



Stantec Consulting Ltd.
845 Prospect Street, Fredericton NB E3B 2T7

June 8, 2016
File: 121812027

Attention: Mr. Cory Alexander
Environmental Officer, Environmental Services
Public Works and Government Services Canada
1713 Bedford Row
Halifax, Nova Scotia B3J 3C9

Dear Mr. Alexander,

Reference: Limited Hazardous Building Materials Assessment, Machias Seal Island Lighthouse, Charlotte County, New Brunswick, LL# 6, DFRP# 03984, and RPIS# MD00190

INTRODUCTION

At the request of Public Works and Government Services Canada (PWGSC), on May 20, 2016, Stantec Consulting Ltd. (Stantec) completed a hazardous building materials (hazmat) assessment of the Machias Seal Island Lighthouse (subject building) located in Charlotte County, New Brunswick.

The purpose of the assessment was to confirm the presence or absence of hazmat that would require specific abatement or disposal requirements prior to the planned renovation activities. The assessment was conducted to identify the nature, location, and condition of asbestos-containing materials (non-friable and friable), lead-containing materials and PCB ballasts, that may be present within the building.

Based on visual observations and experience with known hazardous materials, various samples of potential hazardous materials were collected for analysis of asbestos and lead content.

BACKGROUND AND SCOPE OF WORK

The Machias Seal Island light tower is located on Machias Seal Island, Charlotte County, New Brunswick. The original light tower was established on Machias Seal Island in 1832, while the current tower was constructed in 1960 (Jacques Whitford, 2004). The island is currently occupied by the light tower, two residential dwellings, two storage sheds, one fuel storage building, solar panels, a windmill, and a helicopter pad. The residential dwelling located near the light tower is currently occupied by lightkeepers year round on alternating shifts. The other residential dwelling, located near the north end of the property, is occupied by Canadian Wildlife Service (CWS) research scientists and university students in the summer and monitored by the lightkeepers year round. A wooden walkway leads from the CWS dwelling to the helicopter pad and extends east towards the shoreline.

Based on the information provided by PWGSC, the subject light tower has been designated for rehabilitation, which will include hazmat abatement if required, removal of existing metal projections and concrete coating, localized concrete removal and repairs, reinstatement of a window at the mezzanine level, lantern restoration including paint removal, metal repair and



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repainting, installation of a fall protection system, installation of drainage board at grade, installation of a new metal railing at gallery level, repair of interior drywall, installation of new bolts and refinishing for the interior ladder and rails, installation of a new window, and application of coatings to the exterior concrete surfaces.

The lighthouse was constructed in 1960 with minor repairs and upgrades reportedly performed since. The subject building consists of a tapered octagonal tower with a cast-in concrete base. Construction consists of a concrete structure with texture coating on the exterior, drywall on the interior of the first two levels and bare concrete for the remaining interior levels. Four metal framed windows and a single wooden framed window are present in the structure. The lantern gallery consists of a metal framed structure with single glazed metal-framed windows and a metal roof. The entrance to the lighthouse is a concrete structure with a texture coating on the exterior and roof, there is a wooden canopy structure above the doorway. No ventilation systems were observed within the facility at the time of the assessment.

The following reports were available for review:

- Phase I/II Environmental Site Assessment Machias Seal Island LL#6 LDU/PN # 03984, RPIS # MD00190, Charlotte County, New Brunswick. Project No. NBF15500-0011, Jacques Whitford Environmental Limited, February 16, 2004.
- Phase III Environmental Site Assessment Machias Seal Island, Charlotte County, New Brunswick, LL # 6, DFRP #03984, RPIS #MD00190, Project No. 1028227.05, Jacques Whitford Environmental Limited, March 26, 2008.
- Final Phase III Environmental Site Assessment and Human Health and Ecological Risk Assessment Machias Seal Island Light Station, Charlotte County, New Brunswick, LL # 6, DFRP # 03984, RPIS # MD00190, Jacques Whitford Environmental Limited, March 25, 2010.
- Final Phase III Environmental Site Assessment and Human Health and Ecological Risk Assessment Machias Seal Island Light Station, Charlotte County, New Brunswick, LL# 6, DFRP# 03984, RPIS# MD00190, Project # 121711050, Stantec Consulting Limited, March 23, 2012.
- Mercury Survey in CCG Lighthouses, Prepared by Health Canada Occupational Health and Safety Agency, dated 2000.

The Health Canada report identified no mercury vapors throughout the light tower using a direct reading monitor.

Based on a review of the above reports, sampling for asbestos containing materials and lead in paint was required to assess site conditions prior to renovations.



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The scope of work for the hazardous building materials assessment of the light tower included the following:

- collecting representative samples of suspected ACMs and lead-based paint;
- analyzing (by lab) samples of suspect ACMs and lead-based paint;
- determining the locations and extent of identified ACMs and lead-based paint;
- identifying other hazardous materials (PCBs, and mercury containing equipment) that could be impacted by renovation activities;
- developing specifications for removal and handling of hazardous materials for use in a renovation tender document (SPECs are reported under separate cover); and
- preparing this letter report for the subject building.

REFERENCE DOCUMENTATION

Reference Documentation on asbestos-containing materials, lead-containing building materials, lead-based paint and other hazmat is provided in Attachment A.

HAZARDOUS MATERIALS ASSESSMENT

Suspected hazardous materials were identified, based on visual observations and our experience with known hazardous materials. Representative bulk samples of suspected ACMs and paint samples were collected. Sampling locations and descriptions were recorded. Photographs were taken of various materials and sample locations. A selection of photos for the Site is presented in Attachment B.

Two exterior platforms located on the light tower were inaccessible at the time of the site visit (see photos 17 and 18, Attachment B). As such, sampling was not conducted in these areas.

ASBESTOS SAMPLING

Suspected ACM bulk samples were collected by hand, using clean tools; placed in clean plastic bags; and transported by courier to EMSL Canada for analysis. EMSL Canada is certified under the National Voluntary Laboratory Accreditation Program (NVLAP) for asbestos analysis. Samples were analyzed by either Polarized Light Microscopy (PLM) or Non-Friable Organically Bound (NOB) Materials by PLM, determined by the friability of each specific sample. Multiple samples of each visually similar material were collected.

ASBESTOS ASSESSMENT RESULTS AND RECOMMENDATIONS

Stantec collected 11 bulk samples, three samples of each suspected ACM in the subject building with one exception where only two samples could be collected of a similar group due to small



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material quantities. A summary of the sampling locations and analytical results are provided in Attachment C along with the laboratory certificates of analysis.

Analytical results indicate that asbestos was not detected in any of the samples collected from the light tower.

PAINT SAMPLING

Bulk paint samples were collected using clean tools to cut a representative sample of each surface, as required. For each sampling location, a sample of paint chips was collected (including all layers of paint where possible). Underlying substrate samples were not collected. Each sample was stored in a clean glass jar and transported by courier to Maxxam Analytics (Maxxam) in Bedford, NS, to be analyzed for lead and lead leachate by TCLP.

