019

Ship To:	From:	Priority
CLEAN HARBORS CANADA INC. 2730 BOULEVARD INDUSTRIEL CHAMBLY, QC, J3L 4V2 CA	LSS-C/CAM-M CAMBRIDGE BAY, DND Storeroom Raytheon Canada Limited, LSS Cambridge Bay: P.O. Box 1239 Cambridge Bay, NU, X0B 0C0 867-983-2112	0

Attention:		Attention:	AELLIOTT

Carrier:	Routing:	Waybill #:	Total Pcs.	Total Weight:
NEAS	SHIP TO CONSIGNEE		1 PALLET	743 KG

QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
4	DRUMS		2002406	WASTE - OIL, 45 GAL	1.63 M3		NON REGULATED WASTE...4 DRUMS. ON 1 PALLET..ASSETS 343137, 340105, 344605, 340459

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-37019

SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By:	Date:	
AELLIOTT	Jul 20, 2017 8:52 PM	TCN-37020

Ship To:	From:	Priority
CLEAN HARBORS CANADA INC. 2730 BOULEVARD INDUSTRIEL CHAMBLY, QC, J3L 4V2 CA	LSS-C/CAM-M CAMBRIDGE BAY, DND Storeroom Raytheon Canada Limited, LSS Cambridge Bay: P.O. Box 1239 Cambridge Bay, NU, X0B 0C0 867-983-2112	0

Attention:		Attention:	AELLIOTT

Carrier:	Routing:	Waybill #:	Total Pcs.	Total Weight:
NEAS	SHIP TO CONSIGNEE		1 PALLET	716 KG

QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
4	DRUMS		2002406	WASTE - OIL, 45 GAL	1.63 M3		NON REGULATED WASTE...4 DRUMS. ON 1 PALLET..ASSETS 341610, 334824, 339241, 341719

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-37020

SHIPPING MANIFEST

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

Filled By:	Date:	
AELLIOTT	Jul 20, 2017 8:59 PM	TCN-37021

Ship To:	From:	Priority
CLEAN HARBORS CANADA INC. 2730 BOULEVARD INDUSTRIEL CHAMBLY, QC, J3L 4V2 CA	LSS-C/CAM-M CAMBRIDGE BAY, DND Storeroom Raytheon Canada Limited, LSS Cambridge Bay: P.O. Box 1239 Cambridge Bay, NU, X0B 0C0 867-983-2112	0

Attention:		Attention:	AELLIOTT

Carrier:	Routing:	Waybill #:	Total Pcs.	Total Weight:
NEAS	SHIP TO CONSIGNEE	DR-C16032	1 PALLET	648 KG

QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
4	DRUMS		2002406	WASTE - OIL, 45 GAL	1.63 M3		NON REGULATED WASTE...4 DRUMS. ON 1 PALLET..ASSETS 340984, 340776, 340158, 341280

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-37021

SHIPPING MANIFEST

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

Filled By:	Date:	
AELLIOTT	Jul 20, 2017 9:10 PM	TCN-37022

Ship To:	From:	Priority
CLEAN HARBORS CANADA INC. 2730 BOULEVARD INDUSTRIEL CHAMBLY, QC, J3L 4V2 CA	LSS-C/CAM-M CAMBRIDGE BAY, DND Storeroom Raytheon Canada Limited, LSS Cambridge Bay: P.O. Box 1239 Cambridge Bay, NU, X0B 0C0 867-983-2112	0

Attention:		Attention:	AELLIOTT

Carrier:	Routing:	Waybill #:	Total Pcs.	Total Weight:
NEAS	SHIP TO CONSIGNEE	DR-C16032	1 PALLET	773 KG

QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
4	DRUMS		2002406	WASTE - OIL, 45 GAL	1.63 M3		NON REGULATED WASTE...4 DRUMS. ON 1 PALLET..ASSETS 335241, 331730, 334543, 340494

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-37022

SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By:	Date:	
AELLIOTT	Jul 20, 2017 9:14 PM	TCN-37023

Ship To:	From:	Priority
CLEAN HARBORS CANADA INC. 2730 BOULEVARD INDUSTRIEL CHAMBLY, QC, J3L 4V2 CA	LSS-C/CAM-M CAMBRIDGE BAY, DND Storeroom Raytheon Canada Limited, LSS Cambridge Bay: P.O. Box 1239 Cambridge Bay, NU, X0B 0C0 867-983-2112	0

