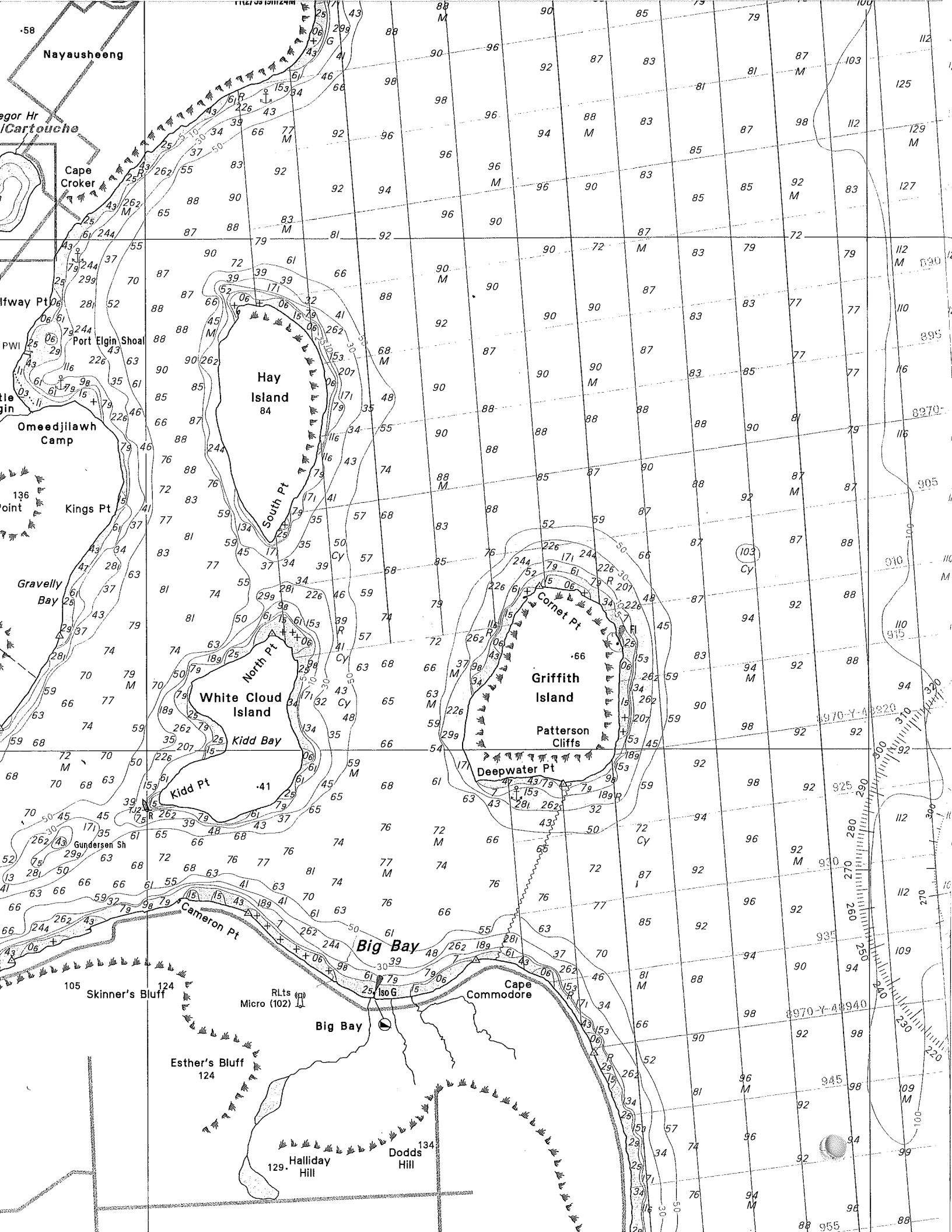


APPENDIX 2

EXCERPT FROM NAUTICAL CHART 2282: OWEN SOUND TO CABOT HEAD



APPENDIX 3
ENVIRONMENTAL SITE ASSESSMENT SCREENING REPORT –
MITIGATION MEASURES



3.0 ENVIRONMENTAL EFFECTS ANALYSIS AND RECOMMENDED MITIGATION MEASURES

(s.16.(1); s. 20.(2))

The potential for Project interaction with VECs and VSCs was analyzed based on: information provided by the proponent; a review of Project related activities; an appraisal of the environmental setting; temporal and/or spatial conflict; personal knowledge and professional judgment. Measures to mitigate the identified potential adverse interactions were then recommended. Significance¹ of any residual effect was ascertained based on an evaluation of the effect's magnitude, geographic extent, duration, frequency and permanence. The analysis also considers public concern, accidental and cumulative effects. Refer to the Checklist for Scoping Valued Ecosystem and Social Components & Environmental Issues above (Table 2-9).

The following table (Table 3-1) summarizes the foregoing, and in particular details the required mitigation measures and best management practices to be implemented. The required mitigation measures associated with potential Accidents and Malfunctions are summarized in Table 3-2.

Note that the mitigation measures are provided to meet the requirements of CEAA and should not be taken to imply authorization of the undertaking in accordance with any other federal, provincial, or municipal legislation. The mitigations are intended to avoid significant adverse environmental effects and do not relieve the proponent from compliance with any applicable legislation.

All required mitigation measures are summarized in the Mitigation Monitoring Report form (Appendix E). This report form may be used to ensure that mitigation measures identified in this report are implemented. It is the responsibility of DFO to ensure that mitigation measures identified in this report are enacted.

As a general comment, the proponent is encouraged to use products and processes that are least harmful to the environment, such as lower toxicity paints, surface coatings, construction and cleaning materials certified and catalogued by Environment Canada's Environmental Choice^M Program (<http://www.environmentalchoice.ca/>).

¹ **Significance** - For clarification of this term, please see Reference Guide: Determining Whether A Project Is Likely To Cause Significant Adverse Environmental Effects. http://www.ceaa.gc.ca/013/0001/0008/guide3_e.htm#4.2
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Table 3-1: Identification of Environmental Effects and Proposed Mitigation Measures

| Valued Ecosystem / Social Component | Description of Potential Project Interaction with VEC/VSC | Proposed Mitigation Measures & Best Management Practices | Residual Effects | Significance of Residual Effects ¹ | Further Study or Follow-up |
|-------------------------------------|---|---|--|---|----------------------------|
| Air Quality | <p>Site Preparation, Excavation and Demobilization: Potential for air emissions from construction vehicles, machinery and equipment to degrade local air quality.</p> | <ul style="list-style-type: none"> • Maintain vehicles, machinery and equipment in good repair, equipped with emission controls, as applicable, and operate them within regulatory requirements. • Comply with operating specifications for heavy equipment and machinery. • Minimize operation and idling of gas-powered equipment and vehicles, in particular, during smog advisories. • No burning of waste or excess materials is permitted. | <p>Low emissions from Project activities.</p> <p>Low potential for residual effect if mitigation measures applied.</p> | -1 | No |
| | <p>Site Preparation and Excavation: Potential impact to air quality and human health due to release of dust, soil and airborne particles.</p> | <ul style="list-style-type: none"> • Suppress releases of dust using water mist or other appropriate methods of control during site preparation, excavation, and loading and unloading of materials. • Soils will only be transported in secure holdings to limit loss of contaminated soils as dust. • Use controlled work procedures in order to eliminate release of dust from construction works including: <ul style="list-style-type: none"> ○ Stabilize areas of stockpiled or exposed soils using tarps or other similar covers; and ○ Avoid activities with potential to release airborne particulates during windy and prolonged dry periods. • Workers to wear protective gear (e.g., safety work boots, respirators, hard hats, etc.) in accordance with the <i>Occupational Health and Safety Act (OHSA)</i> and regulations. • Work shall be carried out in compliance with the Canadian <i>Environmental Protection Act (CEPA)</i>, and applicable air emission regulations and by-laws. | <p>Low potential for fugitive dust during Project activities.</p> <p>Low potential for residual effect if mitigation measures applied.</p> | -1 | No |
| Noise | <p>Site Preparation and Excavation: Temporary disturbance to terrestrial biota from noise generated by site preparation and excavation activities (machinery, human presence).</p> | <ul style="list-style-type: none"> • The regulatory limit for operating machinery will be in accordance with the local noise bylaws. • Where applicable, appropriate ear protection equipment must be worn by all employees working on site. • Install noise mufflers on construction machinery to reduce noise levels. • Contractors should avoid excess and unnecessary noise. • All Project works will be conducted outside the critical nesting period | <p>Low potential for residual effect as generation of noise will be temporary.</p> | -1 | No |