Stantec collected paint samples from three locations throughout the light tower. A summary of the sampling locations and analytical results is presented below. The laboratory results are presented in Attachment D. The condition of the paint was noted during the assessment and all paints that were sampled were observed to be in FAIR to POOR (*i.e.*, 50% of the painted surface coating is loose and flaking away from its substrate) condition.

PAINT ASSESSMENT RESULTS AND RECOMMENDATIONS

Lead Content

Lead was detected at concentrations above the federal Surface Coating Materials Regulation (90 mg/kg) and the Construction & Demolition (C&D) Site disposal guideline (1,000 mg/kg) in each of the paint samples analyzed:

- Red/red over brown colour paint on metal - Interior railings, ladders, floor hatch, and door, and exterior railing and cupola, (sample PS-01), observed to be generally in FAIR to POOR condition.
- White colour paint on wood, concrete and parging - Interior walls and ceilings, light level window frame, and exterior tower walls, (sample PS-02), observed to be generally in FAIR to POOR condition.
- Grey colour paint on wood and concrete - Interior floors, (sample PS-03), observed to be generally in FAIR to POOR condition.

The paint applications noted above had a lead concentration above 1,000 mg/kg and, therefore are considered lead-containing paint under the NBDELG disposal policy (*i.e.* sample concentrations greater than 1,000 mg/kg lead). NBDELG policy dictates that, should these materials be removed during the planned renovation, these materials cannot be disposed of at a Construction and Demolition (C&D) waste disposal site.



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These paints are considered to be lead-containing and appropriate worker protection is required when disturbing this material. During renovation lead concentrations in air should not exceed the ACGIH TWA-TLV of 0.05 mg/m³. The removal/abatement of the lead-based paint should be completed using work procedures outlined in the Ontario Ministry of Labour document entitled "Guideline: Lead on Construction Projects (April 2011)" is required.

The above-noted samples were submitted to Maxxam for lead leachate analysis to confirm disposal requirements.

Lead Leachate Results

Lead leachate was detected at concentrations below the landfill leachate disposal guideline (5 mg/L) in the following sample:

- PS-03 (1.0 mg/L): Grey paint on interior floors.

Analysis of the sample confirmed grey paint is suitable for disposal at an approved solid waste landfill facility pending final authorization from the facility operator.

Lead was detected in leachate at concentrations above the landfill leachate disposal guideline (5 mg/L) in the following samples:

- red/red over brown colour paint chips - Interior railings, ladders, floor hatch, and door, and exterior railing and cupola, (sample PS-01); and
- white colour paint chips - Interior walls and ceilings, light level window frame, and exterior tower walls, (sample PS-02).

Based on laboratory analysis, the above paint chip samples were identified as lead leachate toxic (> 5 mg/L) and cannot be disposed of at a Regional Solid Waste Landfill.

Summary of Paint Results

Paint sample PS-03 (grey paint), was found to have lead leachate concentrations below the NBDELG guideline of 5 mg/L and therefore, the grey paint is not lead-leachate toxic while two other paint colours (PS-01 red/red over brown, and PS-02 white) are lead leachate toxic.

Paint Disposal

Paint sample PS-03 (grey paint chips) was found to have a lead concentration > 1,000 mg/kg (i.e., lead-containing) but found not to have a lead leachate concentration above the NBDELG guideline of 5 mg/L. Grey paint and its substrate can be disposed of at a Regional Solid Waste Landfill provided permission is obtained from the facility.



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Based on laboratory analysis, paint chip samples PS-01 (red/red over brown paint chips), and PS-02 (white paint chips), were identified to be lead leachate toxic (> 5 mg/L) and cannot be disposed of at a Regional Solid Waste Landfill. Loose and flaking lead-leachate toxic paint chips should be removed by a certified contractor and disposed of at an approved hazardous waste disposal facility capable of handling lead leachate toxic waste. Should any non-metallic substrate material covered with these two paints require disposal, a paint with substrate sample should be submitted for analysis, or the material should be assumed to be lead leachate toxic and disposed of accordingly. It is assumed that any metal, steel etc. covered with these paints requiring removal will be recycled.

PCB-CONTAINING EQUIPMENT IDENTIFICATION AND RECOMMENDATIONS

An assessment for equipment likely to contain PCBs was completed within the subject building. Information on the type of and quantity of equipment was recorded, where available.

Light ballasts in fluorescent light fixtures were noted on the first and second floor of the subject building at the time of the assessment. Specific model numbers could not be obtained during inspection but should be collected and verified for PCB content before removal. However based on an interview with the lightkeeper, the lights were installed in the early 1990s, thus the light ballasts are unlikely to be PCB containing. Should any equipment suspected of containing PCBs be uncovered during future renovation or demolition activities, they should be removed from service and properly disposed of to avoid the release of PCBs into the environment.

CONCLUSIONS

The purpose of the work was to assess areas of the subject building that will be disturbed during renovation activities, and identify the presence and locations of hazardous materials.

Based on the findings and observations from the assessment, ACMs were not identified in the representative building samples collected from the light tower. The 2000 Health Canada report indicated that mercury vapour is not present in building. Lead-containing and lead leachate toxic paint was identified in the light tower.

Findings, observations and recommendations associated with the hazardous materials assessment completed in the subject building are summarized in Table 1.



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Table 1 Summary of Findings and Recommendations

| Hazard | Material Identified | Quantity | Recommendations |
|---|---|----------------|---|
| Potential asbestos containing materials | Samples of window glazing, exterior parging/texture coat, drywall joint compound, window caulking were not found to contain asbestos. | Not identified | Based on the results of the sampling, no asbestos related work procedures were recommended at this time. Should material be uncovered during renovations that may be asbestos-containing, work should stop until the material is tested and confirmed not to contain asbestos, or the material should be assumed to contain asbestos and appropriate asbestos work procedures should be implemented. |
| Lead in paint | <ul style="list-style-type: none"> • The majority of painted surfaces (interior and exterior) were observed to be in FAIR to POOR condition at the time of the assessment. • Lead was detected at concentrations above the Construction & Demolition (C&D) Site disposal guideline (1,000 mg/kg) in the following paint samples. • Red/red over brown paint on Interior railings, ladders, floor hatch, and door, and exterior railing and cupola (paint chips). • White paint on interior walls and ceilings, light level window frame, and exterior tower walls, (paint chips). • Grey paint on interior floors (paint chips). <p>Lead leachate was detected at concentrations above the landfill leachate disposal guideline (5 mg/L) in the following samples:</p> <ul style="list-style-type: none"> • Red/red over brown paint (paint chips). • White paint (paint chips). | Not quantified | <p>Appropriate worker protection is required when disturbing these materials. During renovation lead concentrations in air should not exceed the ACGIH TWA-TLV of 0.05 mg/m³.</p> <p>Paint chip samples that exceed a 5 mg/L lead leachate concentration, require out of province disposal at an approved facility capable of accepting lead leachate toxic waste.</p> <p>The remaining paint chip samples below the landfill disposal guidelines are suitable for disposal at an approved solid waste landfill facility pending final authorization from the facility operator.</p> |