Attention:		Attention:	AELLIOTT

Carrier:	Routing:	Waybill #:	Total Pcs.	Total Weight:
NEAS	SHIP TO CONSIGNEE	DR-C16032	1 PALLET	673 KG

QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
4	DRUMS		2002406	WASTE - OIL, 45 GAL	1.63 M3		NON REGULATED WASTE...4 DRUMS. ON 1 PALLET..ASSETS 340778, 340986, 339555, 340777

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-37023

SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By:	Date:	
AELLIOTT	Jul 20, 2017 9:20 PM	TCN-37024

Ship To:	From:	Priority
CLEAN HARBORS CANADA INC. 2730 BOULEVARD INDUSTRIEL CHAMBLY, QC, J3L 4V2 CA	LSS-C/CAM-M CAMBRIDGE BAY, DND Storeroom Raytheon Canada Limited, LSS Cambridge Bay: P.O. Box 1239 Cambridge Bay, NU, X0B 0C0 867-983-2112	0

Attention:		Attention:	AELLIOTT

Carrier:	Routing:	Waybill #:	Total Pcs.	Total Weight:
NEAS	SHIP TO CONSIGNEE	DR-C16045	1 PALLET	752 KG

QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
4	DRUMS		2002406	WASTE - OIL, 45 GAL	1.63 M3		NON REGULATED WASTE...4 DRUMS. ON 1 PALLET..ASSETS 335993, 335992, 340987, 340985

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-37024

SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By:	Date:	
DVAUGHN	Aug 2, 2017 1:19 PM	TCN-37093

Ship To:	From:	Priority
CLEAN HARBORS CANADA INC. 2730 BOULEVARD INDUSTRIEL CHAMBLY, QC, J3L 4V2 CA	LSS-C/CAM-M CAMBRIDGE BAY, DND Storeroom Raytheon Canada Limited, LSS Cambridge Bay: P.O. Box 1239 Cambridge Bay, NU, X0B 0C0 867-983-2112	0

Attention:		Attention:	AELLIOTT

Carrier:	Routing:	Waybill #:	Total Pcs.	Total Weight:
NEAS	SHIP TO CONSIGNEE		1 PALLET	752 KG

QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
4			2002406	WASTE - OIL, 45 GAL	1.63 M3		NON REGULATED WASTE...4 DRUMS ON 1 PALLET...ASSETS 342168, 341695, 341696, 344411

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-37093

SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By:	Date:	
DVAUGHN	Aug 19, 2017 9:37 PM	TCN-37186

Ship To:	From:	Priority
CLEAN HARBORS CANADA INC. 2730 BOULEVARD INDUSTRIEL CHAMBLY, QC, J3L 4V2 CA	LSS-C/CAM-M CAMBRIDGE BAY, DND Storeroom Raytheon Canada Limited, LSS Cambridge Bay: P.O. Box 1239 Cambridge Bay, NU, X0B 0C0 867-983-2112	0

Attention:		Attention:	AELLIOTT

Carrier:	Routing:	Waybill #:	Total Pcs.	Total Weight:
NEAS	SHIP TO CONSIGNEE	DR-C16032	1 PALLET	731 KG

QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
4			2002406	WASTE - OIL, 45 GAL	1.63 M3		NON REGULATED WASTE...4 DRUMS ON 1 PALLAT...ASSETS 339496, 344419, 338006, 338946

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-37186

SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By:	Date:	
DVAUGHN	Aug 19, 2017 9:47 PM	TCN-37188

Ship To:	From:	Priority
CLEAN HARBORS CANADA INC. 2730 BOULEVARD INDUSTRIEL CHAMBLY, QC, J3L 4V2 CA	LSS-C/CAM-M CAMBRIDGE BAY, DND Storeroom Raytheon Canada Limited, LSS Cambridge Bay: P.O. Box 1239 Cambridge Bay, NU, X0B 0C0 867-983-2112	0

Attention:		Attention:	AELLIOTT

Carrier:	Routing:	Waybill #:	Total Pcs.	Total Weight:
NEAS	SHIP TO CONSIGNEE	DR-C16032	1 PALLET	452 KG

QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
4			2002406	WASTE - OIL, 45 GAL	1.63 M3		NON REGULATED WASTE...4 DRUMS ON 1 PALLAT...ASSETS 342682, 345535, 345536, 345534

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-37188

SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By:	Date:	
DVAUGHN	Aug 20, 2017 9:28 AM	TCN-37190

Ship To:	From:	Priority
CLEAN HARBORS CANADA INC. 2730 BOULEVARD INDUSTRIEL CHAMBLY, QC, J3L 4V2 CA	LSS-C/CAM-M CAMBRIDGE BAY, DND Storeroom Raytheon Canada Limited, LSS Cambridge Bay: P.O. Box 1239 Cambridge Bay, NU, X0B 0C0 867-983-2112	0

Attention:		Attention:	AELLIOTT

Carrier:	Routing:	Waybill #:	Total Pcs.	Total Weight:
NEAS	SHIP TO CONSIGNEE	DR-C16045	1 PALLET	341 KG

QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
4			3006639	WASTE - OIL SOAKED ABSORBENT	2.46 M3		NON REGULATED WASTE...4 DRUMS ON 1 PALLET...ASSETS 343367, 342578, 339556, 335178

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-37190

SHIPPING MANIFEST

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

NON NEGOTIABLE

Filled By:	Date:	
DVAUGHN	Aug 26, 2017 6:43 PM	TCN-37250

Ship To:	From:	Priority
CLEAN HARBORS CANADA INC. 2730 BOULEVARD INDUSTRIEL CHAMBLY, QC, J3L 4V2 CA	LSS-C/CAM-M CAMBRIDGE BAY, DND Storeroom Raytheon Canada Limited, LSS Cambridge Bay: P.O. Box 1239 Cambridge Bay, NU, X0B 0C0 867-983-2112	0

Attention:		Attention:	AELLIOTT

Carrier:	Routing:	Waybill #:	Total Pcs.	Total Weight:
NEAS	SHIP TO CONSIGNEE		1 PALLET	325 KG

QTY Order	Type	Line Weight	Item	Description	WO or PO	B/Code or S/N	Remarks
2			2002356	WASTE - OIL FILTERS	1.66 M3		NON REGULATED WASTE....2 DRUMS....ASSETS 340062, 340683
2			3006639	WASTE - OIL SOAKED ABSORBENT			NON REGULATED WASTE...2 DRUMS...ASSETS 343367, 342578....TOTAL 4 DRUMS ON 1 PALLET

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-37250

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

Coordinates of sewage treatment outfall: 69°7’3.20”N, 105°7’11.3”W

ANNEX C: ANALYSIS OF TREATED SEWAGE EFFLUENT

Table C-1: Summary of Analysis of Treated Sewage Effluent at CAM-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[2]
Maximum Concentration	6.0 to 9.0 (pH units)	No visible sheen	120 mg/L	180 mg/L	10,000 CFU/100 mL
19-Jan-17	7.91	A	2	<2	19.7
21-Feb-17	7.73	A	<1	<2	200.3
16-Mar-17	6.3	A	<1	<2	0.3
19-Apr-17	6.92	A	<1	<2	0.3
18-May-17	7.02	A	<1	<2	6.3
16-Jun-17	5.37[3]	A	<4	<2	0.3
18-Jul-17	6.98	A	<1	<2	7.0
11-Aug-17	7.16	A	<1	<2	1.0
15-Sep-17	7.21	A	<1	<2	0.3
20-Oct-17	7.64	A	<1	<2	0.3
10-Nov-17	6.4	A	<1	<2	3.3
7-Dec-17	6.93	A	<1	<2	0.7

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

[3] This result was outside of the acceptable range. The caustic soda pump in the tertiary sewage treatment system had stopped working, so staff had been balancing the pH manually. After this result a new caustic soda pump was ordered and installed.

