

Minor Remediation Projects

Replacement Class Screening Report



***Fisheries & Oceans Canada
Newfoundland & Labrador
Region***

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Please address your comments regarding this report to:

Paula Pretty
Environmental Assessment Officer, NL
Public Works and Government Services Canada
P.O. Box 4600, 10 Barter's Hill
St. John's, NL, A1C 5T2
Telephone: (709) 772-8169, Fax: (709) 772-0916
Email: paula.pretty@pwgsc-tpsgc.gc.ca

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Acronyms

BMP – Best Management Practices

CCG – Canadian Coast Guard

CCME – Canadian Council of Ministers of the Environment

the Act – *Canadian Environmental Assessment Act*

COSEWIC – Committee on the Status of Endangered Wildlife in Canada

DFO – Fisheries & Oceans Canada – Newfoundland and Labrador Region

EC – Environment Canada

ESA - Environmental Site Assessment

FA – Federal Authority

PWGSC – Public Works and Government Services Canada

RA – Responsible Authority

RCSR – Replacement Class Screening Report

SARA – *Species at Risk Act*

SCH – Small Craft Harbours

the Agency – *Canadian Environmental Assessment Agency*

the Registry – *Canadian Environmental Assessment Registry*

VEC – Valued Ecosystem Component

1. Introduction

Fisheries and Oceans Canada (DFO) has one of the largest inventories of properties in the federal government. These sites generally include harbours administered by Small Craft Harbours (SCH), and light stations and fixed navigational aids under the responsibility of the Canadian Coast Guard (CCG). DFO in the Newfoundland and Labrador (NL) Region is responsible for the management of over 800 potentially contaminated sites. Operational and maintenance activities involving the historic use of lead-based paints, the use and disposal of batteries, disposal and burning of waste, the use of mercury baths as part of the light rotation systems and the use of petroleum storage tanks at these sites may have contributed to the contamination of these sites.

DFO, as the property custodian, has begun remediation of priority sites based on risks to human health and the environment. At the present time, regardless of the size and scope of the remediation project, each proposed remediation project must undergo an individual screening level environmental assessment under the *Canadian Environmental Assessment Act* (the Act).

Each year approximately 10-15 individual screening reports are conducted for the remediation of contaminated soil at DFO properties in the Newfoundland and Labrador Region. To date, the environmental assessments (EAs) have identified similar mitigation measures for all projects. These mitigation measures have been incorporated into this replacement class screening report (RCSR) for the purpose of achieving a more streamlined and effective means of environmental assessment that supports sustainable development.

These Minor Remediation Projects are a great candidate for a RCSR as they are small, well-defined projects that when carried out have well-known environmental effects that can be mitigated. Projects of this type, which have routinely been assessed by a screening, have been found unlikely to cause significant adverse environmental effects.

RCSR captures projects that demonstrate proven design standards, best management practices, and effective mitigation that are supported by regulations and industry. The development of a RCSR to include all of these projects is considered to be an efficient planning process that will greatly reduce time and resources associated with conducting individual environmental screenings for each site.

1.1 Class Screening and the Canadian Environmental Assessment Act

The *Canadian Environmental Assessment Act* (the Act) and its regulations set out the legislative basis for federal environmental assessments. The legislation ensures that the environmental effects of projects involving the federal government are carefully considered early in project planning. The Act applies to projects which require a federal authority (FA) to make a decision or take an action, whether as a proponent, land administrator, source of funding or regulator (issuance of a permit or license). The FA then becomes a responsible authority (RA) and is required to ensure that an environmental assessment of the project is carried out prior to making its decision or taking action.

Most projects are assessed under a screening type of assessment. A screening systematically documents the anticipated environmental effects of a proposed project, and determines the need to modify the project plan or recommend further mitigation to eliminate adverse environmental effects or minimize the significance of these effects.

The screening of some repetitive projects may be streamlined through the use of a class screening report. This kind of report presents the accumulated knowledge of the environmental effects of a given type of project and identifies measures that are known to reduce or eliminate any significant adverse environmental effects. The Agency may declare such a report appropriate for use as a class screening after taking into account comments received during a period of public consultation.

A replacement class screening consists of a single report that defines the class of projects and describes the associated environmental effects, design standards and mitigation measures for projects assessed within the report. It includes a determination regarding significance of environmental effects for all projects assessed by the replacement class screening. Once the Agency declares an RCSR and where an RA is satisfied that a project falls within the class described in the RCSR, no further action is required under sections 18 or 20 of the Act with respect to the project, as long as the RA ensures that design standards and mitigation measures described in the RCSR are implemented.

1.2 Rationale for Replacement Class Screening

The applicability of the RCSR to minor remediation projects is based on the following six criteria:

1. *Well-defined Class of Projects:* Contamination of DFO sites, due to historical practices, is familiar and well-defined. Phased Environmental Site Assessments (ESAs) have identified the likely source, nature and extent of contaminants at these sites. Typical volumes of contaminated soil for these sites range from 1 m³ to 500 m³. The proposed remediation activities and methods would be consistent among sites, as would the time period associated with remediation. All remediation work would occur before the freezing months and would consist of either capping the contaminated soil or excavating the soil and transporting it to a provincially approved soil disposal or treatment facility, backfilling the excavated area with clean fill and re-vegetating the impacted area. In the NL Region, approximately 10-15 screening level assessments are conducted annually for DFO remediation projects.
2. *Well-Understood Environmental Setting:* DFO has been custodian of the affected properties for many years. To this end, Phase I, II and III Environmental Site Assessments (ESAs) have been conducted for each proposed remediation site; therefore, the nature and extent of the contamination is well delineated, and the environmental setting well known. The environmental setting of these impacted sites are similar amongst previous projects, therefore there is a common set of valued ecosystem components and a common understanding of project – environment interactions.

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3. *Unlikely to Cause Significant Adverse Environmental Effects, Taking into Account Mitigation Measures:* The potential environmental effects associated with minor remediation are familiar and predictable and can be mitigated through standard and proven methods. DFO's previously conducted screenings on small-scale remediation projects concluded that the projects were unlikely to result in significant adverse environmental effects with the implementation of prescribed mitigation measures. Recent remediation work has resulted in no significant adverse environmental effects identified during the remediation phase or post-remediation phase.
 4. *No Project-specific Follow-up Program Required:* The Act defines "follow-up program" as: a program for
 - (a) verifying the accuracy of the environmental assessment of a project, and
 - (b) determining the effectiveness of any measures taken to mitigate the adverse environmental effects of the project.

In the case of previous minor remediation projects, a follow-up program as defined under the Act was not required, and will not be required as part of this RCSR. Previous project monitoring conducted by DFO has provided knowledge that has contributed to the current design criteria and remediation methods. DFO will conduct quality assurance/quality control (QA/QC) checks to ensure mitigation measures are correctly implemented. Also, soil samples will be extracted post-project to determine if the remediation was effective and a walk-around completed to ensure proper re-vegetation/site restoration.