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Table 1 Summary of Findings and Recommendations

| Hazard | Material Identified | Quantity | Recommendations |
|---------|--|----------------|---|
| PCBs | <ul style="list-style-type: none"> Suspected PCB-containing equipment was not confirmed in the light tower. | Not applicable | <p>If light fixtures need to be removed during renovations:</p> <ol style="list-style-type: none"> 1) assess ballasts in comparison to the Environment Canada document entitled "Identification of Lamp Ballasts Containing PCBs, Report EPS 2/CC/2", dated August 1991; and 2) sort PCB-containing lamp ballasts (if present) from non-PCB-containing lamp ballasts. <p>Waste transportation to be conducted in accordance the Federal Transportation of Dangerous Goods Regulation. Store PCB containing ballasts in accordance with NB Policy on Storage of PCB Light Ballasts.</p> <p>Dispose of ballasts in accordance with the current version of The Federal PCB Regulations (SOR/2008-273).</p> |
| Mercury | A previous survey conducted by Health Canada did not detect mercury vapour concentrations in the light tower. | Not applicable | None. |

CLOSURE

This report has been prepared for the sole benefit of Public Works Government Services Canada and for Fisheries and Oceans Canada. The report may not be relied upon by any other person or entity without the express written consent of Stantec.

Any use which a third party makes of this report or any reliance on decisions made based on it, are the responsibility of such third parties. Stantec accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.



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The information and conclusions contained in this report are based upon work undertaken by trained professional and technical staff in accordance with generally accepted engineering and scientific practices at the time the work was performed. The conclusions presented herein represent the best technical judgment of Stantec based on the information obtained from the specific sampling locations.

In addition, analysis has been carried out for a limited number of chemical parameters, and it should not be inferred that other chemical species are not present. Due to the nature of the investigation and the limited data available, Stantec cannot warrant against undiscovered environmental liabilities or hazardous materials. If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, we request that this information be brought to our attention so that we may re-assess the conclusions presented herein. This report was prepared by Terri O'Neill, and reviewed by Clayton Barclay and Paul Paulin.

Regards,

STANTEC CONSULTING LTD.

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Attachment: A Reference Documentation
B Photo Log
C Summary Table and Laboratory Certificates of Analysis - Asbestos
D Summary Table and Laboratory Certificates of Analysis - Lead in Paint

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Attachment A
Reference Documentation

Regulatory Considerations

Asbestos-Containing Materials

A summary of the regulations, guidelines and other reference documents used for this assessment is provided in Table A1 and is generally discussed below. This information was used to evaluate results and make recommendations.

Table A1 Summary of Regulations and Guidelines for Asbestos-Containing Materials

| Jurisdiction | Regulations, Guidelines, Codes of Practice and Other Reference Documentation |
|---------------------|--|
| Provincial | <ul style="list-style-type: none">• A Code of Practice for Working with Materials Containing Asbestos in New Brunswick referenced in New Brunswick Regulation (NB) 92-106 made under the Occupational Health and Safety Act. |
| Federal | <ul style="list-style-type: none">• Public Works and Government Services Canada Deputy Minister Directive (DIR:057) – Respecting Asbestos Management in Federal Owned or Leased Buildings or Facilities Containing Asbestos, dated March 12, 1997• Federal Treasury Board of Canada Secretariat Hazardous Substances Directive – II, Section 2.9 as it relates to asbestos management |

The above information was used to evaluate results and make recommendations. Because Machias Seal Island is a federal site, the buildings and employees are under federal, not provincial, jurisdiction. Typically, federal buildings and employees come under the Canada Labour Code, however, contractors would be under provincial guidelines.

For the purposes of managing worker exposure during building maintenance, renovation and demolition, the NB Regulation and the PWGSC Directive (DIR:057) define an asbestos-containing material (ACM) as a material which contains 1% or more by volume of asbestos.

The assessment included both friable and non-friable asbestos building materials. The term friable is applied to a material that can be readily reduced to dust or powder by hand or moderate pressure. Asbestos materials that are friable have a much greater potential to release airborne asbestos fibres when disturbed.

The disturbance of ACMs on construction projects is governed by New Brunswick Regulation 92-106, *A Code of Practice for Working with Materials Containing Asbestos in New Brunswick (NB 92-106)*. ACMs must be removed prior to any demolition or renovation that may potentially disturb the asbestos-containing materials.

The New Brunswick waste regulations require the disposal of asbestos waste in a double sealed container, properly labeled and free of cuts, tears or punctures. The waste must be disposed of in a licensed waste facility, which has been properly notified of the presence of asbestos waste.

The transport of asbestos waste to the disposal site is covered by the federal "Transportation of Dangerous Goods Act". Asbestos waste is to be handled by a licensed waste hauler.

Paint

In New Brunswick, building materials covered with lead paint is regulated by the 2011 NBDELG Disposal of Lead Paint and Lead Painted Materials Guideline. There is no specific construction

legislation in Canada that establishes criteria for defining lead-based paint. However, both Canadian federal legislation and guidelines established by the U.S. Department of Housing and Urban Development (HUD) consider paint with lead concentrations greater than 5,000 parts per million (ppm) to be lead-based paint. This criterion is now widely, although not universally, used across Canada.

In Canada, the Surface Coating Materials Regulations (SOR/2005-109) under the federal Hazardous Products Act provides a concentration of lead that must not be exceeded in surface coatings that are presently sold in this country. This value has recently been reduced from 600 ppm to 90 ppm. However, it is important to note that there is not a direct correlation between the concentrations of lead in a material to the potential occupational exposure if the material is disturbed.

Applicable sections of New Brunswick's *Occupational Health and Safety Act* (NB Reg. 91-191) should be followed whenever a material containing lead is disturbed. Under NB Reg. 91-191, a regulatory limit has been established for occupational exposure to airborne lead that may be present in a workplace. Worker exposures should not exceed the time-weighted average (TWA) occupational exposure limit (OEL) for airborne lead dust or fumes of 0.05 mg/m³. The TWA is the applicable regulated occupational exposure limit in New Brunswick and is based on the time-weighted average concentration for a conventional 8-hour work day and a 40-hour work week, to which it is believed that nearly all workers may be repeatedly exposed, day after day, without adverse health effects.

Furthermore, in the absence of a New Brunswick guideline, the Ontario Ministry of Labour (MOL) document entitled **Guideline: Lead on Construction Project (April 2011)**, provides procedures for removing lead paint where work on lead containing materials are likely to produce airborne lead dust or fumes, for example during welding, torch cutting, sanding and sand blasting. If these operations are likely to occur during building renovations or demolition, it is recommended that the removal of lead paint be carried out in accordance with procedures outlined in the Ontario guideline.