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Certificate of Analysis

Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 16-02610-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1700931
Date Submitted: 2017-01-19
Date Reported: 2017-01-26
Project: 140351
COC #: 182162

				Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	1278155 Wastewater 2017-01-16 CAM-Main-Cyclet 1
Group	**Analyte**	**MRL**	**Units**	**Guideline**	
General Chemistry	pH	1.00			7.91
	Total Suspended Solids	2	mg/L		<2
Oil & Grease	Oil & Grease - Mineral	1	mg/L		<1
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		<1
Subcontract	BOD5	1	mg/L		2
Visable Sheen	Visible Sheen		P/A		A

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

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

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Certificate of Analysis

Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 16-02610-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1700914
Date Submitted: 2017-01-19
Date Reported: 2017-01-20
Project: CAM-MAIN
COC #: 182162

				Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	1278093 Sewage 2017-01-16 CAM-MAIN CYCLET 1A	1278094 Sewage 2017-01-16 CAM-MAIN CYCLET 1B	1278095 Sewage 2017-01-16 CAM-MAIN CYCLET 1C
Group	**Analyte**	**MRL**	**Units**	**Guideline**			
Others	Faecal Coliforms	0	ct/100mL		31	3	25

Figure 15: January 2017, sewage effluent laboratory results page 2 of 2

eurofins | 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: 1702439
Date Submitted: 2017-02-21
Date Reported: 2017-02-28
Project: CAM-MAIN
COC #: 182140

				Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	1281685 Sewage 2017-02-14 CAM-MAIN CYCLET 1
Group	**Analyte**	**MRL**	**Units**	**Guideline**	
General Chemistry	BOD5	1	mg/L		<1
	pH	1.00			7.73
	Total Suspended Solids	2	mg/L		<2
Oil & Grease	Oil & Grease - Mineral	1	mg/L		<1
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		<1
Visable Sheen	Visible Sheen		P/A		A

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

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

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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: 1702438
Date Submitted: 2017-02-21
Date Reported: 2017-02-22
Project: CAM-MAIN
COC #: 182140

				Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	1281686 Wastewater 2017-02-14 Cam-Main Cyclet 1A	1281687 Wastewater 2017-02-14 Cam-Main Cyclet 1B	1281688 Wastewater 2017-02-14 Cam-Main Cyclet 1C
Group	**Analyte**	**MRL**	**Units**	**Guideline**			
Others	Faecal Coliforms	0	ct/100mL		247	213	141

Figure 17: February 2017, sewage effluent laboratory results page 2 of 2

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Certificate of Analysis

Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 16-02610-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1703758
Date Submitted: 2017-03-16
Date Reported: 2017-03-22
Project: CAM-MAIN
COC #: 182166

				Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	1284537 Sewage 2017-03-14 CAM-MAIN CYCLET 1
Group	**Analyte**	**MRL**	**Units**	**Guideline**	
General Chemistry	BOD5	1	mg/L		<1
	pH	1.00			6.30
	Total Suspended Solids	2	mg/L		<2
Oil & Grease	Oil & Grease - Mineral	1	mg/L		<1
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		<1
Visable Sheen	Visible Sheen		P/A		A

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

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

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Figure 18: March 2017, sewage effluent laboratory results page 1 of 2

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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: 1703756
Date Submitted: 2017-03-16
Date Reported: 2017-03-17
Project: CAM-MAIN
COC #: 182166

				Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	1284533 Wastewater 2017-03-14 CAM-MAIN CYCLET 1A	1284534 Wastewater 2017-03-14 CAM-MAIN CYCLET 1B	1284535 Wastewater 2017-03-14 CAM-MAIN CYCLET 1C
Group	**Analyte**	**MRL**	**Units**	**Guideline**			
Others	Faecal Coliforms	0	ct/100mL		0	1	0

Figure 19: March 2017, sewage effluent laboratory results page 2 of 2

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Certificate of Analysis

Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 16-02610-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1705669
Date Submitted: 2017-04-19
Date Reported: 2017-04-26
Project: CAM MAIN
COC #: 190070

				Lab I.D.	1288682
				Sample Matrix	Sewage
				Sample Type	
				Sampling Date	2017-04-11
				Sample I.D.	CAM-MAIN CYCLET 1
Group	**Analyte**	**MRL**	**Units**	**Guideline**	
General Chemistry	pH	1.00			6.92
	Total Suspended Solids	2	mg/L		<2
Oil & Grease	Oil & Grease - Mineral	1	mg/L		<1
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		<1
Subcontract	BOD5	1	mg/L		<1
Visable Sheen	Visible Sheen		P/A		A

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

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

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Figure 20: April 2017, sewage effluent laboratory results page 1 of 2

