Appendix 'B'

Regulatory Approvals

FISHERIES AND OCEANS
CANADIAN ENVIRONMENTAL ASSESSMENT ACT (CEAA) 2012
PROJECT EFFECTS DETERMINATION REPORT

GENERAL INFORMATION

1. Project Title: Small Boat Basin Development, Lawn, NL	
2 Proponent: Fisheries and Oceans Canada, Small Craft Harbours (DFO SCH)	
3. Other Contacts (Other Proponent, Consultant or Contractor): Public Works and Government Services Canada	**4. Role:** OGD Consultant
5. Source of Project Information: Dion Upward, Senior Project Engineer, DFO Small Craft Harbours Branch	
6. Project Review Start Date: January 20, 2016	
7. DFO File No.: 16-HNFL-00011	**8. PWGSC File No:**
9. TC File No.: 8200-09-1095 / NEATS: 41445	

BACKGROUND

10. Background about Proposed Development (including a description of the proposed development):

DFO SCH intends to develop a small boat basin at the Lawn SCH site. The scope of work includes dredging of the harbour basin and infilling of the shoreline to prepare a new approach and access area.

PROJECT REVIEW

11. DFO's rationale for the project review:

Project is on federal land ☒ and;

- ☒ DFO is the proponent
- ☐ DFO to issue *Fisheries Act* Authorization or *Species at Risk Act* Permit
- ☐ DFO to provide financial assistance to another party to enable the project to proceed
- ☐ DFO to lease or sell federal land to enable the project to proceed
- ☐ Other

12. Fisheries Act Sections (if applicable): n/a

13. Other Authorities Transport Canada, Navigation Protection Program and Environmental and Indigenous Affairs	**14. Other Authorities rationale for involvement:** *Navigation Protection Act*

15. Other Jurisdiction:

Newfoundland Department of Environment and Conservation, Water Resources Division

16. Other Expert Departments Providing Advice:	**17. Areas of Interest of Expert Departments:**
Fisheries and Oceans Canada, Fisheries Protection Program	*Fisheries Act*

18. Other Contacts and Responses: n/a

19. Scope of Project (details of the project subject to review):

Project Description

Construction/Installation:
The proposed project will consist of dredging and infilling to construct a new approach area. Approximately 11,000 cubic meters of Class B material (sediment of varying sizes) will be dredged from the harbor basin in Lawn. Heavy machinery working from the shoreline or a floating barge will likely be required for dredging (alternatively, a temporary access road may be constructed utilizing dredged material to adequately reach dredge limits; the road will be removed as the excavator works its way back to shore).

The project will also include upland development. Dredged material will be re-used on site to infill an area of approximately 3,750 m^2 to construct an approach and laydown area. .

Operation
The Environmental Management System (EMS) with an integrated Environmental Management Plan (EMP) for the Harbour Authority of Lawn will cover operational aspects of environmental management at the harbour (fuelling, waste disposal, activities on the property and water).

Decommissioning
This facility is not presently planned to be decommissioned. At the time of decommissioning, Small Craft Harbours will develop a site-specific re-use or reclamation plan that is appropriate for the applicable environmental legislation and Fisheries and Oceans Canada policies.

Scheduling
Commencement of this project is subject to DFO SCH operational priorities and funding, as well as regulatory approval, but will likely proceed during the Spring of 2016.

20. Location of Project:

The project site is located at coordinates 46 56' 38" N; 55 32' 30" W and can be accessed along Route 220. The community of Lawn is located approximately 356kms southwest of the City of St. John's on the Burin Peninsula.

21. Environment Description:

Physical Environment

The project site is located on a small peninsula in the small rural town of Lawn, NL. The dredging site is located on the leeward side of the peninsula in close proximity to the existing finger wharf and gravel roadway. Two streams feed into the bay where the project site resides. Vegetation in the area is predominately grassland with coniferous tree stands moving towards the mouth of the bay. The area behind the site is predominately residential zones.

Lawn is located in the South Avalon-Burin Oceanic Barrens ecoregion that occurs along the southern tips of the Avalon and Burin peninsulas in Newfoundland. The ecoregion is marked by cool summers and short, relatively mild winters. It is also strongly affected by the Atlantic Ocean, and its summers are noted for higher frequencies and persistence of fog than in the surrounding barrens. The mean annual temperature is approximately 5.5°C. The mean summer temperature is 11.5°C and the mean winter temperature is -1°C. The mean annual precipitation ranges 1200-1500 mm. This ecoregion is classified as having an oceanic low boreal ecoclimate. It supports dense carpets of moss and fruticose lichen, along with closed, low-growing ericaceous shrubs. The moss-heath of this region is unique to North America. Similar communities are found in northern Scotland and Iceland. Dwarf krummholz of balsam fir occurs on some upland sites. The ecoregion is composed predominantly of a mixture of late Precambrian sedimentary and volcanic strata, and its elevations rise abruptly from sea level to about 200 m asl. Stream erosion has cut deeply, and the uplands are dissected, rugged, and rocky along the coastline, but elsewhere inland they present a rolling terrain of low relief. The surface of the uplands is dominated by peat-covered, rolling to hummocky, sandy morainal deposits with slopes that range 5-30%. Fibrisols are found on blanket and sloping bogs. These wetlands cover more than 25% of the ecoregion. Well- to imperfectly drained Ferro-Humic Podzols developed on sandy loam glacial till are the dominant soils in this ecoregion. Wildlife includes caribou, willow ptarmigan, and seabirds. One of the world's largest gannet colonies is situated at Cape St. Mary's. Fishing and water-oriented recreation are the main land uses. The main community is Trepassey. The population of the ecoregion is approximately 9200.

Species at Risk (Aquatic and Terrestrial)

Lawn is within the distributional range of the Blue Whale (Atlantic population), North Atlantic Right Whale, Red Crossbill (percna subspecies), Harlequin Duck, and the Monarch Butterfly all placed on Schedule 1 of the *Species at Risk Act* by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). However, the proposed project site is not likely to provide critical or limiting habitat for these species and does not contain any environmental components that are considered to be important, sensitive, threatened or endangered that are likely to be affected by the project.

22. Scope of Effects Considered (sections 5(1) and 5(2)):

Table 1: Potential Project / Environment Interactions Matrix

	As per Section 5(1)			*Section 5(1c)*				*Section 5(2)*			*Due Diligence*			
				Aboriginal Interest										
Project Phase / Physical Work/Activity	*Fish (Fisheries Act)*	*Aquatic Species (SARA)*	*Birds (MBCA)*	*Health and Socio economic*	*Physical and cultural heritage*	*Land use*	**HAPA Significance*	*Health and Socio economic*	*Physical and cultural heritage*	**HAPA Significance*	*Water (ground, surface, drainage, etc)*	*Terrestrial / Aquatic Species*	*Soil*	*Air Quality*
Construction/Installation														
Site Dredging	P	-	-	-	-	-	-	-	-	-	P	P	P	P
Site Infilling	P	-	-	-	-	-	-	-	-	-	P	P	P	P
Upland Development	P	-	-	-	-	-	-	-	-	-	P	P	P	P
Operation / Maintenance	P	-	-	-	-	-	-	-	-	-	P	-	-	-
Decommissioning / Abandonment	-	-	-	-	-	-	-	-	-	-	-	-	-	-

**structure, site or thing that is of historical, archaeological, paleontological or architectural significance.*
Legend: P = Potential Effect of Project on Environment; ' - ' = No Interaction

Navigation Consideration

Environmental effects of the project on navigation are taken into consideration as part of the environmental assessment only when the effects are indirect, *i.e.* resulting from a change in the environment affecting navigation. Direct effects on navigation are not considered in the environmental assessment, but any measures necessary to mitigate direct effects will be included as conditions of the *Navigation Protection Act* approval.

☒ Only direct effects are identified; therefore the effects of the project on navigation are not addressed in this environmental assessment.

☐ Indirect effects were identified and have been addressed in this environmental assessment

23. Environmental Effects of Project:

Potential Project/Environment Interactions and their effects are outlined below:

Fish:

- Sedimentation as a result of dredging, infilling and upland development may negatively impact fish and quality of potential fish habitat at the immediate project site.
- Sediment removal and infilling may destroy potential fish habitat within project footprint.
- Accidental discharge of heavy machinery fuel/fluids could negatively impact fish and potential fish habitat.

Water:

- Sedimentation as a result of dredging, infilling and upland development may decrease marine water quality at immediate project site.
- Improperly transported/disposed of dredge spoils may result in contamination of groundwater.
- Construction related refuse may be deposited in water-body, decreasing marine water quality.
- Accidental discharge of heavy machinery fuel/fluids may result in a decrease of marine water quality.

Aquatic species:

- Sedimentation as a result of dredging, infilling and upland development may negatively impact aquatic species present at the immediate project site.
- Sediment removal and infilling may destroy potential fish habitat within project footprint.
- Accidental discharge of heavy machinery fuel/fluids could negatively affect aquatic species present at the immediate project site.

Soil:

- Exposed soils and stockpiled dredge spoils may erode.

Air quality:

- Construction activities may result in nuisance impacts due to noise and dust.
- Improper storage/disposal of dredge spoils may result in unpleasant odours and provide annoyance to facility users and nearby residents.

24. Mitigation Measures for Project (including Habitat Compensation):

- To avoid impacts to salmon that migrate through the Lawn Harbour, dredging should not be carried out during the period of July 1 – August 31.
- Minimize duration of in-water work wherever possible
- Conduct in-water work during periods of low flow, or at low tide, to further reduce the risk to fish and their habitat
- Schedule work to avoid wet, windy and rainy periods that may increase erosion and sedimentation
- Plan activities near water such that materials such as paint, primers, blasting abrasives, rust

solvents, degreasers, grout, or other chemicals do not enter the watercourse

- Develop a response plan that is to be implemented immediately in the event of a sediment release or spill of a deleterious substance and keep an emergency spill kit on site
- Ensure that construction materials used in a watercourse has been handled and treated in a manner to prevent the release or leaching of substances into the water that may be deleterious to fish
- Remove all construction materials from site upon project completion,
- Ensure that machinery arrives on site in a clean condition and is maintained free of fluid leaks.
- Whenever possible, operate machinery on land above the high water mark, on ice, or from a floating barge in a manner that minimizes disturbance to the banks and bed of the waterbody,
- Wash, refuel and service machinery and store fuel and other materials for the machinery in such a way as to prevent any deleterious substances from entering the water.Waste materials should not be deposited in the tidal waters;
- As part of this projects pre-planning process, several sediment samples were collected from the proposed target dredge area. The material will be utilized for the infilling aspect of the project.
- Any hazardous materials produced as a result of this project are to be transported off-site for disposal/treatment at an approved waste handling facility, pursuant to applicable provincial and federal regulations/legislation.
- Certain species of migratory birds (e.g. Bank Swallows) may nest in large piles of dredge spoils left unattended/unvegetated during the breeding season (April 15th to August 15th). To discourage this, the proponent should consider measures to cover or to deter birds from these large piles of unattended soil during the breeding season.

25. Significance of Adverse Environmental Effects of project:

Significant adverse environmental effects are unlikely, taking into account mitigation measures.

26. Other Considerations (Public Consultation, Aboriginal Consultation, Follow-up)

Public Consultation

The proposed project will provide a more adequate facility for vessels utilizing this site. No negative public concern is expected as a result of this project. As such, public consultation was not deemed necessary as part of this determination.

Aboriginal Consultation

Aboriginal fishers are not known to utilize the Lawn SCH facility, nor are there any known aboriginal groups in the surrounding area. As such, aboriginal consultation was not deemed necessary as part of this determination.

Government Consultation

Federal and provincial authorities likely to have an interest in the project were consulted by Public Works & Government Services Canada, Environmental Services, during the course of this assessment. A project description was distributed to the following authorities:

- Fisheries and Oceans Canada – Fisheries Protection Program (DFO FPP)
- Transport Canada – Navigation Protection Program (TC NPP)
- NDOEC, Water Resources Division (NDOEC – WR)

Mitigations prescribed by DFO FPP have been incorporated into this report and may also be found in Appendix C. It is the proponents' responsibility to ensure that appropriate mitigation measures

are adhered to, especially timing mitigations such as avoidance of dredging during the period of July 1st to August 31st.

TC NPP may issue an approval under the Navigation Protection Act. TC Environmental and Indigenous Affairs has reviewed this report and all comments received have been incorporated in the final report.

All Terms and Conditions attached to the NDOEC WR permit # ALT8459-2016 must be adhered to.

All expert advice/specialist information provided by the abovenoted departments has been incorporated into this document.