In 2011 NBDELG established guidelines that restrict materials from municipal landfills and C&D (Construction and Demolition) waste disposal sites that could potentially leach/migrate into the ground and create an adverse environmental effect. Lead is an inorganic contaminant that has been associated with (among others) paints and other protective coatings. Lead can leach from its base material into soil and groundwater creating environmental impacts. The NBDELG recommends that materials with a total lead concentration exceeding 1,000 mg/kg (1,000 ppm) undergo leachate testing to assess whether the leachate exceeds the regulatory limit of 5 mg/L lead. The material may consist of paint and substrate if the paint is in good condition, or paint chips only, if the paint is peeling or in poor condition. Materials with a total lead concentration exceeding 1,000 mg/kg but under the leachate regulatory limit of 5 mg/L, cannot be disposed of at a C&D waste disposal site. However, these materials can be disposed of at an approved provincial "sanitary landfill". If the material has a lead leachate concentration above 5 mg/L, it is considered "lead leachate toxic" and must be disposed of at an approved facility. There are currently no facilities in New Brunswick capable of accepting "lead leachate toxic" materials and out-of-province disposal is required.

Mercury

Mercury is regulated in New Brunswick under the Occupational Health and Safety Act. Mercury is commonly found in buildings as mercury vapour lighting, in thermometers, thermostats and

some electrical switches. Mercury can also be found in minor amounts in fluorescent lamp tubes and in paints and adhesives.

Mercury or mercury vapour within light fixtures, thermometers, thermostats and electrical switches poses no risk to workers or occupants provided the mercury containers remain intact and undisturbed. Prior to demolition, remove mercury-containing materials and store in a safe location until they are properly disposed of.

Canadian Council of Ministers of the Environment (CCME) have developed Canada-Wide Standards for mercury-containing lights and mercury emissions. The goal of the standards is to reduce release of mercury into the environment.

Polychlorinated-Biphenyls (PCBs)

The past use of PCBs (as coolants and lubricants) in electrical equipment such as transformers, fluorescent light ballasts, and capacitors was common throughout North America. From the 1930s to the 1970s, PCBs were widely used in a number of industrial materials, including sealing and caulking compounds, inks and paint additives. PCBs are an environmental concern as they do not readily degrade and have been identified to bioaccumulate. In 1976, the federal Environment Contaminants Act prohibited the use of PCBs in heat transfer equipment installed after September 1, 1977, and in transformers and capacitors installed after July 1, 1980. For federal sites, the PCB Regulations (2008) applies.

The Environment Canada document "Identification of Lamp Ballasts Containing PCBs" Report EPS 2/CC/2 (revised) August, 1991, can be used as a guide to identify PCB capacitors in fluorescent light ballasts and high intensity discharged (HID) light fixtures.

As of September 5, 2008, under Subsection 93(1) of the *Canadian Environmental Protection Act*, (CEPA), Federal PCB regulations have been published by the Canada Gazette Part II (SOR/2008-273) that impose specific deadlines for the elimination of all PCBs in concentrations at or above 50 mg/kg. The regulation requires the elimination of all PCBs and PCB-containing materials currently in-use and in storage and limits the period of time PCB materials can be stored before being eliminated. Other aspects of the regulation govern the labelling and reporting of stored PCB materials and equipment as well as improved practices for the management of PCBs that remain in use (*i.e.*, those with PCB concentrations less than 50 mg/kg) until their eventual elimination.

Attachment B
Photo Log



PHOTO 1: View of Machias Seal Island light tower looking northwest.



PHOTO 2: Exterior of light tower.



PHOTO 3: View of peeling white paint on the exterior of the light tower looking south.



PHOTO 4: View of peeling white paint on the exterior light tower looking northeast. Note the crumbling concrete at the base of the tower.



PHOTO 5: View of white paint on the exterior of the light tower looking north.

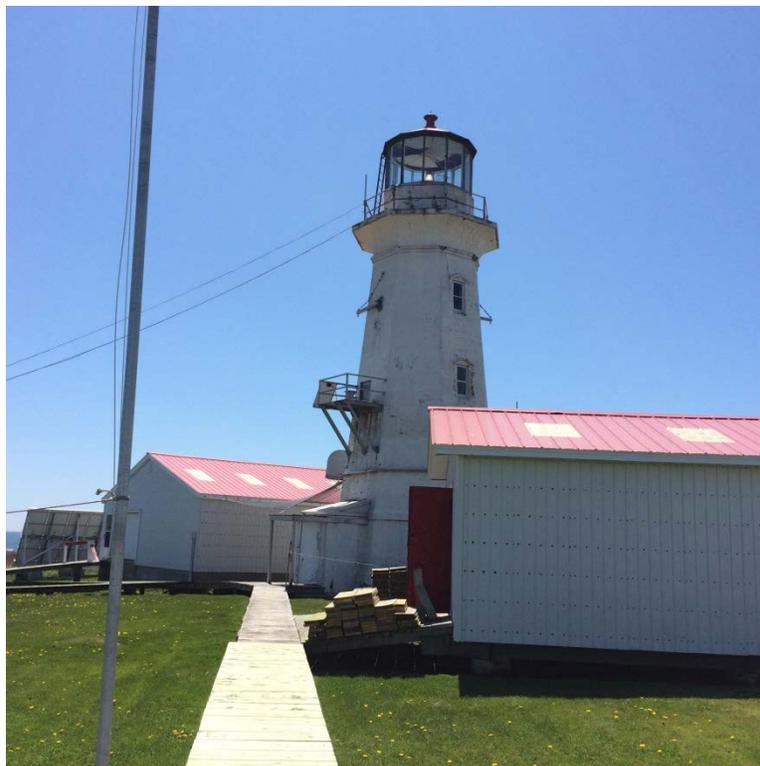


PHOTO 6: View of the light tower looking south from the CWS residence.



PHOTO 7: View of sample BS-01A (window glazing) obtained from window of Level 6 (light level). Asbestos was not detected in the sample.