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| Valued Ecosystem / Social Component | Description of Potential Project Interaction with VEC/VSC | Proposed Mitigation Measures & Best Management Practices | Residual Effects | Significance of Residual Effects ¹ | Further Study or Follow-up |
|-------------------------------------|--|---|---|---|----------------------------|
| | | for migratory and colonial waterbirds (see Section for Birds). | | | |
| Surficial Geology and Soil | Site Preparation and Excavation: Site clearing and excavations will result in temporary exposure of some portions of the Project site to wind and surface run-off. | <ul style="list-style-type: none"> Stabilize soil after excavation to prevent its erosion and transport. Develop and implement an erosion control plan. To minimize land disturbance, the excavation envelope should be clearly demarcated and kept as small as possible. Undertake earthworks using construction techniques designed to prevent sedimentation. Restore and re-vegetate disturbed areas as soon as possible to minimize the duration of soil exposure. | Low potential for residual effect if mitigation measures applied. | -1 | No |
| | Excavation: Contaminated soils removal. | <ul style="list-style-type: none"> Contaminated soils will be characterized against CCME criteria and follow appropriate management strategies. In areas where soils require removal from cracks and crevices in the bedrock, use a high-pressure high efficiency particulate air (HEPA) vacuum unit to remove contaminated soils. Any uncontaminated topsoil removed as part of site clearing should be stockpiled and re-used for on-site restoration. | Low potential for residual effect if mitigation measures applied. | -1 | No |
| | Site Preparation, Excavation and Demobilization: Potential for leak or spill of petroleum products and other deleterious substances from vehicles and machinery to contaminate the soil. | <ul style="list-style-type: none"> Ensure that absorbent materials are available on-site in the event that a spill of deleterious substances should occur. All spills and leaks of deleterious substances must be immediately contained and cleaned up in accordance with Provincial regulatory requirements and reported immediately to the Ontario Spills Action Centre (1-800-268-6060). Maintain a logbook detailing any such measures. Apply elements of Spill Response Plan as outlined in Table 4-2: Accidents and Malfunctions. | Low potential for residual effect if mitigation measures applied. | -1 | No |
| Vegetation | Site Preparation: Loss of existing vegetation and associated wildlife habitat as a result of proposed Project activities. | <ul style="list-style-type: none"> Minimize as much as possible any disturbance to existing vegetation. The footprints for the excavation will be landscaped to match existing condition. The landscaping plan will include site grading, soil reinstatement and planting/seeding plans. Vegetation will be restored upon completion of excavation, using native species typical of the locality and soils. Any seeding should commence as soon as possible, in conjunction with planting works. Scheduling of work shall be such that exposed and disturbed areas can be seeded during the growing season and are not left exposed during the spring period. | <p>Minor loss of vegetated area due to Project activities.</p> <p>Low potential for residual effect if mitigation measures applied.</p> | -1 | No |



| Valued Ecosystem / Social Component | Description of Potential Project Interaction with VEC/VSC | Proposed Mitigation Measures & Best Management Practices | Residual Effects | Significance of Residual Effects ¹ | Further Study or Follow-up |
|-------------------------------------|---|---|--|---|----------------------------|
| | | <ul style="list-style-type: none"> • Topsoil shall be placed to a maximum of 30 mm depth over disturbed bedrock to match pre-excavation soil depths at the site. • Compliance with the <i>Migratory Birds Convention Act (MBCA; 1994)</i> regulations and guidelines for vegetation clearing recommended by Environment Canada. In order to minimize the potential for incidental take of nesting migratory birds, vegetation clearing and any proposed work activities in migratory bird habitat will be undertaken outside of the active breeding season. • Clearing is to be avoided from May 1 to July 31 for this Project location. If clearing (or other work) in migratory bird habitat is required during the nesting season, a nest survey should be conducted by a qualified avian biologist immediately (<i>i.e.</i>, within 2 days) prior to commencement of the works to identify and locate active nests of species covered by the <i>MBCA</i>. An adaptive mitigation plan (which may include establishing appropriate buffers around active nests) should then be developed to address any potential impacts on migratory birds or their active nests, and should be reviewed by EC prior to implementation. | | | |
| | <p>Site Preparation and Excavation: Potential for contamination.</p> | <ul style="list-style-type: none"> • Ensure hazardous substances, if required, are stored, handled and applied in accordance with local regulations and in a manner which prevents re-release into the environment. • Any hazardous substances stored within the stockpile areas will be properly contained to prevent its re-release into the environment. • Ensure a contingency plan is developed and implemented in the event of an accidental spill from construction vehicle, machinery or equipment. | Low potential for residual effect if mitigation measures applied. | -1 | No |
| Mammals | <p>Site Preparation and Excavation: Temporary habitat loss and potential accidental mortality due to Project activities.</p> | <ul style="list-style-type: none"> • Minimize as much as possible any disturbance to vegetation on-site which serves as potential mammal habitat. • Restore vegetation upon completion of excavation, as per mitigation measures provided in Vegetation section above. | <p>Temporary and minor loss of habitat due to Project activities.</p> <p>Low potential for residual effect if mitigation measures applied.</p> | -1 | No |



| Valued Ecosystem / Social Component | Description of Potential Project Interaction with VEC/VSC | Proposed Mitigation Measures & Best Management Practices | Residual Effects | Significance of Residual Effects ¹ | Further Study or Follow-up |
|--|---|--|--|---|----------------------------|
| Birds | Site Preparation and Excavation: Temporary habitat loss and potential accidental mortality due to Project activities. | <ul style="list-style-type: none"> Minimize as much as possible any disturbance to on-site vegetation. Compliance with the <i>Migratory Birds Convention Act (MBCA; 1994)</i> regulations and guidelines for vegetation clearing recommended by Environment Canada. In order to minimize the potential for incidental take of nesting migratory birds, vegetation clearing and any proposed work activities in migratory bird habitat will be undertaken outside of the active breeding season. Clearing is to be avoided from April 1st to August 1st for this Project location. If clearing (or other work) in migratory bird habitat is required during the nesting season, a nest survey should be conducted by a qualified avian biologist immediately (<i>i.e.</i>, within 2 days) prior to commencement of the works to identify and locate active nests of species covered by the <i>MBCA</i>. An adaptive mitigation plan (which may include establishing appropriate buffers around active nests) should then be developed to address any potential impacts on migratory birds or their active nests, and should be reviewed by Environment Canada prior to implementation. Apply mitigation measures as per "Species at Risk listed under <i>SARA/ESA</i>" and "Vegetation" VECs. | <p>Temporary and minor loss of habitat due to Project activities.</p> <p>Low potential for residual effect if mitigation measures applied.</p> | -1 | No |
| Amphibians and Reptiles | Site Preparation and Excavation: Temporary habitat loss and potential accidental mortality due to Project activities. | <ul style="list-style-type: none"> Minimize as much as possible any disturbance to on-site vegetation. Conduct field survey prior to site preparation and excavation activities to determine the presence of potential reptile hibernacula sites within Project footprint. Surveys should be conducted during the optimal time to detect reptiles emerging from hibernation (April). Construct silt fencing to keep amphibians and reptiles out of Project footprint. Avoid use of silt fencing with nylon mesh netting reinforcing the regular, woven plastic strand material. Large-bodied snakes become entangled in this mesh and perish. Apply mitigation measures as per "Species at Risk listed under <i>SARA/ESA</i>" and "Vegetation" VECs. | <p>Minor loss of habitat due to Project activities.</p> <p>Low potential for residual effect if mitigation measures applied.</p> | | |
| Species at Risk listed under <i>SARA/ESA</i> | Site Preparation and Excavation: Habitat loss and potential accidental mortality of the Eastern Massasauga due to | <ul style="list-style-type: none"> Prior to Project commencement, confirmatory inventory for Eastern Massasauga should be undertaken in April by a qualified snake biologist to determine the presence or absence of the species in the Project area. The survey should be conducted during optimum sun-basking time (sunny and warm). | Low potential for residual effect if mitigation measures applied. | -1 | No |



