

**APPENDIX A**  
**Contractor's Copy of the Regulatory Approvals**



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

**GENERAL INFORMATION**

<b>1. Project Title:</b> Wharf Replacement and Dredging – Long Cove, NL	
<b>2. Proponent:</b> <input checked="" type="checkbox"/> DFO – SCH <input type="checkbox"/> Other _____ (proponent's name)	
<b>3. Other Contacts</b> (Proponent, Consultant, Contractor or another DFO Sector): Public Works and Government Services Canada (PWGSC)	<b>4. Role of each contact:</b> OGD Consultant
<b>5. Source of Project Information if project is a referral</b> (DFO sector, company, organization, provincial or federal department):	
<b>6. Project Review Start Date:</b> June 2013	
<b>7. PATH No.:</b>	<b>8. DFO File No:</b>
<b>9. Other relevant file numbers:</b> PWGSC Project # R.057680.001	

**BACKGROUND**

<p><b>10. Background about Proposed Development (including a description of the proposed development):</b>          The existing marginal wharf at Long Cove is in need of replacement. Existing cribs will be removed and new pressure treated cribs will be reinstalled within the same footprint. An excavator, working from shore, will have to dredge material in order to properly place the new cribs and to ensure adequate depth for future facility users. Once installed, the cribs will be filled with clean ballast material and then topped with a concrete deck and associated wharf infrastructure (e.g. wheel guards, ladders, etc). It is estimated that 950m<sup>3</sup> of material will have to be dredged from site. This material meets provincial requirements for landfill disposal.</p> <p>Refer to <b>Figure 1</b> for a topographic map showing the approximate location of the proposed project, <b>Figure 2</b> for an aerial photograph of the harbour.</p> <p>The proposed project is anticipated to commence in August but the timeline is subject to approvals/funding, therefore completion of works could extend into the fall of 2013.</p>
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**PROJECT REVIEW**

<p><b>11. DFO's rationale for the project review:</b>          Project is on federal land <input checked="" type="checkbox"/> and:</p> <p><input checked="" type="checkbox"/> DFO is the proponent  <input type="checkbox"/> DFO to issue <i>Fisheries Act</i> Authorization or <i>Species at Risk Act</i> Permit  <input checked="" type="checkbox"/> DFO to provide financial assistance to another party to enable the project to proceed  <input type="checkbox"/> DFO to issue licence or lease federal land to enable the project to proceed</p>	
<b>12. Fisheries Act Section(s) (if applicable):</b> N/A	<b>13. Species at Risk Act Section(s) (if applicable):</b> N/A
<b>14. Primary Authority:</b> DFO-SCH	<b>15. Primary Authority's rationale for involvement:</b> DFO-SCH is the proponent
<b>16. Other Authorities involved in review:</b> N/A	<b>17. Each Authority's rationale for involvement:</b> N/A

**18. Other Jurisdictions involved in review:** N/A

**19. Other Expert Departments Providing Advice:** N/A

A project notification memo was sent to Environment Canada and Fisheries and Oceans.

**20. Areas of Interest of Other Expert Departments:** N/A

**21. Other Contacts and Responses:**

N/A

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

Refer to Section 10

**23. Location of Project:**

Long Cove, Trinity Bay, NL. 47 34 02 N 53 40 02 E

**24. Environment Description:**

Long Cove is a fishing community located in Trinity Bay approximately seventeen (17) kilometres northwest of the Town of Whitbourne in the electoral district of Avalon.

The proposed project site is located within the Southeastern Barrens Subregion of the Maritime Barrens Ecoregion. This ecoregion has the coldest summers with frequent fog and strong winds. Winters are relatively mild with intermittent snow cover particularly near the coastline.

Characteristic wildlife for the area surrounding the project site includes rabbit, moose, red squirrel, fox and a variety of songbirds, waterfowl and raptors. Marine mammals such as seals may also frequent the project area. The proposed project is located within the distribution range of the Blue Whale (Atlantic Population), the North Atlantic Right Whale, the Barrow's Goldeneye (Eastern Population), the Red Crossbill (Percna Subspecies) 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 any of 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.

**25. Scope of Effects Considered (section 5(1) and 5(2)):**

N/A

**26. Environmental Effects of Project:**

N/A

**27. Mitigation Measures for Project (including Habitat Compensation if applicable):**

Demolition debris and waste materials are to be disposed of and recycled in accordance with Provincial Waste Management Regulations.

As per Service NL approval, dredge material should be disposed of at an approved landfill with owners consent.

As part of this project's pre-planning process, four (4) marine sediment samples were collected from the proposed dredge areas and submitted for chemical analysis. All dredge material must be disposal of at an approved waste disposal site, as per the attached approval from Services NL. All mitigation measures outlined in this approval must be adhered to. In addition, results from the sediment sample analysis are available upon request.

There should be no sedimentation events as a result of proposed activities. If required, mitigation measures must be implemented such as installation of a turbidity barrier, construction of sediment ponds, etc.

Machinery should be well muffled and local municipality construction by-laws must be adhered to.

Machinery must be checked for leakage of lubricants or fuel and must be in good working order. Refuelling must be done at least 100m from any water body. Basic petroleum spill clean-up equipment should be on-site. All spills or leaks should be promptly contained, cleaned up and reported to the 24-hour environmental emergencies report system (1-800-563-9089). The proponent should consider developing a contingency plan specific to the proposed undertaking to enable a quick and effective response to a spill event.

Several environmental approvals / permits have been obtained on behalf of SCH. These include:

1. Environment Canada provided information to support the environmental management process with respect to legislation falling under the auspices of EC (EAS 2013-065)
2. Service NL provided approval to dispose of dredge material to an approved landfill, with owners consent.
3. NWPAs Minor Works Order meets the definition of this project.
4. DFO Operational Statement for Marine Wharf Repair and Reconstruction.
5. The Province of NL has provided approval for working in a waterbody.

These approvals are attached and all conditions/mitigation measures must be reviewed and implemented by the contractor.

**28. Description of any Significant Adverse Environmental Effects of the project (after applying mitigation):**

N/A

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

N/A

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

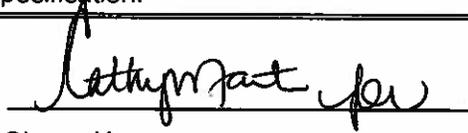
N/A

## CONCLUSION

**31. Conclusion on Significance of Adverse Environmental Effects:**

The Federal Authority has evaluated the project as required under Section 67 of *Canadian Environmental Assessment Act (CEAA), 2012*. On the basis of this evaluation, DFO-SCH has determined that the project is not likely to cause significant adverse environmental effects and the project can be carried out in accordance with current environmental standards, guidelines and objectives based. Project specific environmental protection measures are outlined in the attached tender specification.

**32. Prepared by:**



**33. Date:** August 2, 2013

**34. Name:**

Shawn Kean

**35. Title:**

Environmental Specialist, Public Works and Government Services Canada

**36. Approved by:**

\_\_\_\_\_

**37. Date:** August 2, 2013

**38. Name:**

Andrew Temple

**39. Title:**

Project Engineer, Fisheries and Oceans Canada – Small Craft Harbours

## DECISION

### 40. Decision Taken

- The project is not likely to cause significant adverse environmental effects, and DFO may exercise its power, duty or function.
- The project is likely to cause significant adverse environmental effects, and DFO has decided not to exercise its power, duty or function.
- The project is likely to cause significant adverse environmental effects, and DFO will ask the Governor in Council to determine if the significant adverse environmental effects are justified in the circumstances

41. Approved by: \_\_\_\_\_ 42. Date: \_\_\_\_\_

43. Name: Paul Curran

44. Title: Regional Engineer, Fisheries and Oceans Canada, NL – Small Craft Harbours

45. References: N/A

**APPROVALS AND ASSOCIATED  
CONDITIONS TO BE FOLLOWED**



January 7, 2013

File No: 834.095.2

**Attn: Ms. Paula Pretty**  
Environmental Assessment Officer, Environmental Services  
Public Works and Government Services Canada  
P.O. Box 4600  
St. John's, NL  
A1C 5T2

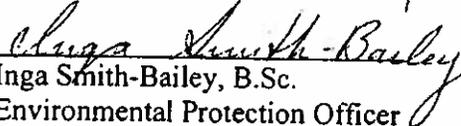
**Re: Service NL Referral – Request to Dispose of Dredged Material from DFO-SCH  
Project in Long Cove, NL**

Dear Ms. Pretty,

We have reviewed your request of January 2, 2013, regarding the abovementioned. Based on the results of chemical analyses provided, Service NL has no objections to 2500m<sup>3</sup> of dredged material being disposed of at an approved waste disposal site with permission from the owner/operator.

Should you have any questions regarding this matter, please contact me at 466-4063.

Sincerely,

  
Inga Smith-Bailey, B.Sc.  
Environmental Protection Officer





Environment Canada    Environnement Canada

Environmental Protection Operations  
Environmental Stewardship Branch  
6 Bruce Street  
Mount Pearl, NL A1N 4T3

9 July 2013

Shawn Kean  
Public Works and Government Services Canada  
P.O. Box 4600  
St. John's, NL, A1C 5T2

Dear Mr. Kean:

**RE: Long Cove Wharf Repairs and Dredging, NL**

**EAS 2013-065**

As requested in your email of 2 July 2013, Environment Canada (EC) has reviewed the project description for the above-noted project. Please note that our review comments, in areas related to Environment Canada's mandate, are being provided to support your environmental management process for this project.

The proposed project involves the replacement of a section of the Small Craft Harbour marginal wharf in Long Cove, NL. The existing cribs will be removed and new pressure treated cribs will be reinstalled within the same footprint. Dredging will be required in order to properly place the new cribs and to ensure adequate depth for future facility users. Once installed, the cribs will be filled with clean ballast material and topped with a concrete deck and associated wharf infrastructure (e.g. wheel guards, ladders, etc). Dredging will be done by an excavator working from shore. It is estimated that 950m<sup>3</sup> of material must be dredged from site. The dredged material will be disposed at a landfill pending approval from the province.

Environment Canada is also responsible for administering several statutes including the *Department of Environment Act*, *Fisheries Act* (Section 36), *Canadian Environmental Protection Act*, *Canada Water Act*, *Canada Wildlife Act* and the *Migratory Birds Convention Act*, which are focused on promoting sustainable development, protecting the environment, conserving certain renewable resources and reporting on environmental conditions. Environment Canada is also the lead federal department in promoting a variety of federal policies and programs including, *A Wildlife Policy for Canada*, the *Toxic Substances Management Policy*, and *Pollution Prevention - A federal strategy for action*. Stemming from these responsibilities, EC possesses expertise relevant to this proposed project that should be considered by the proponent, in conducting the environmental review of this project.

## REVIEW COMMENTS

### ***Regulatory Requirements***

#### ***Fisheries Act***

The proponent should be aware of the general applicability of Section 36(3) of the *Fisheries Act* which states: "no person shall deposit or permit the deposit of a deleterious substance of any type in

water frequented by fish or in any place under any conditions where the deleterious substances or any other deleterious substance that results from the deposit of the deleterious substance may enter any such water". Environmental protection and mitigation measures should reflect the need to comply with Section 36(3) of the Fisheries Act. For example, measures should be taken to prevent substances such as lubricating fluids, fuels, etc. from being deposited into water frequented by fish, and drainage from construction and operational drainage must not be harmful to fish.