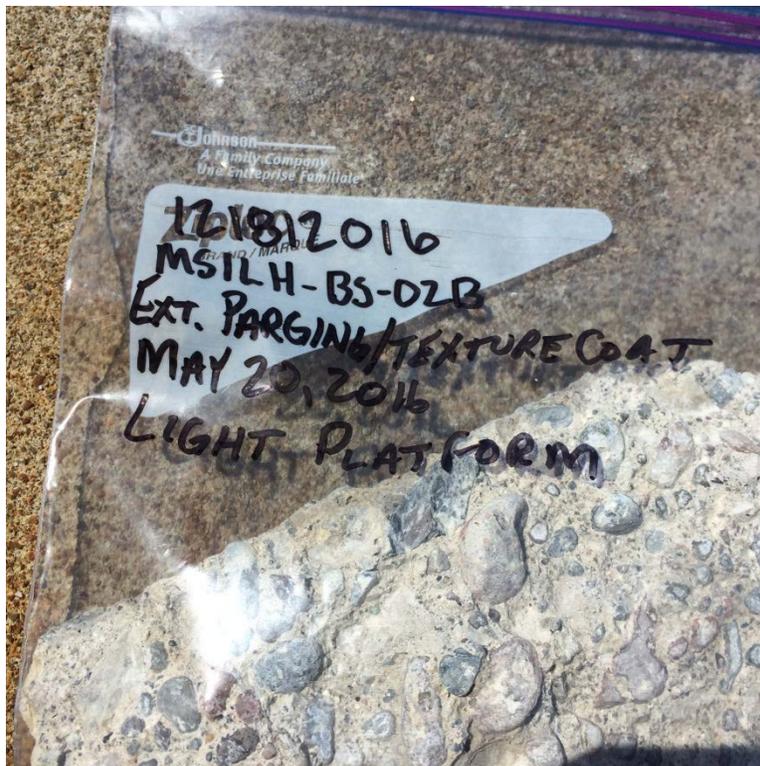


PHOTO 8: View of sample BS-02B (parging/texture coating) obtained from the exterior platform at the light level). Asbestos was not detected in the sample.

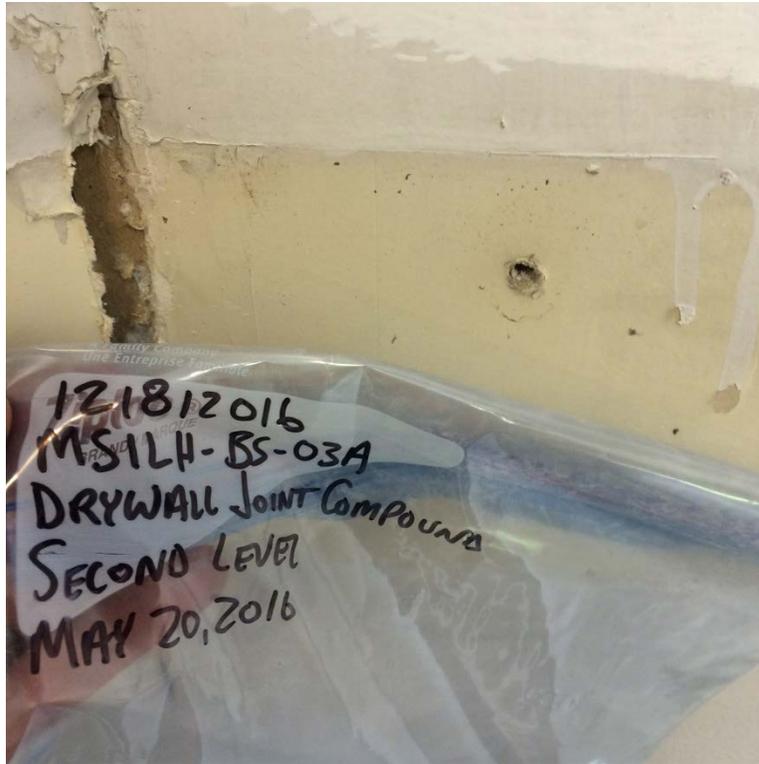


PHOTO 9: View of sample BS-03A (drywall joint compound) obtained from the second level. Asbestos was not detected in the sample.

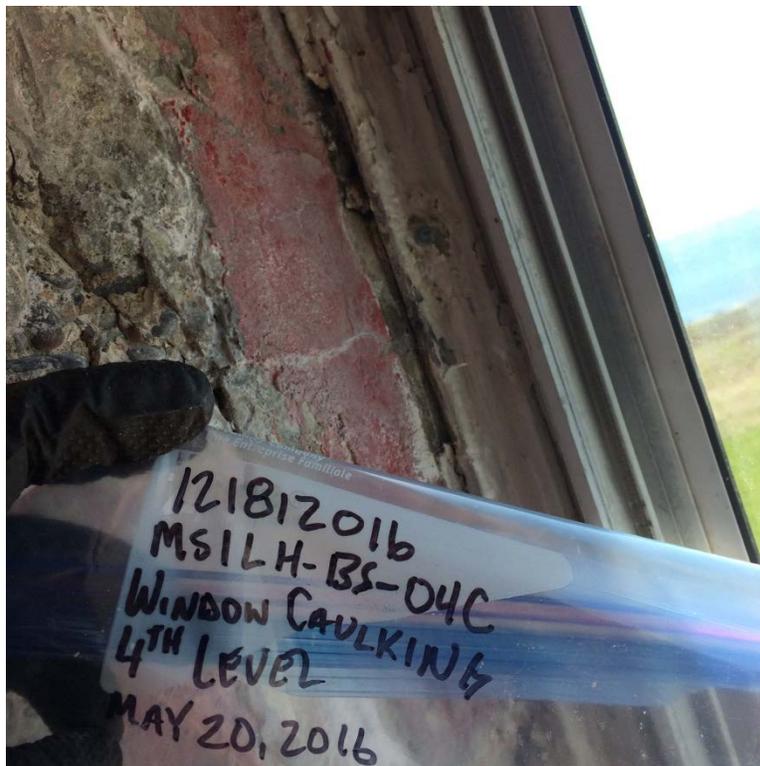


PHOTO 10: View of sample BS-04A (window caulking) obtained from the fourth level. Asbestos was not detected in the sample.



PHOTO 11: View of white paint on interior drywall on Level 2. A sample of white paint chips from this area (PS-02) was found to be lead leachate toxic (i.e. lead leachate concentration was ≥ 5 mg/L).



PHOTO 12: View of red paint on metal on Level 2. Samples of red paint chips collected from ladders on this level and other reds were combined into sample PS-01 which was found to be lead leachate toxic (i.e. lead leachate concentration was ≥ 5 mg/L).



PHOTO 13: View of grey floor paint from Level 3. A sample of grey paint chips collected from this area (PS-03) was found not to be lead leachate toxic (i.e. lead leachate concentration was <5 mg/L).



PHOTO 14: Exterior view of railing around cupola. The red paint is generally in poor condition.



PHOTO 15: Interior view of Level 3. White paint on concrete walls is in poor condition.



PHOTO 16: Interior view of Level 3. White ceiling paint and wall paint, both on concrete, is in poor condition.



PHOTO 17: View of exterior inaccessible platform located over the entrance to the light tower.



PHOTO 18: View of second exterior inaccessible platform located at the rear of the light tower.