| Valued Ecosystem / Social Component | Description of Potential Project Interaction with VEC/VSC | Proposed Mitigation Measures & Best Management Practices | Residual Effects | Significance of Residual Effects ¹ | Further Study or Follow-up |
|-------------------------------------|--|--|--|---|----------------------------|
| | Project activities. | <ul style="list-style-type: none"> • Construct silt fencing to keep Eastern Massasauga out of Project footprint. Avoid use of silt fencing with nylon mesh netting reinforcing the regular, woven plastic strand material. Large-bodied snakes become entangled in this mesh and perish. • Provide information to contractor regarding identification of Eastern Massasauga. Should an Eastern Massasauga be encountered at any time during the Project, measures are to be implemented to avoid destruction, injury, or interference with the species, its residence and/or its habitat (e.g., through siting, timing, or design changes). Work shall cease and the Project Manager should contact DFO who will refer the issue to the appropriate Agency (EC) and/or recovery team for advice on how to proceed. • Should any other SARA/ESA species be encountered during further inventories or during the progress of construction within the study area, work shall cease and EC and/or MNR will be contacted immediately to determine any requirements pursuant to SARA and ESA, respectively. | | | |
| Surface Water | <p>Island Access, Site Preparation, Excavation and Demobilization: Potential for leaks or spills of fuel, sediment, soil or other hazardous substances to be released into surface water during Project activities.</p> | <ul style="list-style-type: none"> • An erosion control plan should be developed to mitigate potential effects on water quality with respect to the transport and movement of remediation equipment and contaminated sediments and remediation soils. • Appropriate measures should be adopted to minimize any impacts of accidental spills during transport, staging and maintenance activities. • Transportation of the contaminated soil via barges to the mainland will be properly contained and secured so that wind does not blow contaminated soil particles into the water. Transportation across the water during storms with heavy rainfall or high winds should be avoided to minimize risk. • Ensure that hazardous substances (including fuel) are handled and applied in a manner to prevent release into the environment. All deleterious substances should be stored at least 30 m from the water. In the scenario that a barge and ramp are used for transport of equipment and sediment/soils, deleterious substances must be transported in appropriate containers and be properly secured at all times. | Low potential for residual effect if mitigation measures applied | -1 | No |



| Valued Ecosystem / Social Component | Description of Potential Project Interaction with VEC/VSC | Proposed Mitigation Measures & Best Management Practices | Residual Effects | Significance of Residual Effects ¹ | Further Study or Follow-up |
|-------------------------------------|---|---|--|---|----------------------------|
| | | <ul style="list-style-type: none"> • Construction machinery and equipment (including ramping structures) are to arrive on-site in a clean condition and be maintained free of fluid leaks. • Any washing, refuelling or servicing to construction equipment in use on the island is to take place a minimum of 30 m from the lake shore (cobble beach) and within a flat, impermeable stable surface to prevent any deleterious substances from entering the water. • Store all oils, lubricants, fuels and chemicals in secure areas on impermeable pads a minimum of 30 m from water. • Stockpiled material will be stored a safe distance from all surface water to ensure that no deleterious substances enter Georgian Bay. • Excavated soils will only be transported in secured units to ensure no loss to the environment. • A spill response kit to be on site in the event of a spill. Immediately contain and clean up any spills in accordance with provincial regulatory requirements. Report spill to the Ontario Spills Action Centre (1-800-268-6060). • Apply elements of Spill Response Plan as outlined in Table 3-2: Accidents and Malfunctions. • Apply Mitigation Measures under Fish/Fish Habitat VEC/VSC as per Water quality impairments (sediment loading; fuels and lubricants from machinery). • Keep all materials securely locked up to avoid vandalism and accidental spills in Georgian Bay. | | | |
| | <p>Island Access, Site Preparation, Excavation and Demobilization: Potential for the release of deleterious substances, sediment and soil into the surface water during ground disturbance and precipitation events.</p> | <ul style="list-style-type: none"> • Site remediation should be completed at a time of year (e.g., during periods of dry weather) that will minimize the potential for sediment, debris and/or other contaminants to enter the lake. • An erosion control plan should be developed to mitigate potential effects on water quality with respect to the transport and movement of remediation equipment and contaminated sediments • Control disposal of runoff of water containing harmful substances through the use of silt screens or other methods. • Runoff water from the excavation, soil stockpile area, and decontamination pad will be collected, analyzed, and disposed of | Low potential for residual effect if mitigation measures applied | -1 | No |



| Valued Ecosystem / Social Component | Description of Potential Project Interaction with VEC/VSC | Proposed Mitigation Measures & Best Management Practices | Residual Effects | Significance of Residual Effects ¹ | Further Study or Follow-up |
|-------------------------------------|---|--|--|---|----------------------------|
| | | <p>according to applicable regulations.</p> <ul style="list-style-type: none"> A spill response kit to be on site in the event of a spill. Immediately contain and clean up any spills in accordance with provincial regulatory requirements. Report spill to the Ontario Spills Action Centre (1-800-268-6060) Apply elements of Spill Response Plan as outlined in Table 3-2: Accidents and Malfunctions. | | | |
| Fish and Fish Habitat | <p>Island Access and Demobilization: Potential for harmful alteration of fish habitat during the island access and demobilization phase.</p> | <ul style="list-style-type: none"> Work will be carried out in accordance with the requirements outlined by DFO under Section 35 of the federal <i>Fisheries Act</i>. Section 35 states that no person shall cause the Harmful Alteration, Disruption or Destruction (HADD) of fish habitat unless authorized by DFO. Consult with DFO throughout the Project's lifespan to obtain input and requirements to be accommodated. | Low potential for residual effect if mitigation measures applied | -1 | No |
| | <p>Island Access and Demobilization: Water quality impairments (sediment loading; fuels and lubricants from machinery).</p> | <ul style="list-style-type: none"> Sediment and erosion control measures will be installed and will be maintained during the work phase, and until the site has been stabilized. Control measures should be inspected daily to ensure they are functioning and are maintained as required. If the control measures are not functioning properly, no further work will occur until the problem is resolved. Any washing, refuelling or servicing to construction equipment in use on the island is to take place a minimum of 30 m from the lake shore (cobble beach) and within a flat, impermeable stable surface to prevent any deleterious substances from entering the water. All materials and equipment used will be operated and stored in a manner that prevents any deleterious substances from entering the water. Store and stabilize stockpiled materials, including any hazardous materials such as fuels and lubricants, a minimum of 30 m away from any surface waters. Ensure equipment entering the water is free of fluid leaks and externally cleaned/degreased to prevent any deleterious substance from entering the river. Establish spill management techniques prior to commencement of work. | Low potential for residual effect if mitigation measures applied | -1 | No |