5. *Effective and Efficient Planning and Decision-making Process:* Remediation of contaminated soil is predictable and methodical. Projects are identified using the Canadian Council of the Ministers of the Environment (CCME) Phased ESA process (CCME, 1997) and prioritized for remediation based on human health and ecological risks. Past experience has shown that planning and decision-making processes for projects covered by this class are effective and efficient.
6. *Public Concerns Unlikely:* Negative public comments regarding remediation activities on DFO properties have not been encountered in the past. Soil remediation projects enhance public safety and environmental quality. The public is unlikely to dispute minor remediation projects because they are beneficial to the environment and their implementation produces minimal environmental impacts that are easily mitigated.

1.3 Consultation

The process for developing this RCSR included consultation within DFO's Real Property (RP) Branch, Small Craft Harbours, Habitat Management Division and with Environment Canada (EC), Public Works and Government Services Canada (PWGSC), the Canadian Environmental Assessment Agency (the Agency). Consultation has also taken place with the Newfoundland and Labrador Department of Environment and Conservation. A draft of the RCSR was reviewed and comments were incorporated before submission of the final draft to the Agency. Following its submission, the Agency will conduct a 30-day public consultation on the RCSR. All comments received will be taken into consideration and incorporated into the RCSR, as appropriate, before its declaration by the Agency.

Internal consultation with DFO – Real Property (RP) was completed to ensure the validity of project activity descriptions. The practicality of mitigation was also reviewed to provide the highest potential for successful implementation.

1.3.1 Aboriginal Consultation

In the context of the Crown's legal duty to consult with Aboriginal groups, where it contemplates conduct that might adversely impact any potential or established Aboriginal and Treaty rights:

The RA confirms that a preliminary assessment has been undertaken to determine if a legal duty to consult arises in respect of the declaration of the report as a class screening report. The RA also confirms that based on its assessment, it is of the view that the declaration of this class of project does not give rise to a duty to consult.

The RA undertakes to ensure that, as appropriate, an analysis consistent with the approach proposed in the Government of Canada's Updated Guidelines for Federal Officials to Fulfill the Duty to Consult (March 2011) is carried out when a project is assigned to the class within the proposed RCSR to determine if, in the particular circumstance, the Crown conduct related to that project gives rise to the legal duty to consult.

1.4 Canadian Environmental Assessment Registry

The purpose of the Canadian Environmental Assessment Registry (the Registry) is to facilitate public access to records relating to environmental assessments and to provide notice in a timely manner. The Registry consists of two components – an Internet site and a project file.

The Registry project file must include a copy of the RCSR. The RA maintains the file, ensures convenient public access, and responds to information requests in a timely manner.

The Registry Internet site is administered by the Agency. The RA and the Agency are required to post specific records to the Internet site in relation to the RCSR.

Upon declaration of the RCSR, the Act requires RAs to post on the Internet site of the Registry, at least every three months, statements of projects for which an RCSR was used. Each statement should be in the form of a list of projects, and should include:

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- the title of each project for which the RCSR was used;
 - the location of each project;
 - RA contact information (name, phone number, address, email); and
 - the date when it was determined that the project falls within the class of projects covered by the report.

Note: The schedule for posting statements is:

- no later than July 15 (for projects assessed from April 1 to June 30)
- no later than October 15 (for projects assessed from July 1 to September 30)
- no later than January 15 (for projects assessed from October 1 to December 31)
- no later than April 15 (for projects assessed from January 1 to March 31).

Further sources of information regarding the Registry can be found in the “*Guide to the Canadian Environmental Assessment Registry*”, prepared by the Agency (CEAA, 2005) (<http://www.ceaa.gc.ca/default.asp?lang=En&n=52400497-1&toc=hide>).

2. Projects Subject to Class Screening

2.1 Projects Subject to the Act

Soil remediation activities are projects under the Act. The definition of a “project” in the Act includes activities that appear on the *Inclusion List Regulations*. Section 41.1 of the Inclusion List Regulations lists “the remediation of contaminated land in Canada”; therefore, except under emergency conditions, all remediation projects, including those in the class discussed in this report must undergo an EA prior to decision-making or further action.

Section 7 of the Act states that projects will be excluded if: (a) the project is described in the *Exclusion List Regulations*; (b) the project is to be carried out in response to a national emergency for which special temporary measures are being taken under the *Emergencies Act*; or (c) the project is to be carried out in response to an emergency and carrying out the project forthwith is in the interest of preventing damage to property or the environment or is in the interest of public health or safety. It is possible that a remediation project may be initiated quickly under the auspices of Paragraph 7(c).

As DFO is the project proponent and triggers the Act as an RA, the completion of an EA is necessary before it can exercise any duty, power or function in relation to a project, as defined by paragraph 5(1)(a) of the Act.

2.2 Projects Subject to the RCSR

The project class for this RCSR involves the remediation of soil under 500m³ volume and involves two methods of remediation of contaminated soils: capping of small areas of contamination, and extraction and backfilling of areas of contamination. Projects which include the extraction of contaminated soil for treatment and or disposal will adhere to all applicable provincial and federal regulatory requirements. Projects subject to the RCSR are those undertaken on DFO property within the Province of Newfoundland and Labrador.

Characteristics of Capping projects subject to the RCSR:

- occur on previously developed land;
- quantity of impacted soil to be capped is limited to a maximum of 500 cubic metres;
- contaminants are non-leachable;
- contamination not by petroleum hydrocarbons;
- contamination is in stable soil*;
- water table unaffected;
- all work will be carried out at a distance of more than 2 metres from a water body;
- on higher ground where ground water will not penetrate;
- site is more than 20 metres from habitat containing a Species at Risk, see section 2.3 for details.

* Soil which is resistant to change of position or condition; not easily moved or disturbed.

Characteristics of Excavation and Backfill projects subject to the RCSR:

- occur on previously developed land;
- quantity of impacted soil to be removed is limited to a maximum of 500 cubic metres;
- contamination accessible without damaging structures;
- all work will be carried out at a distance of more than 2 metres from a water body;
- site is more than 20 metres from habitat containing a Species at Risk, see section 2.3 for details.

2.3 Projects Not Subject to the Replacement Class Screening Report

Minor remediation projects that include any of the following are not subject to the RCSR:

- Excavation of more than 500 cubic metres of soil;
- Contaminants in soil include PCBs*;
- Complex, new or alternative remediation methods planned or required;
- Involves the likely release of a polluting substance into a waterbody;
- Work would involve activities closer than 2 m from a water body or involve activities on unstable ground or slopes;
- Contamination extends off-site (outside the property lines of the facility);
- Site located in a National Park or adjacent in the “greater park ecosystem”, or in or adjacent to a National Wildlife Area or Migratory Bird Sanctuary or nearby nesting colonies;
- Project requires a provincial environmental assessment;
- Project requires another permit, approval or authorization from another federal department;
- Project is located on First Nations land;
- Project requires follow-up monitoring;
- Presence of a species at risk, as noted by SARA, COSEWIC or provincial or territorial authorities;
- In the context of the Crown’s legal duty to consult with Aboriginal groups, where it contemplates conduct that might adversely impact any potential or established Aboriginal and Treaty rights: those projects for which issues raised during Aboriginal consultation remain to be adequately addressed or are addressed in such a way that the project no longer fits in the class as defined in the RCSR.