#### Migratory Birds Convention Act

Migratory birds, their eggs, nests, and young are protected under the Migratory Birds Convention Act (MBCA). Migratory birds protected by the MBCA generally include all seabirds except cormorants and pelicans, all waterfowl, all shorebirds, and most landbirds (birds with principally terrestrial life cycles). Most of these birds are specifically named in the Environment Canada (EC) publication, *Birds Protected in Canada under the Migratory Birds Convention Act*, Canadian Wildlife Service Occasional Paper No. 1.

Under Section 6 of the Migratory Bird Regulations (MBR), it is forbidden to disturb, destroy or take a nest or egg of a migratory bird; or to be in possession of a live migratory bird, or its carcass, skin, nest or egg, except under authority of a permit. It is important to note that under the current MBR, no permits can be issued for the incidental take of migratory birds caused by development projects or other economic activities.

Furthermore, subsection 5.1 of the MBCA describes prohibitions related to deposit of substances harmful to migratory birds:

- "5.1 (1) No person or vessel shall deposit a substance that is harmful to migratory birds, or permit such a substance to be deposited, in waters or an area frequented by migratory birds or in a place from which the substance may enter such waters or such an area.
- (2) No person or vessel shall deposit a substance or permit a substance to be deposited in any place if the substance, in combination with one or more substances, results in a substance — in waters or an area frequented by migratory birds or in a place from which it may enter such waters or such an area — that is harmful to migratory birds."

It is the responsibility of the proponent to ensure that activities are managed so as to ensure compliance with the MBCA and associated regulations.

#### Species at Risk Act

The proponent should be reminded that the prohibitions under the Species at Risk Act (SARA) are now in force. The complete text of SARA, including prohibitions, is available at [www.sararegistry.gc.ca](http://www.sararegistry.gc.ca).

#### Canadian Environmental Protection Act

The proponent should also be aware of the potential applicability of the *Canadian Environmental Protection Act* (CEPA). The *Canadian Environmental Protection Act* enables protection of the environment, and human life and health, through the establishment of environmental quality objectives, guidelines and codes of practice, and the regulation of toxic substances, emissions and discharges from federal facilities, international air pollution, and disposal at sea.

#### **Migratory Birds**

The Canadian Wildlife Service of Environment Canada (EC-CWS) has reviewed the above project and offers the following comments.

### Dredging

The project description does not definitively state the method of disposal of the dredge material. Though the dredged material may meet provincial requirements for landfill disposal, the proponent has not committed to disposing of dredge materials at such a landfill. If beach disposal of dredge material is being considered, the proponent should be aware that EC-CWS has concerns about the disposal of dredge material on beaches.

Should the proponent decide to proceed with beach disposal, EC-CWS recommends proceeding outside of the critical period of the migratory bird breeding season, which is May 1<sup>st</sup> to July 31<sup>st</sup> in this area. If this is not possible, then prior to commencing project activities it should be determined if there are any nests or fledglings of migratory birds in areas where dredge material would be deposited on beaches. Presence of nests or fledglings must be determined by a professional ornithologist or a skilled birder. If any birds are found to be nesting or rearing chicks in the vicinity of the proposed dredge spoil disposal area, then EC-CWS should be contacted for further instructions before commencing with the project.

The proponent should be advised that old dredge spoils have been known to attract migratory birds such as Piping Plovers and other species of ground nesting birds such as terns or Killdeer.

### Other Coastal Infrastructure Activities

EC-CWS has the following recommended beneficial management practices for working on shorelines:

- Project staff should not approach concentrations of seabirds, sea ducks or shorebirds.
- Project staff should use the main navigation channels to get to and from the site; and should have well muffled vessels and machinery.
- Project staff should undertake any measures that may minimize or eliminate discharge of oily waste into the marine environment.
- Food scraps and other garbage left on beaches and other coastal habitats can artificially enhance the populations of avian and mammalian predators of eggs and chicks. The proponent should ensure that no litter (including food waste) is left in coastal areas by their staff and/or contractors
- If there is any noticeable change in seabird numbers or distribution at the location during operations, EC-CWS should be notified.

### Species at Risk

The following species at risk may occur within the study area: Olive-sided flycatcher (Threatened) and Red Crossbill (*Percna* subspecies, Endangered). Though unlikely to be found within the project footprint, these species may occur within the study area and we request that sightings be reported to EC-CWS.

### Fuel

The Canadian Wildlife Service of Environment Canada recommends that the proponent adhere to best practices with regard to fuelling and servicing equipment, using biodegradable fluids, fuel spills and spill contingency plans, to protect migratory birds and their habitats (described in more detail under **Management of Hazardous Materials and Waste**). Furthermore, the proponent should ensure that contractors are aware that under the *Migratory Birds Regulations*, "no person shall deposit or permit to be deposited oil, oil wastes or any other substance harmful to migratory birds in any waters or any area frequented by migratory birds."

### ***Suspension of Sediments***

The disturbance of substrate during dredging increases sediment concentrations and turbidity in the water column. This disturbance may alter light penetration, temperature and water chemistry regimes, and may affect photosynthesis. The CCME (Canadian Council of Ministers of the Environment) *Canadian Environmental Quality Guidelines* (1999) recommend that, for protection of marine waters, human activities should not cause suspended solids levels to increase by more than 10% of the natural conditions expected at the time. The guidelines also recommend that no solid debris, including floating or drifting materials or settleable matter, be introduced into marine and estuarine waters.

### ***On-land Disposal and Site Disturbance***

The on-land disposal method should ensure that the dredged material will not be re-deposited in the ocean through environmental factors, such as heavy precipitation, storm surge, and/or significant wave action.

In general, impacts related to onshore disturbance should be designed so as to:

- place a priority on pollution prevention;
- facilitate compliance with the general prohibition against the deposit of a deleterious substance into waters frequented by fish (Section 36 of the *Fisheries Act*); and
- respect applicable Canadian Council of Ministers of the Environment (CCME) *Canadian Environmental Quality Guidelines*.

In terms of site disturbance the following 'best practices' should be reflected in efforts to manage impacts so as to respect the above-noted objectives:

- install siltation control structures (e.g. silt curtains, cofferdams, sediment fences) prior to beginning any activities involving disturbance of the site and work along the shoreline if appropriate;
- schedule work to avoid periods of heavy precipitation;
- maintain a vegetated buffer zone, as appropriate and where possible, to protect surface waters;
- immediately stabilize any disturbed areas along the shoreline to prevent erosion;
- monitor the integrity and effectiveness of the siltation control structures daily for the duration of the project; and
- upon completion of the project, only remove silt control structures when suspended sediment concentrations within any contained water have returned to background conditions.

### ***Management of Hazardous Materials and Waste***

In order to ensure compliance with Section 36 (3) of the *Fisheries Act* and with the *Migratory Birds Convention Act* and related Regulations, provisions for the management of hazardous materials (e.g. fuels, lubricants) and wastes (e.g. contaminated soil, sediments, waste oil) should be identified and implemented so as to ensure the risk of chronic and accidental releases is minimized. Additionally, the following mitigation recommendations are made with respect to the transport, storage, use and disposal of petroleum products and toxic substances which, when employed, may minimize impacts to nearby receiving waters:

- Even small spills of oil can have very serious effects on migratory birds and fish. Therefore, every effort should be taken to ensure that no oil spills occur in the area. Refuelling and maintenance activities should be undertaken on level terrain, at least 30m from any surface water (including shorelines), on a prepared impermeable surface with a collection system to ensure oil, gasoline and hydraulic fluids do not enter surface waters. Waste oil should be disposed of in an approved manner.
- Biodegradable alternatives to petroleum-based hydraulic fluid for heavy machinery and chainsaw bar oil are commonly available from major manufacturers. Such biodegradable fluids should be considered for use in place of petroleum products whenever possible, as a standard for best practices.
- Drums of petroleum products or chemicals should be tightly sealed against corrosion and rust and surrounded by an impermeable barrier in a dry, water-tight building or shed with an impermeable floor.
- Proponents should ensure that storage tanks and equipment are leak-free (i.e. conduct routine inspections).
- In order to ensure that a quick and effective response to a spill event is possible, spill response equipment should be readily available on-site. Response equipment, such as adsorbents and open-ended barrels for collection of cleanup debris, should be stored in an accessible location on-site. Personnel working on the project should be knowledgeable about response procedures. The proponent should consider developing a contingency plan specific to the proposed undertaking to enable a quick and effective response to a spill event. The proponent should indicate how the contingency plans will be prepared, and response measures implemented, to reflect site-specific conditions and sensitivities. In developing a contingency plan, it is recommended that the Canadian Standards Association publication Emergency Planning for Industry CAN/CSA-Z731-03, be consulted as a useful reference.
- The proponent should report any spills of petroleum or other hazardous materials to the Environmental Emergencies 24 Hour Report Line (St. John's 709-772-2083; other areas 1-800-563-9089).

### **Construction Materials**

At the project planning stage, all available construction materials should be considered (e.g., untreated wood, treated wood, pre-cast concrete, corrosive-resistant steel, plastic lumber), and those materials best suited to the conditions and intended use of the structure should be selected. Analysis of the preferred construction material should include a consideration of the full life-cycle of the material (i.e. ease of use, design factors associated with the construction material, maintenance requirements, and final disposal). Environmental implications associated with each life-cycle phase should also be considered (e.g. storm and ice damage). For example, it may not be cost effective to use pressure treated wood for a coastal structure that may be destroyed or damaged by storm surge during the life expectancy of the structure.

### **Pressure Treated Wood**

The long-term impacts of pressure treated wood in aquatic environments remain uncertain; therefore EC urges that a precautionary approach be taken. If pressure treated wood (e.g. Chromated Copper Arsenate [CCA]) is determined to be the most suitable material for the project, the proponent is encouraged to incorporate the following standards into the planning and management of construction activities:

- Products should be approved for use by Health Canada's Pest Management Regulatory Agency, which sets out use limitations for all treated wood products under the *Pest Control Products Act*;

- Only wood treated according to the 2012 industry publication entitled "*Best Management Practices for the Use of Treated Wood in Aquatic and Wetland Environments*" should be used (this report is available at <http://www.VWPinstitute.org/>);
- Only proper construction techniques should be used (e.g. keep as much of the product above the high water mark as possible, and capture sawdust to avoid entry into water bodies);
- The use of pressure treated wood in *freshwater* environments is discouraged;
- According to "*Guidelines to Protect Fish and Fish Habitat from Treated Wood Used in Aquatic Environments in the Pacific Region*" by Hutton and Samis (2000), the use limitation restriction for Ammoniacal Copper Quaternary (ACQ) treated wood does not allow its use in aquatic environments when submerged (this report is available online at <http://www.dfo-mpo.gc.ca/Library/245973.pdf> ); however, it can be used for above-water applications such as decking.
- When decommissioning in-water structures, treated wood should be completely removed from the water environment, including bottom sediment (for piles). According to Hutton and Samis (2000), piles should be removed by a slow, steady pull to minimize disturbance of surface habitats and to avoid bringing potentially contaminated sediments to the surface. If the pile breaks off below the biologically-active zone in the sediment, it may not be advisable to dredge the remainder out, depending on the sensitivity of the habitat at the site.
- Only wood treated according to the 2012 industry publication "*Best Management Practices for the Use of Treated Wood in Aquatic and Wetland Environments*" should be recycled/reused. Treated wood from structures *not* treated in accordance with the Best Management Practices (i.e. generally structures built prior to 1997, such as those constructed with creosoted wood) should be disposed of at a provincial landfill with approval of the owner, or through incineration at an approved hazardous waste incinerator.