| Valued Ecosystem / Social Component | Description of Potential Project Interaction with VEC/VSC | Proposed Mitigation Measures & Best Management Practices | Residual Effects | Significance of Residual Effects ¹ | Further Study or Follow-up |
|-------------------------------------|---|--|--|---|----------------------------|
| | | <ul style="list-style-type: none"> Keep an emergency spill kit on site in case of fluid leaks or spills from machinery into the river. | | | |
| Aesthetics | <p>Site Preparation, Excavation and Demobilization: Temporary visual disruption of aesthetic appearance of Lighthouse from Georgian Bay.</p> | <ul style="list-style-type: none"> Minimize period of disturbance. Grounds to be restored promptly upon construction completion to meet DFO use objectives. | Low potential for residual effect if mitigation measures applied. | -1 | No |
| Land Use | <p>Site Preparation, Excavation and Demobilization: Potential disturbance to surrounding private lands.</p> | <ul style="list-style-type: none"> Maintain temporary fencing for the duration of the Project to ensure contractors do not trespass on private properties, unless a land use agreement has been prepared between DFO and the GIHC. Provide security guard on-site when the workers have left for the day (if necessary). Project must be completed by September 13th, 2011 to avoid interference with local hunting club activities. | Low potential for residual effect if mitigation measures applied. | -1 | No |
| Navigation | <p>Island Access, Site Preparation, Excavation and Demobilization: A barge will be required for the delivery and removal of excavation equipment and for the waste soil removal. Temporary interference with boat traffic.</p> | <ul style="list-style-type: none"> Apply and comply with TC legislation and regulations. | Short duration activity. Low potential for residual effect if mitigation measures applied. | -1 | No |
| Cultural Resources | <p>Site Preparation, Excavation and Demobilization: Potential accidental damage to Lighthouse structures from excavation equipment.</p> | <ul style="list-style-type: none"> Implement and maintain temporary fencing around the Lighthouse structure for the duration of the Project. | Low potential for residual effect if mitigation measures applied. | -1 | No |
| Archaeology | <p>Site Preparation, Excavation: Potential to uncover of</p> | <ul style="list-style-type: none"> Immediately suspend all work in the vicinity of the discovery, should human remains be found during excavation. Notify the Ontario Provincial Police, or local police, for them to conduct a site | Low potential for residual effect if mitigation | -1 | No |



| Valued Ecosystem / Social Component | Description of Potential Project Interaction with VEC/VSC | Proposed Mitigation Measures & Best Management Practices | Residual Effects | Significance of Residual Effects ¹ | Further Study or Follow-up |
|-------------------------------------|---|--|--|---|----------------------------|
| | artefacts. | <p>investigation and to contact the district coroner. Also notify the Ministry of Culture at 1-800-461-7629.</p> <ul style="list-style-type: none"> Should other un-recorded cultural heritage values (archaeological or historical features) be identified during the construction, suspend all activities in the vicinity of the discovery and contact DFO and the Ministry of Culture. | measures applied. | | |
| Human Health and Safety | <p>Land Access, Site Preparation, Excavation and Demobilization: Potential adverse safety conditions to workers during the Project activities.</p> | <ul style="list-style-type: none"> Workers to wear protective gear (e.g., safety work boots, respirators, hard hats, safety vests, etc.) in accordance with the <i>Occupational Health and Safety Act (OHSA)</i> and regulations. Use adequate safety barriers and signs to provide a safe environment for workers, employees of the site and the public. The contractor will be required to implement a Health and Safety Plan as per the <i>OHSA</i>. Clearly delineate the excavation site. Produce a Health and Safety plan for the project, including the procedures and practices as stated in the <i>OHSA</i>. Adequate safety barriers and signs should be used to provide a safe environment for workers. A plan will be developed to prevent the public from mooring at the dock and avoid accidental exposure to contaminated soils. The use of a security guard onsite when the workers have left for the day may be required. All Project works will be conducted prior to hunting season on Griffith Island (September 13th, 2011). In the event Project works are required after the start of the hunting season, the contractor will notify the GIHC when workers are on-site. | Low potential for residual effect if mitigation measures applied | -1 | No |
| Waste | <p>Excavation: Generation, storage and disposal of wastes during the excavation of the contaminated soil.</p> | <ul style="list-style-type: none"> All waste generated will be disposed according to regulations (i.e., O. Reg. 347, and as amended). The contractor is required to submit proof that a licensed waste hauler is transporting the waste to a facility certified to accept the material. A copy of waste disposal/transfer site's Certificate of Approval and a letter verifying that the said disposal/transfer site will accept the waste must be supplied to the proponent prior to removal of waste from site. Potentially hazardous wastes will be separated from normal waste through segregation of storage areas and proper labelling of containers. All registered waste will be removed from the site by licensed waste contractors and disposed at approved facilities. | Low potential for residual effect if waste management measures applied | -1 | No |



| Valued Ecosystem / Social Component | Description of Potential Project Interaction with VEC/VSC | Proposed Mitigation Measures & Best Management Practices | Residual Effects | Significance of Residual Effects ¹ | Further Study or Follow-up |
|-------------------------------------|---|--|------------------|---|----------------------------|
| | | <ul style="list-style-type: none"> The Project will implement a solid waste management program for typical debris handling and disposal. The disposal of designated substances is regulated under the Ontario <i>Environmental Protection Act (EPA)</i>, specifically O. Reg. 347, General – Waste Management (most recently amended by O. Reg. 395/07). | | | |

¹ Significance of Residual Impacts rated as follows:

0 = None, 1 = Not significant, 2 = Significant, 3 = Unknown, Positive (+), Negative (-).



Table 3-2: Accidents and Malfunctions

| Accident or Malfunction | Description of Effect | Required Mitigation | Likelihood Residual Effects | Significance of Residual Effects ¹ | Further Study or Follow Up |
|---|--|--|-----------------------------|---|----------------------------|
| Leak or Spill of petroleum and/or other deleterious substances from vehicles and equipment. | Contamination of soils | <ul style="list-style-type: none"> Apply relevant mitigation measures for accidental leaks and spills, as per the 'Surficial Soils and Geology', 'Surface Water' and 'Fish and Fish Habitat' sections provided in Table 3-1. Protocols for management of hazardous materials (e.g., responsibilities, emission control, safe storage practices, refuelling protocols, spill containment; emergency response, regulatory compliance, accident/incident reporting) should be in place. Ensure spill response plan and clean up materials are available at the site when hazardous materials are being used. Immediately contain and clean up spills in accordance with provincial regulatory requirements. All personnel will be trained to respond to a spill. Report spills to Ontario Spills Action Centre at 1-800-268-6060 and DFO. | Low | -1 Insignificant due to small magnitude and limited geographical extent, duration and frequency. No residual permanent adverse effect. | No |
| Accidents that could harm workers | Excavation site could be a safety hazard to workers. | <ul style="list-style-type: none"> Provide adequate safety barriers and signs to protect safety of workers. Reduce worker fall hazards near the excavation site. Maintain safe ingress and egress to work area. Make medical provisions prior to Project's start for prompt medical aid in the event of serious injury. Develop and implement a site specific Health and Safety Plan as per the OSHA. All Project works will be conducted prior to hunting season on Griffith Island (mid-September). In the event Project works are required after the start of the hunting season, the contractor will notify the GIHC when workers are on-site. | Low | -1 Insignificant due to small magnitude and limited geographical extent, duration and frequency. No residual permanent adverse effect | No |

¹ Significance of Residual Impacts rated as follows:

0 = None, 1 = Not significant, 2 = Significant, 3 = Unknown, Positive (+), Negative (-).