* PCB contaminated soil refers to soil exceeding the latest version of the Canadian Council of Ministers of the Environment, Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health.

Projects are not suitable for application of the RCSR if they are likely to have an adverse effect on a species at risk, either directly or indirectly, such as by adversely affecting their habitat*, and/or that would require a permit under the *Species at Risk Act* (SARA). For the purposes of this RCSR, species at risk include:

- Species identified on the List of Wildlife Species at Risk set out in Schedule 1 of SARA, and including the critical habitat or the residences of individuals of that species, as those terms are defined in subsection 2(1) of SARA;
- Species that have been recognized as "at risk" by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) or by provincial or territorial authorities.

* if, after reviewing the project description using the class screening report, it becomes known or reasonably suspected that species at risk could be adversely affected by the proposed project, do not use the replacement class screening report. The project requires an individual environmental assessment under the Act. Note, the contents of the replacement class screening report may be used in the preparation of the individual screening report to the extent appropriate.

The RA must review the proposed project description using the RCSR to ensure that there will be no adverse impacts on a listed wildlife species or its critical habitat. If appropriate information is not available, the RA must consult with appropriate resource personnel including SARA-competent ministers such as DFO Habitat Management Program (HMP) for aquatic species and EC for terrestrial species, who will search on the Atlantic Canada Conservation Data Centre (ACCDC) database to ascertain if it is known or reasonably suspected that species at risk could be adversely affected by the proposed project. If so, the RA must not proceed with using the RCSR.

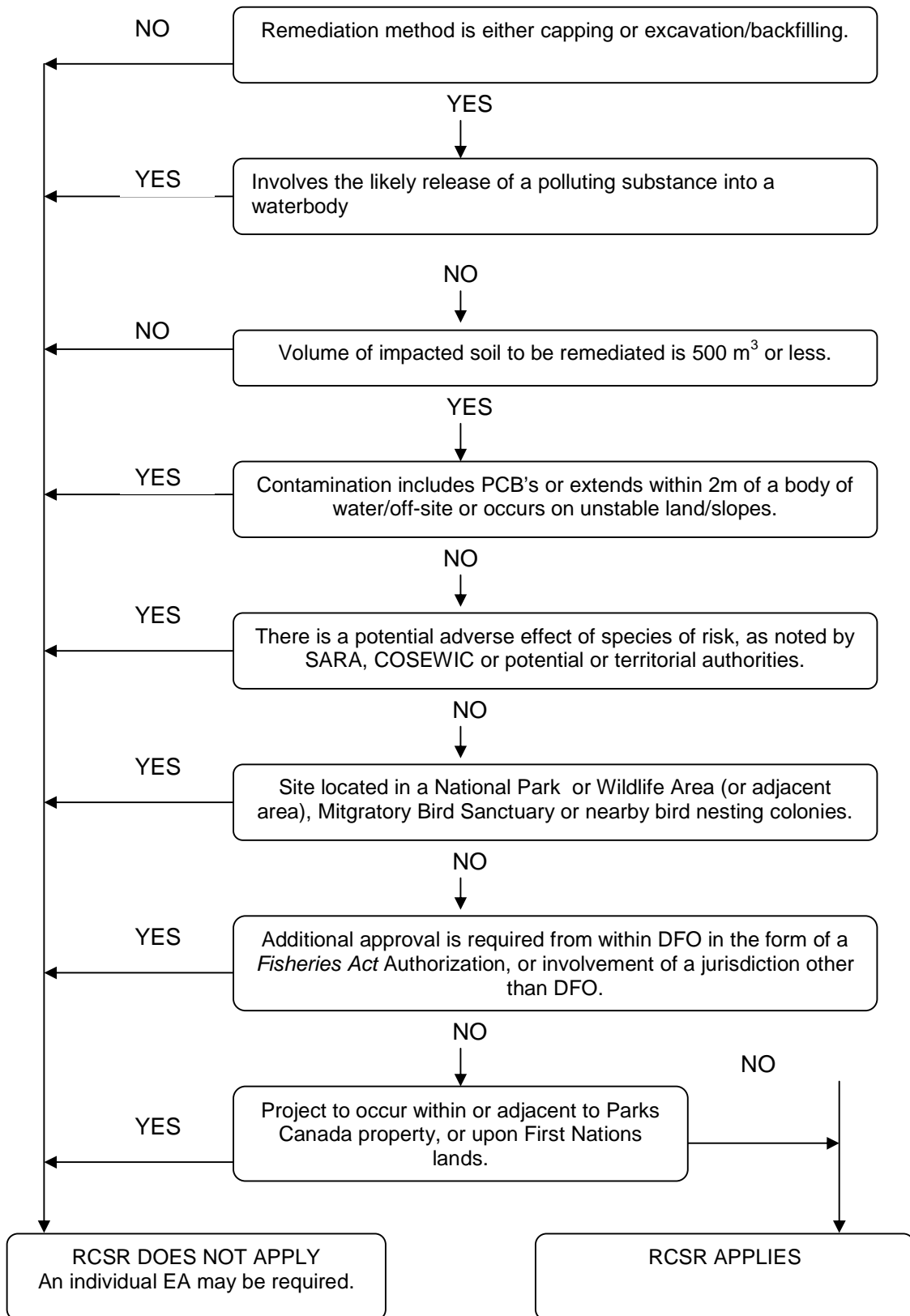
The RA must also consult with EC personnel with regard to projects located in or adjacent to National Wildlife Areas or Migratory Bird Sanctuaries. Projects located in these areas are not subject to the RCSR, as detailed above. Similarly, the RA must consult with EC personnel with regard to the location and seasonality of any nearby bird nesting colonies.

The RA must consult with personnel at DFO HMP if the project may potentially impact on fish or fish habitat. It is also important to note that watercourse crossings are not covered by this RCSR. Any watercourse crossings must be approved by Transport Canada, DFO HMP and the province beforehand.

This RCSR does not apply to projects where the proposed project activities are located on First Nations land.

Figure 1 (below) provides a flow chart that describes RCSR inclusion/exclusion for minor remediation projects.