Accuracy and Compliance Monitoring

A follow-up program (as defined in S. 2(1) and as applicable to non-designated projects on federal lands) is a program for determining the effectiveness of any mitigation measures. Site monitoring (accuracy and compliance monitoring) may be conducted to verify whether required mitigation measures were implemented. The proponent must provide site access to Responsible Authority officials and/or its agents upon request.

27. Other Monitoring and Compliance Requirements (e.g. *Fisheries Act* or *Species at Risk Act* requirements)

n/a

CONCLUSION

28. Conclusion on Significance of Adverse Environmental Effects:

The Federal Authority has evaluated the project in accordance with Section 67 of *Canadian Environmental Assessment Act (CEAA), 2012*. On the basis of this evaluation, the department has determined that the project is not likely to cause significant adverse environmental effects with mitigation and therefore can proceed using mitigative measures as outlined.

29. Prepared by: Cathy Martin

30. Date: March 17, 2016

31. Name: Cathy Martin

32. Title: Environmental Specialist, PWGSC-ES

DECISION

33. Decision Taken

☒ DFO may exercise its power, duty or function, i.e. may issue the authorization - where the project is not likely to cause significant adverse environmental effects. Confirm below the specific power, duty or function that may be exercised.

- ☐ DFO to issue *Fisheries Act* Authorization or *Species at Risk Act* Permit
- ☒ DFO to proceed with project (as proponent)
- ☐ DFO to provide financial assistance for project to proceed
- ☐ DFO to provide federal land for project to proceed

☐ DFO has decided not to exercise its power, duty or function because the project is likely to cause significant adverse environmental effects.

☐ DFO to ask the Governor in Council to determine if the significant adverse environmental effects are justified in the circumstances

34. Approved by: _____ **35. Date:** _____

36. Name: Paul Curran

37. Title: Regional Engineer, DFO-SCH, NL

38. References: n/a

TRANSPORT CANADA RECOMMENDATION

Project Title:	Lawn, NL – Small Boat Basin Development
TC File No.:	NEATS: 41445
NPP File No.:	8200-09-1095
Environmental Review Decision:	Taking into account the implementation of any mitigation measures that Transport Canada considers appropriate, the project **is not likely** to cause significant adverse environmental effects and, as such, Transport Canada may exercise any power or perform any duty or function that would permit the project to be carried out in whole or in part.

Prepared by:	**Melissa Ginn** Environmental Officer Environmental and Indigenous Affairs	
Signature:		**Date:**
Mailing Address:		
Tel:		
Fax:		
Email:		
Recommended by:	**J. Jason Flanagan** Senior Environmental Assessment Officer Environmental and Indigenous Affairs	
Signature:		**Date:**
Approved by:	**Kevin LeBlanc** Regional Manager Environmental Affairs and Indigenous Affairs	
Signature:		**Date:**

APPENDICES

-Appendix A - Topographic Map and Aerial Photographs
- Appendix B: Site Plan
- Appendix C: Regulatory Approvals

Appendix A
Topographic Map and Aerial Photos

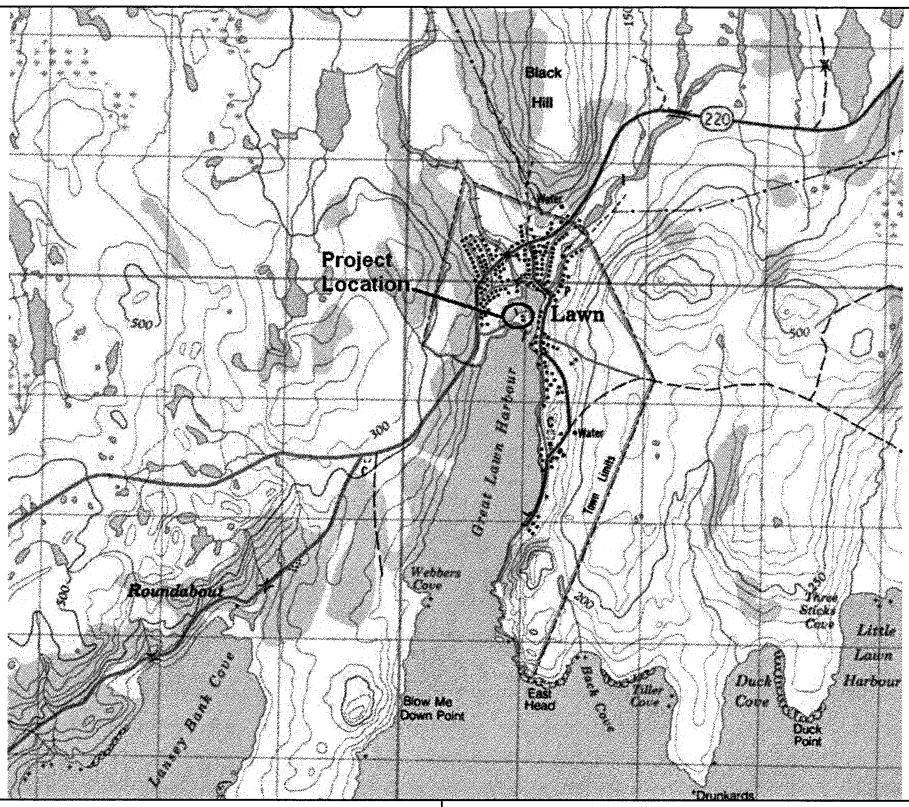
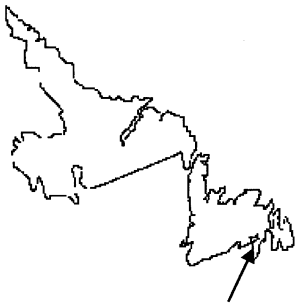
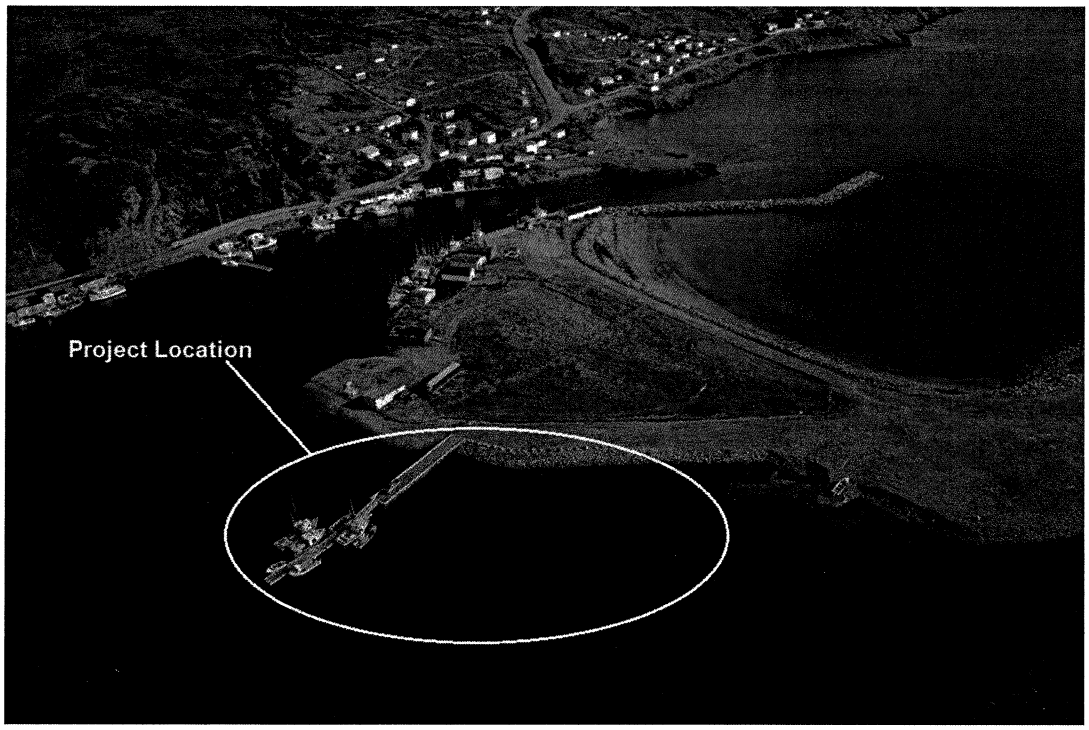


Figure 1. Topographic map indicating location of proposed project

Scale: 1:15,000

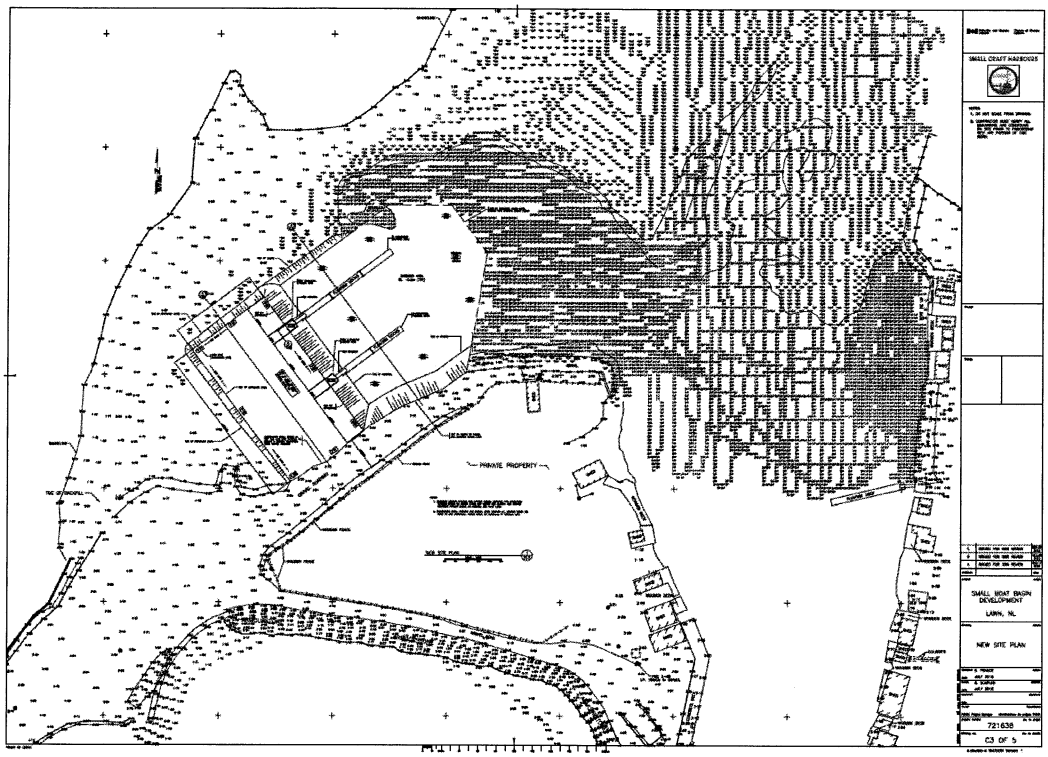




Aerial 1: Photo indicating proposed project site (photo courtesy of DFO, 2010).

Aerial 2: Google photo showing project area (photo courtesy of Google, 2016).

Appendix B
Site Plan of proposed project



Site plan: Lawn Site Plan indicating footprint of proposed marginal

Fisheries and Oceans Canada | Pêches et Océans Canada

P.O. Box 5667
St. John's, NL A1C 5X1

Your file *Votre référence*

March 15, 2016

Our file *Notre référence*
16-HNFL-00014

Mr. Paul Curran
Fisheries and Oceans Canada - Small Craft Harbours Branch
10 Barter's Hill St. John's NL A1C 5T2

Dear Mr. Curran:

Subject: Implementation of mitigation measures to avoid and mitigate serious harm to fish – Lawn Harbour Development.

The Fisheries Protection Program (the Program) of Fisheries and Oceans Canada received your proposal on Jan 21, 2016. Your proposal has been reviewed to determine whether it is likely to result in serious harm to fish which is prohibited under subsection 35(1) of the *Fisheries Act*.

The proposal has also been reviewed to determine whether it will adversely impact listed aquatic species at risk and contravene sections 32, 33 and 58 of the *Species at Risk Act*.

Our review consisted of:

- DFO Request for Review Application;
- Project description and drawings received from PWGSC; and
- Personal communication with local fishery officer.

We understand that you propose to improve facilities in Lawn Harbour by removing existing floating dock structures, infilling an area for use as a new approach, dredging the area around the new approach, and reinstalling floating docks to the new approach.

To avoid the potential for serious harm to fish and their habitat, we are recommending that the following mitigation measures be included into your plans:

- To avoid impacts on salmon that migrate through Lawn Harbour, dredging should not be carried out during the period of July 1 – Aug 31.

- Measures should be implemented to minimize the release of sediment, including:

    - Dredging/excavation and placement of material for the new approach should be carried out during low tide and low wind/wave conditions and should be suspended whenever wind or tide conditions cause sediment to be visible outside the immediate project area.