3.1 Effects of the Environment on the Project (s. 16.(1)(c))

Potential effects of the environment on the Project include those associated with climatic fluctuations and natural phenomena. Climatic fluctuations resulting in excessive rain and wind may cause flooding in the excavation areas, erosion and sediment control issues in exposed soil areas, or the release of fugitive dust and airborne particulates. Excessive wind events could distribute material from the excavation site across and beyond the Project site. The effects of climate could also damage or cause loss of equipment/materials resulting in temporary inability to proceed with Project activities or be responsive to the need to implement mitigation measures in response to events. Another potential climatic effect is excessive winds causing blow-down of trees in the vicinity of the Project site and along access roads (if applicable). These potential effects could result in an increase of maintenance requirements. Such effects to Project activities could also result in delays or additional cost.

Mitigation measures for the aforementioned potential effects of the environment on the Project include:

- Implement standard safe working practices;
- Monitor weather reports and plan for adverse weather forecasts daily;
- Undertake the work as promptly as feasible to avoid exposure to effects; and
- All work areas must be organized or stabilized against the impacts of wind and high precipitation events during periods of forecasted extreme events.

There are no likely significant effects of the environment on the Project given the short, temporary duration and relatively limited extent of the Project.

3.2 Cumulative Effects (s.16.(1)(a))

In assessing the potential environmental impacts of the proposed Project described in this Screening Report, it is necessary to consider the potential for, and significance of, any cumulative effects. Cumulative effects are changes to the environment that may be caused by the proposed Project in combination with other past, present, and future human actions and activities in the local area.

No past, present or future projects were identified in the vicinity of the Project site. In the event that the wharf at the GIHC is used to access the site, the added use of the road network for transportation of contaminated soils, in combination with road use by visitors to the GIHC, may result in a cumulative negative effect on wildlife (e.g., disturbance, road mortality). Mitigation measures should include limiting speed limits to 30 km/h and monitoring of roads for the presence of wildlife. Wildlife encountered on the road should be removed to a safe area (unless the species is a SAR) in a manner not to harm the species (e.g., turtles, snakes) or allowed to move off the road on their own accord (e.g., birds, mammals). In the event the species is a SAR



or the status of the species is unknown, road access shall cease until the species has moved on its own accord to comply with the *SARA* and/or *ESA*. DFO and EC/MNR would be contacted in such an event.

3.3 Significance and Residual Effects (s.16.(1)(b))

The analysis in the Environmental Effects, Significance and Mitigation Measures section addresses significant residual effects/impacts on different VECs and/or VSCs. The determination of significance of an effect included considerations of magnitude, frequency, and duration. For all components it is anticipated that environmental effects can be mitigated (Tables 3-1 and 3-2). Accordingly, based on the documentation review and taking into account the specific mitigation measures mentioned above, it is also anticipated that the Project is not likely to cause significant adverse residual environmental effects.

3.4 Follow-up and Monitoring

No follow-up appears to be warranted based on the results of this screening assessment. The Project work is straightforward, the environment is well known, and the methods and mitigations are proven effective in their intentions.

Relative to potential Project effects and proposed mitigation measures, as well as associated environmental protection planning; possible associated monitoring requirements may be required as follows:

Fish/Fish Habitat: Potential harmful alteration of fish habitat during the land access and the demobilization phases of the Project. Consultations with DFO will be undertaken throughout the Project's lifespan to obtain input and requirements. Monitoring sediment and erosion control measures should be inspected daily to ensure they are functioning and are maintained as required. If the control measures are not functioning properly, no further work will occur until the problem is resolved.

Vegetation/Terrestrial Habitat: There will be a temporary disturbance or loss of existing vegetation and generally associated wildlife habitat as a result of proposed activities. The disturbance will be for a short duration and the extent of disturbance will be minimized. Upon Project completion, the excavation area will be restored to the original condition using only native vegetation species.



ENVIRONMENTAL ASSESSMENT MITIGATION MONITORING REPORT FORM

Responsible Authority: Fisheries and Oceans Canada (DFO)
Griffith Island Lighthouse Soil Remediation, Georgian Bay, Ontario
PWGSC Project No.: R.044281.001
PWGSC File No.: 3612-58231.00-R-044281.001

The purpose of this record is to monitor the implementation of mitigation measures identified in the Environmental Assessment Screening Report. It is the responsibility of the DFO to ensure that this record is completed over the duration of the project. This Environmental Mitigation Monitoring Report form must be completed in full. Specify in the table below whether the mitigation measures set out in the environmental assessment have been applied. If a mitigation measure has not been applied, specify the reason(s) why this was not done. **A copy of the completed Mitigation Monitoring Report form should be included in the Project file and a copy must be sent to Jeff Karn (Fax: 416-590-8284) of PWGSC-Environmental Services on completion of the Project.**

| Environmental Mitigation Measure | Implementation Schedule/Date | Person/Title/ Firm Responsible | Compliance (Task Complete – Yes or No/Date) If No, provide reason |
|--|------------------------------|--------------------------------------|--|
| AIR QUALITY | | | |
| Maintain vehicles, machinery and equipment in good repair, equipped with emission controls, as applicable, and operate them within regulatory requirements. | | | |
| Minimize operation and idling of gas-powered equipment and vehicles, in particular, during smog advisories. | | | |
| No burning of waste or excess materials. | | | |
| Suppress releases of dust using water mist or other appropriate methods of control during site preparation, excavation, and loading and unloading of materials. | | | |
| Use controlled work procedures in order to eliminate release of dust from construction works including: stabilize areas of stockpiled or exposed soils using tarps or other similar covers; and avoid activities with potential to release airborne particulates during windy and prolonged dry periods. | | | |



| Environmental Mitigation Measure | Implementation Schedule/Date | Person/Title/ Firm Responsible | Compliance (Task Complete – Yes or No/Date) If No, provide reason |
|--|------------------------------|--------------------------------------|--|
| Workers to wear protective gear (e.g., safety work boots, respirators, hard hats, etc.) in accordance with the <i>Occupational Health and Safety Act (OHSA)</i> and regulations. | | | |
| Carried out work in compliance with the <i>Canadian Environmental Protection Act (CEPA)</i> , and applicable air emission regulations and by-laws. | | | |
| NOISE | | | |
| Where applicable, appropriate ear protection equipment must be worn by all employees working on site. | | | |
| Install noise mufflers on construction machinery to reduce noise levels. | | | |
| Avoid excess and unnecessary noise. | | | |
| SURFICIAL GEOLOGY AND SOIL | | | |
| Stabilize soil after excavation to prevent its erosion and transport. | | | |
| Develop and implement an erosion control plan. | | | |
| To minimize land disturbance, the excavation envelope should be clearly demarcated and kept as small as possible. | | | |
| Undertake earthworks using construction techniques designed to prevent sedimentation. | | | |
| Restore and re-vegetate disturbed areas as soon as possible to minimize the duration of soil exposure. | | | |
| Characterize contaminated soils against CCME criteria and follow appropriate management strategies. | | | |
| In areas where soils require removal from cracks and crevices in the bedrock, use a high-pressure high efficiency particulate air (HEPA) vacuum unit to remove contaminated soils. | | | |
| Remove any uncontaminated topsoil as part of site clearing and stockpile for re-used at on-site restoration. | | | |



| Environmental Mitigation Measure | Implementation Schedule/Date | Person/Title/ Firm Responsible | Compliance (Task Complete – Yes or No/Date) If No, provide reason |
|---|------------------------------|--------------------------------------|--|
| Ensure that absorbent materials are available on | | | |
| All spills and leaks of deleterious substances must be immediately contained and cleaned up in accordance with Provincial regulatory requirements and reported immediately to the Ontario Spills Action Centre (1 | | | |
| VEGETATION | | | |
| Minimize as much as possible any disturbance to existing vegetation. | | | |
| Landscape excavation footprint to match existing condition. The landscaping plan should include site grading, soil reinstatement and planting/seeding plans. | | | |
| Topsoil shall be placed to a maximum of 30 mm depth over disturbed bedrock to match pre-excavation soil depths at the site. | | | |
| Compliance with the <i>Migratory Birds Convention Act (MBCA; 1994)</i> regulations and guidelines for vegetation clearing recommended by Environment Canada. | | | |
| Ensure hazardous substances, if required, are stored, handled and applied in accordance with local regulations and in a manner which prevents re-release into the environment. | | | |
| Properly contain any hazardous substances stored within the stockpile areas to prevent its re-release into the environment. | | | |
| Ensure a contingency plan is developed and implemented in the event of an accidental spill from construction vehicle, machinery or equipment. | | | |
| MAMMALS | | | |
| Minimize as much as possible any disturbance to vegetation on-site which serves as potential mammal habitat. | | | |