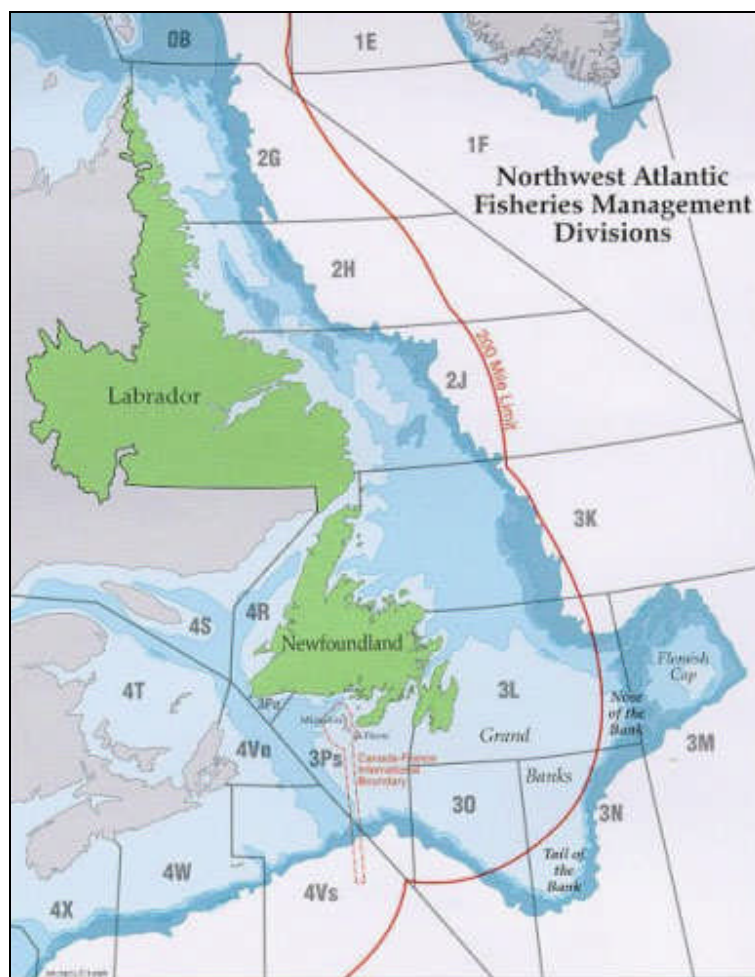
Figure 1: Minor Remediation Projects RCSR Decision Flow Chart



3. Project Class Description

The Project Class is characterized by a large geographic boundary as it includes all DFO owned properties within Newfoundland and Labrador. The minor remediation projects are typically located at SCH and RP properties, although some may be located at fixed navigation aids sites (minor shore lights or light stations), at currently vacant properties or other DFO properties. The majority of facilities are located in sheltered harbours or on headlands and islands (light stations and smaller fixed navigation aids). Remediation activities will occur on land in a generally disturbed terrestrial environment, often within 30 metres of a body of water.

Figure 2 shows the geographic area under consideration. Project sites will be throughout the green shaded areas.



<http://www.dfo-mpo.gc.ca>

Figure 2: RCSR study area, which includes all DFO properties located in the Newfoundland and Labrador Region.

Within the project class, the project scope is quite narrow, essentially confined to the area of impact at the upland service area of a harbour or the disturbed/developed area around a light station, fixed aid property or other DFO property. The minor remediation activities will be conducted directly on site by means of well-understood methodologies and professional design that is compliant with the latest federal environmental regulations and industry standard remediation practices. Contingency plans will be in place as required, which will include mitigation measures in the event of accidental spills, leaks or other accidents that could result in hazards to public health or the environment.

3.1 Remediation

Remediating or “cleaning up” and addressing the risks associated with contamination on federal land is realized through a series of progressive and logical steps developed by the Contaminated Sites Management Working Group of the Government of Canada. This 10-step process, which includes identifying suspect sites, detailed testing, classifying the sites, setting priorities for future work, reducing human health and ecological risks and long-term monitoring is detailed in the guidance document entitled “*A Federal Approach to Contaminated Sites*” (Contaminated Sites Management Working Group, 1999). These steps guide the analysis of a site, develop a plan of action and then ensure that the objectives have been met. The steps are:

Step 1 - Identify Suspect Sites: Identifies potentially contaminated sites based on activities (past or current) at or near the site.

Step 2 - Historical Review: Assembles and reviews all historical information pertaining to the site.

Step 3 – Initial Testing Program: Provides a preliminary characterization of contamination and site conditions.

Step 4 - Classify Contaminated Site Using the CCME National Classification System: Prioritizes the site for future investigations and/or remediation/risk management actions.

Step 5 - Detailed Testing Program: Focuses on specific areas of concern identified in Step 3 and provides further in-depth investigations and analysis.

Step 6 - Reclassify the Site Using the CCME National Classification System: Updates the ranking based on the results of the detailed investigations.

Step 7 - Develop Remediation/Risk Management Strategy: Develops a site-specific plan to address contamination issues.

Step 8 - Implement Remediation/Risk Management Strategy: Implements the site-specific remediation/risk management plan that addresses contamination issues.

Step 9 - Confirmatory Sampling and Final Reporting: Verifies and documents the success of the remediation/risk management strategy.

Step 10 - Long-Term Monitoring: If required, ensures remediation and long-term risk management goals are achieved.

This RCSR deals with Steps 8, 9 and 10 of the above process and are discussed in more detail below.

Step 8: The remediation process

Site remediation is intended to return a contaminated site to a state in which there is reduced risk to humans or the environment. Often the final state is “brownfield” where the site is not ecologically pristine, but is safe for redevelopment. The CCME has set remediation guidelines at several levels depending on the planned future land use.

Remediation is intended to eliminate or sequester contaminants so that there is reduced risk to human or ecological health. Remediation designs under consideration in this RCSR include capping an area with an impermeable layer such as clay, fabric, or pavement so that impacted soils are no longer accessible or exposed; or excavation and backfilling with clean material, with the contaminated soils placed in a safe storage location or treated to reduce contaminant levels. For each proposed project, site-specific remediation action plans (RAPs) have been developed by environmental professionals, which take into account the nature of the contaminants, the local environment and ecological risk.

The physical operations associated with site remediation are common practice engineering and construction activities, including but not limited to, digging and dumping, installing geotextile, paving or recontouring land.

3.1.2. Minor Remediation

Minor remediation is a convenient term for projects that follow the above strategy for sites with smaller areas of contamination and smaller volumes of impacted soil to be addressed. For the purposes of this RCSR, soil capping, and soil excavation and back filling with clean fill are considered, where the volume of contaminated soil is less than 500 cubic metres.

Soil Capping:

Soil capping is a method of sequestering non-mobile contaminants. It is used to prevent rain and runoff from percolating through contaminants and mobilizing them into surrounding soils or groundwater. Capping is also an effective risk management strategy as it limits exposure to the contaminants, reducing human and ecological health risks. Caps can be clay, geotextile, concrete, pavement or a combination of these. Caps are meant to be permanent and must remain undisturbed or protected from disruption. Caps can be covered with topsoil and re-vegetated with shallow rooting plants that will not penetrate the cap.

Soil Excavation:

Soil excavation is the removal of contaminated soil from the ground with an excavator or by another suitable method. The soil may be transferred directly into a truck for transport, or stored onsite covered on a liner for further delineation or testing. Trucks that are sealed and covered to prevent contaminated material from leaking or blowing onto the transport route and surrounding area are used to transport the soil. Contaminated materials are transported to provincially approved landfill disposal sites or to provincially approved treatment facilities. Backfilling is the importation of clean fill to the site, again usually by truck, and infilling and tamping the excavated area to bring it back to grade. The backfill is re-vegetated with local vegetation or repaved depending on the context of the site.