- Dredged or excavated material not used for the new approach should be disposed of at an approved site above the high water mark. If necessary adequate sedimentation control measures should be deployed around stored dredge material to minimize potential erosion and sedimentation from the material.

- The rock material to be used for infill / approach development must be installed in a manner that prevents it from being displaced or washed away during storms and or periods of high water.

- Rock material should not be end dumped, but should be dumped on land and placed on station using an excavator or similar equipment.

- Shoreline disturbance should be restricted to the immediate work area. Any shoreline areas disturbed by project activities should be stabilized as soon as possible to prevent erosion.

Provided that these mitigation measures are incorporated into your plans, the Program is of the view that your proposal will not result in serious harm to fish. The Program is also of the view that your proposal will not contravene sections 32, 33 or 58 of the *Species at Risk Act*. No formal approval is required from the Program under the *Fisheries Act* or the *Species at Risk Act* in order to proceed with your proposal.

If your plans have changed or if the description of your proposal is incomplete, or changes in the future, you should consult our website (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html) or consult with a qualified environmental consultant to determine if further review is required by the Program.

A copy of this letter should be kept on site while the work is in progress. Please contact Darrin Sooley (phone (709) 772-3521, fax 709 772-5562 or email darrin.sooley@dfo-mpo.gc.ca) if you have any questions in this respect and to provide notification 10 days prior to commencement of the proposed project. Please refer to the file number referenced above when corresponding with the Program.

Sincerely,

Tilman Bieger
Manager, Fisheries Protection - Regulatory Reviews
Ecosystems Management Branch
NL Region

Cc: C. Martin – PWGSC, St. John's

Newfoundland Labrador

Government of Newfoundland and Labrador
Department of Environment and Conservation
Water Resources Management Division

PERMIT TO ALTER A BODY OF WATER

Pursuant to the *Water Resources Act*, SNL 2002 cW-4.01, specifically Section(s) 48

Date: FEBRUARY 26, 2016

File No: 524
Permit No: ALT8495-2016

Permit Holder: Department of Fisheries and Oceans Canada
Small Craft Harbour Branch
John Cabot Building, 10 Barter's Hill
St. John's NL A1C 5X1

Attention: Mr. Paul Curran

Re: Lawn (Great Lawn Harbour) - Infilling and Dredging

Permission is hereby given for : the removal of approximately 11,000 cubic meters of material from Great Lawn Harbour and the infilling of an area approximately 3750 square meter with approximately 10,000 cubic meters of Great Lawn Harbour to accommodate an approach and laydown area, in the Community of Lawn, as outlined in the application dated January 30, 2016 and further information provided on or before February 25, 2016.

- This Permit does not release the Permit Holder from the obligation to obtain appropriate approvals from other concerned municipal, provincial and federal agencies.
- The Permit Holder must obtain the approval of the Crown Lands Administration Division if the project is being carried out on Crown Land.
- This Permit is subject to the terms and conditions indicated in Appendices A and B (attached).
- It should be noted that prior to any significant changes in the design or installation of the proposed works, or in event of changes in ownership or management of the project, an amendment to this Permit must be obtained from the Department of Environment and Conservation under Section 49 of the *Water Resources Act*.
- Failure to comply with the terms and conditions will render this Permit null and void, place the Permit Holder and their agent (s) in violation of the *Water Resources Act* and make the Permit Holder responsible for taking any remedial measures as may be prescribed by this Department.

MINISTER

GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
Department of Environment and Conservation

File No: 524
Permit No: ALT8495-2016

APPENDIX A

Terms and Conditions for Permit

Dredging

1. Dredging activity must only be carried out during periods when wind, wave and tide conditions minimize the dispersion of silt and sediment from the work site.

2. The area to be dredged must be enclosed and isolated from the rest of the body of water through the use of a filter fabric curtain or similar method.

3. Dredged material must be disposed of in accordance with the regional Service NL Centre of the Department of Service NL. The Department of Service NL may require samples to be submitted for testing and analysis.

Infilling

4. The slopes along the perimeter of infilled areas must be no steeper than two horizontal to one vertical (2H:1V).

5. The constructed works must be inspected regularly so that action can be taken to undertake repairs as required.

6. Fill material must be obtained from an approved quarry site. It must not be taken from beaches or streams, and must not be dredged from a body of water.

7. Infilling must not disrupt the established surface drainage pattern of the area.

8. The constructed works must comply with all other terms and conditions provided in the Crown Lands grant, lease, or license for occupancy.

9. Select heavy rocks must be placed along the toe of any infilling to provide slope stability and erosion protection.

General Alterations

10. Any work that must be performed below the high water mark must be carried out during a period of low water levels.

11. Any flowing or standing water must be diverted around work sites so that work is carried out in the dry.

12. Water pumped from excavations or work areas, or any runoff or effluent directed out of work sites, must have silt and turbidity removed by settling ponds, filtration, or other suitable treatment before discharging to a body of water. Effluent discharged into receiving waters must comply with the *Environmental Control Water and Sewage Regulations, 2003*.

13. All operations must be carried out in a manner that prevents damage to land, vegetation, and watercourses, and which prevents pollution of bodies of water.

14. The use of heavy equipment in streams or bodies of water is not permitted. The operation of heavy equipment must be confined to dry stable areas.

15. All vehicles and equipment must be clean and in good repair, free of mud and oil, or other harmful substances that could impair water quality.

16. During the construction of concrete components, formwork must be properly constructed to prevent any fresh concrete from entering a body of water. Dumping of concrete or washing of tools and equipment in any body of water is prohibited.

17. Wood preservatives such as penta, CCA or other such chemicals must not be applied to timber near a body of water. All treated wood or timber must be thoroughly dry before being brought to any work site and installed.

18. Any areas adversely affected by this project must be restored to a state that resembles local natural conditions. Further remedial measures to mitigate environmental impacts on water resources can and will be specified, if considered necessary in the opinion of the Department.

19. The bed, banks and floodplains of watercourses, or other vulnerable areas affected by this project, must be adequately protected from erosion by seeding, sodding or placing of rip-rap.

20. All waste materials resulting from this project must be disposed of at a site approved by the Department of Service NL.

21. Periodic maintenance such as painting, resurfacing, clearing of debris, or minor repairs, must be carried out without causing any physical disruption of any watercourse. Care must be taken to prevent spillage of pollutants into the water.

22. The owners of structures are responsible for any environmental damage resulting from dislodgement caused by wind, wave, ice action, or structural failure.

23. Sediment and erosion control measures must be installed before starting work. All control measures must be inspected regularly and any necessary repairs made if damage is discovered.

24. Fill material must be of good quality, free of fines or other substances including metals, organics, or chemicals that may be harmful to the receiving waters.

25. The attached Completion Report (Appendix C) for Permit No. 8495 must be completed and returned to this Department upon completion of the approved works. Pictures must be submitted along with the completion report, showing the project site prior to and after development.

26. This Permit is valid for two years from the date of issue. Work must be completed by that date or the application and approval procedure must be repeated.

27. The location of the work is highlighted on the Location Map for this Permit attached as Appendix D.

28. All work must be carried out within the proponent's legal property boundaries.

GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
Department of Environment and Conservation

File No: 524
Permit No: ALT8495-2016

APPENDIX B

Special Terms and Conditions for Permit

1. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall keep all systems and works in good condition and repair and in accordance with all laws, by-laws, directions, rules and regulations of any governmental authority. The Permit Holder or its agent(s), subcontractor(s), or consultant(s) shall immediately notify the Minister if any problem arises which may threaten the structural stability of the systems and works, endanger public safety and/or the environment or adversely affect others and/or any body of water either in or outside the said Project areas. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall be responsible for all damages suffered by the Minister and Government resulting from any defect in the systems and works, operational deficiencies/inadequacies, or structural failure.

2. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall operate the said Project and its systems and works in a manner which does not cause any water related and/or environmental problems, including but not limited to problems of erosion, deposition, flooding, and deterioration of water quality and groundwater depletion, in or outside the said Project areas, The Permit Holder and its agent(s), subcontractor(s), and consultant(s) shall be responsible for any and all damages associated with these problems caused as a result of changes, deficiencies, and inadequacies in the operational procedures by the Permit Holder or its agent(s), subcontractor(s), or consultant(s).

3. If the Permit Holder or its agent(s), subcontractor(s), or consultant(s) fails to perform, fulfil, or observe any of the terms and conditions, or provisions of this Permit and/or Ministerial orders and guidelines, as determined by this Department, the Minister may, after providing ten (10) day notice to the Permit Holder, amend, modify, suspend or cancel this Permit in accordance with the *Water Resources Act*.

4. The Permit Holder and its agent(s), subcontractor(s), and consultant(s) indemnify and hold the Minister and Government harmless against any and all liabilities, losses, claims, demands, damages or expenses including legal expenses of any nature whatsoever whether arising in tort, contract, statute, trust or otherwise resulting directly or indirectly from granting this Permit, systems and works in or outside the said Project areas, or any act or omission of the Permit Holder or its agent(s), subcontractor (s), or consultant(s) in or outside the said Project areas, or arising out of a breach or non-performance of any of the terms and conditions, or provisions of this Permit by the Permit Holder or its agent(s), subcontractor(s), or consultant(s).

5. This Permit is subject to all provisions of the *Water Resources Act* and any regulations in effect either at the date of this Permit or hereafter made pursuant thereto or any other relevant legislation enacted by the Province of Newfoundland and Labrador in the future.

6. This Permit shall be construed and interpreted in accordance with the laws of the Province of Newfoundland and Labrador.

File No: 524
Permit No: ALT8495-2016

cc: File Copy for Binder

cc: Dr. Abdel-Zaher Kamal Abdel-Razek, Ph. D., P.Eng.
Manager, Water Rights and Investigations Section
Water Resources Management Division
Department of Environment and Conservation
P.O. Box 8700
St. John's NL A1B 4J6

cc: Fisheries Protection Division
Ecosystem Management Branch
Fisheries and Oceans Canada
P.O. Box 5667
St. John's NL A1C 5X1

cc: Marine Safety
Transport Canada
P.O. Box 42
Moncton, NB E1C 8K6

cc: Town of Lawn
Ms. Ruth M. Bennett
PO Box 29
Lawn NL A0E 2E0

cc: Ms. Cathy Martin
Public Works and Government Services Canada, ES
10 Barter's Hill
PO Box 4600
St. John's NL A1C 5T2

Newfoundland Labrador

Government of Newfoundland and Labrador
Department of Environment and Conservation
Water Resources Management Division

Appendix C - Completion Report

Pursuant to the *Water Resources Act*, SNL 2002 cW-4.01, specifically Section(s) 48

Date: **FEBRUARY 26, 2016**

File No: 524
Permit No: ALT8495-2016

Permit Holder: **Department of Fisheries and Oceans Canada**
Small Craft Harbour Branch
John Cabot Building, 10 Barter's Hill
St. John's NL A1C 5X1

Attention: **Mr. Paul Curran**

Re: **Lawn (Great Lawn Harbour) - Infilling and Dredging**

Permission was given for : the removal of approximately 11,000 cubic meters of material from Great Lawn Harbour and the infilling of an area approximately 3750 square meter with approximately 10,000 cubic meters of Great Lawn Harbour to accommodate an approach and laydown area, in the Community of Lawn, as outlined in the application dated January 30, 2016 and further information provided on or before February 25, 2016.

I (the Permit Holder named above or agent authorized to represent the Permit Holder) do hereby certify that the project described above was completed in accordance with the plans and specifications submitted to the Department of Environment and Conservation and that the work was carried out in strict compliance with the terms and conditions of the Permit issued for this project.

Date: _____ Signature: _____

This completion report must be completed and forwarded to the following address upon completion of the approved work.