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Certificate of Analysis

Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 16-02610-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1705702
Date Submitted: 2017-04-19
Date Reported: 2017-04-20
Project: Cam Main
COC #: 190070

				Lab I.D.	1288813	1288814	1288815
				Sample Matrix	Sewage	Sewage	Sewage
				Sample Type			
				Sampling Date	2017-04-11	2017-04-11	2017-04-11
				Sample I.D.	Cam-Main Cyclet 1A	Cam-Main Cyclet 1B	Cam-Main Cyclet 1C
Group	**Analyte**	**MRL**	**Units**	**Guideline**			
Others	Faecal Coliforms	0	ct/100mL		0	1	0

Figure 21: April 2017, sewage effluent laboratory results page 2 of 2

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Certificate of Analysis

Client: Raytheon Canada Limited Ottawa
400 Cooper St., Suite 3000
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 16-02610-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1707708
Date Submitted: 2017-05-18
Date Reported: 2017-05-26
Project: Cam -Main
COC #: 190069

				Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	1293538 Wastewater 2017-05-15 Cam-Main Cyclet 1
Group	**Analyte**	**MRL**	**Units**	**Guideline**	
General Chemistry	BOD5	1	mg/L		<1
	pH	1.00			7.02
	Total Suspended Solids	2	mg/L		<2
Oil & Grease	Oil & Grease - Mineral	1	mg/L		<1
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		<1
Visable Sheen	Visible Sheen		P/A		A

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

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

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Certificate of Analysis

Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 16-02610-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1707702
Date Submitted: 2017-05-18
Date Reported: 2017-05-19
Project: CAM-MAIN
COC #: 190069

				Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	1293530 Wastewater 2017-05-15 CAM-MAIN CYCLET 1A	1293531 Wastewater 2017-05-15 CAM-MAIN CYCLET 1B	1293532 Wastewater 2017-05-15 CAM-MAIN CYCLET 1C
Group	**Analyte**	**MRL**	**Units**	**Guideline**			
Others	Faecal Coliforms	0	ct/100mL		5	2	12

Figure 23: May 2017, sewage effluent laboratory results page 2 of 2

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Certificate of Analysis

Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 16-02610-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1709750
Date Submitted: 2017-06-16
Date Reported: 2017-06-23
Project: CAM-MAIN
COC #: 190068

				Lab I.D.	1298743
				Sample Matrix	Sewage
				Sample Type	
				Sampling Date	2017-06-13
				Sample I.D.	CAM-MAIN CYCLET 1
Group	**Analyte**	**MRL**	**Units**	**Guideline**	
General Chemistry	BOD5	1	mg/L		<4
	pH	1.00			5.37
	Total Suspended Solids	2	mg/L		<2
Oil & Grease	Oil & Grease - Mineral	1	mg/L		<1
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		<1
Visable Sheen	Visible Sheen		P/A		A

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

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 24: June 2017, sewage effluent laboratory results page 1 of 2

eurofins | 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: 1709727
Date Submitted: 2017-06-16
Date Reported: 2017-06-18
Project: CAM-MAIN
COC #: 190068

				Lab I.D.	1298700	1298701	1298702
				Sample Matrix	Sewage	Sewage	Sewage
				Sample Type			
				Sampling Date	2017-06-13	2017-06-13	2017-06-13
				Sample I.D.	CAM-MAIN CYCLET 1A	CAM-MAIN CYCLET 1B	CAM-MAIN CYCLET 1C
Group	**Analyte**	**MRL**	**Units**	**Guideline**			
Others	Faecal Coliforms	0	ct/100mL		0	1	0

Figure 25: June 2017, sewage effluent laboratory results page 2 of 2

eurofins | 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: 1713345
Date Submitted: 2017-07-18
Date Reported: 2017-07-27
Project: CAM Main
COC #: 190077

				Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	1306910 Wastewater 2017-07-10 CAM-Main Cyclet 1
Group	**Analyte**	**MRL**	**Units**	**Guideline**	
General Chemistry	pH	1.00			6.98
	Total Suspended Solids	2	mg/L		<2
Oil & Grease	Oil & Grease - Mineral	1	mg/L		<1
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		<1
Subcontract	BOD5	1	mg/L		<1
Visable Sheen	Visible Sheen		P/A		A