| Environmental Mitigation Measure | Implementation Schedule/Date | Person/Title/ Firm Responsible | Compliance (Task Complete – Yes or No/Date) If No, provide reason |
|--|------------------------------|--------------------------------------|--|
| Restore vegetation upon completion of excavation, as per mitigation measures provided in Vegetation section above. | | | |
| BIRDS | | | |
| Minimize as much as possible any disturbance to on-site vegetation. | | | |
| Compliance with the <i>Migratory Birds Convention Act</i> (MBCA; 1994) regulations and guidelines for vegetation clearing recommended by Environment Canada. | | | |
| Clearing is to be avoided from April 1 st to August 1 st for this Project location. | | | |
| AMPHIBIANS AND REPTILES | | | |
| Minimize as much as possible any disturbance to on-site vegetation. | | | |
| Construct silt fencing to keep amphibian and reptiles out of Project footprint. Avoid use of silt fencing with nylon mesh netting reinforcing the regular, woven plastic strand material. Large-bodied snakes become entangled in this mesh and perish. | | | |
| SPECIES AT RISK | | | |
| Construct silt fencing to keep Eastern Massasauga out of Project footprint. Avoid use of silt fencing with nylon mesh netting reinforcing the regular, woven plastic strand material. Large-bodied snakes become entangled in this mesh and perish. | | | |
| Should any <i>SARA/ESA</i> species be encountered during further inventories or during the progress of construction within the study area, work shall cease and EC and/or MNR will be contacted immediately to determine any requirements pursuant to <i>SARA</i> and <i>ESA</i> , respectively. | | | |



| Environmental Mitigation Measure | Implementation Schedule/Date | Person/Title/ Firm Responsible | Compliance (Task Complete – Yes or No/Date) If No, provide reason |
|---|------------------------------|--------------------------------------|--|
| SURFACE WATER | | | |
| An erosion control plan should be developed to mitigate potential effects on water quality with respect to the transport and movement of remediation equipment and contaminated sediments and remediation soils. | | | |
| Appropriate measures should be adopted to minimize any impacts of accidental spills during transport, staging and maintenance activities. | | | |
| Transportation of the contaminated soil via barges to the mainland will be properly contained and secured so that wind does not blow contaminated soil particles into the water. Transportation across the water during storms with heavy rainfall or high winds should be avoided to minimize risk. | | | |
| Ensure that hazardous substances (including fuel) are handled and applied in a manner to prevent release into the environment. All deleterious substances should be stored at least 30 m from the water. In the scenario that a barge and ramp are used for transport of equipment and sediment/soils, deleterious substances must be transported in appropriate containers and be properly secured at all times. | | | |
| Construction machinery and equipment (including ramping structures) are to arrive on-site in a clean condition and be maintained free of fluid leaks. | | | |
| Any washing, refuelling or servicing to construction equipment in use on the island is to take place a minimum of 30 m from the lake shore (cobble beach) and within a flat, impermeable stable surface to prevent any deleterious substances from entering the water. | | | |
| Store all oils, lubricants, fuels and chemicals in secure areas on impermeable pads a minimum of 30 m from water. | | | |



| Environmental Mitigation Measure | Implementation Schedule/Date | Person/Title/ Firm Responsible | Compliance (Task Complete – Yes or No/Date) If No, provide reason |
|---|------------------------------|--------------------------------------|--|
| Stockpiled material will be stored a safe distance from all surface water to ensure that no deleterious substances enter Georgian Bay. | | | |
| Excavated soils will only be transported in secured units to ensure no loss to the environment. | | | |
| A spill response kit to be on site in the event of a spill. Immediately contain and clean up any spills in accordance with provincial regulatory requirements. Report spill to the Ontario Spills Action Centre (1-800-268-6060). | | | |
| Keep all materials securely locked up to avoid vandalism and accidental spills in Georgian Bay. | | | |
| Site remediation should be completed at a time of year (e.g., during periods of dry weather) that will minimize the potential for sediment, debris and/or other contaminants to enter the lake. | | | |
| An erosion control plan should be developed to mitigate potential effects on water quality with respect to the transport and movement of remediation equipment and contaminated sediments | | | |
| Control disposal of runoff of water containing harmful substances through the use of silt screens or other methods. | | | |
| Runoff water from the excavation, soil stockpile area, and decontamination pad will be collected, analyzed, and disposed of according to applicable regulations. | | | |
| FISH AND FISH HABITAT | | | |
| Carry out work in accordance with the requirements outlined by DFO under Section 35 of the federal <i>Fisheries Act</i> . Section 35 states that no person shall cause the Harmful Alteration, Disruption or Destruction (HADD) of fish habitat unless authorized by DFO. | | | |



| Environmental Mitigation Measure | Implementation Schedule/Date | Person/Title/ Firm Responsible | Compliance (Task Complete – Yes or No/Date) If No, provide reason |
|--|------------------------------|--------------------------------------|--|
| Consult with DFO throughout the Project’s lifespan to obtain input and requirements to be accommodated. | | | |
| Install and maintain sediment and erosion control measures during the work phase, and until the site has been stabilized. | | | |
| Control measures should be inspected daily to ensure they are functioning and are maintained as required. If the control measures are not functioning properly, no further work will occur until the problem is resolved. | | | |
| Any washing, refuelling or servicing to construction equipment in use on the island is to take place a minimum of 30 m from the lake shore (cobble beach) and within a flat, impermeable stable surface to prevent any deleterious substances from entering the water. | | | |
| Store and operate all materials and equipment in a manner that prevents any deleterious substances from entering the water. | | | |
| Store and stabilize stockpiled materials, including any hazardous materials such as fuels and lubricants, a minimum of 30 m away from any surface waters. | | | |
| Ensure equipment entering the water is free of fluid leaks and externally cleaned/degreased to prevent any deleterious substance from entering the river. | | | |
| Establish spill management techniques prior to commencement of work. | | | |
| Keep an emergency spill kit on site in case of fluid leaks or spills from machinery into the river. | | | |
| LAND USE | | | |
| Maintain temporary fencing for the duration of the Project to ensure contractors do not trespass on private properties, unless a land use agreement has been prepared between DFO and the GIHC. | | | |



| Environmental Mitigation Measure | Implementation Schedule/Date | Person/Title/ Firm Responsible | Compliance (Task Complete – Yes or No/Date) If No, provide reason |
|---|------------------------------|--------------------------------------|--|
| Provide security guard on-site when the workers have left for the day (if necessary). | | | |
| Project must be completed by September 13 th , 2011 to avoid interference with local hunting club activities. | | | |
| NAVIGATION | | | |
| Apply and comply with Transport Canada legislation and regulations. | | | |
| ARCHAEOLOGY | | | |
| Immediately suspend all work in the vicinity of the discovery, should human remains be found during excavation. Notify the Ontario Provincial Police, or local police, for them to conduct a site investigation and to contact the district coroner. Also notify the Ministry of Culture at 1-800-461-7629. | | | |
| Should other un-recorded cultural heritage values (archaeological or historical features) be identified during the construction, suspend all activities in the vicinity of the discovery and contact DFO and the Ministry of Culture. | | | |
| HUMAN HEALTH AND SAFETY | | | |
| Workers to wear protective gear (e.g., safety work boots, respirators, hard hats, safety vests, etc.) in accordance with the <i>Occupational Health and Safety Act (OHS)</i> and regulations. | | | |
| Use adequate safety barriers and signs to provide a safe environment for workers, employees of the site and the public. The contractor will be required to implement a Health and Safety Plan as per the <i>OHS</i> . | | | |
| Clearly delineate the excavation site. Produce a Health and Safety plan for the project, including the procedures and practices as stated in the <i>OHS</i> . Adequate safety barriers and signs should be used to provide a safe environment for workers. | | | |