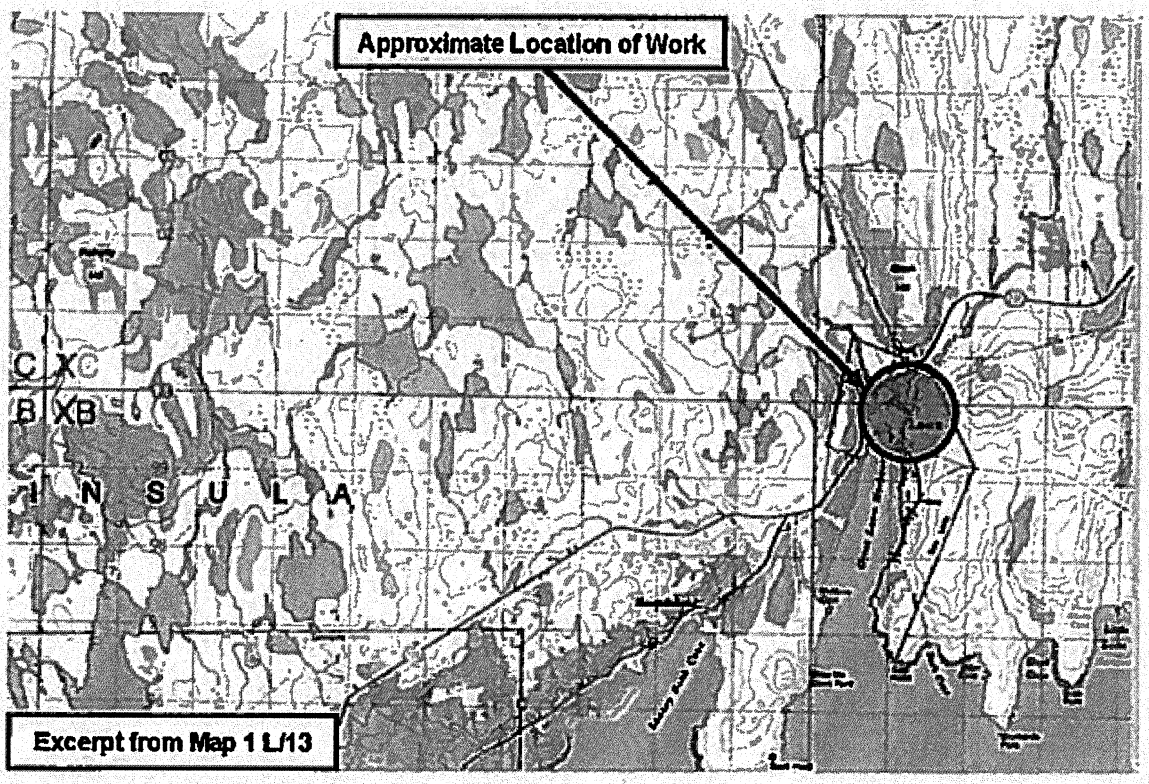
Department of Environment and Conservation
Water Resources Management Division
PO Box 8700
St. John's NL A1B 4J6

GOVERNMENT OF NEWFOUNDLAND AND LABRADOR
Department of Environment and Conservation

File No: 524
Permit No: ALT8495-2016

APPENDIX D

Location Map for Permit



Fisheries and Oceans Canada | Pêches et Océans Canada

P.O. Box 5667
St. John's, NL A1C 5X1

Your file *Votre référence*

March 15, 2016

Our file *Notre référence*
16-HNFL-00014

Mr. Paul Curran
Fisheries and Oceans Canada - Small Craft Harbours Branch
10 Barter's Hill St. John's NL A1C 5T2

Dear Mr. Curran:

Subject: Implementation of mitigation measures to avoid and mitigate serious harm to fish – Lawn Harbour Development.

The Fisheries Protection Program (the Program) of Fisheries and Oceans Canada received your proposal on Jan 21, 2016. Your proposal has been reviewed to determine whether it is likely to result in serious harm to fish which is prohibited under subsection 35(1) of the *Fisheries Act*.

The proposal has also been reviewed to determine whether it will adversely impact listed aquatic species at risk and contravene sections 32, 33 and 58 of the *Species at Risk Act*.

Our review consisted of:

- DFO Request for Review Application;
- Project description and drawings received from PWGSC; and
- Personal communication with local fishery officer.

We understand that you propose to improve facilities in Lawn Harbour by removing existing floating dock structures, infilling an area for use as a new approach, dredging the area around the new approach, and reinstalling floating docks to the new approach.

To avoid the potential for serious harm to fish and their habitat, we are recommending that the following mitigation measures be included into your plans:

- To avoid impacts on salmon that migrate through Lawn Harbour, dredging should not be carried out during the period of July 1 – Aug 31.

- Measures should be implemented to minimize the release of sediment, including:

    - Dredging/excavation and placement of material for the new approach should be carried out during low tide and low wind/wave conditions and should be suspended whenever wind or tide conditions cause sediment to be visible outside the immediate project area.

- Dredged or excavated material not used for the new approach should be disposed of at an approved site above the high water mark. If necessary adequate sedimentation control measures should be deployed around stored dredge material to minimize potential erosion and sedimentation from the material.

- The rock material to be used for infill / approach development must be installed in a manner that prevents it from being displaced or washed away during storms and or periods of high water.

- Rock material should not be end dumped, but should be dumped on land and placed on station using an excavator or similar equipment.

- Shoreline disturbance should be restricted to the immediate work area. Any shoreline areas disturbed by project activities should be stabilized as soon as possible to prevent erosion.

Provided that these mitigation measures are incorporated into your plans, the Program is of the view that your proposal will not result in serious harm to fish. The Program is also of the view that your proposal will not contravene sections 32, 33 or 58 of the *Species at Risk Act*. No formal approval is required from the Program under the *Fisheries Act* or the *Species at Risk Act* in order to proceed with your proposal.

If your plans have changed or if the description of your proposal is incomplete, or changes in the future, you should consult our website (http://www.dfo-mpo.gc.ca/pnw-ppe/index-eng.html) or consult with a qualified environmental consultant to determine if further review is required by the Program.

A copy of this letter should be kept on site while the work is in progress. Please contact Darrin Sooley (phone (709) 772-3521, fax 709 772-5562 or email darrin.sooley@dfo-mpo.gc.ca) if you have any questions in this respect and to provide notification 10 days prior to commencement of the proposed project. Please refer to the file number referenced above when corresponding with the Program.

Sincerely,

Tilman Bieger
Manager, Fisheries Protection - Regulatory Reviews
Ecosystems Management Branch
NL Region

Cc: C. Martin – PWGSC, St. John's

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Your P.O. #: CALLUP #069
Your Project #: R.076635.013
Site Location: LAWN DREDGING
Your C.O.C. #: C#491999-10-01

Attention:Megan Vivian

Public Works & Government Services Canada
PO Box 4600
10 Barter's Hill
St. John's , NL
A1C 5T2

Report Date: 2015/07/02
Report #: R3530332
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B5B2859
Received: 2015/06/12, 14:30

Sample Matrix: SEDIMENT
Samples Received: 12

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Free (WAD) Cyanide (1)	12	2015/06/18	2015/06/18	CAM SOP-00457	OMOE E3015 m
TEH in Soil (PIRI) (2, 4)	11	2015/06/16	2015/06/17	ATL SOP-00197	Atl. PIRI v3 m
TEH in Soil (PIRI) (1, 4)	1	2015/06/16	2015/06/18	ATL SOP-00197	Atl. PIRI v3 m
Metals Leach TCLP/CGSB extraction (3)	3	2015/06/30	2015/07/01	ATL SOP 00058	EPA 6020A R1 m
Metals Solids Acid Extr. ICPMS (3)	12	2015/06/18	2015/06/19	ATL SOP 00058	EPA 6020A R1 m
Moisture	12	N/A	2015/06/16	ATL SOP-00196	OMOE Handbook 1983 m
PAH in sediment by GC/MS (Low Level) (3, 4)	12	2015/06/16	2015/06/18	ATL SOP 00102	EPA 8270D 2007 m
Low Level PCB in Soil by GC-ECD (3)	12	2015/06/17	2015/06/18	ATL SOP 00106	EPA 8082 m
PCB Aroclor sum (low level soil) (3)	12	N/A	2015/06/18		Auto Calc.
pH (5:1 DI Water Extract) (3)	12	2015/06/18	2015/06/18	ATL SOP 00003	SM 22 4500-H+ B m
VPH in Soil (PIRI) (1)	12	2015/06/16	2015/06/17	ATL SOP 00199	Atl. PIRI v3 m
TCLP Inorganic extraction - pH (3)	3	N/A	2015/06/30	ATL SOP 00035	EPA 1311 m
TCLP Inorganic extraction - Weight (3)	3	N/A	2015/06/30	ATL SOP 00035	EPA 1311 m
ModTPH (T1) Calc. for Soil	11	N/A	2015/06/17	N/A	Atl. PIRI v3 m
ModTPH (T1) Calc. for Soil	1	N/A	2015/06/18	N/A	Atl. PIRI v3 m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Maxxam Analytics Mississauga
(2) Reported on a dry weight basis.
(3) This test was performed by Maxxam Bedford
(4) Soils are reported on a dry weight basis unless otherwise specified.

Maxxam Analytics International Corporation o/a Maxxam Analytics 49-55 Elizabeth Ave, Suite 101A, St.John's, NL, Canada A1A 1W9 Tel: 709-754-0203 Toll Free: 888-492-7227 Fax: 709-754-8612 www.maxxamanalytics.com

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Your P.O. #: CALLUP #069
Your Project #: R.076635.013
Site Location: LAWN DREDGING
Your C.O.C. #: C#491999-10-01

Attention:Megan Vivian

Public Works & Government Services Canada
PO Box 4600
10 Barter's Hill
St. John's , NL
A1C 5T2

Report Date: 2015/07/02
Report #: R3530332
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

MAXXAM JOB #: B5B2859
Received: 2015/06/12, 14:30

Encryption Key Rachael Mansfield
02 Jul 2015 16:45:42 -03:00

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Heather Macumber, Project Manager
Email: HMacumber@maxxam.ca
Phone# (902)420-0203 Ext:226
==========
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Maxxam Job #: B5B2859
Report Date: 2015/07/02

Public Works & Government Services Canada
Client Project #: R.076635.013
Site Location: LAWN DREDGING
Your P.O. #: CALLUP #069
Sampler Initials: EB

RBCA HYDROCARBONS IN SOIL (SEDIMENT)

Maxxam ID		AKZ794	AKZ821	AKZ822	AKZ823	AKZ824		
Sampling Date		2015/06/09	2015/06/09	2015/06/09	2015/06/09	2015/06/09		
COC Number		C#491999-10-01	C#491999-10-01	C#491999-10-01	C#491999-10-01	C#491999-10-01		
	Units	SAMPLE 1	SAMPLE 1B	SAMPLE 2	SAMPLE 3	SAMPLE 3B	RDL	QC Batch
Petroleum Hydrocarbons								
Benzene	mg/kg	ND	ND	ND	ND	ND	0.025	4067882
Toluene	mg/kg	ND	ND	ND	ND	ND	0.025	4067882
Ethylbenzene	mg/kg	ND	ND	ND	ND	ND	0.025	4067882
Total Xylenes	mg/kg	ND	ND	ND	ND	ND	0.050	4067882
C6 - C10 (less BTEX)	mg/kg	ND	ND	ND	ND	ND	2.5	4067882
>C10-C16 Hydrocarbons	mg/kg	ND	ND	ND	18	ND	10	4067681
>C16-C21 Hydrocarbons	mg/kg	ND	ND	ND	ND	ND	10	4067681
>C21-<C32 Hydrocarbons	mg/kg	42	76	45	ND	ND	15	4067681
Modified TPH (Tier1)	mg/kg	42	76	45	18	ND	15	4063015
Reached Baseline at C32	mg/kg	No	No	No	Yes	Yes	N/A	4067681
Hydrocarbon Resemblance	mg/kg	COMMENT (1)	COMMENT (1)	COMMENT (1)	COMMENT (2)		N/A	4067681
Surrogate Recovery (%)								
Isobutylbenzene - Extractable	%	98	101	101	102	100		4067681
n-Dotriacontane - Extractable	%	101	105	104	102	104		4067681
Isobutylbenzene - Volatile	%	114	116	108	106	102		4067882

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable
(1) No resemblance to petroleum products in lube oil range.
(2) Weathered fuel oil fraction.

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Maxxam Job #: B5B2859
Report Date: 2015/07/02

Public Works & Government Services Canada
Client Project #: R.076635.013
Site Location: LAWN DREDGING
Your P.O. #: CALLUP #069
Sampler Initials: EB

RBCA HYDROCARBONS IN SOIL (SEDIMENT)

Maxxam ID		AKZ825	AKZ826	AKZ827	AKZ828	AKZ829		
Sampling Date		2015/06/09	2015/06/09	2015/06/09	2015/06/09	2015/06/09		
COC Number		C#491999-10-01	C#491999-10-01	C#491999-10-01	C#491999-10-01	C#491999-10-01		
	Units	SAMPLE 4	SAMPLE 4B	SAMPLE 5	SAMPLE 5B	SAMPLE 6	RDL	QC Batch
Petroleum Hydrocarbons								
Benzene	mg/kg	ND	ND	ND	ND	ND	0.025	4067882
Toluene	mg/kg	ND	ND	ND	ND	ND	0.025	4067882
Ethylbenzene	mg/kg	ND	ND	ND	ND	ND	0.025	4067882
Total Xylenes	mg/kg	ND	ND	ND	ND	ND	0.050	4067882
C6 - C10 (less BTEX)	mg/kg	ND	ND	ND	ND	ND	2.5	4067882
>C10-C16 Hydrocarbons	mg/kg	ND	ND	ND	ND	ND	10	4067681
>C16-C21 Hydrocarbons	mg/kg	ND	ND	ND	ND	ND	10	4067681
>C21-<C32 Hydrocarbons	mg/kg	ND	ND	ND	ND	120	15	4067681
Modified TPH (Tier1)	mg/kg	ND	ND	ND	ND	120	15	4063015
Reached Baseline at C32	mg/kg	Yes	Yes	Yes	Yes	No	N/A	4067681
Hydrocarbon Resemblance	mg/kg					COMMENT (1)	N/A	4067681
Surrogate Recovery (%)								
Isobutylbenzene - Extractable	%	102	101	105	101	103		4067681
n-Dotriacontane - Extractable	%	99	101	103	102	107		4067681
Isobutylbenzene - Volatile	%	106	104	105	103	112		4067882

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable
(1) No resemblance to petroleum products in lube oil range.