### Concrete Production

Discharges from project activities involving the use of concrete, cement, mortars and other Portland cement or lime-containing construction materials may have a high pH. Work should be planned and conducted to ensure that sediments, debris, concrete, and concrete fines are not deposited, either directly or indirectly into the aquatic environment. Measures must be taken to prevent any potentially contaminated water (e.g. exposed aggregate wash-off, wet curing, equipment and truck washing) from entering the aquatic environment unless it can be confirmed that this water will not be deleterious to fish or harmful to migratory birds. Containment facilities should be provided at the site.

### ***Effects of Weather and Climate on the Project***

Over its lifetime, coastal infrastructure will be sensitive to the impacts of wind, waves, storm surge, sea ice and sea level rise. Global average sea level rise projections range from 18 to 59 cm over the next century (Intergovernmental Panel on Climate Change). Some recent trends in research indicate that due to ice sheet melt, this range can be much higher than the projected 59cm by the year 2100. Coastal erosion will add to the effects of sea level rise. Sea level rise and crustal subsidence will exacerbate the effects of winds, waves and storm surges. In addition, climate warming will also lead to an increase in the water-holding capacity of the atmosphere, and more intense precipitation events are likely over the coming decades. This may affect local flooding and infrastructure drainage. In considering the full life-cycle of the project, any sensitivity to climate change should be identified and adjustments made if necessary. It may be more cost-effective to adjust design criteria at this stage than to retrofit in future.

Historical data and local area knowledge should be utilized to determine adequacy of design. Based on an analysis of the potential effects of climate and weather elements, mitigation should be focused on minimizing risk of environmental damage and other accidents. Climatological data can be found at <http://www.climate.weatheroffice.ec.gc.ca/>, and value-added data can be obtained from EC's Climate Services. Contact: 1-900-565-1111 or email: [weather.info.meteo@ec.gc.ca](mailto:weather.info.meteo@ec.gc.ca). Hydrometric station data, both archived and real-time, are available at <http://www.ec.gc.ca/rhc-wsc/>. The proponent is also encouraged to regularly consult EC's local forecast at <http://www.weatheroffice.ec.gc.ca/>.

I trust that this information will be of assistance in your review of this project. If you wish to discuss these comments or have further questions, please do not hesitate to contact me at 709-772-4313 or via email at [jerry.pulchan@ec.gc.ca](mailto:jerry.pulchan@ec.gc.ca) at your convenience.

Yours truly,



Jerry Pulchan  
Environmental Assessment Analyst  
Environmental Protection Operations Directorate- Atlantic

Attachment

Cc: J. Corkum  
M. Hingston





# MARINE WHARF REPAIR / RECONSTRUCTION

Fisheries and Oceans Canada  
Operational Statement Newfoundland and Labrador

Version 1.0

Marine wharves are common features along the shoreline of many coastal communities throughout Newfoundland and Labrador. Over time wharves deteriorate or do not adequately serve their intended purpose. As a result repair/reconstruction is required to restore functionality or relieve safety concerns. The scale of wharf repair/reconstruction can range from simply replacing decomposed or damaged boards to a complete removal and reconstruction of a wharf. Additionally, the physical size may range from a small private wharf to a large scale commercial wharf (e.g., hundreds of square metres).

Shoreline areas where wharves are located provide important habitat for a variety of marine organisms. Fish lay eggs, feed and hide from predators in these areas. Repairing or reconstructing a wharf can change or disrupt important fish habitat and may threaten fish populations. The input of deleterious substances (e.g., sediment, fuel, oil etc.) into the marine environment may also occur which may be detrimental to fish and/or their habitat.

Fisheries and Oceans Canada (DFO) is responsible for protecting fish and fish habitat within Canada. Under Subsection 35(1) of the *Fisheries Act* no one may carry out a work or undertaking that will cause the harmful alteration, disruption or destruction (HADD) of fish habitat unless it has been authorized by DFO. By following the conditions and measures set out in this Operational Statement you will be in compliance with Subsection 35(1) of the *Fisheries Act*.

This Operational Statement applies to the repair, maintenance, demolition and reconstruction of wharves which include activities such as painting, resurfacing, clearing of debris and replacing damaged wharf components. Repair/reconstruction may also include repairs to piles and cribbing or complete reconstruction.

The purpose of the following sections is to describe the conditions under which this Operational Statement is applicable to your project and the measures to incorporate into your project in order to avoid negative impacts to fish habitat. You may proceed with your marine wharf repair/reconstruction project without a DFO review if the following conditions apply to your activities:

- the project does not increase the size of the footprint of the wharf (i.e., the wharf may be reconstructed within the same/or smaller footprint than the original wharf);
- the project is of the same or similar design and construction as the original wharf (i.e., a pile wharf must be replaced with a pile wharf);
- the project does not include any infilling, blasting or excavating outside the original footprint of the wharf;

- the Measures to Protect Fish and Fish Habitat when repairing / reconstructing a wharf, listed in this Operational Statement, are incorporated;
- this Operational Statement does not address wharf decommissioning.

If you cannot meet all of the conditions listed above and incorporate all of the measures listed below, your project may result in a HADD of fish habitat, which contravenes Subsection 35(1) of the *Fisheries Act* and you could be subject to enforcement action. In this case, you should contact the DFO office in your area if you wish to obtain more information on the possible options you should consider to avoid contravention of the *Fisheries Act*.

You are required to respect all municipal, provincial, territorial or federal legislation that applies to the work being carried out in relation to this Operational Statement. The activities undertaken in this Operational Statement must also comply with the *Species at Risk Act* ([www.sararegistry.gc.ca](http://www.sararegistry.gc.ca)). If you have questions regarding this Operational Statement, please contact the DFO office in your area.

We ask that you please notify DFO, preferably 10 days before starting your work, by filling out and sending in, by mail or fax, the Newfoundland and Labrador Region notification form (<http://www.nff.dfo-mpo.gc.ca/e0005353>) to the DFO office in your area. This information is requested in order to evaluate the effectiveness of this Operational Statement in relation to the work carried out.

## Measures to Protect Fish and Fish Habitat when Repairing/Reconstructing a Marine Wharf

1. Conduct work in a manner that prevents the release of debris (e.g., cribbing, ballast, etc.) or sediments into the marine environment.
  - 1.1. Install effective sediment and erosion control measures such as floating booms and silt screens around the perimeter of the work area before starting work and during the course of construction to prevent debris and sediment from entering the water. Inspect these measures regularly and make all necessary repairs if damage occurs.
  - 1.2. Work should be carried out during low wind, wave and tidal conditions.
  - 1.3. Use shoreline stabilization techniques in conjunction with



sedimentation and erosion measures where appropriate to minimize impacts due to sedimentation.

2. Installation of concrete structures below the ordinary high water mark (OHWM) should be done using methods that minimize impacts to the marine environment. Concrete that is pre-cast and cured away from the water is preferred, but where this is not feasible concrete may be poured in place provided it is done so using industry approved techniques and applicable standards (e.g., Tremie Process in accordance with CSA A23.1) and all available measures (e.g., watertight molds, sheet piles, properly sealed chutes and funnels, site dewatering, wave and current protection, etc...) are taken to ensure there is no seepage/spillage of concrete or concrete residues into the marine environment.
3. Operate machinery in a manner that prevents the release of deleterious substances (e.g., fuel, grease, oil, etc.) into the marine environment and that minimizes disturbance to the shoreline and bed of the water body.
  - 3.1. Machinery is to arrive on site in a clean, washed condition and is to be maintained free of fluid leaks.
  - 3.2. Designate an area to wash, refuel and service machinery which is a safe distance from any water body. A minimum 30 meter setback is required.
  - 3.3. Fuel storage containers/facilities should be located a minimum of 100 meters from any water body and must comply with Provincial Government regulations.
  - 3.4. Keep emergency spill kit on site in case of fluid leaks or spills from machinery.
  - 3.5. Restore banks to original condition if any disturbance occurs.
4. Drilling required to assess the structural integrity of wharf foundation/pillars, etc. should be done when wind, tidal and wave conditions are low in order to minimize turbidity and the area affected by turbidity.
5. Do not acquire material used for timber crib ballast, rip-rap, gabion basket ballast etc. from below the OHWM or from the bed of any water body or intertidal areas.
  - 5.1. Use clean rocks or quarry materials. Avoid the use of rock that is acid-generating (mine waste rock). Also, avoid the use of rock that fractures or breaks down easily when exposed to the elements.
  - 5.2. Cribbing, decking and other structural components can be constructed of either untreated, treated or creosote treated wood, but the use of environmentally-friendly lumber (see definition below) is preferred.
  - 5.3. Seal and stain all lumber a minimum of 30 meters away from the water using only environmentally-friendly stains. All sealed and stained lumber should be completely dry before being used near water.
  - 5.4. Salvaged wood and rock from the demolition may be reused to reconstruct the wharf components.

6. Stabilize any waste materials removed from the work site to prevent them from entering the water body (i.e., placing them above the OHWM). This could include covering spoil piles with biodegradable mats or tarps or planting them with grass or shrubs. Any material to be stored/stockpiled onsite must be stored in an approved location above the OHWM.
7. Shoreline disturbance should be restricted to the immediate work area and stabilized when work is completed.
  - 7.1. Stabilize disturbed shoreline areas to prevent erosion using riprap (armor stone). Material used for shoreline stabilization must not be removed from below the OHWM. Material is to be sufficient size to resist displacement by wave or tidal activity. Shoreline stabilization material may be salvaged during wharf demolition or clean quarry run material with minimal fine / erodible material can be used.

#### Definitions:

**Environmentally-friendly lumber and stains** - Chemical wood preservatives used in Canada are regulated by the Pest Management Regulatory Agency, Health Canada. Approved preservatives most commonly used in lumber are Chromated Copper Arsenate (CCA) and Ammoniacal Zinc Copper Arsenate (ACZA). Ask your local building supply outlet for further information on available products.

**Ordinary High Water Mark (OHWM)** - The OHWM refers to the mean high tide mark and includes the intertidal zone which is exposed to the air at low tide and is underwater at high tide.

**Intertidal Zone** - The coastal zone measuring from the lowest to the highest tide mark; subject to alternating periods of flooding and drying.

**Fish** - "Fish" is defined as "fish, shellfish, crustaceans, marine animals, the eggs, sperm, spawn, spat and juvenile stages of fish, shellfish, crustaceans, and marine animals."