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

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

eurofins | 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: 1713359
Date Submitted: 2017-07-18
Date Reported: 2017-07-19
Project: CAM MAIN
COC #: 190077

				Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	1306990 Sewage 2017-07-10 CAM-MAIN CYCLET 1A	1306991 Sewage 2017-07-10 CAM-MAIN CYCLET 1B	1306992 Sewage 2017-07-10 CAM-MAIN CYCLET 1C
Group	**Analyte**	**MRL**	**Units**	**Guideline**			
Others	Faecal Coliforms	0	ct/100mL		5	6	10

Figure 27: July 2017, sewage effluent laboratory results page 2 of 2

eurofins | 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: 1715253
Date Submitted: 2017-08-11
Date Reported: 2017-08-17
Project: CAM-Main
COC #: 190072

				Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	1313496 Wastewater 2017-08-09 Cam-Main Cyclet 1
Group	Analyte	MRL	Units	Guideline	
General Chemistry	pH	1.00			7.16
	Total Suspended Solids	2	mg/L		<2
Oil & Grease	Oil & Grease - Mineral	1	mg/L		<1
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		<1
Subcontract	BOD5	1	mg/L		<1
Visable Sheen	Visible Sheen		P/A		A

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

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

eurofins | 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: 1715241
Date Submitted: 2017-08-11
Date Reported: 2017-08-14
Project: CAM-MAIN
COC #: 190072

				Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	1313463 Sewage 2017-08-09 CAM-MAIN CYCLET 1A	1313464 Sewage 2017-08-09 CAM-MAIN CYCLET 1B	1313465 Sewage 2017-08-09 CAM-MAIN CYCLET 1C
Group	Analyte	MRL	Units	Guideline			
Others	Faecal Coliforms	0	ct/100mL		0	3	0

Figure 29: August 2017, sewage effluent laboratory results page 2 of 2

eurofins | 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: 1717759
Date Submitted: 2017-09-15
Date Reported: 2017-09-22
Project: CAM MAIN
COC #: 190073

				Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	1320544 / Sewage / 2017-09-11 / CAM-MAIN CYCLET 1
Group	**Analyte**	**MRL**	**Units**	**Guideline**	
General Chemistry	pH	1.00			7.21
	Total Suspended Solids	2	mg/L		<2
Oil & Grease	Oil & Grease - Mineral	1	mg/L		<1
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		<1
Subcontract	BOD5	1	mg/L		<1
Visable Sheen	Visible Sheen		P/A		A

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

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

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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: 1717783
Date Submitted: 2017-09-15
Date Reported: 2017-09-18
Project: Cam Main
COC #: 190073

				Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	1320596 / Wastewater / 2017-09-11 / Cam-main Cyclet 1A	1320597 / Wastewater / 2017-09-11 / Cam-main Cyclet 1B	1320598 / Wastewater / 2017-09-11 / Cam-main Cyclet 1C
Group	**Analyte**	**MRL**	**Units**	**Guideline**			
Others	Faecal Coliforms	0	ct/100mL		0	1	0

Figure 31: September 2017, sewage effluent laboratory results page 2 of 2

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Certificate of Analysis

Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 16-02610-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1720460
Date Submitted: 2017-10-20
Date Reported: 2017-10-26
Project: CAM-MAIN
COC #: 190075

Group	Analyte	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D. 1328099 / Sewage / 2017-10-11 / CAM-MAIN CYCLET 1
General Chemistry	pH	1.00			7.64
	Total Suspended Solids	2	mg/L		<2
Oil & Grease	Oil & Grease - Mineral	1	mg/L		2
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		2
Subcontract	BOD5	1	mg/L		<1
Visable Sheen	Visible Sheen		P/A		A

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

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

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Certificate of Analysis

Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 16-02610-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1720452
Date Submitted: 2017-10-20
Date Reported: 2017-10-23
Project: CAM-MAIN
COC #: 190075

Group	Analyte	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D. 1328086 / Sewage / 2017-10-11 / CAM-MAIN CYCLET 1 A	1328087 / Sewage / 2017-10-11 / CAM-MAIN CYCLET 1 B	1328088 / Sewage / 2017-10-11 / CAM-MAIN CYCLET 1 B
Others	Faecal Coliforms	0	ct/100mL		0	0	1