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Report Date: 2015/07/02

Public Works & Government Services Canada
Client Project #: R.076635.013
Site Location: LAWN DREDGING
Your P.O. #: CALLUP #069
Sampler Initials: EB

RBCA HYDROCARBONS IN SOIL (SEDIMENT)

Maxxam ID		AKZ830	AKZ831		
Sampling Date		2015/06/09	2015/06/09		
COC Number		C#491999-10-01	C#491999-10-01		
	Units	SAMPLE 7	SAMPLE 8	RDL	QC Batch
Petroleum Hydrocarbons					
Benzene	mg/kg	ND	ND	0.025	4067882
Toluene	mg/kg	ND	ND	0.025	4067882
Ethylbenzene	mg/kg	ND	ND	0.025	4067882
Total Xylenes	mg/kg	ND	ND	0.050	4067882
C6 - C10 (less BTEX)	mg/kg	ND	ND	2.5	4067882
>C10-C16 Hydrocarbons	mg/kg	ND	ND	10	4067681
>C16-C21 Hydrocarbons	mg/kg	ND	ND	10	4067681
>C21-<C32 Hydrocarbons	mg/kg	41	ND	15	4067681
Modified TPH (Tier1)	mg/kg	41	ND	15	4063015
Reached Baseline at C32	mg/kg	No	Yes	N/A	4067681
Hydrocarbon Resemblance	mg/kg	COMMENT (1)		N/A	4067681
Surrogate Recovery (%)					
Isobutylbenzene - Extractable	%	99	104		4067681
n-Dotriacontane - Extractable	%	102	106		4067681
Isobutylbenzene - Volatile	%	107	95		4067882

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable
(1) No resemblance to petroleum products in lube oil range.

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Maxxam Job #: B5B2859
Report Date: 2015/07/02

Public Works & Government Services Canada
Client Project #: R.076635.013
Site Location: LAWN DREDGING
Your P.O. #: CALLUP #069
Sampler Initials: EB

ATLANTIC TCLP LEACHATE + METALS (SEDIMENT)

Maxxam ID		AKZ824	AKZ824	AKZ829	AKZ830		
Sampling Date		2015/06/09	2015/06/09	2015/06/09	2015/06/09		
COC Number		C#491999-10-01	C#491999-10-01	C#491999-10-01	C#491999-10-01		
	Units	SAMPLE 3B	SAMPLE 3B Lab-Dup	SAMPLE 6	SAMPLE 7	RDL	QC Batch
Inorganics							
Sample Weight (as received)	g	100	100	100	100	N/A	4086486
Initial pH	N/A	5.5	NA	8.3	8.3		4086488
Final pH	N/A	5.0	5.0	5.1	5.0		4086488
Metals							
Leachable Arsenic (As)	ug/L	25	30	24	38	20	4086482

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

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Maxxam Job #: B5B2859
Report Date: 2015/07/02

Public Works & Government Services Canada
Client Project #: R.076635.013
Site Location: LAWN DREDGING
Your P.O. #: CALLUP #069
Sampler Initials: EB

RESULTS OF ANALYSES OF SEDIMENT

Maxxam ID		AKZ794	AKZ821	AKZ822	AKZ823		AKZ823	
Sampling Date		2015/06/09	2015/06/09	2015/06/09	2015/06/09		2015/06/09	
COC Number		C#491999-10-01	C#491999-10-01	C#491999-10-01	C#491999-10-01		C#491999-10-01	
	Units	SAMPLE 1	SAMPLE 1B	SAMPLE 2	SAMPLE 3	RDL	SAMPLE 3 Lab-Dup	QC Batch
Inorganics								
Free Cyanide	ug/g	0.02	0.03	0.03	0.01	0.01		4071212
Moisture	%	34	46	34	26	1.0		4065760
Soluble (5:1) pH	pH	6.63	6.44	6.81	6.89	N/A	6.86	4071340

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Maxxam ID		AKZ824	AKZ825	AKZ826	AKZ827	AKZ828		
Sampling Date		2015/06/09	2015/06/09	2015/06/09	2015/06/09	2015/06/09		
COC Number		C#491999-10-01	C#491999-10-01	C#491999-10-01	C#491999-10-01	C#491999-10-01		
	Units	SAMPLE 3B	SAMPLE 4	SAMPLE 4B	SAMPLE 5	SAMPLE 5B	RDL	QC Batch
Inorganics								
Free Cyanide	ug/g	ND	ND	0.01	0.01	0.01	0.01	4071212
Moisture	%	24	24	27	24	29	1.0	4065760
Soluble (5:1) pH	pH	6.78	6.63	6.74	7.04	7.07	N/A	4071340

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
N/A = Not Applicable

Maxxam ID		AKZ829	AKZ830	AKZ831		
Sampling Date		2015/06/09	2015/06/09	2015/06/09		
COC Number		C#491999-10-01	C#491999-10-01	C#491999-10-01		
	Units	SAMPLE 6	SAMPLE 7	SAMPLE 8	RDL	QC Batch
Inorganics						
Free Cyanide	ug/g	0.04	0.02	0.01	0.01	4071212
Moisture	%	59	34	18	1.0	4065760
Soluble (5:1) pH	pH	7.65	7.85	8.05	N/A	4071340

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Maxxam Job #: B5B2859
Report Date: 2015/07/02

Public Works & Government Services Canada
Client Project #: R.076635.013
Site Location: LAWN DREDGING
Your P.O. #: CALLUP #069
Sampler Initials: EB

PCB'S AND DDT BY GC-ECD (SEDIMENT)

Maxxam ID		AKZ794	AKZ794	AKZ821	AKZ822	AKZ823		
Sampling Date		2015/06/09	2015/06/09	2015/06/09	2015/06/09	2015/06/09		
COC Number		C#491999-10-01	C#491999-10-01	C#491999-10-01	C#491999-10-01	C#491999-10-01		
	Units	SAMPLE 1	SAMPLE 1 Lab-Dup	SAMPLE 1B	SAMPLE 2	SAMPLE 3	RDL	QC Batch
PCBs								
Aroclor 1016	mg/kg	ND	ND	ND	ND	ND	0.010	4069074
Aroclor 1221	mg/kg	ND	ND	ND	ND	ND	0.010	4069074
Aroclor 1232	mg/kg	ND	ND	ND	ND	ND	0.010	4069074
Aroclor 1248	mg/kg	ND	ND	ND	ND	ND	0.010	4069074
Aroclor 1242	mg/kg	ND	ND	ND	ND	ND	0.010	4069074
Aroclor 1254	mg/kg	ND	ND	ND	ND	ND	0.010	4069074
Aroclor 1260	mg/kg	ND	ND	ND	ND	ND	0.010	4069074
Calculated Total PCB	mg/kg	ND		ND	ND	ND	0.010	4063761
Surrogate Recovery (%)								
Decachlorobiphenyl	%	93 (1)	96 (1)	94 (1)	99 (1)	102 (1)		4069074

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
(1) PCB:Unidentified (possibly halogenated) compounds detected.

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Maxxam Job #: B5B2859
Report Date: 2015/07/02

Public Works & Government Services Canada
Client Project #: R.076635.013
Site Location: LAWN DREDGING
Your P.O. #: CALLUP #069
Sampler Initials: EB

PCB'S AND DDT BY GC-ECD (SEDIMENT)

Maxxam ID		AKZ824	AKZ825	AKZ826	AKZ827	AKZ828		
Sampling Date		2015/06/09	2015/06/09	2015/06/09	2015/06/09	2015/06/09		
COC Number		C#491999-10-01	C#491999-10-01	C#491999-10-01	C#491999-10-01	C#491999-10-01		
	Units	SAMPLE 3B	SAMPLE 4	SAMPLE 4B	SAMPLE 5	SAMPLE 5B	RDL	QC Batch
PCBs								
Aroclor 1016	mg/kg	ND	ND	ND	ND	ND	0.010	4069074
Aroclor 1221	mg/kg	ND	ND	ND	ND	ND	0.010	4069074
Aroclor 1232	mg/kg	ND	ND	ND	ND	ND	0.010	4069074
Aroclor 1248	mg/kg	ND	ND	ND	ND	ND	0.010	4069074
Aroclor 1242	mg/kg	ND	ND	ND	ND	ND	0.010	4069074
Aroclor 1254	mg/kg	ND	ND	ND	ND	ND	0.010	4069074
Aroclor 1260	mg/kg	ND	ND	ND	ND	ND	0.010	4069074
Calculated Total PCB	mg/kg	ND	ND	ND	ND	ND	0.010	4063761
Surrogate Recovery (%)								
Decachlorobiphenyl	%	99 (1)	97 (1)	109	98 (1)	104 (1)		4069074

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected
(1) PCB:Unidentified (possibly halogenated) compounds detected.

Maxxam ID		AKZ829	AKZ830	AKZ831		
Sampling Date		2015/06/09	2015/06/09	2015/06/09		
COC Number		C#491999-10-01	C#491999-10-01	C#491999-10-01		
	Units	SAMPLE 6	SAMPLE 7	SAMPLE 8	RDL	QC Batch
PCBs						
Aroclor 1016	mg/kg	ND	ND	ND	0.010	4069074
Aroclor 1221	mg/kg	ND	ND	ND	0.010	4069074
Aroclor 1232	mg/kg	ND	ND	ND	0.010	4069074
Aroclor 1248	mg/kg	ND	ND	ND	0.010	4069074
Aroclor 1242	mg/kg	ND	ND	ND	0.010	4069074
Aroclor 1254	mg/kg	ND	ND	ND	0.010	4069074
Aroclor 1260	mg/kg	ND	ND	ND	0.010	4069074
Calculated Total PCB	mg/kg	ND	ND	ND	0.010	4063761
Surrogate Recovery (%)						
Decachlorobiphenyl	%	91	94	95		4069074

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Maxxam Job #: B5B2859
Report Date: 2015/07/02

Public Works & Government Services Canada
Client Project #: R.076635.013
Site Location: LAWN DREDGING
Your P.O. #: CALLUP #069
Sampler Initials: EB

ELEMENTS BY ATOMIC SPECTROSCOPY (SEDIMENT)