### CROSS SECTION OF A MARINE ENVIRONMENT

TEMPERATURE  
ELEVATION

SHORELINE

WATER LEVEL

INTERTIDAL ZONE

WATER LEVEL

PC

AQUATIC  
VEGETATION

Marine Environmental Services  
Environmental Services Group

WATER LEVEL



# NOTIFICATION FORM

Version 6.0

## PROPOSER INFORMATION

NAME: \_\_\_\_\_ STREET ADDRESS: \_\_\_\_\_  
 CITY/TOWN: \_\_\_\_\_ PROVINCE/TERRITORY: \_\_\_\_\_ POSTAL CODE: \_\_\_\_\_  
 TEL. NO. (RESIDENCE): \_\_\_\_\_ TEL. NO. (WORK): \_\_\_\_\_  
 FAX NO: \_\_\_\_\_ EMAIL ADDRESS: \_\_\_\_\_

## CONTRACTOR INFORMATION (provide this information if a Contractor is working on behalf of the Proposer)

NAME: \_\_\_\_\_ STREET ADDRESS: \_\_\_\_\_  
 CITY/TOWN: \_\_\_\_\_ PROVINCE/TERRITORY: \_\_\_\_\_ POSTAL CODE: \_\_\_\_\_  
 TEL. NO. (RESIDENCE): \_\_\_\_\_ TEL. NO. (WORK): \_\_\_\_\_  
 FAX NO: \_\_\_\_\_ EMAIL ADDRESS: \_\_\_\_\_

## PROJECT INFORMATION

Select Operational Statements that are being used (check all applicable boxes):

- |                                                                        |                                                             |                                                                                       |
|------------------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------------------------------|
| <input type="checkbox"/> Aquatic Vegetation Removal                    | <input type="checkbox"/> Culvert Maintenance                | <input type="checkbox"/> Maintenance of Riparian Vegetation in Existing Rights-of-Way |
| <input type="checkbox"/> Beach Creation                                | <input type="checkbox"/> High-Pressure Directional Drilling | <input type="checkbox"/> Moorings                                                     |
| <input type="checkbox"/> Public Beach Maintenance                      | <input type="checkbox"/> Dock and Boathouse Construction    | <input type="checkbox"/> Overhead Lines                                               |
| <input type="checkbox"/> Beaver Dam Removal                            | <input type="checkbox"/> Ice and Snow Fill Bridges          | <input type="checkbox"/> Punch and Bore Crossings                                     |
| <input type="checkbox"/> Bridge Maintenance                            | <input type="checkbox"/> Isolated Pond Construction         | <input type="checkbox"/> Routine Maintenance Dredging                                 |
| <input type="checkbox"/> Clear-Span Bridges                            | <input type="checkbox"/> Submerged Log Salvage              | <input type="checkbox"/> Underwater Cables                                            |
| <input type="checkbox"/> Cottage Lot Development                       | <input type="checkbox"/> Marine Wharf Repair/Reconstruction | <input type="checkbox"/> Temporary Stream Crossing                                    |
| <input type="checkbox"/> Boat Launching Facility Repair/Reconstruction |                                                             |                                                                                       |

Select the type of water body or watercourse at or near your project.

- |                                                       |                                                |                                                                         |
|-------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------------------|
| <input type="checkbox"/> River, Stream, Creek         | <input type="checkbox"/> Marine (Ocean or Sea) | <input type="checkbox"/> Pond or wetland (pond is less than 8 hectares) |
| <input type="checkbox"/> Lake (8 hectares or greater) | <input type="checkbox"/> Estuary               |                                                                         |

## PROJECT Siting (provide this information if a Contractor is working on behalf of the Proposer)

Name of water body or watercourse	Coordinates of the Project (UTM co-ordinate or Degrees, Minutes, Seconds), if available Easting: _____ Northing: _____ Latitude: _____ Longitude: _____
Legal Description (Plan, Block, Lot, Concession, Township, Section, Range)	Directions to Access the Project Site (i.e., Route or highway number, etc.)
Proposed Start Date (YYYY/MM/DD): _____	Proposed Completion Date (YYYY/MM/DD): _____

We ask that you notify DFO, preferably 10 working days before starting your work, by filling out and sending in, by mail or by fax, this notification form to the DFO office in your area. This information is requested in order to evaluate the effectiveness of the work carried out in relation to the Operational Statement.

I, \_\_\_\_\_ (print name) certify that the information given on this form is, to the best of my knowledge, correct and complete.

Signature \_\_\_\_\_ Date \_\_\_\_\_

Note: If you cannot meet all of the conditions and cannot incorporate all of the measures in the Operational Statement then your project may result in a violation of Subsection 35(1) of the Fisheries Act and you could be subject to enforcement action. In this case, you should contact the DFO office in your area if you wish to obtain DFO's opinion on the possible options you should consider to avoid contravention of the Fisheries Act.

Information about the above-noted proposed work or undertaking is collected by DFO under the authority of the Fisheries Act for the purpose of administering the fish habitat protection provisions of the Fisheries Act. Personal information will be protected under the provisions of the Privacy Act and will be stored in the Personal Information Bank DFO-PPU-080. Under the Privacy Act, individuals have a right to, and on request shall be given access to, any personal information about them contained in a personal information bank. Instructions for obtaining personal information are contained in the Government of Canada's Info Source publications available at [www.infosource.gc.ca](http://www.infosource.gc.ca) or in Government of Canada offices. Information other than "personal" information may be accessible or protected as required by the provisions of the Access to Information Act.

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**FISHERIES AND OCEANS CANADA (DFO)  
NEWFOUNDLAND & LABRADOR OFFICE**

**DFO Fisheries Protection Program**  
80 East White Hills Road  
PO Box 5667  
St. John's NL A1C 5X1  
Tel: (709) 772-4140  
Fax: (709) 772-2659  
Email: FPP-NL@DFO-MPO.GC.CA

*Aussi disponible en français*

<http://www.dfo-mpo.gc.ca/habitat/what-quoi/os-eo/nl/pdf/form-fra.pdf>

File Reference #

December 15, 2010

Paul Curran, P. Eng.  
Regional Engineer  
Small Crafts Harbours  
St. John's NL A1C 5X1

Dear Mr. Curran:

**Re: Section 48 Permitting Requirements under the Water Resources Act –  
Wharves, Breakwaters, Slipways and Boathouses**

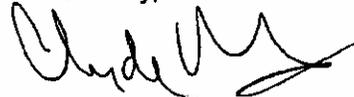
This letter is to inform you that as of January 1, 2011 permits will no longer be required under Section 48 of the *Water Resources Act* for the construction and maintenance of wharves, breakwaters, slipways and boathouses. Therefore blanket permit ALT5055 is canceled effective January 1, 2011. Water Resources Management Division is currently preparing guidelines on environmental controls which should be followed during the construction and maintenance of wharves, breakwaters, slipways and boathouses. These guidelines will be posted on the department's website once they are completed. In the interim, we have attached a list of terms and conditions which we recommend be followed when completing these types of projects.

This letter does not affect other activities, such as dredging, which will continue to require permits under Section 48 of the Act. As such existing blanket permit ALT5054 remains valid.

This letter does not release Small Crafts Harbours from the obligation to obtain permits and approvals from other concerned provincial, federal and municipal agencies for wharves, breakwaters, slipways and boathouses.

Please do not hesitate to contact this office at **729-5713** if you have any questions.

Yours truly,



**Clyde McLean, P.Eng**  
Manager Water Investigations

cc. Shawn Kean  
Haseen Khan

RCM/MSWord 2003  
SCH Wharves Breakwaters Permitting Dec 15 2010.doc

## **Environmental Terms and Conditions**

### **General Alterations**

1. All work must take place within the legal boundaries of the proponent or with the approved of the land owner. The constructed works must comply with all other terms and conditions provided in the Crown Lands grant, lease or license for occupancy.
2. Any work that must be performed below the high water mark must be carried out during a period of low water levels.
3. Any flowing or standing water must be diverted around work sites so that work is carried out in the dry.
4. Water pumped from excavations for 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*.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.
10. The use of creosote treated wood is strictly prohibited within 15 metres of all bodies of fresh water in the province.
11. 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 of Environment and Conservation.

12. All waste materials resulting from this project must be disposed of at a site approved by the regional Government Service Center of the Department of Government Services. The Department of Government Services may require samples to be submitted for testing and analysis.
13. 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.
14. The owners of structures are responsible for any environmental damage resulting from dislodgement caused by the wind, wave, ice action, or structural failure.
15. 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.
16. Fill or ballast 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.
17. Armour stone must be placed around cribbing, where required, to prevent erosion.
18. Suitable booms must be deployed around construction sites to contain any floating debris that might otherwise be carried away. All booms must be properly maintained and remain in place until all work is completed.
19. The proponent must consult with the Department of Fisheries and Oceans should the total combined footprint of the dock exceed 15 metres squared ( $15\text{m}^2$ ) and/or it is made of concrete or steel sheeting or any other skirting that isolates the inside of the crib from the rest of the water.
20. This work must not interfere with the operation of any sanitary or storm sewer outfalls in the area. If it is determined that your work adversely impacts any outfalls, you will be responsible for any repairs, modifications or associated costs to correct the problem.
21. Before commencing work on this project, approval must first be obtained from any municipality in which the work is planned.



Your P.O. #: CALL UP #41  
 Your Project #: R.057680.001  
 Site Location: LONG COVE  
 Your C.O.C. #: B 085926

**Attention: Shawn Kean**

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

Report Date: 2012/11/26

**CERTIFICATE OF ANALYSIS**

**MAXXAM JOB #: B211423**

**Received: 2012/11/19, 12:55**

Sample Matrix: Soil  
 # Samples Received: 4

Analyses	Quantity	Date	Date	Laboratory Method	Method Reference
		Extracted	Analyzed		
TEH in Soil (PIRI) (1,3)	2	2012/11/21	2012/11/22	ATL SOP-00197	Based on Atl. PIRI
TEH in Soil (PIRI) (1,3)	2	2012/11/21	2012/11/23	ATL SOP-00197	Based on Atl. PIRI
Metals Solids Acid Extr. ICPMS (2,4)	3	2012/11/22	2012/11/23	ATL SOP 00024/58	Based on EPA6020A
Metals Solids Acid Extr. ICPMS (2,4)	1	2012/11/23	2012/11/23	ATL SOP 00024/58	Based on EPA6020A
Moisture	4	N/A	2012/11/21	ATL SOP-00196	MOE Handbook 1983
PAH in sediment by GC/MS (Low Level) (2)	4	2012/11/22	2012/11/23	ATL SOP 00102	based on EPA8270C
PCBs in soil by GC/ECD (2,3)	4	2012/11/22	2012/11/23	ATL SOP 00106	Based on EPA8082
pH (5:1 DI Water Extract) (2)	4	2012/11/23	2012/11/26	ATL SOP 00003	Based on SM4500H+B
VPH in Soil (PIRI) (1)	2	2012/11/21	2012/11/21	ATL SOP 00199	Based on Atl. PIRI
VPH in Soil (PIRI) (1)	2	2012/11/21	2012/11/23	ATL SOP 00199	Based on Atl. PIRI
Total Oil and Grease - Soil (2)	4	2012/11/22	2012/11/26	ATL SOP 00100	Based on EPA9071B
ModTPH (T1) Calc. for Soil	4	2012/11/19	2012/11/26		Based on Atl. PIRI

**Remarks:**

Reporting results to two significant figures at the RDL is to permit statistical evaluation and is not intended to be an indication of analytical precision.

\* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

- (1) Reported on a dry weight basis.
- (2) This test was performed by Bedford
- (3) Soils are reported on a dry weight basis unless otherwise specified.
- (4) Note: Metals naming convention has been changed from "Available" to "Acid Extractable" as part of a national harmonization initiative. Contact your project manager for additional details.

..12

Your P.O. #: CALL UP #41  
Your Project #: R.057680.001  
Site Location: LONG COVE  
Your C.O.C. #: B 085926

**Attention: Shawn Kean**

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

**Report Date: 2012/11/26**

**CERTIFICATE OF ANALYSIS**

-2-

**Encryption Key**

*Marie Muise* Marie Muise  
26 Nov 2012 16:55:04 -0400

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Mari Kenny, Project Manager  
Email: MKenny@maxxam.ca  
Phone# (902) 420-0203 Ext:291

=====  
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.

Total cover pages: 2

Page 2 of 16

Maxxam Job #: B211423  
 Report Date: 2012/11/26

 Public Works & Government Services Canada  
 Client Project #: R.057680.001  
 Site Location: LONG COVE  
 Your P.O. #: CALL UP #41

**ATLANTIC MUST IN SOIL (SOIL)**

Maxxam ID		PQ7144	PQ7145		PQ7146		
Sampling Date		2012/11/16	2012/11/16		2012/11/16		
COC Number		B 085926	B 085926		B 085926		
	Units	SAMPLE # 1	SAMPLE # 2	QC Batch	SAMPLE # 3	RDL	QC Batch

Inorganics							
Moisture	%	26	72	3043244	74	1	3043244
Petroleum Hydrocarbons							
Benzene	mg/kg	ND	ND	3043882	ND	0.025	3045273
Toluene	mg/kg	ND	ND	3043882	ND	0.025	3045273
Ethylbenzene	mg/kg	ND	ND	3043882	ND	0.025	3045273
Xylene (Total)	mg/kg	ND	ND	3043882	ND	0.050	3045273
C6 - C10 (less BTEX)	mg/kg	ND	ND	3043882	ND	2.5	3045273
>C10-C16 Hydrocarbons	mg/kg	ND	ND	3043267	ND	10	3045257
>C16-C21 Hydrocarbons	mg/kg	14	ND	3043267	ND	10	3045257
>C21-<C32 Hydrocarbons	mg/kg	73	58	3043267	240	15	3045257
Modified TPH (Tier1)	mg/kg	87 ✓	58 ✓	3040708	240 ✓	15	3040708
Reached Baseline at C32	mg/kg	No	No	3043267	No	N/A	3045257
Hydrocarbon Resemblance	mg/kg	SEECOMMENT (1)	SEECOMMENT (2)	3043267	SEECOMMENT (2)	N/A	3045257
Surrogate Recovery (%)							
Isobutylbenzene - Extractable	%	108	108	3043267	103		3045257
n-Dotriacontane - Extractable	%	92	87	3043267	107		3045257
Isobutylbenzene - Volatile	%	116	98	3043882	106		3045273

ND = Not detected

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

(1) No resemblance to petroleum products in fuel oil /lube oil range.

(2) No resemblance to petroleum products in lube oil range.

Maxxam Job #: B211423  
 Report Date: 2012/11/26

Public Works & Government Services Canada  
 Client Project #: R.057680.001  
 Site Location: LONG COVE  
 Your P.O. #: CALL UP #41

### ATLANTIC MUST IN SOIL (SOIL)

Maxxam ID		PQ7147		
Sampling Date		2012/11/16		
COC Number		B 085926		
	Units	SAMPLE # 4	RDL	QC Batch

<b>Inorganics</b>				
Molsture	%	82	1	3043276
<b>Petroleum Hydrocarbons</b>				
Benzene	mg/kg	ND	0.025	3045273
Toluene	mg/kg	ND	0.025	3045273
Ethylbenzene	mg/kg	ND	0.025	3045273
Xylene (Total)	mg/kg	ND	0.050	3045273
C6 - C10 (less BTEX)	mg/kg	ND	2.5	3045273
>C10-C16 Hydrocarbons	mg/kg	ND	10	3045257
>C16-C21 Hydrocarbons	mg/kg	ND	10	3045257
>C21-<C32 Hydrocarbons	mg/kg	97	15	3045257
Modified TPH (Tler1)	mg/kg	97 ✓	15	3040708
Reached Baseline at C32	mg/kg	No	N/A	3045257
Hydrocarbon Resemblance	mg/kg	SEECOMMENT (1)	N/A	3045257
<b>Surrogate Recovery (%)</b>				
Isobutylbenzene - Extractable	%	100		3045257
n-Dotriacontane - Extractable	%	102		3045257
Isobutylbenzene - Volatile	%	96		3045273

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

Maxxam Job #: B211423  
 Report Date: 2012/11/26

Public Works & Government Services Canada  
 Client Project #: R.057680.001  
 Site Location: LONG COVE  
 Your P.O. #: CALL UP #41

**RESULTS OF ANALYSES OF SOIL**

Maxxam ID		PQ7144	PQ7145	PQ7145	PQ7146	PQ7147		
Sampling Date		2012/11/16	2012/11/16	2012/11/16	2012/11/16	2012/11/16		
COC Number		B 085926	B 085926	B 085926	B 085926	B 085926		
	Units	SAMPLE # 1	SAMPLE # 2	SAMPLE # 2 Lab-Dup	SAMPLE # 3	SAMPLE # 4	RDL	QC Batch

<b>Inorganics</b>								
Soluble (5:1) pH	pH	7.70	7.53		7.80	7.80	N/A	3048311
<b>Petroleum Hydrocarbons</b>								
Total Oil & Grease	mg/kg	280	740	740	1200	1700	100	3045301

RDL = Reportable Detection Limit  
 QC Batch = Quality Control Batch

Maxxam Job #: B211423  
 Report Date: 2012/11/26

Public Works & Government Services Canada  
 Client Project #: R.057680.001  
 Site Location: LONG COVE  
 Your P.O. #: CALL UP #41

### ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Maxxam ID		PQ7144	PQ7145	PQ7146		PQ7147		
Sampling Date		2012/11/16	2012/11/16	2012/11/16		2012/11/16		
COC Number		B 085926	B 085926	B 085926		B 085926		
	Units	SAMPLE # 1	SAMPLE # 2	SAMPLE # 3	QC Batch	SAMPLE # 4	RDL	QC Batch

Metals								
Acid Extractable Aluminum (Al)	mg/kg	13000	15000	15000	3045241	11000	10	3046497
Acid Extractable Antimony (Sb)	mg/kg	ND	ND	ND	3045241	ND	2.0	3046497 ✓
Acid Extractable Arsenic (As)	mg/kg	16	12	16	3045241	11	2.0	3046497
Acid Extractable Barium (Ba)	mg/kg	110	100	260	3045241	320	5.0	3046497
Acid Extractable Beryllium (Be)	mg/kg	ND	ND	ND	3045241	ND	2.0	3046497 ✓
Acid Extractable Boron (B)	mg/kg	26	56	54	3045241	45	5.0	3046497
Acid Extractable Cadmium (Cd)	mg/kg	ND	0.86	0.63	3045241	0.44	0.30	3046497
Acid Extractable Chromium (Cr)	mg/kg	26	33	34	3045241	23	2.0	3046497
Acid Extractable Cobalt (Co)	mg/kg	12	13	13	3045241	8.8	1.0	3046497 ✓
Acid Extractable Copper (Cu)	mg/kg	39	37	120	3045241	64	2.0	3046497
Acid Extractable Iron (Fe)	mg/kg	27000	29000	27000	3045241	16000	50	3046497
Acid Extractable Lead (Pb)	mg/kg	17	26	23	3045241	13	0.50	3046497
Acid Extractable Manganese (Mn)	mg/kg	710	600	630	3045241	380	2.0	3046497
Acid Extractable Mercury (Hg)	mg/kg	ND	ND	ND	3045241	ND	0.10	3046497
Acid Extractable Molybdenum (Mo)	mg/kg	2.2	11	6.1	3045241	4.9	2.0	3046497 ✓
Acid Extractable Nickel (Ni)	mg/kg	23	27	27	3045241	20	2.0	3046497
Acid Extractable Selenium (Se)	mg/kg	ND	ND	ND	3045241	ND	2.0	3046497
Acid Extractable Silver (Ag)	mg/kg	ND	ND	ND	3045241	ND	0.50	3046497 ✓
Acid Extractable Strontium (Sr)	mg/kg	39	70	130	3045241	67	5.0	3046497
Acid Extractable Thallium (Tl)	mg/kg	ND	0.25	0.14	3045241	ND	0.10	3046497
Acid Extractable Tin (Sn)	mg/kg	ND	4.6	3.4	3045241	ND	2.0	3046497 ✓
Acid Extractable Uranium (U)	mg/kg	1.3	3.6	3.2	3045241	2.5	0.10	3046497
Acid Extractable Vanadium (V)	mg/kg	28	36	32	3045241	20	2.0	3046497
Acid Extractable Zinc (Zn)	mg/kg	95	110	170	3045241	77	5.0	3046497

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

Maxxam Job #: B211423  
 Report Date: 2012/11/26

Public Works & Government Services Canada  
 Client Project #: R.057680.001  
 Site Location: LONG COVE  
 Your P.O. #: CALL UP #41

### SEMI-VOLATILE ORGANICS BY GC-MS (SOIL)

Maxxam ID		PQ7144	PQ7145	PQ7146	PQ7147		
Sampling Date		2012/11/16	2012/11/16	2012/11/16	2012/11/16		
COC Number		B 085926	B 085926	B 085926	B 085926		
	Units	SAMPLE # 1	SAMPLE # 2	SAMPLE # 3	SAMPLE # 4	RDL	QC Batch

Polyaromatic Hydrocarbons							
1-Methylnaphthalene	mg/kg	ND	ND	ND	ND	0.0050	3044966
2-Methylnaphthalene	mg/kg	0.0073	ND	ND	ND	0.0050	3044966
Acenaphthene	mg/kg	0.0082	0.018	0.027	0.10	0.0050	3044966
Acenaphthylene	mg/kg	ND	0.021	0.056	ND	0.0050	3044966
Anthracene	mg/kg	0.094	0.15	0.27	0.20	0.0050	3044966
Benzo(a)anthracene	mg/kg	0.40	1.1	2.5	1.2	0.0050	3044966 ✓
Benzo(a)pyrene	mg/kg	0.20	0.59	1.2	0.58	0.0050	3044966 ✓
Benzo(b)fluoranthene	mg/kg	0.27	1.0	1.9	0.79	0.0050	3044966 ✓
Benzo(g,h,i)perylene	mg/kg	0.070	0.23	0.50	0.19	0.0050	3044966
Benzo(j)fluoranthene	mg/kg	0.14	0.49	0.85	0.41	0.0050	3044966 ✓
Benzo(k)fluoranthene	mg/kg	0.14	0.51	0.87	0.41	0.0050	3044966 ✓
Chrysene	mg/kg	0.34	0.92	2.2	0.94	0.0050	3044966 ✓
Dibenz(a,h)anthracene	mg/kg	0.021	0.072	0.15	0.063	0.0050	3044966 ✓
Fluoranthene	mg/kg	1.4	3.2	7.5	4.6	0.0050	3044966
Fluorene	mg/kg	0.087	0.030	0.053	0.028	0.0050	3044966
Indeno(1,2,3-cd)pyrene	mg/kg	0.072	0.24	0.51	0.20	0.0050	3044966 ✓
Naphthalene	mg/kg	0.016	ND	ND	ND	0.0050	3044966 ✓
Perylene	mg/kg	0.076	0.23	0.44	0.27	0.0050	3044966
Phenanthrene	mg/kg	0.38	0.20	0.31	0.16	0.0050	3044966 ✓
Pyrene	mg/kg	0.66	1.8	2.9	2.7	0.0050	3044966 ✓
<b>Surrogate Recovery (%)</b>							
D10-Anthracene	%	78	91	84	80		3044966
D14-Terphenyl	%	90	100	89	87		3044966
D8-Acenaphthylene	%	81	78	77	78		3044966