Figure 33: October 2017, sewage effluent laboratory results page 2 of 2

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Certificate of Analysis

Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Will Wyman
PO#: 16-02610-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1722032
Date Submitted: 2017-11-10
Date Reported: 2017-11-16
Project: CAM-MAIN
COC #: 190067

				Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	1332598 Sewage - 2017-11-01 CAM-MAIN CYCLET 1
Group	Analyte	MRL	Units	Guideline	
General Chemistry	pH	1.00			6.40
	Total Suspended Solids	2	mg/L		<2
Oil & Grease	Oil & Grease - Mineral	1	mg/L		<1
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		<1
Subcontract	BOD5	1	mg/L		<1
Visable Sheen	Visible Sheen		P/A		A

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

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

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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: 1722024
Date Submitted: 2017-11-10
Date Reported: 2017-11-12
Project: CAM-MAIN
COC #: 190067

				Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.	1332580 Sewage - 2017-11-01 CAM-MAIN CYCLET 1A	1332581 Sewage - 2017-11-01 CAM-MAIN CYCLET 1B	1332582 Sewage - 2017-11-01 CAM-MAIN CYCLET 1C
Group	Analyte	MRL	Units	Guideline			
Others	Faecal Coliforms	0	ct/100mL		4	3	3

Figure 35: November 2017, sewage effluent laboratory results page 2 of 2

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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: 1723665
Date Submitted: 2017-12-07
Date Reported: 2017-12-14
Project: CAM-Main
COC #: 190074

				Lab I.D.	1336719
				Sample Matrix	Sewage
				Sample Type	
				Sampling Date	2017-12-04
				Sample I.D.	CAm-Main Cyclet 1
Group	**Analyte**	**MRL**	**Units**	**Guideline**	
General Chemistry	pH	1.00			6.93
	Total Suspended Solids	2	mg/L		<2
Oil & Grease	Oil & Grease - Mineral	1	mg/L		<1
	Oil & Grease - Non-mineral	1	mg/L		<1
	Oil & Grease - Total	1	mg/L		<1
Subcontract	BOD5	1	mg/L		<1
Visable Sheen	Visible Sheen		P/A		A

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

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

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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: 1723699
Date Submitted: 2017-12-07
Date Reported: 2017-12-08
Project: CAM-Main
COC #: 190074

				Lab I.D.	1336786	1336787	1336788
				Sample Matrix	Sewage	Sewage	Sewage
				Sample Type			
				Sampling Date	2017-12-04	2017-12-04	2017-12-04
				Sample I.D.	CAM-Main Cyclet 1A	CAM-Main Cyclet 1B	CAM-Main Cyclet 1C
Group	**Analyte**	**MRL**	**Units**	**Guideline**			
Others	Faecal Coliforms	0	ct/100mL		0	1	1

Figure 37: December 2017, sewage effluent laboratory results page 2 of 2

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

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

Berm	**Maximum concentration of any grab sample (ug/L)**	CAM W22A	CAM W22C & W20D
Location on-site		Summit	Beach
Discharge Latitude[4]		69° 7'2.76"N	69° 6'11.41"N
Discharge Longitude		105° 7'2.69"W	105° 5'50.26"W
Date		23-May-17	23-May-17
pH (pH Units)	6 to 9	7.73	7.62
Oil and Grease (ug/L)	5000	<1000	<1000
Arsenic (total) (ug/L)	100	<20	<20
Cadmium (dissolved) (ug/L)	10	0.2	<0.1
Chromium (dissolved) (ug/L)	100	<1	2
Cobalt (dissolved) (ug/L)	50	0.5	0.4
Copper (dissolved) (ug/L)	200	15	10
Lead (dissolved) (ug/L)	50	<1	<1
Mercury (total) (ug/L)	0.6	<0.1	<0.1
Nickel (dissolved) (ug/L)	200	<5	<5
PCB (total) (ug/L)	1000	<0.1	<0.1
Phenols (ug/L)	20	3	8
Zinc (total) (ug/L)	500	60	<40
Benzene (ug/L)	370	<0.5	<0.5
Toluene (ug/L)	2	<0.5	<0.5
Ethyl benzene (ug/L)	90	<0.5	<0.5

[4] Final discharge point of bermed fuel storage facility

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Certificate of Analysis

Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Gabe Landry
PO#: 16-02610-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1708344
Date Submitted: 2017-05-30
Date Reported: 2017-06-07
Project:
COC #: 176792