Maxxam ID		AKZ794	AKZ821	AKZ822	AKZ823	AKZ823		
Sampling Date		2015/06/09	2015/06/09	2015/06/09	2015/06/09	2015/06/09		
COC Number		C#491999-10-01	C#491999-10-01	C#491999-10-01	C#491999-10-01	C#491999-10-01		
	Units	SAMPLE 1	SAMPLE 1B	SAMPLE 2	SAMPLE 3	SAMPLE 3 Lab-Dup	RDL	QC Batch
Metals								
Acid Extractable Aluminum (Al)	mg/kg	8100	8300	8100	7900	7900	10	4071031
Acid Extractable Antimony (Sb)	mg/kg	ND	ND	ND	ND	ND	2.0	4071031
Acid Extractable Arsenic (As)	mg/kg	6.4	10	7.1	3.4	3.2	2.0	4071031
Acid Extractable Barium (Ba)	mg/kg	18	43	19	14	10	5.0	4071031
Acid Extractable Beryllium (Be)	mg/kg	ND	ND	ND	ND	ND	2.0	4071031
Acid Extractable Boron (B)	mg/kg	ND	ND	ND	ND	ND	50	4071031
Acid Extractable Cadmium (Cd)	mg/kg	0.32	0.31	ND	ND	ND	0.30	4071031
Acid Extractable Chromium (Cr)	mg/kg	9.7	11	8.7	8.1	8.6	2.0	4071031
Acid Extractable Cobalt (Co)	mg/kg	5.3	5.1	4.5	4.6	4.8	1.0	4071031
Acid Extractable Copper (Cu)	mg/kg	8.7	7.4	7.9	3.3	2.9	2.0	4071031
Acid Extractable Iron (Fe)	mg/kg	16000	21000	15000	15000	15000	50	4071031
Acid Extractable Lead (Pb)	mg/kg	15	12	15	4.5	4.3	0.50	4071031
Acid Extractable Manganese (Mn)	mg/kg	390	390	370	380	390	2.0	4071031
Acid Extractable Mercury (Hg)	mg/kg	ND	ND	ND	ND	ND	0.10	4071031
Acid Extractable Molybdenum (Mo)	mg/kg	3.0	3.0	3.0	ND	ND	2.0	4071031
Acid Extractable Nickel (Ni)	mg/kg	9.1	10	8.0	8.1	8.7	2.0	4071031
Acid Extractable Selenium (Se)	mg/kg	ND	ND	ND	ND	ND	1.0	4071031
Acid Extractable Silver (Ag)	mg/kg	ND	ND	ND	ND	ND	0.50	4071031
Acid Extractable Strontium (Sr)	mg/kg	25	38	25	19	18	5.0	4071031
Acid Extractable Thallium (Tl)	mg/kg	ND	ND	ND	ND	ND	0.10	4071031
Acid Extractable Tin (Sn)	mg/kg	ND	ND	ND	ND	ND	2.0	4071031
Acid Extractable Uranium (U)	mg/kg	1.9	2.4	2.1	1.3	1.3	0.10	4071031
Acid Extractable Vanadium (V)	mg/kg	23	24	24	20	20	2.0	4071031
Acid Extractable Zinc (Zn)	mg/kg	68	61	65	50	49	5.0	4071031

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected

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Public Works & Government Services Canada
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Your P.O. #: CALLUP #069
Sampler Initials: EB

ELEMENTS BY ATOMIC SPECTROSCOPY (SEDIMENT)

Maxxam ID		AKZ824	AKZ825	AKZ826	AKZ827	AKZ828		
Sampling Date		2015/06/09	2015/06/09	2015/06/09	2015/06/09	2015/06/09		
COC Number		C#491999-10-01	C#491999-10-01	C#491999-10-01	C#491999-10-01	C#491999-10-01		
	Units	SAMPLE 3B	SAMPLE 4	SAMPLE 4B	SAMPLE 5	SAMPLE 5B	RDL	QC Batch
Metals								
Acid Extractable Aluminum (Al)	mg/kg	7800	8600	8100	8000	7700	10	4071031
Acid Extractable Antimony (Sb)	mg/kg	ND	ND	ND	ND	ND	2.0	4071031
Acid Extractable Arsenic (As)	mg/kg	18	3.0	2.6	3.7	3.0	2.0	4071031
Acid Extractable Barium (Ba)	mg/kg	78	6.4	6.3	16	16	5.0	4071031
Acid Extractable Beryllium (Be)	mg/kg	ND	ND	ND	ND	ND	2.0	4071031
Acid Extractable Boron (B)	mg/kg	ND	ND	ND	ND	ND	50	4071031
Acid Extractable Cadmium (Cd)	mg/kg	ND	ND	ND	ND	ND	0.30	4071031
Acid Extractable Chromium (Cr)	mg/kg	8.5	10	9.2	9.1	8.4	2.0	4071031
Acid Extractable Cobalt (Co)	mg/kg	4.7	5.3	5.1	4.9	4.9	1.0	4071031
Acid Extractable Copper (Cu)	mg/kg	3.1	3.8	3.0	4.3	3.9	2.0	4071031
Acid Extractable Iron (Fe)	mg/kg	16000	17000	15000	15000	14000	50	4071031
Acid Extractable Lead (Pb)	mg/kg	5.2	3.9	3.8	6.3	5.6	0.50	4071031
Acid Extractable Manganese (Mn)	mg/kg	410	440	430	400	400	2.0	4071031
Acid Extractable Mercury (Hg)	mg/kg	ND	ND	ND	ND	ND	0.10	4071031
Acid Extractable Molybdenum (Mo)	mg/kg	ND	ND	ND	2.0	ND	2.0	4071031
Acid Extractable Nickel (Ni)	mg/kg	8.3	11	9.4	8.9	8.5	2.0	4071031
Acid Extractable Selenium (Se)	mg/kg	ND	ND	ND	ND	ND	1.0	4071031
Acid Extractable Silver (Ag)	mg/kg	ND	ND	ND	ND	ND	0.50	4071031
Acid Extractable Strontium (Sr)	mg/kg	16	14	14	18	16	5.0	4071031
Acid Extractable Thallium (Tl)	mg/kg	ND	ND	ND	ND	ND	0.10	4071031
Acid Extractable Tin (Sn)	mg/kg	ND	ND	ND	2.7	ND	2.0	4071031
Acid Extractable Uranium (U)	mg/kg	0.96	0.92	0.87	1.5	0.92	0.10	4071031
Acid Extractable Vanadium (V)	mg/kg	19	20	20	21	19	2.0	4071031
Acid Extractable Zinc (Zn)	mg/kg	50	54	51	58	52	5.0	4071031

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Your P.O. #: CALLUP #069
Sampler Initials: EB

ELEMENTS BY ATOMIC SPECTROSCOPY (SEDIMENT)

Maxxam ID		AKZ829	AKZ830	AKZ831		
Sampling Date		2015/06/09	2015/06/09	2015/06/09		
COC Number		C#491999-10-01	C#491999-10-01	C#491999-10-01		
	Units	SAMPLE 6	SAMPLE 7	SAMPLE 8	RDL	QC Batch
Metals						
Acid Extractable Aluminum (Al)	mg/kg	9000	12000	8800	10	4071031
Acid Extractable Antimony (Sb)	mg/kg	ND	ND	ND	2.0	4071031
Acid Extractable Arsenic (As)	mg/kg	17	25	5.7	2.0	4071031
Acid Extractable Barium (Ba)	mg/kg	61	150	29	5.0	4071031
Acid Extractable Beryllium (Be)	mg/kg	ND	ND	ND	2.0	4071031
Acid Extractable Boron (B)	mg/kg	76	ND	ND	50	4071031
Acid Extractable Cadmium (Cd)	mg/kg	0.90	0.91	ND	0.30	4071031
Acid Extractable Chromium (Cr)	mg/kg	15	15	9.8	2.0	4071031
Acid Extractable Cobalt (Co)	mg/kg	6.3	7.5	5.7	1.0	4071031
Acid Extractable Copper (Cu)	mg/kg	29	41	8.7	2.0	4071031
Acid Extractable Iron (Fe)	mg/kg	23000	24000	17000	50	4071031
Acid Extractable Lead (Pb)	mg/kg	36	55	12	0.50	4071031
Acid Extractable Manganese (Mn)	mg/kg	350	460	450	2.0	4071031
Acid Extractable Mercury (Hg)	mg/kg	ND	ND	ND	0.10	4071031
Acid Extractable Molybdenum (Mo)	mg/kg	12	5.5	ND	2.0	4071031
Acid Extractable Nickel (Ni)	mg/kg	17	18	9.8	2.0	4071031
Acid Extractable Selenium (Se)	mg/kg	ND	ND	ND	1.0	4071031
Acid Extractable Silver (Ag)	mg/kg	ND	ND	ND	0.50	4071031
Acid Extractable Strontium (Sr)	mg/kg	74	54	28	5.0	4071031
Acid Extractable Thallium (Tl)	mg/kg	0.17	0.16	ND	0.10	4071031
Acid Extractable Tin (Sn)	mg/kg	5.1	ND	ND	2.0	4071031
Acid Extractable Uranium (U)	mg/kg	3.3	2.1	0.77	0.10	4071031
Acid Extractable Vanadium (V)	mg/kg	39	37	24	2.0	4071031
Acid Extractable Zinc (Zn)	mg/kg	120	130	65	5.0	4071031

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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Report Date: 2015/07/02

Public Works & Government Services Canada
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Sampler Initials: EB

SEMI-VOLATILE ORGANICS BY GC-MS (SEDIMENT)

Maxxam ID		AKZ794	AKZ794		AKZ821		AKZ822		
Sampling Date		2015/06/09	2015/06/09		2015/06/09		2015/06/09		
COC Number		C#491999-10-01	C#491999-10-01		C#491999-10-01		C#491999-10-01		
	Units	SAMPLE 1	SAMPLE 1 Lab-Dup	RDL	SAMPLE 1B	RDL	SAMPLE 2	RDL	QC Batch
Polyaromatic Hydrocarbons									
1-Methylnaphthalene	mg/kg	ND	ND	0.0050	ND	0.0050	ND	0.0050	4067954
2-Methylnaphthalene	mg/kg	ND	ND	0.0050	ND	0.0050	ND	0.0050	4067954
Acenaphthene	mg/kg	0.011	ND	0.0050	ND	0.0050	0.010	0.0050	4067954
Acenaphthylene	mg/kg	0.010	ND	0.0050	ND	0.0050	ND	0.0050	4067954
Anthracene	mg/kg	0.045	0.036	0.0050	0.015	0.0050	0.036	0.0050	4067954
Benzo(a)anthracene	mg/kg	0.18	0.13	0.0050	0.077	0.0050	0.12	0.0050	4067954
Benzo(a)pyrene	mg/kg	0.15	0.12	0.0050	0.063	0.0050	0.10	0.0050	4067954
Benzo(b)fluoranthene	mg/kg	0.13	0.11	0.0050	0.058	0.0050	0.096	0.0050	4067954
Benzo(g,h,i)perylene	mg/kg	0.11	0.086	0.0050	ND (1)	0.070	0.068	0.0050	4067954
Benzo(j)fluoranthene	mg/kg	0.081	0.062	0.0050	0.033	0.0050	0.054	0.0050	4067954
Benzo(k)fluoranthene	mg/kg	0.073	0.062	0.0050	0.033	0.0050	0.052	0.0050	4067954
Chrysene	mg/kg	0.17	0.14	0.0050	0.072	0.0050	0.13	0.0050	4067954
Dibenz(a,h)anthracene	mg/kg	0.027	0.021	0.0050	ND	0.0050	0.017	0.0050	4067954
Fluoranthene	mg/kg	0.42	0.32	0.0050	0.16	0.0050	0.31	0.0050	4067954
Fluorene	mg/kg	0.026	0.018	0.0050	ND	0.0050	0.024	0.0050	4067954
Indeno(1,2,3-cd)pyrene	mg/kg	0.086	0.070	0.0050	0.034	0.0050	0.059	0.0050	4067954
Naphthalene	mg/kg	0.0097	ND	0.0050	0.0074	0.0050	0.0090	0.0050	4067954
Perylene	mg/kg	0.099	0.082	0.0050	0.46	0.0050	0.049	0.0050	4067954
Phenanthrene	mg/kg	0.22	0.14	0.0050	0.057	0.0050	0.20	0.0050	4067954
Pyrene	mg/kg	0.34	0.25	0.0050	0.13	0.0050	0.23	0.0050	4067954
Surrogate Recovery (%)									
D10-Anthracene	%	102	94		98		98		4067954
D14-Terphenyl	%	109	102		103		104		4067954
D8-Acenaphthylene	%	89	87		71		92		4067954

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate
ND = Not detected
(1) Elevated PAH RDL(s) due to matrix / co-extractive interference.