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

Maxxam Job #: B211423  
 Report Date: 2012/11/26

Public Works & Government Services Canada  
 Client Project #: R.057680.001  
 Site Location: LONG COVE  
 Your P.O. #: CALL UP #41

**POLYCHLORINATED BIPHENYLS BY GC-ECD (SOIL)**

Maxxam ID		PQ7144	PQ7145	PQ7146	PQ7147		
Sampling Date		2012/11/16	2012/11/16	2012/11/16	2012/11/16		
COC Number		B 085926	B 085926	B 085926	B 085926		
	Units	SAMPLE # 1	SAMPLE # 2	SAMPLE # 3	SAMPLE # 4	RDL	QC Batch

<b>PCBs</b>							
Total PCB	ug/g	ND	ND	ND	ND	0.050	3045129
Surrogate Recovery (%)							
Decachlorobiphenyl	%	87	89	87	87		3045129

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

Maxxam Job #: B211423  
Report Date: 2012/11/26

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**GENERAL COMMENTS**

Results relate only to the items tested.

Public Works & Government Services Canada  
 Attention: Shawn Kean  
 Client Project #: R.057680.001  
 P.O. #: CALL UP #41  
 Site Location: LONG COVE

Quality Assurance Report  
 Maxxam Job Number: ZB211423

QA/QC Batch	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3043244 CKN	RPD	Moisture	2012/11/21	6.5		%	25
3043267 SPI	Matrix Spike	Isobutylbenzene - Extractable	2012/11/22		100	%	30 - 130
		n-Dotriacontane - Extractable	2012/11/22		113	%	30 - 130
		>C10-C16 Hydrocarbons	2012/11/22		86	%	30 - 130
		>C16-C21 Hydrocarbons	2012/11/22		95	%	30 - 130
		>C21-<C32 Hydrocarbons	2012/11/22		91	%	30 - 130
	Spiked Blank	Isobutylbenzene - Extractable	2012/11/22		99	%	30 - 130
		n-Dotriacontane - Extractable	2012/11/22		109	%	30 - 130
		>C10-C16 Hydrocarbons	2012/11/22		86	%	30 - 130
		>C16-C21 Hydrocarbons	2012/11/22		93	%	30 - 130
		>C21-<C32 Hydrocarbons	2012/11/22		90	%	30 - 130
	Method Blank	Isobutylbenzene - Extractable	2012/11/22		103	%	30 - 130
		n-Dotriacontane - Extractable	2012/11/22		104	%	30 - 130
		>C10-C16 Hydrocarbons	2012/11/22	ND, RDL=10		mg/kg	
		>C16-C21 Hydrocarbons	2012/11/22	ND, RDL=10		mg/kg	
		>C21-<C32 Hydrocarbons	2012/11/22	ND, RDL=15		mg/kg	
	RPD	>C10-C16 Hydrocarbons	2012/11/22	NC		%	50
		>C16-C21 Hydrocarbons	2012/11/22	NC		%	50
		>C21-<C32 Hydrocarbons	2012/11/22	NC		%	50
3043276 CKN	RPD	Moisture	2012/11/21	NC		%	25
3043882 JHW	Spiked Blank	Isobutylbenzene - Volatile	2012/11/21		102	%	60 - 140
		Benzene	2012/11/21		90	%	60 - 140
		Toluene	2012/11/21		88	%	60 - 140
		Ethylbenzene	2012/11/21		86	%	60 - 140
		Xylene (Total)	2012/11/21		87	%	60 - 140
	Method Blank	Isobutylbenzene - Volatile	2012/11/21		100	%	60 - 140
		Benzene	2012/11/21	ND, RDL=0.025		mg/kg	
		Toluene	2012/11/21	ND, RDL=0.025		mg/kg	
		Ethylbenzene	2012/11/21	ND, RDL=0.025		mg/kg	
		Xylene (Total)	2012/11/21	ND, RDL=0.050		mg/kg	
		C6 - C10 (less BTEX)	2012/11/21	ND, RDL=2.5		mg/kg	
3044966 GTH	Matrix Spike	D10-Anthracene	2012/11/23		84	%	30 - 130
		D14-Terphenyl	2012/11/23		96	%	30 - 130
		D8-Acenaphthylene	2012/11/23		81	%	30 - 130
		1-Methylnaphthalene	2012/11/23		73	%	30 - 130
		2-Methylnaphthalene	2012/11/23		80	%	30 - 130
		Acenaphthene	2012/11/23		76	%	30 - 130
		Acenaphthylene	2012/11/23		68	%	30 - 130
		Anthracene	2012/11/23		88	%	30 - 130
		Benzo(a)anthracene	2012/11/23		83	%	30 - 130
		Benzo(a)pyrene	2012/11/23		74	%	30 - 130
		Benzo(b)fluoranthene	2012/11/23		78	%	30 - 130
		Benzo(g,h,i)perylene	2012/11/23		77	%	30 - 130
		Benzo(j)fluoranthene	2012/11/23		81	%	30 - 130
		Benzo(k)fluoranthene	2012/11/23		82	%	30 - 130
		Chrysene	2012/11/23		98	%	30 - 130
		Dibenz(a,h)anthracene	2012/11/23		80	%	30 - 130
		Fluoranthene	2012/11/23		NC	%	30 - 130
		Fluorene	2012/11/23		77	%	30 - 130
		Indeno(1,2,3-cd)pyrene	2012/11/23		76	%	30 - 130
		Naphthalene	2012/11/23		80	%	30 - 130
		Perylene	2012/11/23		84	%	30 - 130
		Phenanthrene	2012/11/23		85	%	30 - 130
		Pyrene	2012/11/23		NC	%	30 - 130
	Spiked Blank	D10-Anthracene	2012/11/22		82	%	30 - 130

Public Works & Government Services Canada  
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## Quality Assurance Report (Continued)

Maxxam Job Number: ZB211423

QA/QC Batch Num Inlt	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3044966	GTH	Spiked Blank	D14-Terphenyl	2012/11/22		98 %	30 - 130
		D8-Acenaphthylene	2012/11/22		78 %	30 - 130	
		1-Methylnaphthalene	2012/11/22		69 %	30 - 130	
		2-Methylnaphthalene	2012/11/22		73 %	30 - 130	
		Acenaphthene	2012/11/22		73 %	30 - 130	
		Acenaphthylene	2012/11/22		66 %	30 - 130	
		Anthracene	2012/11/22		76 %	30 - 130	
		Benzo(a)anthracene	2012/11/22		89 %	30 - 130	
		Benzo(a)pyrene	2012/11/22		78 %	30 - 130	
		Benzo(b)fluoranthene	2012/11/22		78 %	30 - 130	
		Benzo(g,h,i)perylene	2012/11/22		79 %	30 - 130	
		Benzo(j)fluoranthene	2012/11/22		84 %	30 - 130	
		Benzo(k)fluoranthene	2012/11/22		81 %	30 - 130	
		Chrysene	2012/11/22		93 %	30 - 130	
		Dibenz(a,h)anthracene	2012/11/22		74 %	30 - 130	
		Fluoranthene	2012/11/22		82 %	30 - 130	
		Fluorene	2012/11/22		74 %	30 - 130	
		Indeno(1,2,3-cd)pyrene	2012/11/22		74 %	30 - 130	
		Naphthalene	2012/11/22		70 %	30 - 130	
		Perylene	2012/11/22		82 %	30 - 130	
		Phenanthrene	2012/11/22		85 %	30 - 130	
		Pyrene	2012/11/22		87 %	30 - 130	
		Method Blank	D10-Anthracene	2012/11/22		81 %	30 - 130
			D14-Terphenyl	2012/11/22		93 %	30 - 130
			D8-Acenaphthylene	2012/11/22		79 %	30 - 130
			1-Methylnaphthalene	2012/11/22	ND, RDL=0.0050	mg/kg	
			2-Methylnaphthalene	2012/11/22	ND, RDL=0.0050	mg/kg	
			Acenaphthene	2012/11/22	ND, RDL=0.0050	mg/kg	
			Acenaphthylene	2012/11/22	ND, RDL=0.0050	mg/kg	
			Anthracene	2012/11/22	ND, RDL=0.0050	mg/kg	
			Benzo(a)anthracene	2012/11/22	ND, RDL=0.0050	mg/kg	
			Benzo(a)pyrene	2012/11/22	ND, RDL=0.0050	mg/kg	
			Benzo(b)fluoranthene	2012/11/22	ND, RDL=0.0050	mg/kg	
Benzo(g,h,i)perylene	2012/11/22		ND, RDL=0.0050	mg/kg			
Benzo(j)fluoranthene	2012/11/22		ND, RDL=0.0050	mg/kg			
Benzo(k)fluoranthene	2012/11/22		ND, RDL=0.0050	mg/kg			
Chrysene	2012/11/22		ND, RDL=0.0050	mg/kg			
Dibenz(a,h)anthracene	2012/11/22		ND, RDL=0.0050	mg/kg			
Fluoranthene	2012/11/22		ND, RDL=0.0050	mg/kg			
Fluorene	2012/11/22		ND, RDL=0.0050	mg/kg			
Indeno(1,2,3-cd)pyrene	2012/11/22		ND, RDL=0.0050	mg/kg			
Naphthalene	2012/11/22		ND, RDL=0.0050	mg/kg			
Perylene	2012/11/22		ND, RDL=0.0050	mg/kg			
Phenanthrene	2012/11/22		ND, RDL=0.0050	mg/kg			
Pyrene	2012/11/22		ND, RDL=0.0050	mg/kg			
RPD	1-Methylnaphthalene		2012/11/23	NC	%	50	
	2-Methylnaphthalene		2012/11/23	NC	%	50	
	Acenaphthene		2012/11/23	NC	%	50	
	Acenaphthylene		2012/11/23	NC	%	50	
	Anthracene		2012/11/23	NC	%	50	
	Benzo(a)anthracene		2012/11/23	NC	%	50	
	Benzo(a)pyrene		2012/11/23	4.5	%	50	
	Benzo(b)fluoranthene		2012/11/23	2.5	%	50	
	Benzo(g,h,i)perylene		2012/11/23	NC	%	50	
	Benzo(j)fluoranthene		2012/11/23	NC	%	50	