Attachment C
Summary Table and Laboratory Certificate of Analysis - Asbestos

Table C1: Asbestos Concentrations for Suspected ACM Bulk Samples - Machias Seal Island Light Tower

| Sample ID | Material Description | Sample Location | Asbestos Type and Concentration (% by volume) |
|------------------|-------------------------------|------------------------|--|
| BS-01A | Window Glazing, Tan | Level 6 (light) | None detected |
| BS-01B | Window Glazing, Tan | Level 6 (light) | None detected |
| BS-02A | Exterior Parging/Texture Coat | Light Platform | None detected |
| BS-02B | Exterior Parging/Texture Coat | Light Platform | None detected |
| BS-02C | Exterior Parging/Texture Coat | East Side at Base | None detected |
| BS-03A | Drywall Joint Compound, White | Second Level | None detected |
| BS-03B | Drywall Joint Compound, White | First Level | None detected |
| BS-03C | Drywall Joint Compound, White | First Level | None detected |
| BS-04A | Window Caulking, White | Third Level | None detected |
| BS-04B | Window Caulking, White | Third Level | None detected |
| BS-04C | Window Caulking, White | Fourth Level | None detected |

Bold indicates asbestos containing material (ACM) 1 % by volume or greater as defined by *A Code of Practice for Working with Materials Containing Asbestos in New Brunswick (Regulation 92-106)*



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Received: 5/25/2016
Analyzed: 5/30/2016

Proj: 121812027

Test Report: Asbestos Analysis of Bulk Materials for New Brunswick Regulation 92-106 via EPA600/R-93/116 Method

Client Sample ID: BS-01A **Lab Sample ID:** 551605860-0001

Sample Description: WINDOW GLAZING, TAN, LEVEL 6 (LIGHT)

| TEST | Analyzed Date | Color | Non-Asbestos | | Asbestos | Comment |
|---------------------|---------------|-------|--------------|-------------|---------------|---------|
| | | | Fibrous | Non-Fibrous | | |
| PLM Grav. Reduction | 5/30/2016 | Beige | 0.0% | 100% | None Detected | |

Client Sample ID: BS-01B **Lab Sample ID:** 551605860-0002

Sample Description: WINDOW GLAZING, TAN, LEVEL 6 (LIGHT)

| TEST | Analyzed Date | Color | Non-Asbestos | | Asbestos | Comment |
|---------------------|---------------|---------|--------------|-------------|---------------|---------|
| | | | Fibrous | Non-Fibrous | | |
| PLM Grav. Reduction | 5/30/2016 | Various | 0.0% | 100% | None Detected | |

Client Sample ID: BS-02A-Plaster **Lab Sample ID:** 551605860-0003

Sample Description: EXTERIOR PARGING/TEXTURE COAT, LIGHT PLATFORM

| TEST | Analyzed Date | Color | Non-Asbestos | | Asbestos | Comment |
|------|---------------|-------|--------------|-------------|---------------|---------|
| | | | Fibrous | Non-Fibrous | | |
| PLM | 5/30/2016 | Gray | 0% | 100% | None Detected | |

Client Sample ID: BS-02A-Texture **Lab Sample ID:** 551605860-0003A

Sample Description: EXTERIOR PARGING/TEXTURE COAT, LIGHT PLATFORM

| TEST | Analyzed Date | Color | Non-Asbestos | | Asbestos | Comment |
|------|---------------|-------|--------------|-------------|---------------|---------|
| | | | Fibrous | Non-Fibrous | | |
| PLM | 5/30/2016 | White | 0% | 100% | None Detected | |

Client Sample ID: BS-02B **Lab Sample ID:** 551605860-0004

Sample Description: EXTERIOR PARGING/TEXTURE COAT, LIGHT PLATFORM

| TEST | Analyzed Date | Color | Non-Asbestos | | Asbestos | Comment |
|------|---------------|-------|--------------|-------------|---------------|---------|
| | | | Fibrous | Non-Fibrous | | |
| PLM | 5/30/2016 | Gray | 0% | 100% | None Detected | |

Client Sample ID: BS-02C **Lab Sample ID:** 551605860-0005

Sample Description: EXTERIOR PARGING/TEXTURE COAT, EAST SIDE AT BASE

| TEST | Analyzed Date | Color | Non-Asbestos | | Asbestos | Comment |
|------|---------------|-------|--------------|-------------|---------------|---------|
| | | | Fibrous | Non-Fibrous | | |
| PLM | 5/30/2016 | Gray | 0% | 100% | None Detected | |

Client Sample ID: BS-03A **Lab Sample ID:** 551605860-0006

Sample Description: DRYWALL JOINT COMPOUND, WHITE, SECOND LEVEL

| TEST | Analyzed Date | Color | Non-Asbestos | | Asbestos | Comment |
|------|---------------|-------|--------------|-------------|---------------|---------|
| | | | Fibrous | Non-Fibrous | | |
| PLM | 5/30/2016 | Gray | 0% | 100% | None Detected | |



EMSL Canada Inc.

2756 Slough Street Mississauga, ON L9T 5N4
Phone/Fax: 289-997-4602 / (289) 997-4607
<http://www.EMSL.com> / torontolab@emsl.com

EMSL Canada Order 551605860
Customer ID: 55JACQ30S
Customer PO: 121812027
Project ID:

Test Report: Asbestos Analysis of Bulk Materials for New Brunswick Regulation 92-106 via EPA600/R-93/116 Method

Client Sample ID: BS-03B **Lab Sample ID:** 551605860-0007
Sample Description: DRYWALL JOINT COMPOUND, WHITE, FIRST LEVEL

| TEST | Analyzed Date | Color | Non-Asbestos | | Asbestos | Comment |
|------|---------------|-------|--------------|-------------|---------------|---------|
| | | | Fibrous | Non-Fibrous | | |
| PLM | 5/30/2016 | Gray | 0% | 100% | None Detected | |

Client Sample ID: BS-03C **Lab Sample ID:** 551605860-0008
Sample Description: DRYWALL JOINT COMPOUND, WHITE, FIRST LEVEL

| TEST | Analyzed Date | Color | Non-Asbestos | | Asbestos | Comment |
|------|---------------|-------|--------------|-------------|---------------|---------|
| | | | Fibrous | Non-Fibrous | | |
| PLM | 5/30/2016 | Gray | 0% | 100% | None Detected | |

Client Sample ID: BS-04A **Lab Sample ID:** 551605860-0009
Sample Description: WINDOW CAULKING, WHITE , THIRD LEVEL

| TEST | Analyzed Date | Color | Non-Asbestos | | Asbestos | Comment |
|---------------------|---------------|-------|--------------|-------------|---------------|---------|
| | | | Fibrous | Non-Fibrous | | |
| PLM Grav. Reduction | 5/30/2016 | Gray | 0.0% | 100% | None Detected | |

Client Sample ID: BS-04B **Lab Sample ID:** 551605860-0010
Sample Description: WINDOW CAULKING, WHITE , THIRD LEVEL

| TEST | Analyzed Date | Color | Non-Asbestos | | Asbestos | Comment |
|---------------------|---------------|-------|--------------|-------------|---------------|---------|
| | | | Fibrous | Non-Fibrous | | |
| PLM Grav. Reduction | 5/30/2016 | Gray | 0.0% | 100% | None Detected | |

Client Sample ID: BS-04C **Lab Sample ID:** 551605860-0011
Sample Description: WINDOW CAULKING, WHITE , FOURTH LEVEL

| TEST | Analyzed Date | Color | Non-Asbestos | | Asbestos | Comment |
|---------------------|---------------|-------|--------------|-------------|---------------|---------|
| | | | Fibrous | Non-Fibrous | | |
| PLM Grav. Reduction | 5/30/2016 | Gray | 0.0% | 100% | None Detected | |

Analyst(s):
Arabee Sathiaselalan PLM (7)
PLM Grav. Reduction (5)

Reviewed and approved by: 
Matthew Davis
or Other Approved Signatory

None Detected = <1%. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP of any agency of the U.S. Government.