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Sampler Initials: EB

SEMI-VOLATILE ORGANICS BY GC-MS (SEDIMENT)

Maxxam ID		AKZ823	AKZ824	AKZ825	AKZ826	AKZ827		
Sampling Date		2015/06/09	2015/06/09	2015/06/09	2015/06/09	2015/06/09		
COC Number		C#491999-10-01	C#491999-10-01	C#491999-10-01	C#491999-10-01	C#491999-10-01		
	Units	SAMPLE 3	SAMPLE 3B	SAMPLE 4	SAMPLE 4B	SAMPLE 5	RDL	QC Batch
Polyaromatic Hydrocarbons								
1-Methylnaphthalene	mg/kg	ND	ND	ND	ND	ND	0.0050	4067954
2-Methylnaphthalene	mg/kg	ND	ND	ND	ND	ND	0.0050	4067954
Acenaphthene	mg/kg	ND	0.029	ND	ND	ND	0.0050	4067954
Acenaphthylene	mg/kg	ND	ND	ND	ND	ND	0.0050	4067954
Anthracene	mg/kg	ND	0.10	ND	0.0075	ND	0.0050	4067954
Benzo(a)anthracene	mg/kg	0.012	0.18	ND	0.015	0.014	0.0050	4067954
Benzo(a)pyrene	mg/kg	0.0089	0.16	ND	0.0093	0.013	0.0050	4067954
Benzo(b)fluoranthene	mg/kg	0.0071	0.12	ND	ND	0.012	0.0050	4067954
Benzo(g,h,i)perylene	mg/kg	0.0073	0.093	ND	ND	0.0098	0.0050	4067954
Benzo(j)fluoranthene	mg/kg	ND	0.064	ND	ND	0.0076	0.0050	4067954
Benzo(k)fluoranthene	mg/kg	ND	0.072	ND	ND	0.0071	0.0050	4067954
Chrysene	mg/kg	0.011	0.18	ND	0.013	0.015	0.0050	4067954
Dibenz(a,h)anthracene	mg/kg	ND	0.024	ND	ND	ND	0.0050	4067954
Fluoranthene	mg/kg	0.027	0.43	ND	0.031	0.040	0.0050	4067954
Fluorene	mg/kg	ND	0.041	ND	ND	ND	0.0050	4067954
Indeno(1,2,3-cd)pyrene	mg/kg	ND	0.083	ND	ND	0.0078	0.0050	4067954
Naphthalene	mg/kg	ND	ND	ND	ND	ND	0.0050	4067954
Perylene	mg/kg	0.0077	0.048	0.014	0.013	0.0098	0.0050	4067954
Phenanthrene	mg/kg	0.015	0.36	ND	0.027	0.020	0.0050	4067954
Pyrene	mg/kg	0.027	0.33	ND	0.026	0.031	0.0050	4067954
Surrogate Recovery (%)								
D10-Anthracene	%	100	94	99	107	95		4067954
D14-Terphenyl	%	104	102	103	114	101		4067954
D8-Acenaphthylene	%	94	93	93	105	95		4067954

RDL = Reportable Detection Limit
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SEMI-VOLATILE ORGANICS BY GC-MS (SEDIMENT)

Maxxam ID		AKZ828	AKZ829	AKZ830	AKZ831		
Sampling Date		2015/06/09	2015/06/09	2015/06/09	2015/06/09		
COC Number		C#491999-10-01	C#491999-10-01	C#491999-10-01	C#491999-10-01		
	Units	SAMPLE 5B	SAMPLE 6	SAMPLE 7	SAMPLE 8	RDL	QC Batch
Polyaromatic Hydrocarbons							
1-Methylnaphthalene	mg/kg	ND	ND	ND	ND	0.0050	4067954
2-Methylnaphthalene	mg/kg	ND	ND	ND	ND	0.0050	4067954
Acenaphthene	mg/kg	ND	0.015	ND	0.0061	0.0050	4067954
Acenaphthylene	mg/kg	ND	ND	ND	ND	0.0050	4067954
Anthracene	mg/kg	ND	0.085	0.037	0.014	0.0050	4067954
Benzo(a)anthracene	mg/kg	0.0092	0.21	0.11	0.042	0.0050	4067954
Benzo(a)pyrene	mg/kg	0.0078	0.16	0.084	0.037	0.0050	4067954
Benzo(b)fluoranthene	mg/kg	0.0075	0.15	0.076	0.034	0.0050	4067954
Benzo(g,h,i)perylene	mg/kg	0.0082	0.084	0.050	0.024	0.0050	4067954
Benzo(j)fluoranthene	mg/kg	ND	0.089	0.044	0.021	0.0050	4067954
Benzo(k)fluoranthene	mg/kg	ND	0.077	0.048	0.019	0.0050	4067954
Chrysene	mg/kg	0.0099	0.21	0.14	0.045	0.0050	4067954
Dibenz(a,h)anthracene	mg/kg	ND	0.021	0.013	ND	0.0050	4067954
Fluoranthene	mg/kg	0.029	0.54	0.26	0.10	0.0050	4067954
Fluorene	mg/kg	ND	0.040	0.019	0.0098	0.0050	4067954
Indeno(1,2,3-cd)pyrene	mg/kg	ND	0.072	0.039	0.020	0.0050	4067954
Naphthalene	mg/kg	ND	ND	ND	ND	0.0050	4067954
Perylene	mg/kg	0.018	0.19	0.15	0.019	0.0050	4067954
Phenanthrene	mg/kg	0.016	0.23	0.15	0.066	0.0050	4067954
Pyrene	mg/kg	0.022	0.41	0.20	0.077	0.0050	4067954
Surrogate Recovery (%)							
D10-Anthracene	%	101	103	105	95		4067954
D14-Terphenyl	%	106	100	105	103		4067954
D8-Acenaphthylene	%	94	91	98	93		4067954

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
ND = Not detected

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GENERAL COMMENTS

Revised report - Additional Leachate + As analysis requested on the below samples by Megan. HM June 30/15

Sample 1
Sample 6
Sample 7

Results relate only to the items tested.

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Sampler Initials: EB

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
4065760	ACL	RPD	Moisture	2015/06/16	14		%	25
4067681	SPI	Matrix Spike	Isobutylbenzene - Extractable	2015/06/17		106	%	30 - 130
			n-Dotriacontane - Extractable	2015/06/17		116	%	30 - 130
			>C10-C16 Hydrocarbons	2015/06/17		95	%	30 - 130
			>C16-C21 Hydrocarbons	2015/06/17		94	%	30 - 130
			>C21-<C32 Hydrocarbons	2015/06/17		105	%	30 - 130
4067681	SPI	Spiked Blank	Isobutylbenzene - Extractable	2015/06/17		97	%	30 - 130
			n-Dotriacontane - Extractable	2015/06/17		108	%	30 - 130
			>C10-C16 Hydrocarbons	2015/06/17		84	%	30 - 130
			>C16-C21 Hydrocarbons	2015/06/17		88	%	30 - 130
			>C21-<C32 Hydrocarbons	2015/06/17		92	%	30 - 130
4067681	SPI	Method Blank	Isobutylbenzene - Extractable	2015/06/17		101	%	30 - 130
			n-Dotriacontane - Extractable	2015/06/17		102	%	30 - 130
			>C10-C16 Hydrocarbons	2015/06/17	ND, RDL=10		mg/kg	
			>C16-C21 Hydrocarbons	2015/06/17	ND, RDL=10		mg/kg	
			>C21-<C32 Hydrocarbons	2015/06/17	ND, RDL=15		mg/kg	
4067681	SPI	RPD	>C10-C16 Hydrocarbons	2015/06/17	NC		%	50
			>C16-C21 Hydrocarbons	2015/06/17	NC		%	50
			>C21-<C32 Hydrocarbons	2015/06/17	NC		%	50
4067882	MCT	Spiked Blank	Isobutylbenzene - Volatile	2015/06/17		96	%	60 - 130
			Benzene	2015/06/17		86	%	60 - 140
			Toluene	2015/06/17		83	%	60 - 140
			Ethylbenzene	2015/06/17		84	%	60 - 140
			Total Xylenes	2015/06/17		92	%	60 - 140
4067882	MCT	Method Blank	Isobutylbenzene - Volatile	2015/06/17		96	%	60 - 130
			Benzene	2015/06/17	ND, RDL=0.025		mg/kg	
			Toluene	2015/06/17	ND, RDL=0.025		mg/kg	
			Ethylbenzene	2015/06/17	ND, RDL=0.025		mg/kg	
			Total Xylenes	2015/06/17	ND, RDL=0.050		mg/kg	
			C6 - C10 (less BTEX)	2015/06/17	ND, RDL=2.5		mg/kg	
4067882	MCT	RPD	Benzene	2015/06/17	NC		%	50
			Toluene	2015/06/17	NC		%	50
			Ethylbenzene	2015/06/17	NC		%	50
			Total Xylenes	2015/06/17	NC		%	50
			C6 - C10 (less BTEX)	2015/06/17	NC		%	50
4067954	GTH	Matrix Spike [AKZ794-01]	D10-Anthracene	2015/06/18		92	%	30 - 130
			D14-Terphenyl	2015/06/18		101	%	30 - 130
			D8-Acenaphthylene	2015/06/18		88	%	30 - 130
			1-Methylnaphthalene	2015/06/18		97	%	30 - 130
			2-Methylnaphthalene	2015/06/18		104	%	30 - 130
			Acenaphthene	2015/06/18		96	%	30 - 130
			Acenaphthylene	2015/06/18		80	%	30 - 130

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Maxxam Job #: B5B2859
Report Date: 2015/07/02

Public Works & Government Services Canada
Client Project #: R.076635.013
Site Location: LAWN DREDGING
Your P.O. #: CALLUP #069
Sampler Initials: EB

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Anthracene	2015/06/18		102	%	30 - 130
			Benzo(a)anthracene	2015/06/18		NC	%	30 - 130
			Benzo(a)pyrene	2015/06/18		NC	%	30 - 130
			Benzo(b)fluoranthene	2015/06/18		NC	%	30 - 130
			Benzo(g,h,i)perylene	2015/06/18		NC	%	30 - 130
			Benzo(j)fluoranthene	2015/06/18		NC	%	30 - 130
			Benzo(k)fluoranthene	2015/06/18		NC	%	30 - 130
			Chrysene	2015/06/18		NC	%	30 - 130
			Dibenz(a,h)anthracene	2015/06/18		99	%	30 - 130
			Fluoranthene	2015/06/18		NC	%	30 - 130
			Fluorene	2015/06/18		100	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2015/06/18		NC	%	30 - 130
			Naphthalene	2015/06/18		100	%	30 - 130
			Perylene	2015/06/18		NC	%	30 - 130
			Phenanthrene	2015/06/18		NC	%	30 - 130
			Pyrene	2015/06/18		NC	%	30 - 130
4067954	GTH	Spiked Blank	D10-Anthracene	2015/06/18		93	%	30 - 130
			D14-Terphenyl	2015/06/18		101	%	30 - 130
			D8-Acenaphthylene	2015/06/18		99	%	30 - 130
			1-Methylnaphthalene	2015/06/18		103	%	30 - 130
			2-Methylnaphthalene	2015/06/18		113	%	30 - 130
			Acenaphthene	2015/06/18		98	%	30 - 130
			Acenaphthylene	2015/06/18		102	%	30 - 130
			Anthracene	2015/06/18		95	%	30 - 130
			Benzo(a)anthracene	2015/06/18		104	%	30 - 130
			Benzo(a)pyrene	2015/06/18		98	%	30 - 130
			Benzo(b)fluoranthene	2015/06/18		98	%	30 - 130
			Benzo(g,h,i)perylene	2015/06/18		94	%	30 - 130
			Benzo(j)fluoranthene	2015/06/18		93	%	30 - 130
			Benzo(k)fluoranthene	2015/06/18		95	%	30 - 130
			Chrysene	2015/06/18		107	%	30 - 130
			Dibenz(a,h)anthracene	2015/06/18		86	%	30 - 130
			Fluoranthene	2015/06/18		102	%	30 - 130
			Fluorene	2015/06/18		100	%	30 - 130
			Indeno(1,2,3-cd)pyrene	2015/06/18		88	%	30 - 130
			Naphthalene	2015/06/18		111	%	30 - 130
			Perylene	2015/06/18		95	%	30 - 130
			Phenanthrene	2015/06/18		108	%	30 - 130
			Pyrene	2015/06/18		100	%	30 - 130
4067954	GTH	Method Blank	D10-Anthracene	2015/06/18		77	%	30 - 130
			D14-Terphenyl	2015/06/18		80	%	30 - 130
			D8-Acenaphthylene	2015/06/18		71	%	30 - 130
			1-Methylnaphthalene	2015/06/18	ND, RDL=0.0050		mg/kg	
			2-Methylnaphthalene	2015/06/18	ND, RDL=0.0050		mg/kg	
			Acenaphthene	2015/06/18	ND, RDL=0.0050		mg/kg	
			Acenaphthylene	2015/06/18	ND, RDL=0.0050		mg/kg	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Anthracene	2015/06/18	ND, RDL=0.0050		mg/kg	
			Benzo(a)anthracene	2015/06/18	ND, RDL=0.0050		mg/kg	
			Benzo(a)pyrene	2015/06/18	ND, RDL=0.0050		mg/kg	
			Benzo(b)fluoranthene	2015/06/18	ND, RDL=0.0050		mg/kg	
			Benzo(g,h,i)perylene	2015/06/18	ND, RDL=0.0050		mg/kg	
			Benzo(j)fluoranthene	2015/06/18	ND, RDL=0.0050		mg/kg	
			Benzo(k)fluoranthene	2015/06/18	ND, RDL=0.0050		mg/kg	
			Chrysene	2015/06/18	ND, RDL=0.0050		mg/kg	
			Dibenz(a,h)anthracene	2015/06/18	ND, RDL=0.0050		mg/kg	
			Fluoranthene	2015/06/18	0.0065, RDL=0.0050		mg/kg	
			Fluorene	2015/06/18	ND, RDL=0.0050		mg/kg	
			Indeno(1,2,3-cd)pyrene	2015/06/18	ND, RDL=0.0050		mg/kg	
			Naphthalene	2015/06/18	ND, RDL=0.0050		mg/kg	
			Perylene	2015/06/18	ND, RDL=0.0050		mg/kg	
			Phenanthrene	2015/06/18	ND, RDL=0.0050		mg/kg	
			Pyrene	2015/06/18	ND, RDL=0.0050		mg/kg	
4067954	GTH	RPD [AKZ794-01]	1-Methylnaphthalene	2015/06/18	NC		%	50
			2-Methylnaphthalene	2015/06/18	NC		%	50
			Acenaphthene	2015/06/18	NC		%	50
			Acenaphthylene	2015/06/18	NC		%	50
			Anthracene	2015/06/18	20		%	50
			Benzo(a)anthracene	2015/06/18	29		%	50
			Benzo(a)pyrene	2015/06/18	24		%	50
			Benzo(b)fluoranthene	2015/06/18	17		%	50
			Benzo(g,h,i)perylene	2015/06/18	22		%	50
			Benzo(j)fluoranthene	2015/06/18	27		%	50
			Benzo(k)fluoranthene	2015/06/18	16		%	50
			Chrysene	2015/06/18	21		%	50
			Dibenz(a,h)anthracene	2015/06/18	NC		%	50
			Fluoranthene	2015/06/18	28		%	50
			Fluorene	2015/06/18	NC		%	50
			Indeno(1,2,3-cd)pyrene	2015/06/18	20		%	50
			Naphthalene	2015/06/18	NC		%	50