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 Site Location: LONG COVE

## Quality Assurance Report (Continued)

Maxxam Job Number: ZB211423

QA/QC Batch	Date Analyzed	Value	Recovery	Units	QC Limits	
Num Init QC Type	Parameter	yyyy/mm/dd				
3044966 GTH RPD	Benzo(k)fluoranthene	2012/11/23	NC	%	50	
	Chrysene	2012/11/23	17.6	%	50	
	Dibenz(a,h)anthracene	2012/11/23	NC	%	50	
	Fluoranthene	2012/11/23	10	%	50	
	Fluorene	2012/11/23	NC	%	50	
	Indeno(1,2,3-cd)pyrene	2012/11/23	NC	%	50	
	Naphthalene	2012/11/23	NC	%	50	
	Perylene	2012/11/23	NC	%	50	
	Phenanthrene	2012/11/23	12.0	%	50	
	Pyrene	2012/11/23	9.9	%	50	
3045129 KJO Matrix Spike	Decachlorobiphenyl	2012/11/23		85 %	30 - 130	
	Total PCB	2012/11/23		104 %	30 - 130	
	Spiked Blank	Decachlorobiphenyl	2012/11/23		91 %	70 - 130
	Total PCB	2012/11/23		116 %	70 - 130	
Method Blank	Decachlorobiphenyl	2012/11/23		85 %	30 - 130	
	Total PCB	2012/11/23	ND, RDL=0.050	ug/g		
	Total PCB	2012/11/23	NC	%	50	
	RPD	Total PCB	2012/11/23			
3045241 DLB Matrix Spike	Acid Extractable Antimony (Sb)	2012/11/23		94 %	75 - 125	
	Acid Extractable Arsenic (As)	2012/11/23		100 %	75 - 125	
	Acid Extractable Barium (Ba)	2012/11/23		NC %	75 - 125	
	Acid Extractable Beryllium (Be)	2012/11/23		98 %	75 - 125	
	Acid Extractable Boron (B)	2012/11/23		NC %	75 - 125	
	Acid Extractable Cadmium (Cd)	2012/11/23		95 %	75 - 125	
	Acid Extractable Chromium (Cr)	2012/11/23		96 %	75 - 125	
	Acid Extractable Cobalt (Co)	2012/11/23		94 %	75 - 125	
	Acid Extractable Copper (Cu)	2012/11/23		NC %	75 - 125	
	Acid Extractable Lead (Pb)	2012/11/23		95 %	75 - 125	
	Acid Extractable Manganese (Mn)	2012/11/23		NC %	75 - 125	
	Acid Extractable Mercury (Hg)	2012/11/23		99 %	75 - 125	
	Acid Extractable Molybdenum (Mo)	2012/11/23		NC %	75 - 125	
	Acid Extractable Nickel (Ni)	2012/11/23		93 %	75 - 125	
	Acid Extractable Selenium (Se)	2012/11/23		97 %	75 - 125	
	Acid Extractable Silver (Ag)	2012/11/23		98 %	75 - 125	
	Acid Extractable Strontium (Sr)	2012/11/23		NC %	75 - 125	
	Acid Extractable Thallium (Tl)	2012/11/23		102 %	75 - 125	
	Acid Extractable Tin (Sn)	2012/11/23		NC %	75 - 125	
	Acid Extractable Uranium (U)	2012/11/23		97 %	75 - 125	
	Acid Extractable Vanadium (V)	2012/11/23		NC %	75 - 125	
	Acid Extractable Zinc (Zn)	2012/11/23		NC %	75 - 125	
	Spiked Blank	Acid Extractable Antimony (Sb)	2012/11/23		107 %	75 - 125
		Acid Extractable Arsenic (As)	2012/11/23		103 %	75 - 125
		Acid Extractable Barium (Ba)	2012/11/23		96 %	75 - 125
		Acid Extractable Beryllium (Be)	2012/11/23		99 %	75 - 125
		Acid Extractable Boron (B)	2012/11/23		102 %	75 - 125
		Acid Extractable Cadmium (Cd)	2012/11/23		97 %	75 - 125
		Acid Extractable Chromium (Cr)	2012/11/23		97 %	75 - 125
		Acid Extractable Cobalt (Co)	2012/11/23		98 %	75 - 125
		Acid Extractable Copper (Cu)	2012/11/23		98 %	75 - 125
		Acid Extractable Lead (Pb)	2012/11/23		98 %	75 - 125
		Acid Extractable Manganese (Mn)	2012/11/23		96 %	75 - 125
		Acid Extractable Mercury (Hg)	2012/11/23		103 %	75 - 125
Acid Extractable Molybdenum (Mo)		2012/11/23		105 %	75 - 125	
Acid Extractable Nickel (Ni)		2012/11/23		96 %	75 - 125	
Acid Extractable Selenium (Se)		2012/11/23		102 %	75 - 125	
Acid Extractable Silver (Ag)		2012/11/23		102 %	75 - 125	

Public Works & Government Services Canada  
 Attention: Shawn Kean  
 Client Project #: R.057680.001  
 P.O. #: CALL UP #41  
 Site Location: LONG COVE

## Quality Assurance Report (Continued)

Maxxam Job Number: ZB211423

QA/QC Batch Num Init	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits		
3045241 DLB	Spiked Blank	Acid Extractable Strontium (Sr)	2012/11/23		99	%	75 - 125		
		Acid Extractable Thallium (Tl)	2012/11/23		102	%	75 - 125		
		Acid Extractable Tin (Sn)	2012/11/23		110	%	75 - 125		
		Acid Extractable Uranium (U)	2012/11/23		99	%	75 - 125		
		Acid Extractable Vanadium (V)	2012/11/23		97	%	75 - 125		
	Method Blank	Acid Extractable Zinc (Zn)	2012/11/23			103	%	75 - 125	
		Acid Extractable Aluminum (Al)	2012/11/23	ND, RDL=10			mg/kg		
		Acid Extractable Antimony (Sb)	2012/11/23	ND, RDL=2.0			mg/kg		
		Acid Extractable Arsenic (As)	2012/11/23	ND, RDL=2.0			mg/kg		
		Acid Extractable Barium (Ba)	2012/11/23	ND, RDL=5.0			mg/kg		
		Acid Extractable Beryllium (Be)	2012/11/23	ND, RDL=2.0			mg/kg		
		Acid Extractable Boron (B)	2012/11/23	ND, RDL=5.0			mg/kg		
		Acid Extractable Cadmium (Cd)	2012/11/23	ND, RDL=0.30			mg/kg		
		Acid Extractable Chromium (Cr)	2012/11/23	ND, RDL=2.0			mg/kg		
		Acid Extractable Cobalt (Co)	2012/11/23	ND, RDL=1.0			mg/kg		
		Acid Extractable Copper (Cu)	2012/11/23	ND, RDL=2.0			mg/kg		
		Acid Extractable Iron (Fe)	2012/11/23	ND, RDL=50			mg/kg		
		Acid Extractable Lead (Pb)	2012/11/23	ND, RDL=0.50			mg/kg		
		Acid Extractable Manganese (Mn)	2012/11/23	ND, RDL=2.0			mg/kg		
		Acid Extractable Mercury (Hg)	2012/11/23	ND, RDL=0.10			mg/kg		
		Acid Extractable Molybdenum (Mo)	2012/11/23	ND, RDL=2.0			mg/kg		
		Acid Extractable Nickel (Ni)	2012/11/23	ND, RDL=2.0			mg/kg		
		Acid Extractable Selenium (Se)	2012/11/23	ND, RDL=2.0			mg/kg		
		Acid Extractable Silver (Ag)	2012/11/23	ND, RDL=0.50			mg/kg		
		Acid Extractable Strontium (Sr)	2012/11/23	ND, RDL=5.0			mg/kg		
		Acid Extractable Thallium (Tl)	2012/11/23	ND, RDL=0.10			mg/kg		
		Acid Extractable Tin (Sn)	2012/11/23	ND, RDL=2.0			mg/kg		
		Acid Extractable Uranium (U)	2012/11/23	ND, RDL=0.10			mg/kg		
		Acid Extractable Vanadium (V)	2012/11/23	ND, RDL=2.0			mg/kg		
		Acid Extractable Zinc (Zn)	2012/11/23	ND, RDL=5.0			mg/kg		
		RPD	Acid Extractable Aluminum (Al)	2012/11/23	0.3			%	35
			Acid Extractable Antimony (Sb)	2012/11/23	NC			%	35
			Acid Extractable Arsenic (As)	2012/11/23	NC			%	35
			Acid Extractable Barium (Ba)	2012/11/23	0.7			%	35
Acid Extractable Beryllium (Be)			2012/11/23	NC			%	35	
Acid Extractable Boron (B)	2012/11/23		2.6			%	35		
Acid Extractable Cadmium (Cd)	2012/11/23		0.4			%	35		
Acid Extractable Chromium (Cr)	2012/11/23		1.1			%	35		
Acid Extractable Cobalt (Co)	2012/11/23		1.9			%	35		
Acid Extractable Copper (Cu)	2012/11/23		1.0			%	35		
Acid Extractable Iron (Fe)	2012/11/23		0.5			%	35		
Acid Extractable Lead (Pb)	2012/11/23		2.6			%	35		
Acid Extractable Manganese (Mn)	2012/11/23		0.1			%	35		
Acid Extractable Mercury (Hg)	2012/11/23		NC			%	35		
Acid Extractable Molybdenum (Mo)	2012/11/23		3.7			%	35		
Acid Extractable Nickel (Ni)	2012/11/23		4.5			%	35		
Acid Extractable Selenium (Se)	2012/11/23		NC			%	35		
Acid Extractable Silver (Ag)	2012/11/23		NC			%	35		
Acid Extractable Strontium (Sr)	2012/11/23		2.8			%	35		
Acid Extractable Thallium (Tl)	2012/11/23		NC			%	35		
Acid Extractable Tin (Sn)	2012/11/23		NC			%	35		
Acid Extractable Uranium (U)	2012/11/23		0.1			%	35		
Acid Extractable Vanadium (V)	2012/11/23		5.0			%	35		
Acid Extractable Zinc (Zn)	2012/11/23		3.4			%	35		
3045257 SPI	Matrix Spike	Isobutylbenzene - Extractable	2012/11/23		102	%	30 - 130		

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## Quality Assurance Report (Continued)