| Environmental Mitigation Measure | Implementation Schedule/Date | Person/Title/Firm Responsible | Compliance (Task Complete – Yes or No/Date) If No, provide reason |
|---|-------------------------------------|--------------------------------------|--|
| WASTE | | | |
| Dispose all waste generated according to regulations (<i>i.e.</i> , O. Reg. 347, and as amended). | | | |
| The contractor is required to submit proof that a licensed waste hauler is transporting the waste to a facility certified to accept the material. A copy of waste disposal/transfer site’s Certificate of Approval and a letter verifying that the said disposal/transfer site will accept the waste must be supplied to the proponent prior to removal of waste from site. | | | |
| Separate potentially hazardous wastes from normal waste through segregation of storage areas and proper labelling of containers. All registered waste will be removed from the site by licensed waste contractors and disposed at approved facilities. | | | |
| Implement a solid waste management program for typical debris handling and disposal. | | | |
| ACCIDENTS AND MALFUNCTIONS | | | |
| Apply relevant mitigation measures for accidental leaks and spills, as per the ‘Surficial Soils and Geology’, ‘Surface Water’ and ‘Fish and Fish Habitat’ sections provided above. | | | |
| Protocols for management of hazardous materials (<i>e.g.</i> , responsibilities, emission control, safe storage practices, refuelling protocols, spill containment; emergency response, regulatory compliance, accident/incident reporting) should be in place. | | | |
| Ensure spill response plan and clean up materials are available at the site when hazardous materials are being used. | | | |
| Immediately contain and clean up spills in accordance with provincial regulatory requirements. | | | |



| Environmental Mitigation Measure | Implementation Schedule/Date | Person/Title/ Firm Responsible | Compliance (Task Complete – Yes or No/Date) If No, provide reason |
|---|------------------------------|--------------------------------------|--|
| Report spills to Ontario Spills Action Centre at 1-800-268-6060 and DFO. | | | |
| Provide adequate safety barriers and signs to protect safety of workers. | | | |
| Reduce worker fall hazards near the excavation site. | | | |
| Maintain safe ingress and egress to work area. | | | |
| Make medical provisions prior to Project's start for prompt medical aid in the event of serious injury. | | | |

NOTES: _____

Completed by:

Name: _____

Title: _____

Firm: _____

Telephone No.: _____

Signature: _____

Date: _____

APPENDIX 4
ENVIRONMENTAL SITE ASSESSMENT SCREENING REPORT –
ADDENDUM TO MITIGATION MEASURES

Eastern Milksnake Mitigation Measures, Griffith Island Lighthouse Remediation

Milksnake Mitigation Measures, Griffith Lighthouse Remediation

Fisheries and Oceans Canada is proposing to undertake remediation of metals-impacted soils around Lighthouse No. 832 located on the eastern portion of Griffith Island, Georgian Bay, Ontario. The proposed project involves the excavation and removal of impacted soils in and around the lighthouse area and the lightkeepers house as well as the sloped area between the structures and the shore. Existing herbaceous vegetation such as shrubs and some regenerating trees will be cleared before excavation. The excavated soils disposed off-site. Clean fill will be backfilled into the excavation with topsoil and the areas will be re-vegetated and/or seeded with native vascular plant species.

On March 2011, an Environmental Assessment Screening Report (AMEC, 2011) of the proposed remediation project determined there was a moderate potential of Massasauga Rattlesnake (*Sistrurus catenatus*), an at-risk species listed at “Threatened” under Schedule 1 of the Canadian federal *Species-at-Risk Act*, of occurring and that prior to remediation a confirmatory survey was recommended to determine presence or absence.

On June 5th and 6th, 2012, a survey for the Massasauga Rattlesnake was undertaken during which one Eastern Milksnake (*Lampropeltis triangulum*), listed as “Special Concern” under Schedule 1 of SARA, was detected during a survey (CH2M Hill,2012). However, no Massasauga Rattlesnake was detected and it was determined that the potential for this species to occur at the site was very low.

This document serves as an addendum to the mitigation measures outlined in the Environmental Assessment Screening Report. Habitat for Milksnakes is not protected under SARA. However, Massasauga Rattlesnake habitat is protected given the “Threatened” status under SARA, which means that destruction of such habitat is prohibited. Thus in the unlikely event that a specimen of such species is detected within the remediation area, work shall cease and DFO should be notified of the occurrence. DFO should subsequently confer with Environment Canada on further proceedings.

Table 1: Milksnake Mitigation Measures, Griffith Island Lighthouse Remediation

| Activity | Milksnake Behaviour | Mitigation Measure |
|--|---|---|
| <i>Site Preparation</i> | | |
| Site clearing of vegetative growth and top layer of soils. This will involve the use of heavy machinery. | The following are general behaviour characteristics that should be taken to account when following these mitigation measures: | Due to present suitable habitat and present cool temperatures the initial “search and sweep” activity for snakes will likely be slow and methodical – each area should be searched carefully and thoroughly before clearing of vegetation. A trained biologist is recommended to be used for the initial clearing activity. |
| Entire site is suitable snake habitat (rural | | Thereafter, a trained environmental consultant should inspect the site every two/three days for a few hours per visit. The environmental consultant |

Eastern Milksnake Mitigation Measures, Griffith Island Lighthouse Remediation

| | | |
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| <p>area, herbaceous vegetation, proximity to water).</p> | <p>1. Milksnakes can be difficult to locate in herbaceous vegetation .</p> <p>2. Milksnakes when alarmed have a tendency to stand their ground when confronted and will vibrate their tail similar to a rattlesnake and strike at people when cornered. However, it is not venomous snake.</p> <p>3. Some Milksnakes can be quite unpredictable whereas others can be handled fairly easily – they vary in temperament. Refer to</p> | <p>should be familiarized with identification of snake species as well as with safe techniques in the capture and removal of snakes. He/she should also be familiar with the COSEWIC Status Report for the Milksnake (see References).</p> <p>There are many methods and items (including tools) that can be used to capture and transport snakes. As Milksnakes are not poisonous, EC recommends using leather gloves and plastic garbage cans. Michael Oldham (MNR Herptologist (705) 755-2160)) and Bob Johnson of the Toronto Zoo can also be consulted on techniques. As well the environmental consultant should use the methods/tools similar to those recommended on various websites which avoid harm to the snake or to themselves. See “tools you can use” in:</p> <p>http://www.kingsnake.com/snakegetters/class/handling-tips.html</p> <p>The following steps are recommended to be employed:</p> <p>1. A trained biologist familiar with snakes is recommended to be on-site for the duration of the vegetation clearing. Afterwards, it is recommended that the environmental consultant, who will be on-site for the duration of the project, should conduct snake monitoring and handling (if required).</p> <p>2. Snake handling should be conducted by the experienced biologist or trained environmental consultant who will undertake careful handling of snakes detected within the remediation area. Care will be used in capturing, transporting and releasing snakes to avoid harm to both the snakes and the personnel. For care and handling of snakes, Bob Johnson, Curator of Amphibians and Reptiles, Metro Toronto Zoo or another reptile expert ((416) 392-5968) can also be consulted.</p> <p>3. The link to the COSEWIC report is in the Reference section of this document for reference by on-site personnel, primarily the personnel who will be handling snakes.</p> |
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Eastern Milksnake Mitigation Measures, Griffith Island Lighthouse Remediation