Attachment D

Summary Table and Laboratory Certificate of Analysis - Lead Paint

Table D1: Paint Sample Lead Concentrations - Machias Seal Island Light Tower

| Sample ID | Material Description | Sample Location | Lead Concentration (mg/kg) | Lead Leachate Concentration (mg/L) |
|---|----------------------------|-----------------------------------|----------------------------|------------------------------------|
| PS-01 | Red over brown paint chips | Metal ladder and wood door casing | 33,000 | <u>56</u> |
| PS-02 | White paint chips | Interior drywall | 4,900 | <u>12</u> |
| PS-03 | Grey paint chips | Interior Floors | 3,700 | 1.0 |
| <p>Bold - lead concentration >1,000 mg/kg</p> <p><u>Bold</u> - lead leachate concentration >5 mg/L; paint is considered lead leachate toxic</p> | | | | |

Your Project #: 121812027
Site Location: MACHIAS SEAL ISLAND
Your C.O.C. #: N/A

Attention:CLAYTON BARCLAY

Stantec Consulting Ltd
845 Prospect Street
Fredericton, NB
E3B 2T7

Report Date: 2016/05/31
Report #: R4010854
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B6A4718

Received: 2016/05/25, 10:52

Sample Matrix: Paint
Samples Received: 3

| Analyses | Quantity | Date | | Laboratory Method | Reference |
|------------------------------------|----------|------------|------------|-------------------|----------------|
| | | Extracted | Analyzed | | |
| Metals Leach TCLP/CGSB extraction | 3 | 2016/05/31 | 2016/05/31 | ATL SOP 00058 | EPA 6020A R1 m |
| Metals Paint Acid Extr. ICPMS | 3 | 2016/05/27 | 2016/05/27 | ATL SOP 00058 | EPA 6020A R1 m |
| TCLP Inorganic extraction - pH | 3 | N/A | 2016/05/31 | ATL SOP 00035 | EPA 1311 m |
| TCLP Inorganic extraction - Weight | 3 | N/A | 2016/05/31 | ATL SOP 00035 | EPA 1311 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.

Encryption Key



Maxxam
31 May 2016 17:46:31 -03:00

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

Marie Muise, Project Manager
Email: MMuise@maxxam.ca
Phone# (902)420-0203 Ext:253

=====
This report has been generated and distributed using a secure automated process.

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.

Maxxam Job #: B6A4718
Report Date: 2016/05/31

Stantec Consulting Ltd
Client Project #: 121812027
Site Location: MACHIAS SEAL ISLAND
Sampler Initials: AW

RESULTS OF ANALYSES OF PAINT

| Maxxam ID | | CKI204 | CKI205 | CKI206 | |
|----------------------------------|--------------|---|------------------------------|-----------------------------|-----------------|
| Sampling Date | | 2016/05/20 | 2016/05/20 | 2016/05/20 | |
| COC Number | | N/A | N/A | N/A | |
| | UNITS | PS-01 RED OVER BROWN PAINT | PS-02 WHITE PAINT | PS-03 GREY PAINT | QC Batch |
| Inorganics | | | | | |
| Sample Weight (as received) | g | 15 | 100 | 39 | 4517202 |
| Initial pH | N/A | 5.0 | 5.0 | 5.3 | 4517203 |
| Final pH | N/A | 5.4 | 5.7 | 6.6 | 4517203 |
| QC Batch = Quality Control Batch | | | | | |

Maxxam Job #: B6A4718
Report Date: 2016/05/31

Stantec Consulting Ltd
Client Project #: 121812027
Site Location: MACHIAS SEAL ISLAND
Sampler Initials: AW

ELEMENTS BY ICP/MS (PAINT)

| | | | | | | |
|----------------------------------|--------------|---|------------------------------|-----------------------------|------------|-----------------|
| Maxxam ID | | CKI204 | CKI205 | CKI206 | | |
| Sampling Date | | 2016/05/20 | 2016/05/20 | 2016/05/20 | | |
| COC Number | | N/A | N/A | N/A | | |
| | UNITS | PS-01 RED OVER BROWN PAINT | PS-02 WHITE PAINT | PS-03 GREY PAINT | RDL | QC Batch |
| Metals | | | | | | |
| Leachable Lead (Pb) | mg/L | 56 | 12 | 1.0 | 0.005 | 4518221 |
| RDL = Reportable Detection Limit | | | | | | |
| QC Batch = Quality Control Batch | | | | | | |

Maxxam Job #: B6A4718
Report Date: 2016/05/31

Stantec Consulting Ltd
Client Project #: 121812027
Site Location: MACHIAS SEAL ISLAND
Sampler Initials: AW

ELEMENTS BY ATOMIC SPECTROSCOPY (PAINT)

| | | | | | | |
|----------------------------------|--------------|---|------------------------------|-----------------------------|------------|-----------------|
| Maxxam ID | | CKI204 | CKI205 | CKI206 | | |
| Sampling Date | | 2016/05/20 | 2016/05/20 | 2016/05/20 | | |
| COC Number | | N/A | N/A | N/A | | |
| | UNITS | PS-01 RED OVER BROWN PAINT | PS-02 WHITE PAINT | PS-03 GREY PAINT | RDL | QC Batch |
| Metals | | | | | | |
| Acid Extractable Lead (Pb) | mg/kg | 33000 | 4900 | 3700 | 5 | 4514116 |
| RDL = Reportable Detection Limit | | | | | | |
| QC Batch = Quality Control Batch | | | | | | |

Maxxam Job #: B6A4718
Report Date: 2016/05/31

Stantec Consulting Ltd
Client Project #: 121812027
Site Location: MACHIAS SEAL ISLAND
Sampler Initials: AW

GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

| | |
|-----------|--------|
| Package 1 | 13.0°C |
|-----------|--------|

Sample CKI204-01 : Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Sample CKI206-01 : Method Deviation Comment: Reduced sample weight used for leachate procedure due to insufficient sample. All extraction ratios maintained. Minimal impact on sample data quality.