Maxxam Job Number: ZB211423

QA/QC Batch	Date Analyzed	Value	Recovery	Units	QC Limits	
3045257 SPI	Matrix Spike	n-Dotriacontane - Extractable	2012/11/23	115	%	30 - 130
		>C10-C16 Hydrocarbons	2012/11/23	90	%	30 - 130
		>C16-C21 Hydrocarbons	2012/11/23	95	%	30 - 130
		>C21-<C32 Hydrocarbons	2012/11/23	87	%	30 - 130
	Spiked Blank	Isobutylbenzene - Extractable	2012/11/23	98	%	30 - 130
		n-Dotriacontane - Extractable	2012/11/23	107	%	30 - 130
		>C10-C16 Hydrocarbons	2012/11/23	85	%	30 - 130
		>C16-C21 Hydrocarbons	2012/11/23	90	%	30 - 130
		>C21-<C32 Hydrocarbons	2012/11/23	85	%	30 - 130
	Method Blank	Isobutylbenzene - Extractable	2012/11/23	99	%	30 - 130
		n-Dotriacontane - Extractable	2012/11/23	103	%	30 - 130
		>C10-C16 Hydrocarbons	2012/11/23	ND, RDL=10	mg/kg	
		>C16-C21 Hydrocarbons	2012/11/23	ND, RDL=10	mg/kg	
		>C21-<C32 Hydrocarbons	2012/11/23	ND, RDL=15	mg/kg	
	RPD	>C10-C16 Hydrocarbons	2012/11/23	NC	%	50
		>C16-C21 Hydrocarbons	2012/11/23	NC	%	50
		>C21-<C32 Hydrocarbons	2012/11/23	NC	%	50
3045273 JHW	Spiked Blank	Isobutylbenzene - Volatile	2012/11/23	91	%	60 - 140
		Benzene	2012/11/23	81	%	60 - 140
		Toluene	2012/11/23	77	%	60 - 140
		Ethylbenzene	2012/11/23	70	%	60 - 140
		Xylene (Total)	2012/11/23	75	%	60 - 140
	Method Blank	Isobutylbenzene - Volatile	2012/11/23	93	%	60 - 140
		Benzene	2012/11/23	ND, RDL=0.025	mg/kg	
		Toluene	2012/11/23	ND, RDL=0.025	mg/kg	
		Ethylbenzene	2012/11/23	ND, RDL=0.025	mg/kg	
		Xylene (Total)	2012/11/23	ND, RDL=0.050	mg/kg	
		C6 - C10 (less BTEX)	2012/11/23	ND, RDL=2.5	mg/kg	
	RPD	Benzene	2012/11/23	NC	%	50
		Toluene	2012/11/23	NC	%	50
		Ethylbenzene	2012/11/23	NC	%	50
		Xylene (Total)	2012/11/23	NC	%	50
		C6 - C10 (less BTEX)	2012/11/23	NC	%	50
3045301 CDS	Matrix Spike (PQ7145-01)	Total Oil & Grease	2012/11/26	NC	%	30 - 130
	Spiked Blank	Total Oil & Grease	2012/11/26	74	%	30 - 130
	Method Blank	Total Oil & Grease	2012/11/26	110, RDL=100	mg/kg	
	RPD [PQ7145-01]	Total Oil & Grease	2012/11/26	0	%	50
3046497 DLB	Matrix Spike	Acid Extractable Antimony (Sb)	2012/11/23	97	%	75 - 125
		Acid Extractable Arsenic (As)	2012/11/23	101	%	75 - 125
		Acid Extractable Barium (Ba)	2012/11/23	NC	%	75 - 125
		Acid Extractable Beryllium (Be)	2012/11/23	108	%	75 - 125
		Acid Extractable Boron (B)	2012/11/23	103	%	75 - 125
		Acid Extractable Cadmium (Cd)	2012/11/23	102	%	75 - 125
		Acid Extractable Chromium (Cr)	2012/11/23	NC	%	75 - 125
		Acid Extractable Cobalt (Co)	2012/11/23	101	%	75 - 125
		Acid Extractable Copper (Cu)	2012/11/23	95	%	75 - 125
		Acid Extractable Lead (Pb)	2012/11/23	101	%	75 - 125
		Acid Extractable Manganese (Mn)	2012/11/23	NC	%	75 - 125
		Acid Extractable Mercury (Hg)	2012/11/23	97	%	75 - 125
		Acid Extractable Molybdenum (Mo)	2012/11/23	103	%	75 - 125
		Acid Extractable Nickel (Ni)	2012/11/23	NC	%	75 - 125
		Acid Extractable Selenium (Se)	2012/11/23	107	%	75 - 125
		Acid Extractable Silver (Ag)	2012/11/23	98	%	75 - 125
		Acid Extractable Strontium (Sr)	2012/11/23	NC	%	75 - 125

Public Works & Government Services Canada  
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 Client Project #: R.057680.001  
 P.O. #: CALL UP #41  
 Site Location: LONG COVE

## Quality Assurance Report (Continued)

Maxxam Job Number: ZB211423

QA/QC Batch	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits			
3046497 DLB	Matrix Spike	Acid Extractable Thallium (Tl)	2012/11/23		104	%	75 - 125			
		Acid Extractable Tin (Sn)	2012/11/23		105	%	75 - 125			
		Acid Extractable Uranium (U)	2012/11/23		104	%	75 - 125			
	Spiked Blank		Acid Extractable Vanadium (V)	2012/11/23		NC	%	75 - 125		
			Acid Extractable Zinc (Zn)	2012/11/23		NC	%	75 - 125		
			Acid Extractable Antimony (Sb)	2012/11/23		98	%	75 - 125		
			Acid Extractable Arsenic (As)	2012/11/23		102	%	75 - 125		
			Acid Extractable Barium (Ba)	2012/11/23		99	%	75 - 125		
			Acid Extractable Beryllium (Be)	2012/11/23		106	%	75 - 125		
			Acid Extractable Boron (B)	2012/11/23		110	%	75 - 125		
			Acid Extractable Cadmium (Cd)	2012/11/23		102	%	75 - 125		
			Acid Extractable Chromium (Cr)	2012/11/23		100	%	75 - 125		
			Acid Extractable Cobalt (Co)	2012/11/23		103	%	75 - 125		
			Acid Extractable Copper (Cu)	2012/11/23		102	%	75 - 125		
			Acid Extractable Lead (Pb)	2012/11/23		101	%	75 - 125		
			Acid Extractable Manganese (Mn)	2012/11/23		99	%	75 - 125		
			Acid Extractable Mercury (Hg)	2012/11/23		103	%	75 - 125		
			Acid Extractable Molybdenum (Mo)	2012/11/23		101	%	75 - 125		
			Acid Extractable Nickel (Ni)	2012/11/23		102	%	75 - 125		
			Acid Extractable Selenium (Se)	2012/11/23		107	%	75 - 125		
			Acid Extractable Silver (Ag)	2012/11/23		101	%	75 - 125		
			Acid Extractable Strontium (Sr)	2012/11/23		96	%	75 - 125		
			Acid Extractable Thallium (Tl)	2012/11/23		102	%	75 - 125		
			Acid Extractable Tin (Sn)	2012/11/23		98	%	75 - 125		
			Acid Extractable Uranium (U)	2012/11/23		104	%	75 - 125		
			Acid Extractable Vanadium (V)	2012/11/23		100	%	75 - 125		
			Acid Extractable Zinc (Zn)	2012/11/23		97	%	75 - 125		
			Method Blank		Acid Extractable Aluminum (Al)	2012/11/23	ND, RDL=10		mg/kg	
					Acid Extractable Antimony (Sb)	2012/11/23	ND, RDL=2.0		mg/kg	
					Acid Extractable Arsenic (As)	2012/11/23	ND, RDL=2.0		mg/kg	
	Acid Extractable Barium (Ba)	2012/11/23			ND, RDL=5.0		mg/kg			
	Acid Extractable Beryllium (Be)	2012/11/23			ND, RDL=2.0		mg/kg			
	Acid Extractable Boron (B)	2012/11/23			ND, RDL=5.0		mg/kg			
Acid Extractable Cadmium (Cd)	2012/11/23	ND, RDL=0.30				mg/kg				
Acid Extractable Chromium (Cr)	2012/11/23	ND, RDL=2.0				mg/kg				
Acid Extractable Cobalt (Co)	2012/11/23	ND, RDL=1.0				mg/kg				
Acid Extractable Copper (Cu)	2012/11/23	ND, RDL=2.0				mg/kg				
Acid Extractable Iron (Fe)	2012/11/23	ND, RDL=50				mg/kg				
Acid Extractable Lead (Pb)	2012/11/23	ND, RDL=0.50				mg/kg				
Acid Extractable Manganese (Mn)	2012/11/23	ND, RDL=2.0				mg/kg				
Acid Extractable Mercury (Hg)	2012/11/23	ND, RDL=0.10				mg/kg				
Acid Extractable Molybdenum (Mo)	2012/11/23	ND, RDL=2.0				mg/kg				
Acid Extractable Nickel (Ni)	2012/11/23	ND, RDL=2.0				mg/kg				
Acid Extractable Selenium (Se)	2012/11/23	ND, RDL=2.0				mg/kg				
Acid Extractable Silver (Ag)	2012/11/23	ND, RDL=0.50				mg/kg				
Acid Extractable Strontium (Sr)	2012/11/23	ND, RDL=5.0				mg/kg				
Acid Extractable Thallium (Tl)	2012/11/23	ND, RDL=0.10				mg/kg				
Acid Extractable Tin (Sn)	2012/11/23	ND, RDL=2.0				mg/kg				
Acid Extractable Uranium (U)	2012/11/23	ND, RDL=0.10				mg/kg				
Acid Extractable Vanadium (V)	2012/11/23	ND, RDL=2.0				mg/kg				
Acid Extractable Zinc (Zn)	2012/11/23	ND, RDL=5.0				mg/kg				
RPD		Acid Extractable Aluminum (Al)			2012/11/23	1.6		%	35	
		Acid Extractable Antimony (Sb)			2012/11/23	NC		%	35	
		Acid Extractable Arsenic (As)			2012/11/23	NC		%	35	
		Acid Extractable Barium (Ba)			2012/11/23	31.5		%	35	

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Quality Assurance Report (Continued)  
 Maxxam Job Number: ZB211423

QA/QC Batch	QC Type	Parameter	Date Analyzed yyyy/mm/dd	Value	Recovery	Units	QC Limits
3046497 DLB	RPD	Acid Extractable Beryllium (Be)	2012/11/23	NC		%	35
		Acid Extractable Boron (B)	2012/11/23	NC		%	35
		Acid Extractable Cadmium (Cd)	2012/11/23	NC		%	35
		Acid Extractable Chromium (Cr)	2012/11/23	8.5		%	35
		Acid Extractable Cobalt (Co)	2012/11/23	5.8		%	35
		Acid Extractable Copper (Cu)	2012/11/23	1.6		%	35
		Acid Extractable Iron (Fe)	2012/11/23	4.3		%	35
		Acid Extractable Lead (Pb)	2012/11/23	5.2		%	35
		Acid Extractable Manganese (Mn)	2012/11/23	1.1		%	35
		Acid Extractable Mercury (Hg)	2012/11/23	NC		%	35
		Acid Extractable Molybdenum (Mo)	2012/11/23	NC		%	35
		Acid Extractable Nickel (Ni)	2012/11/23	7.3		%	35
		Acid Extractable Selenium (Se)	2012/11/23	NC		%	35
		Acid Extractable Silver (Ag)	2012/11/23	NC		%	35
		Acid Extractable Strontium (Sr)	2012/11/23	27.1		%	35
		Acid Extractable Thallium (Tl)	2012/11/23	NC		%	35
		Acid Extractable Tin (Sn)	2012/11/23	NC		%	35
		Acid Extractable Uranium (U)	2012/11/23	NC		%	35
		Acid Extractable Vanadium (V)	2012/11/23	9.3		%	35
		Acid Extractable Zinc (Zn)	2012/11/23	11.3		%	35
3048311 SCR	RPD	Soluble (5:1) pH	2012/11/26	1.3		%	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 not sufficiently significant to permit a reliable recovery calculation.

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.