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| <p>Behaviour section of COSEWIC (2002) for more information on this species' known behaviours.</p> | <p>4. Based on previous biological studies of this snake, a typical home range radius was represented by the mean movement of 254 metres suggesting that a home range of this species can potentially cover 20 hectares; this would mean that milksnakes may roam over the entire project site and could be found anywhere on site during the remediation project. Milksnakes have been reported to move up to 396 (nearly 400 m) over a period of several months.</p> <p>5. Milksnake is very secretive and does not bask in open areas but rather bask underneath objects that are being warmed by sunlight such as debris, logs, boards, etc.</p> <p>6. Snakes are cold-blooded and will be lethargic in cool temperatures such as early morning hours. This will create a tendency to be</p> | <p>4. For the entire duration of the remediation project, on-site monitoring for snake activity in the work area is recommended. Any snakes that are found within the work area should be removed and relocated off of the work site and into the surrounding vicinity. As well, each morning prior to work, the work areas are recommended to be inspected for any snakes that may have strayed into those areas overnight. These should be carefully captured and relocated to a safe area of suitable habitat in the vicinity (far enough away that the operation of heavy equipment will not pose a risk).</p> <p>5. During the clearing of vegetation, any debris (logs, rocks, etc.) encountered in the areas to be cleared will be examined for any snakes. Any debris and snakes that are discovered will be immediately removed off the work site and relocated to a safer area in the vicinity. During the duration of the remediation project, it is recommended that work areas be inspected each morning for snakes that may have entered the area or have hidden underneath parked equipment during the off-work areas.</p> <p>6. It is recommended to conduct the search for snakes in the early morning as it will be easier to capture immobile or lethargic snakes.</p> |
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Eastern Milksnake Mitigation Measures, Griffith Island Lighthouse Remediation

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| <p>Use of heavy machinery.</p> | <p>immobile thus compounding the difficulty of detection.</p> <p>7. As Milksnakes are active during evening hours (nocturnal) presumably hunting prey during the summer.</p> <p>8. It is expected that the use of heavy machinery will alarm and cause snakes to disperse from the site as it is being cleared.</p> <p>9. Snakes (other than Milksnake) may bask on gravel that is exposed to sunlight and thereby heated.</p> <p>10. Milksnakes tend to burrow – even open areas just cleared of vegetation may still have snake intrusions. This species can burrow down to 0.3 metres depth underground and it also tends to use small mammal burrows.</p> | <p>7. Any snakes found within the work area, should be relocated to safer areas in the vicinity and away from active heavy machinery .</p> <p>8. Heavy machinery should avoid transversing over un-cleared areas that are not within the scope of remediation. This is in case snakes are present in those areas.</p> <p>9. For the entire duration of the remediation project, the work area should be monitored for the presence of snakes and any snakes found should be removed from the work area. These will be relocated to safer areas in the vicinity and away from active heavy machinery.</p> <p>10. Silt fences should be installed around the perimeter of the excavated area(s). These would form a barrier against snake intrusions. See below for recommended characteristics of silt fences.</p> |
| <p><i>Remedial Activities</i></p> | | |
| <p>Movement of snakes back into the work area during the evenings.</p> | <p>Milksnakes will likely not bask in open (cleared) areas. However other snake species may.</p> | <p>Before work is to occur during early morning, it is recommended that the work site be inspected for any snakes. Any detected individuals should then be removed from the work site (including from within the excavation) just prior to commencement of work. While it is still cool, it will be easy to capture and relocate snakes. Also, as areas of work have been cleared, it</p> |

Eastern Milksnake Mitigation Measures, Griffith Island Lighthouse Remediation

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| <p>If excavation of contaminated soils involve:</p> <ol style="list-style-type: none"> 1. Excavated soils being stockpiled near the immediate area. 2. Clean fill being stockpiled near the work area. | <p>Clumpy loose soils/substrate that has just been excavated are ideal medium for burrowing. There may be a potential that snakes may enter the stockpiled material while hunting.</p> | <p>will be easy to detect snakes that may occur within the cleared areas.</p> <p>Equipment or machinery should avoid travelling through areas of that have not been cleared to avoid risk to any snakes that may be present in the vegetation (although it is expected that the snakes will avoid the general area due to the noise and vibration from the heavy machinery).</p> <p>Remediation operations are scheduled to occur during the warm, summer period (August 1 – September 15) during which snakes are relatively active and can move away quickly from the area of activity or, if required, they can be easily detected as they move thereby aiding their capture and safe removal.</p> <p>The following is EC's comment regarding the use of silt fencing as a snake barrier during a previous similar project that also involved Milksnakes:</p> <p><i>EC has information showing silt fencing will not be entirely effective for milksnakes because they are very good climbers (of trees, barn walls, etc. It is expected that silt fences will be a deterrent, so we do encourage their use around the perimeter of the work site, but want to advise that they will not be entirely effective in containing milksnakes.</i></p> <p><i>Do not use the heavy duty silt fencing which has mono-filament mesh (resembles a fish net) attached to the back of the silt fencing to strengthen it. If proponent decides to use silt fencing, EC recommends the use of regular silt fencing buried about 15 cm into the ground or if, they cannot bury the fence they can place soil on the bottom of the fence to a depth of 10-15 cm, will make for an affective short term solution to keep, non-climbing snakes away, however, this will not necessarily be effective for climbing snakes such as the milksnake. They will not be stopped by silt fencing. For further information see advisory at the following link (http://www.massasauga.ca/pub_docs/Advisory_silt_fence.pdf)</i></p> <p>In the event that excavated soils or clean fill will be stockpiled on the work site, steps should be undertaken to discourage the use of such piles by</p> |
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Eastern Milksnake Mitigation Measures, Griffith Island Lighthouse Remediation

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| | | <p>snakes.</p> <p>In light of the EC's comment that Milksnakes will not be deterred by silt fencing, the following steps is recommended to be employed:</p> <ol style="list-style-type: none"> 1. Below each stockpile, a liner will be deployed. 2. Once the stockpile is deposited on the liner, a tarp will cover the entire stockpile and the edges will be sealed with sandbags around the perimeter of the stockpile. (The liner and tarp is required anyway to prevent runoff). 3. During each morning, just before commencement of work, the edges of the stockpiles should be inspected for any snakes which shall be subsequently removed and relocated outside the work area. 4. A silt fence may be installed along the entire perimeter of the excavation. 5. Silt fencing at least 1 metre in height should be installed around the stockpiles. If snakes seem to be gaining access to the piles, a biologist should inspect the piles and remove any intruding snake(s). 6. The fences shall be installed such that there are no folds and that the surfaces are as smooth as possible to negate any traction; also the fences will be angled outwards to produce an overhang. 7. These barriers will be inspected daily for any snake intrusions. 8. Silt fencing will be buried to a depth of 10-15 cm. |
| <i>Backfilling and Grading</i> | | |
| Use of stockpiled clean fill on-site. | See "Remedial Activities". | See "Remedial Activities" |
| <i>Post-Remediation</i> | | |
| Reseeding | Habitat to be re-established via reseeded native plants. | <i>Optional:</i> place natural objects for basking such as logs, etc. Otherwise, no further action is required in addition to the reseeded. Natural regeneration after remediation activity should produce similar conditions as those in pre-remediation period. |

Eastern Milksnake Mitigation Measures, Griffith Island Lighthouse Remediation

References:

COSEWIC Status Report - Milksnake (COSEWIC 2002): (http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=222) for further information on the Milksnake.

Griffith Island Lighthouse Soil Remediation, Environmental Assessment Screening Report, AMEC Earth & Environmental, March 2011.

Massassauga Rattlesnake Survey, Griffith Island Lighthouse, Georgian Bay, Ontario, CH2M Hill, June 2012.

Canadian Wildlife Service, Environment Canada, personal communication, 2010.