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Perylene	2015/06/18	19		%	50
			Phenanthrene	2015/06/18	40		%	50
			Pyrene	2015/06/18	28		%	50
4069074	LGE	Matrix Spike [AKZ794-01]	Decachlorobiphenyl	2015/06/18		91	%	70 - 130
			Aroclor 1254	2015/06/18		79	%	30 - 130
4069074	LGE	Spiked Blank	Decachlorobiphenyl	2015/06/18		98	%	70 - 130
			Aroclor 1254	2015/06/18		84	%	30 - 130
4069074	LGE	Method Blank	Decachlorobiphenyl	2015/06/18		98	%	70 - 130
			Aroclor 1016	2015/06/18	ND, RDL=0.010		mg/kg	
			Aroclor 1221	2015/06/18	ND, RDL=0.010		mg/kg	
			Aroclor 1232	2015/06/18	ND, RDL=0.010		mg/kg	
			Aroclor 1248	2015/06/18	ND, RDL=0.010		mg/kg	
			Aroclor 1242	2015/06/18	ND, RDL=0.010		mg/kg	
			Aroclor 1254	2015/06/18	ND, RDL=0.010		mg/kg	
			Aroclor 1260	2015/06/18	ND, RDL=0.010		mg/kg	
4069074	LGE	RPD [AKZ794-01]	Aroclor 1016	2015/06/18	NC		%	50
			Aroclor 1221	2015/06/18	NC		%	50
			Aroclor 1232	2015/06/18	NC		%	50
			Aroclor 1248	2015/06/18	NC		%	50
			Aroclor 1242	2015/06/18	NC		%	50
			Aroclor 1254	2015/06/18	NC		%	50
			Aroclor 1260	2015/06/18	NC		%	50
4071031	BAN	Matrix Spike [AKZ823-01]	Acid Extractable Antimony (Sb)	2015/06/19		102	%	75 - 125
			Acid Extractable Arsenic (As)	2015/06/19		98	%	75 - 125
			Acid Extractable Barium (Ba)	2015/06/19		110	%	75 - 125
			Acid Extractable Beryllium (Be)	2015/06/19		98	%	75 - 125
			Acid Extractable Boron (B)	2015/06/19		94	%	75 - 125
			Acid Extractable Cadmium (Cd)	2015/06/19		99	%	75 - 125
			Acid Extractable Chromium (Cr)	2015/06/19		97	%	75 - 125
			Acid Extractable Cobalt (Co)	2015/06/19		97	%	75 - 125
			Acid Extractable Copper (Cu)	2015/06/19		94	%	75 - 125
			Acid Extractable Lead (Pb)	2015/06/19		98	%	75 - 125
			Acid Extractable Manganese (Mn)	2015/06/19		NC	%	75 - 125
			Acid Extractable Mercury (Hg)	2015/06/19		95	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2015/06/19		96	%	75 - 125
			Acid Extractable Nickel (Ni)	2015/06/19		97	%	75 - 125
			Acid Extractable Selenium (Se)	2015/06/19		99	%	75 - 125
			Acid Extractable Silver (Ag)	2015/06/19		99	%	75 - 125
			Acid Extractable Strontium (Sr)	2015/06/19		95	%	75 - 125
			Acid Extractable Thallium (Tl)	2015/06/19		102	%	75 - 125
			Acid Extractable Tin (Sn)	2015/06/19		103	%	75 - 125
			Acid Extractable Uranium (U)	2015/06/19		107	%	75 - 125
			Acid Extractable Vanadium (V)	2015/06/19		97	%	75 - 125

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Acid Extractable Zinc (Zn)	2015/06/19		NC	%	75 - 125
4071031	BAN	Spiked Blank	Acid Extractable Antimony (Sb)	2015/06/18		102	%	75 - 125
			Acid Extractable Arsenic (As)	2015/06/18		99	%	75 - 125
			Acid Extractable Barium (Ba)	2015/06/18		100	%	75 - 125
			Acid Extractable Beryllium (Be)	2015/06/18		97	%	75 - 125
			Acid Extractable Boron (B)	2015/06/18		95	%	75 - 125
			Acid Extractable Cadmium (Cd)	2015/06/18		99	%	75 - 125
			Acid Extractable Chromium (Cr)	2015/06/18		98	%	75 - 125
			Acid Extractable Cobalt (Co)	2015/06/18		97	%	75 - 125
			Acid Extractable Copper (Cu)	2015/06/18		95	%	75 - 125
			Acid Extractable Lead (Pb)	2015/06/18		98	%	75 - 125
			Acid Extractable Manganese (Mn)	2015/06/18		100	%	75 - 125
			Acid Extractable Mercury (Hg)	2015/06/18		98	%	75 - 125
			Acid Extractable Molybdenum (Mo)	2015/06/18		101	%	75 - 125
			Acid Extractable Nickel (Ni)	2015/06/18		96	%	75 - 125
			Acid Extractable Selenium (Se)	2015/06/18		98	%	75 - 125
			Acid Extractable Silver (Ag)	2015/06/18		99	%	75 - 125
			Acid Extractable Strontium (Sr)	2015/06/18		98	%	75 - 125
			Acid Extractable Thallium (Tl)	2015/06/18		101	%	75 - 125
			Acid Extractable Tin (Sn)	2015/06/18		102	%	75 - 125
			Acid Extractable Uranium (U)	2015/06/18		104	%	75 - 125
			Acid Extractable Vanadium (V)	2015/06/18		98	%	75 - 125
			Acid Extractable Zinc (Zn)	2015/06/18		96	%	75 - 125
4071031	BAN	Method Blank	Acid Extractable Aluminum (Al)	2015/06/18	ND, RDL=10		mg/kg	
			Acid Extractable Antimony (Sb)	2015/06/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Arsenic (As)	2015/06/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Barium (Ba)	2015/06/18	ND, RDL=5.0		mg/kg	
			Acid Extractable Beryllium (Be)	2015/06/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Boron (B)	2015/06/18	ND, RDL=50		mg/kg	
			Acid Extractable Cadmium (Cd)	2015/06/18	ND, RDL=0.30		mg/kg	
			Acid Extractable Chromium (Cr)	2015/06/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Cobalt (Co)	2015/06/18	ND, RDL=1.0		mg/kg	
			Acid Extractable Copper (Cu)	2015/06/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Iron (Fe)	2015/06/18	ND, RDL=50		mg/kg	
			Acid Extractable Lead (Pb)	2015/06/18	ND, RDL=0.50		mg/kg	
			Acid Extractable Manganese (Mn)	2015/06/18	ND, RDL=2.0		mg/kg	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
			Acid Extractable Mercury (Hg)	2015/06/18	ND, RDL=0.10		mg/kg	
			Acid Extractable Molybdenum (Mo)	2015/06/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Nickel (Ni)	2015/06/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Selenium (Se)	2015/06/18	ND, RDL=1.0		mg/kg	
			Acid Extractable Silver (Ag)	2015/06/18	ND, RDL=0.50		mg/kg	
			Acid Extractable Strontium (Sr)	2015/06/18	ND, RDL=5.0		mg/kg	
			Acid Extractable Thallium (Tl)	2015/06/18	ND, RDL=0.10		mg/kg	
			Acid Extractable Tin (Sn)	2015/06/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Uranium (U)	2015/06/18	ND, RDL=0.10		mg/kg	
			Acid Extractable Vanadium (V)	2015/06/18	ND, RDL=2.0		mg/kg	
			Acid Extractable Zinc (Zn)	2015/06/18	ND, RDL=5.0		mg/kg	
4071031	BAN	RPD [AKZ823-01]	Acid Extractable Aluminum (Al)	2015/06/19	0.78		%	35
			Acid Extractable Antimony (Sb)	2015/06/19	NC		%	35
			Acid Extractable Arsenic (As)	2015/06/19	NC		%	35
			Acid Extractable Barium (Ba)	2015/06/19	NC		%	35
			Acid Extractable Beryllium (Be)	2015/06/19	NC		%	35
			Acid Extractable Boron (B)	2015/06/19	NC		%	35
			Acid Extractable Cadmium (Cd)	2015/06/19	NC		%	35
			Acid Extractable Chromium (Cr)	2015/06/19	NC		%	35
			Acid Extractable Cobalt (Co)	2015/06/19	NC		%	35
			Acid Extractable Copper (Cu)	2015/06/19	NC		%	35
			Acid Extractable Iron (Fe)	2015/06/19	0.99		%	35
			Acid Extractable Lead (Pb)	2015/06/19	4.1		%	35
			Acid Extractable Manganese (Mn)	2015/06/19	1.2		%	35
			Acid Extractable Mercury (Hg)	2015/06/19	NC		%	35
			Acid Extractable Molybdenum (Mo)	2015/06/19	NC		%	35
			Acid Extractable Nickel (Ni)	2015/06/19	NC		%	35
			Acid Extractable Selenium (Se)	2015/06/19	NC		%	35
			Acid Extractable Silver (Ag)	2015/06/19	NC		%	35
			Acid Extractable Strontium (Sr)	2015/06/19	NC		%	35
			Acid Extractable Thallium (Tl)	2015/06/19	NC		%	35
			Acid Extractable Tin (Sn)	2015/06/19	NC		%	35
			Acid Extractable Uranium (U)	2015/06/19	4.7		%	35
			Acid Extractable Vanadium (V)	2015/06/19	0.094		%	35
			Acid Extractable Zinc (Zn)	2015/06/19	1.6		%	35
4071212	XQI	Matrix Spike	Free Cyanide	2015/06/18		99	%	75 - 125
4071212	XQI	Spiked Blank	Free Cyanide	2015/06/18		100	%	80 - 120
4071212	XQI	Method Blank	Free Cyanide	2015/06/18	ND, RDL=0.01		ug/g	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	Units	QC Limits
4071212	XQI	RPD	Free Cyanide	2015/06/18	NC		%	35
4071340	TPE	RPD [AKZ823-01]	Soluble (5:1) pH	2015/06/18	0.44		%	N/A
4086482	BAN	Matrix Spike [AKZ824-01]	Leachable Arsenic (As)	2015/07/01		101	%	75 - 125
4086482	BAN	Spiked Blank	Leachable Arsenic (As)	2015/07/01		99	%	80 - 120
4086482	BAN	Method Blank	Leachable Arsenic (As)	2015/07/01	ND, RDL=20		ug/L	
4086482	BAN	RPD [AKZ824-01]	Leachable Arsenic (As)	2015/07/01	NC		%	35
4086486	LBU	Method Blank	Sample Weight (as received)	2015/06/30	NA		g	
4086486	LBU	RPD [AKZ824-01]	Sample Weight (as received)	2015/06/30	0.019		%	N/A

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

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Maxxam Job #: B5B2859
Report Date: 2015/07/02

Public Works & Government Services Canada
Client Project #: R.076635.013
Site Location: LAWN DREDGING
Your P.O. #: CALLUP #069
Sampler Initials: EB

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Cristina Carriere

Cristina Carriere, Scientific Services

Eric Dearman, Scientific Specialist

Mike MacGillivray, Scientific Specialist (Inorganics)

Paula Chaplin, Project Manager

Rose MacDonald, Scientific Specialist (Organics)

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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