The minor remediation project work will be done directly onsite using suitable machinery and, for remediation projects involving excavation and offsite disposal or treatment, the contaminated soil will be transported off site to a provincially approved landfill site or treatment facility. Clean back fill or capping material will then be transported to the site, and confirmatory soil sampling undertaken to complete the remediation work. The actual work site and adjacent area will be where the capping or excavation, soil testing, and backfilling activities will occur.

Typical projects involve the remediation of petroleum hydrocarbon contaminated soil around petroleum storage tanks at many DFO sites. This contamination is usually the result of improper tank use, spills during tank fill-up, or the improper disposal of fuel, lubricants or waste oil. Soil samples collected from these areas have typically identified that only surficial soils are affected (i.e. less than 0.5 metres) with a minimal aerial extent (usually limited to the immediate vicinity around the storage tanks). Other examples of potential remediation projects that would be included in this RCSR are burn pits (poly aromatic hydrocarbons (PAHs), metals, and petroleum hydrocarbon impacts) and small metal-impacted soil areas. Contaminated soil that will be remediated under this RCSR include those impacted with petroleum hydrocarbons, metals and polycyclic aromatic hydrocarbons (PAHs).

Step 9: Confirmatory Sampling and Final Reporting

After site remediation, it is desirable to confirm that the remediation was successful and also to document the state of the site to provide a baseline in case of future impacts. Upon completion of excavations, confirmatory sampling will be conducted to verify removal of all impacted soil. The imported backfill may also be sampled to ensure its acceptability. Where deemed necessary, monitoring wells may be installed to check for mobilization of contaminants from capped sites or from neighbouring sites. The data from these samplings will be documented and the resulting reports held in the project file for reference or further action.

Step 10 - Long-Term Monitoring

After site remediation a monitoring program can confirm the integrity and stability of a cap or filled area. DFO will monitor remediated sites within its routine property inspection and maintenance program. Disruptions or subsidence will be repaired if and when detected. In circumstances where capping is used as a remedial option, DFO would monitor the site as appropriate.

3.2 Seasonal Scheduling and Duration of Projects

Excavation, soil testing, backfilling, and re-vegetation may occur during any season with the exception of winter freeze-up. The preferred time of year for the work is April to November. A minor remediation project usually takes from one day to one week to complete.

4. Environmental Review

DFO routinely undertakes remediation projects involving soil capping or excavation. Individual screening level EAs previously completed for these types of projects have developed standard remediation methods and mitigation. If a Phased ESA or RAP recommends more complex or innovative remedial methods for a site, then an individual EA will be conducted.

Environmental review methods used in the creation of this report include desktop literature review, internal consultation, and discussion with site remediation experts at PWGSC and DFO.

4.1 Environmental Assessment Boundaries

The environmental assessment boundaries for the RCSR have been defined by the terrestrial boundaries of Newfoundland and Labrador. Smaller boundaries have been defined for the assessment scope to identify project-specific environmental effects. The project spatial boundaries, essentially the actively used areas of the harbour, light station, fixed aid properties, or other DFO properties will be used as a basis for the assessment. A radius of 200m around project areas has been found effective in capturing potential environmental effects resulting from project activities.

The temporal boundaries of the RCSR include the full life cycle of the project, including remediation and monitoring. Minor remediation projects usually require from one day to one week for completion.

4.2 Environmental Setting

Contamination can occur at any DFO property, but most commonly occur at Small Craft Harbours, or at sites of fixed navigation aids, such as light stations. Other DFO properties where contamination can occur include but are not limited to Coast Guard Stations, warehouses, offices, and bait depots.

DFO properties may be located in sheltered harbours, or exposed headlands and islands occurring on land in disturbed terrestrial environments, often within 30 metres of a water body. Typical environmental settings within project boundaries may include any that are found across Newfoundland and Labrador. Typical substrates may include bedrock, cobblestone, sand, soil or peat, with varying degrees of vegetation.

As there are no specific environmental criteria that determine the location of harbours, light stations, or fixed aids, a general description of the environmental settings in which these facilities are constructed is provided below. In addition, a general description of the ecozones found within the Newfoundland and Labrador region is included.

4.2.1 Fisheries and Oceans Canada Property

Small Craft Harbours

The primary purpose of a Small Craft Harbour is to provide refuge for smaller marine vessels and the infrastructure to support the commercial fishing and aquaculture industries. SCH is a branch of DFO that is responsible for the management of a national system of harbours that accommodates primarily commercial fishing vessels. Within Newfoundland and Labrador there are 372 commercial fishing harbours and 1 recreational harbour. The harbours also serve a wide range of other interests including aquaculture operators, commercial tour operators and private and public ferry services. Typically a harbour consists of marine infrastructure such as wharves, breakwaters and launching facilities as well as terrestrial (upland) portions that often contain such facilities as service and parking areas, fuel systems, waste containment systems, and various types of buildings. SCH harbours may have been created by artificial breakwaters, be in the sheltered part of an inlet, or have been carved out of a sandy-silt area by dredging. A typical small craft harbour is pictured below.



Figure 3: Small Craft Harbour, Cape St. George (Rouzes Brook), NL

The majority of SCH's in Newfoundland and Labrador are developed, operational harbours with varying degrees of utilization over many years. Environmental Site Assessments have been completed for most SCH sites and have revealed some typical environmental site conditions that are consistent with the land use for these types of properties. In the upland areas, soils located near fuel storage tanks and waste oil storage tanks may be impacted with hydrocarbons due to previous spills and leaks. Heavy metals may be found in dredged harbour sediments, which are sometimes used onsite for the construction of service and parking areas. Lead-based paints are found on the building materials of older structures at these sites. Creosote timbers have also been used as a building material in the past for various marine structures such as wharves, breakwaters and slipways.

Fixed Navigation Aids

The primary purpose of fixed aids to navigation is to “facilitate the safe and expeditious movement of marine traffic” (CCG, 2006). The locations selected for navigation aid placement, headlands or islands, reflect this purpose. Smaller fixed aids can be found at very small sites to mark obstructions or to guide navigators into a harbour or bay.

The Terrestrial fixed aids, apart from light stations, include fog horns, Loran-C or other configurations and are built to be highly visible to vessels. There are 64 fog horns throughout Newfoundland and Labrador Region. There are 3 Long Range Aids to Navigation (Loran-C) located at Cape Race and Comfort Cove on the Island, and one at Fox Harbour in Labrador. These fixed aids are built on specific properties of varying sizes owned by DFO. Some properties are no longer in use and are vacant. Terrestrial sites tend to be ecologically similar to light station sites. Many sites are used for local navigation and are situated in more sheltered locations within bays. The sites may be surrounded by forest, wetland, dunes, grassland or developed lands. A typical fixed aid is pictured below.