				Lab I.D.	1295025
				Sample Matrix	Water
				Sample Type	
				Sampling Date	2017-05-23
				Sample I.D.	MLCAM W22A - Total
Group	Analyte	MRL	Units	Guideline	
General Chemistry	pH	1.00			7.73
Mercury	Hg	0.0001	mg/L		<0.0001
Metals	Aqua-Regia Digest				Y
	As	0.02	mg/L		<0.02
	Zn	0.04	mg/L		0.06
Oil & Grease	Oil & Grease - Total	1	mg/L		<1
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L		<0.1
Subcontract	Phenols	0.001	mg/L		0.003
VOCs	Benzene	0.5	ug/L		<0.5
	Ethylbenzene	0.5	ug/L		<0.5
	Toluene	0.5	ug/L		<0.5
VOCs Surrogates (%	Toluene-d8	0	%		94

Guideline = *** = Guideline Exceedence**
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Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

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Figure 38: CAM W22A berm water laboratory results page 1 of 2 (May 2017)

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Certificate of Analysis

Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Gabe Landry
PO#: 16-02610-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1708345
Date Submitted: 2017-05-30
Date Reported: 2017-06-02
Project:
COC #: 176792

				Lab I.D.	1295030
				Sample Matrix	Water
				Sample Type	
				Sampling Date	2017-05-23
				Sample I.D.	MLCAM W22A - Dissolved Metals
Group	Analyte	MRL	Units	Guideline	
Metals	Cd	0.0001	mg/L		0.0002
	Co	0.0002	mg/L		0.0005
	Cr	0.001	mg/L		<0.001
	Cu	0.001	mg/L		0.015
	Ni	0.005	mg/L		<0.005
	Pb	0.001	mg/L		<0.001

Figure 39: CAM W22A berm water laboratory results page 2 of 2 (May 2017)

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Certificate of Analysis

Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Gabe Landry
PO#: 16-02610-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1708342
Date Submitted: 2017-05-30
Date Reported: 2017-06-07
Project:
COC #: 170381

				Lab I.D.	1295024
				Sample Matrix	Water
				Sample Type	
				Sampling Date	2017-05-23
				Sample I.D.	MLCAM W20D/W22C - Total
Group	**Analyte**	**MRL**	**Units**	**Guideline**	
General Chemistry	pH	1.00			7.62
Mercury	Hg	0.0001	mg/L		<0.0001
Metals	Aqua-Regia Digest				Y
	As	0.02	mg/L		<0.02
	Zn	0.04	mg/L		<0.04
Oil & Grease	Oil & Grease - Total	1	mg/L		<1
PCBs	Polychlorinated Biphenyls (PCBs)	0.1	ug/L		<0.1
Subcontract	Phenols	0.001	mg/L		0.008
VOCs	Benzene	0.5	ug/L		<0.5
	Ethylbenzene	0.5	ug/L		<0.5
	Toluene	0.5	ug/L		<0.5
VOCs Surrogates (%	Toluene-d8	0	%		96

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

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Page 2 of 5

Figure 40: CAM W22C and W20D berm water laboratory results page 1 of 2 (May 2017)

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Certificate of Analysis

Client: Raytheon Canada Limited Ottawa
400 Cooper St.
Ottawa, ON
K2P 2H8
Attention: Mr. Gabe Landry
PO#: 16-02610-OT
Invoice to: Raytheon Canada Limited Ottawa

Report Number: 1708340
Date Submitted: 2017-05-30
Date Reported: 2017-06-02
Project:
COC #: 170381

				Lab I.D.	1295022
				Sample Matrix	Water
				Sample Type	
				Sampling Date	2017-05-23
				Sample I.D.	MLCAM W20D/W22C - Dissolved
Group	**Analyte**	**MRL**	**Units**	**Guideline**	
Metals	Cd	0.0001	mg/L		<0.0001
	Co	0.0002	mg/L		0.0004
	Cr	0.001	mg/L		0.002
	Cu	0.001	mg/L		0.010
	Ni	0.005	mg/L		<0.005
	Pb	0.001	mg/L		<0.001

Figure 41: CAM W22C and W20D berm water laboratory results page 2 of 2 (May 2017)