Results relate only to the items tested.

Maxxam Job #: B6A4718
Report Date: 2016/05/31

QUALITY ASSURANCE REPORT

Stantec Consulting Ltd
Client Project #: 121812027
Site Location: MACHIAS SEAL ISLAND
Sampler Initials: AW

| QC Batch | Parameter | Date | Matrix Spike | | SPIKED BLANK | | Method Blank | | RPD | |
|----------|-----------------------------|------------|--------------|-----------|--------------|-----------|--------------|-------|-----------|-----------|
| | | | % Recovery | QC Limits | % Recovery | QC Limits | Value | UNITS | Value (%) | QC Limits |
| 4514116 | Acid Extractable Lead (Pb) | 2016/05/27 | NC | 75 - 125 | 95 | 75 - 125 | <5 | mg/kg | 2.2 | 35 |
| 4517202 | Sample Weight (as received) | 2016/05/31 | | | | | NA | g | | |
| 4518221 | Leachable Lead (Pb) | 2016/05/31 | 95 | 75 - 125 | 97 | 80 - 120 | <0.005 | mg/L | | |

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.

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).

Maxxam Job #: B6A4718
Report Date: 2016/05/31

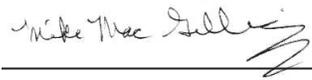
Stantec Consulting Ltd
Client Project #: 121812027
Site Location: MACHIAS SEAL ISLAND
Sampler Initials: AW

VALIDATION SIGNATURE PAGE

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



Kevin MacDonald, Inorganics Supervisor



Mike MacGillivray, Scientific Specialist (Inorganics)

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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ATL FCD 00149 / Revision 18

CHAIN OF CUSTODY RECORD

COC #:

Page 1 of 1

| Invoice Information | | | | Report Information (if differs from invoice) | | | | Project Information (where applicable) | | | | Turnaround Time (TAT) Required | | | | | | | | | | | | | | | | | |
|--|----------------------------|---------------------------|----------------------|--|---------------------------|--------------------------------|-------------------------|--|------------------------------------|--|----------------------------|---|--|----------------|---------------|---|-------------------------------------|--|--|--|---|------|--|------|------|--------------------|-----------------------|----------|--|
| Company Name: <u>Stantec Consulting Ltd.</u> | | | | Company Name: _____ | | | | Quotation #: <u>Stantec Standing Offer</u> | | | | <input checked="" type="checkbox"/> Regular TAT (5 business days) Most analyses | | | | | | | | | | | | | | | | | |
| Contact Name: <u>Clayton Barclay</u> | | | | Contact Name: _____ | | | | P.O. #/ AFE#: <u>121812027</u> | | | | PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS | | | | | | | | | | | | | | | | | |
| Address: <u>845 Prospect Street</u> | | | | Address: _____ | | | | Project ID: <u>121812027</u> | | | | RUSH please specify date (Surcharges will be applied) | | | | | | | | | | | | | | | | | |
| <u>Fredericton, N.B. Postal Code: E3B 2T7</u> | | | | Postal Code: _____ | | | | Site Location: <u>Machias Seal Island</u> | | | | Date Required: | | | | | | | | | | | | | | | | | |
| Phone: <u>506-452-7000</u> Fax: <u>506-452-0112</u> | | | | Phone: _____ Fax: _____ | | | | Site #: _____ | | | | Rush Confirmation # | | | | | | | | | | | | | | | | | |
| Email: <u>clayton.barclay@stantec.com</u> | | | | Email: _____ | | | | Sampled By: <u>Andrew Wayne</u> | | | | | | | | | | | | | | | | | | | | | |
| Laboratory Use Only | | | | Analysis Requested | | | | | | | | | | | | Regulatory Requirements | | | | | | | | | | | | | |
| CUSTODY SEAL Y / N | | COOLER TEMPERATURES | | AVERAGE TEMP | | INTEGRITY | | | | | | | | | | | | | | | | | | | | | | | |
| Present | Intact | | | | | YES / (NO) | | | | | | | | | | | | | | | | | | | | | | | |
| | | <u>13</u> | <u>13</u> | <u>13</u> | | | | | | | | | | | | | | | <input type="checkbox"/> PIRI <input type="checkbox"/> CCME <input type="checkbox"/> Tier 1 <input type="checkbox"/> Tier 2 <input type="checkbox"/> OTHER (Please Specify) | | | | | | | | | | |
| Integrity Checklist By: <u>TS</u> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SAMPLES MUST BE KEPT COOL (< 10 °C) FROM TIME OF SAMPLING UNTIL DELIVERY TO MAXXAM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SAMPLE IDENTIFICATION | | DATE SAMPLED (YYYY/MM/DD) | TIME SAMPLED (HH:MM) | MATRIX | # OF CONTAINERS SUBMITTED | FIELD FILTERED & PRESERVED | Lab Filtration Required | RCAP-30 (CIRCLE) TOTAL / DISSOLVED | RCAP-MS (CIRCLE) TOTAL / DISSOLVED | Total Digest (Default Method) for well water & surface water | Disposhed for ground water | Mercury | Metals & Mercury Default Acid Extractable (Available) Digest | Metals (Water) | Metals (Soil) | Metals Total Digest for Ocean sediments (HNO3/HF/HClO4) | Mercury Low level by Cold Vapour AA | Hot Water Soluble Boron (required for CCME Agricultural) | RECA Hydrocarbons (BTEX, CE-C32) | Hydrocarbons Soil (Pentables), NS Fuel Oil Spill Policy Low Level BTEX, CE-C32 | NR Potable Water BTEX, VPH, Low level T.E.H | PAHs | FWAL PAHs in water (with Acridine, Cameline) | PCBs | VOCs | TCLP Lead Leachate | HOLD - DO NOT ANALYZE | COMMENTS | |
| 1 | PS-01 Red over Brown Paint | 20/05/2016 | AM | Paint Chip | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | PS-02 White Paint | 20/05/2016 | AM | Paint Chip | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | PS-03 Grey Paint | 20/05/2016 | AM | Paint Chip | 1 | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RELINQUISHED BY: (Signature/Print) | | DATE: (YYYY/MM/DD) | | TIME: (HH:MM) | | RECEIVED BY: (Signature/Print) | | DATE: (YYYY/MM/DD) | | TIME: (HH:MM) | | MAXXAM JOB # | | | | | | | | | | | | | | | | | |
| Andrew Wayne <u>AW</u> | | 24/05/2016 | | | | <u>Office Complete</u> | | 2016/05/24 | | | | 13644718 | | | | | | | | | | | | | | | | | |
| | | | | | | <u>M. Monney</u> | | <u>MARYANN CONLAN</u> | | | | | | | | | | | | | | | | | | | | | |

Attempt to Cool:
 Yes
 No

2016 MAY 25 10:52