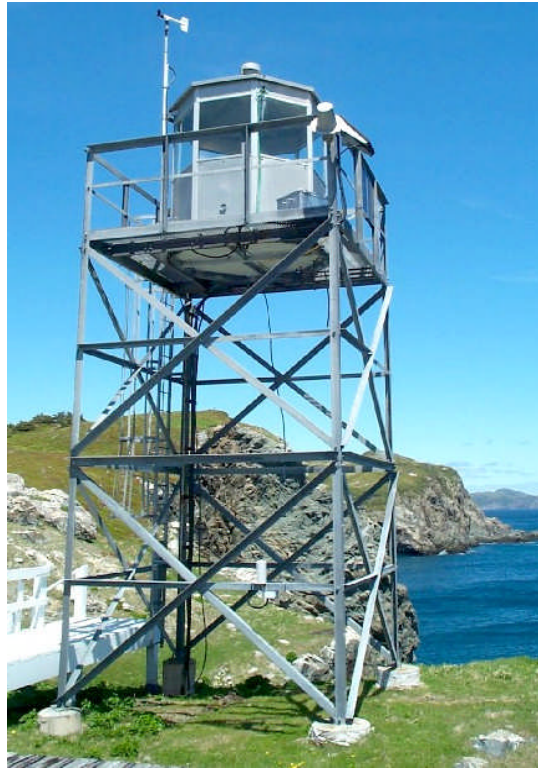


Figure 4: Fixed Navigational Aid

Typical environmental site conditions at fixed navigational aid stations include lead-acid and hydrocarbon impacted soil from onsite disposal of battery waste and fuel storage.

Light Stations

The Canadian Coast Guard within the Newfoundland and Labrador region currently operates 55 light stations (23 staffed and 32 unstaffed). Light stations tend to be built on promontories or on islands at the extent of safe navigation along a waterway. The intention is to maximize visibility and audibility to passing shipping. Many light stations are remote and difficult to access. Many are built on bedrock while others are on overburden set back from the wave zone. The local ecology tends to be exposed rock or grass or stunted trees in an area of high wind exposure. A typical light station is pictured below.



Figure 5: Light Station, Fortune, NL

Most light station properties in the region have had at least a Phase 1 Environmental Site Assessments conducted. Results have shown that lead-based paints were extensively used on structures at these sites. Hydrocarbon and metal impacted soils associated with fuel storage tanks are also typical. Due to the remote location of some of the light stations, typically there was an area designated for garbage disposal and refuse burning, which resulted in impacted soils.

4.2.2. Ecozones

All of the sites under consideration are located within both the Eastern Taiga Shield and the Boreal Shield ecozones of Canada (Environment Canada 2005), which include both Newfoundland and Labrador.

The Eastern Taiga Shield ecozone covers central Quebec and the majority of Labrador. This ecozone is comprised of two large biophysical features, the Taiga Forest and the Canadian Shield. Numerous lakes and wetlands formed by glacially-carved depressions span the landscape as well as an abundance of long, winding eskers, characteristic of the Eastern Taiga Forest. The barren grounds of Precambrian bedrock outcrops and waterlogged lowlands covered with peatlands are habitat for approximately fifty species of mammals including caribou, moose, fox and beavers. The Eastern Taiga Shield is similar to that of the arctic tundra bordering the northern edge of the latitudinal limits of tree growth. Forest stands contain lichen, stunted black spruce, jack pine and tamarack trees mixed with shrublands of alder and willow. Open forests of mixed tree stands are found upland along rivers and streams, supporting trembling aspen, balsam poplar and white birch.

The climate conditions of this ecozone are subarctic rather than Atlantic with short summers and cool temperatures (averaging temperature about 11°C), and long, cold winters (temperature averaging between -11°C and -24.5°C). The incursion of the easterly Labrador Current brings the cool, moist air off the Atlantic, a result of the pack ice and icebergs cooling the sea temperatures (Environment Canada 2004). This current creates snow flurries in the winter and fog in the summer over coastal areas. Mean annual temperatures of the Eastern Taiga Shield range between -5°C and 0°C. Mean annual precipitation ranges from 500- 800 mm and 1000 mm along the coast of Labrador (Environment Canada 2005).

The Boreal Shield ecozone, the largest in Canada, extends from northern Saskatchewan to Newfoundland, passing north of Lake Winnipeg, the Great Lakes and the St. Lawrence River. Within the project area the Boreal Shield encompasses southern Labrador and all of Newfoundland. More than half of this ecozone is forested and much of it accessible, but for some portions that remain as wilderness condition.

Similar to the Taiga Shield, the Boreal Shield's landscape consists of Precambrian bedrock outcrops, glacial moraine deposits and numerous eskers. Similar mammals also utilize the dense forests of this ecozone but are greater in diversity. The Boreal Shield forests are conifer dominant to the north and comprised of white and black spruce, balsam fir and tamarack. The southern portion of this ecozone is mixed stands with deciduous trees more pronounced. These include white birch, trembling aspen and balsam poplar mixed in with conifers such as white, red pine and jack pine. Various lichens and shrubs can be found with more open areas with exposed bedrock.

Typical climate conditions for this ecozone are cold winters and warm summers with influence to coastal locations from the Atlantic. Throughout the Island of Newfoundland and southern portions of Labrador weather conditions are generalized as cooler, wetter, windier and foggier than the rest of the country. The sea influences the weather greatly throughout the Island and southern Labrador, with less variability inland than along the coast (Environment Canada 2005). The mean annual temperature is approximately 5.5°C, the mean a summer temperature of approximately 15°C and winter temperatures average between -2°C and -10°C (Environment Canada 2005). The average growing season lengths are between 100 and 150 days, with frost-free periods being the shortest inland (Environment Canada 2005). Annual precipitation amounts are approximately 1000 mm or greater inland and along the south coast (Environment Canada 2005).

Heritage Resources

Newfoundland and Labrador is rich with geologic history and archaeological evidence of exploration to the New World. The landscape of the province contains geologic significance such as the components of Central Newfoundland being the remains of old ocean floor that originated between North America and Africa 500 million year years ago (Bell and Liverman 1997). Some of the oldest rock known on Earth was found in the Canadian Shield of eastern Labrador derived from plutonic and metamorphic rocks that date 4 billion years (Bell and Liverman 1997).

Historical evidence resides throughout the province in fossil and archaeological record. The province is world renowned for fossil discovery in such locations as Fortune Head (for marine strata), Mistaken Point (deep water marine and soft tissue fossils), and Bell Island (trace fossils; tracks, trails and burrows produced by trilobites and soft bodied animals) (Boyce 2006). Archaeological artifacts discovered include dwellings, tools, pottery, organic artifacts of leather, wood, bone, ivory, antler or fabrics, and ornate objects such as jewellery. Archaeological

evidence throughout the province have established the first humans to reach the province (in southern Labrador), descendants of Palaeo-Indians about 10,500 years BP (Before Present), explorers of Norse voyagers in Newfoundland and Labrador around 1000 A.D. and European discovery to harvest cod off the coast of Newfoundland in the early sixteenth century (Pastore 1998 and Newfoundland and Labrador Heritage Web Site Project. 1997).

Light stations occupy a prominent position in the heritage consciousness of Atlantic Canadians. They are among the oldest structures built by Europeans in Eastern Canada and have been the subject of picture books, historical references and art works. Many sites are visited by tourists and decommissioned light stations are often acquired by local community groups to be used as tourist destinations. Some of these light stations have been designated National Historic Sites, such as the light stations at Cape Spear and Cape Bonavista, NL.

Species at Risk

There are numerous species at risk within the RCSR boundary due to the large area that it encompasses. Species can include marine and terrestrial mammals, birds, amphibians, fishes, arthropods, molluscs, insects, vascular plants, mosses, and lichens.

A list of species at risk has not been included in this report as the list is very dynamic and information regarding species at risk within project boundaries will be obtained from the Federal and Provincial listings for an area on a project-by-project basis. The resource for location information on species at risk in Atlantic Canada is the ACCDC which can be readily accessed.

Any project that is likely to have an adverse effect on a species at risk, either directly or indirectly, will not be subject to this RCSR (see Section 2.3). See Appendix 1 for a list of environmental information resources that guides to more species at risk information.

4.3 Issues Scoping and Valued Ecosystem Components

Issue scoping included analysis of previous project activities with respect to locations and identified ecosystem receptors. The scoping exercise was internal and focused on existing information and institutional knowledge.

A Valued Ecosystem Component (VEC) - Project Interaction matrix, provided in Table 1 identifies the possible interactions between project activities and ecosystem components within the spatial boundaries of this assessment, including accidents and malfunctions. Only the ecosystem components that have the potential to be affected by remediation of contaminated sites projects have been selected as VECs for further analysis in this EA.

VEC's have been identified by assessing parts of the ecosystem that may be affected as a result of project activities. VECs are summarized into three categories: physical-chemical, ecological, and anthropogenic effects.

VEC's were determined based on the benefits they provide ecologically and anthropologically. VEC-Project interactions were then identified by reviewing project activities and their relationship to physical-chemical, ecological, and anthropogenic elements. A summary of VEC justifications and project activities interactions is included in Table 2.

Table 1: Valued Ecosystem Components – Project Interaction Matrix

		Valued Environmental Components																																				
		PHYSICAL – CHEMICAL EFFECTS														ECOLOGICAL EFFECTS										ANTHROPOGENIC EFFECTS												
		WATER RESOURCES							LAND RESOURCES							ATMOSPHERIC QUALITY				SPECIES AND POPULATIONS					COMMUNITIES AND HABITATS													
																				TERRESTRIAL		AQUATIC																
		WATER TABLE ALTERATION	GROUND WATER FLOW	GROUND WATER QUALITY CHANGES	SHORELINE AND BOTTOM ALTERATION	SURFACE FLOW VARIATION	FRESHWATER QUALITY	MARINE WATER QUALITY CHANGES	WETLANDS & /MARSHES	SOIL EROSION	SOIL QUALITY	UNIQUE PHYSICAL FEATURES	COMPACTION AND SETTLING	STABILITY (SLIDES AND SLUMP)	GEOLOGY	AIR QUALITY	NOISE	DUST	CLIMATE CHANGE	VEGETATION	BIRDS AND MAMMALS	AMPHIBIANS AND REPTILES	INVERTEBRATES	VEGETATION	BIRDS AND MAMMALS	AMPHIBIANS AND REPTILES	FISH AND INVERTEBRATES	TERRESTRIAL COMMUNITIES	TERRESTRIAL HABITATS	AQUATIC COMMUNITIES	AQUATIC HABITATS	HUMAN HEALTH & SAFETY	HERITAGE / ARCHAEOLOGICAL RESOURCES	LAND/ RESOURCE USE	AESTHETICS			
PROJECT PHASE	PROJECT ACTIVITIES																																					
MOBILIZATION / DEMOBILIZATION	MACHINERY OPERATION (incl. operation of all equipment required for remediation operations below)			•	•		•	•	•	•						•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	STORAGE of FILL/CAPPING MATERIAL (physical alteration/impact)			•	•		•	•	•	•						•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	SITE ACCESS (incl. transportation methods)			•	•		•	•	•	•						•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
REMEDIATION	EXCAVATION (physical alteration/impact)			•	•		•	•	•	•						•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	PLACEMENT of FILL/CAPPING MATERIAL (physical alteration/impact)			•	•		•	•	•	•						•	•	•		•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	
	DISPOSAL / TREATMENT OF IMPACTED SOIL																																					
	SITE RESTORATION																																					
MONITORING	MONITORING OF SITE (incl. transportation and operation of all equipment required for such activities, may include installation of groundwater monitoring wells or soil testing).			•	•		•	•	•	•						•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
ACCIDENTS/ MALFUNCTIONS	UPSETS (incl. transportation and operation of all equipment required for remediation activities)			•	•		•	•	•	•						•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	

• Indicates Interaction

Table 2: VEC Justification and Project Activities Interaction

Valued Ecosystem Components	VEC Justification	Project Phase	VEC – Project Activities Interaction
Physical-Chemical			
Water Resources	- direct relationship to terrestrial and aquatic habitat quality and abundance.	- remediation	- chemical/physical interactions from machinery operation, excavation, filling, and capping
		- operation	- potential for re-contamination of the site during activities of site users
Land Resources	-support habitat for terrestrial as well as near-shore aquatic species.	- remediation	- chemical/physical interactions from machinery operation, excavation, filling, and capping
		- operation	- potential for re-contamination of the site during activities of site users
Atmospheric Quality	- important indicator of habitat health	- remediation	- chemical/physical interactions from machinery operation

Ecological			
Species and Populations	- indicator for ecosystem health and resiliency	- remediation	- chemical/physical interactions from machinery operation, excavation, filling, and capping
		- operation	- potential for re-contamination of the site during activities of site users
Anthropogenic			
Health and Safety	- contributes directly to enhancing quality of life	- all phases	- potential accidents and health repercussions from physical dangers including machinery operation and contact with chemicals
	- components for the building of strong families and communities		
Social-Economic Stability	- contributes directly to enhancing quality of life - contributes to development of individuals, communities, and sustainable practices	- all phases	- employment created at the individual and community level

4.4 Potential Environmental Effects

The ensuing discussion briefly describes the potential environmental effects associated with unmitigated project activities. This discussion is separated into physical-chemical, ecological, and anthropogenic effects. The potential environmental effects associated with VEC - Project interaction and a summary of the mitigation that addresses these effects are provided in Table 3.

4.4.1 Physical-Chemical Effects

Water: Changes in marine/freshwater surface and groundwater quality could result from remediation activities such as excavation, back filling, and possible stock piling of material. Fines, foreign materials and organic debris might also enter the aquatic environment or wetlands due to project activities. These environmental effects would be expected to last only as long as the remediation phase is engaged: from approximately one day to one week.

Land: Site access and machinery operation could contribute to soil erosion, compaction and settling, and changes in stability. Excavation and backfilling physically change soil structure in a small localized manner, and fines, foreign materials, and organic debris may enter the terrestrial environment. Environmental effects should only continue while project activities are engaged, although, after project completion, there is a risk of fill compaction causing settling of the surface below grade and a change in soil quality at the disposal site.

Atmosphere: The primary atmospheric effects are localized noise, dust, and fumes that result from machinery operation and activities. The exposure of contaminated soil may also result in the small scale release of fumes. The duration of these effects is equal to project activity duration: approximately one day to a week.

4.4.2 Ecological Effects

Minor remediation projects are typically carried out at developed sites, therefore ecological risks are minimal. Aquatic and terrestrial species and populations might experience short-term disturbance from project activities. At the community and habitat level, the negative environmental effects resulting from project activities are negligible, while the positive effects of removing or sequestering contaminants are significant. Minor soil remediation activities, and the environmental effects associated with them, are minor and short term and therefore too small to impact at the community and habitat level. It should be pointed out that the net effect of minor remediation projects is to remove risks to human health and the environment.

4.4.3 Anthropogenic Effects

Project crews are vulnerable to health risks from exposure to fumes from machinery, and contaminated soils. Further effects include potential disruption of heritage resources such as archaeological sites and artefacts during excavation.

An archaeological survey of potential sites for remediation projects has not been conducted. The projects will require some excavation of the underlying soil during site remediation, however in a limited fashion. In addition, most of the sites have a long history of anthropogenic activities and many are highly developed, such as SCH harbours. The potential for the disruption of archaeological/heritage resources is considered to be minimal.

Archaeological sites in remote locations may not have been previously identified. Care should be taken to observe and identify any archaeological deposits while work is being completed. Work must be stopped if evidence shows a potential archaeological artifact or deposit and the following provincial representatives will be contacted:

- Newfoundland and Labrador: Martha Drake – (709) 729-2462.

Specifically, an assessment has been made on the interaction with potential or established Aboriginal or Treaty rights (with respect to fisheries) at those sites. Prior to any project-related activities occurring, the DFO Area Aboriginal Coordinator will be contacted, as appropriate, by project authorities.

Project activities positively affect the short term economic stability of the area by creating employment at the individual and community level. Remediation itself is positive as it decreases human health and safety risk as contamination is removed or capped.

4.5 Accidents and Malfunctions

The likelihood of accidents or malfunctions occurring and causing negative environmental impacts due to project activities and physical works is minimal. Potential accidents and malfunctions may occur at the staging location and during the excavation/filling phase. These may include:

- vehicle collisions
- spills from equipment operated on site
- mechanical failures
- spills or leaks (from chemicals) into the marine and terrestrial environment
- major storm events

Project activities that could result in accidents and/or malfunctions largely relate to the operation and maintenance of heavy machinery, vehicles, and the use of hand tools. Mechanical failures, vehicle collisions, spills, and leaks would likely be attributed to human error. Spills resulting from improperly stored materials are also possible. Major storm events could cause erosion or mobilization of contaminated soils or backfill with potential impacts on downflow populations or habitats.

Accidents and malfunctions will be avoided through compliance with mitigation measures listed in Section 4.6, Table 3 and Appendix 2 of this RCSR. For example, vehicles will be regularly serviced to avoid malfunctions and all spills, regardless of size, will be reported in accordance with local legislation. Weather forecasts will be monitored and contingency plans will be in place as required by mitigation measures.

4.6 Effects of the Environment on the Projects

Under the Act, an EA must consider potential effects the environment may have on projects. Increased weather extremes and a number of adverse events may affect remediation projects. Following standards and ensuring protection against these effects are increasingly important. The projects are vulnerable to a variety of effects from the environment such as:

Extreme and adverse weather-related effects (i.e. heavy precipitation) can delay project activities and can damage the projects, and/or cause unpredictable run-off, erosion or sedimentation during the excavation phase and/or cause problems for machinery operation.

- Tidal surges and flooding in the vicinity of project activities, given that many of the sites are adjacent to the coastline and in relatively low-lying estuarine areas
- Sinking or settling of soils, ground subsidence and ground surface movement could become a liability, potentially leading to structural failure of tank supports or adjacent buildings.

The effects that have been identified are considered mitigable and avoidable through design and the use of stringent remediation standards. Specific mitigations to avoid effects of the environment on remediation projects are covered in Section 4.6, Table 4 and Appendix 2 of this RCSR.

4.7 Mitigation Measures

Mitigation measures that address the environmental effects associated with remediation activities have been developed from various levels of government, industry BMP and internal DFO protocols. The mitigation measures included in these documents have been synthesized, modified, and enhanced for the purposes of this report.

The “The Federal Approach to Contaminated Sites” (CSMWG, 1999) provides the framework for dealing with contamination at federal facilities. DFO mitigation and mitigation standards have evolved from this process and from many years of practical experience with contamination issues. Therefore, the primary sources for the mitigation included in this report are previous screening documents written for remediation of DFO harbour and light station properties. These documents provided a suitable starting point for mitigation as they include standard mitigation for RCSR - applicable project activities.

DFO will ensure that mitigation measures will be implemented by including the necessary compliance with the RCSR in contracts with outsourced projects. Furthermore, all DFO staff will be introduced to the RCSR and required to implement it properly as part of standard operating procedures. All remediation projects will be supervised by a qualified environmental professional to ensure compliance with the RCSR and all regulatory requirements. A copy of the RCSR mitigations will be available on-site when project activities area being undertaken.

A full copy of the RCSR mitigation measures is included in Table 3, which includes a summary of the potential environmental effects and mitigation measures that address these effects organized by VEC. Standard mitigation measures, organized by project activity, are included in Appendix 2 with the intention of providing a convenient reference for crews to access the measures to be implemented.

Table 3: Potential Environmental Effects and Mitigation Summary

VEC	Potential Environmental Effects	Mitigative Measures
WATER RESOURCES	Shoreline and bottom alteration, siltation, and other changes in water quality could result from silty or contaminated runoff from excavation, filling, capping or stock piling of material.	<p>GENERAL</p> <ol style="list-style-type: none"> 1. Any and all stipulations of federal, provincial, or municipal authorities or their officers must be strictly followed. Any discrepancies must be successfully resolved before the pertinent work may begin. 2. All construction, operational, and maintenance wastes must be recycled where possible or otherwise disposed of appropriately. Any hazardous waste (i.e., fuels, lubricants) must be stored in sealed, labeled containers and disposed of in accordance with applicable regulations. <p>SITE ACCESS</p> <ol style="list-style-type: none"> 1. Site access practices must prevent machines from entering watercourses at all times. 2. Vehicles must not be operated below the Highest High Water mark. 3. Equipment must be in proper running order and operated in a responsible manner. <p>MACHINERY OPERATION</p> <ol style="list-style-type: none"> 1. Equipment and vehicle refueling must be done at least 30m from any water body or wetland and on an impermeable surface. Petroleum spill clean-up equipment, adequate for the activity involved, must be on-site. Spill equipment will include, as a minimum, at least one 250L (i.e., 55 gallon) overpak spill kit containing items to prevent a spill from spreading; absorbent booms, pillows, and mats; rubber gloves; and plastic disposal bags. All spills or leaks should be promptly contained, cleaned up, and reported to the 24-Hour Environmental Emergencies Report System (1-800-565-1633). 2. Vehicles must remain on stable, hardened surfaces and not be operated below the line of Highest High Water (never in the intertidal zone). 3. All equipment must be maintained in proper running order to prevent leaking or spilling of potentially hazardous or toxic products. This includes hydraulic fluid, diesel, gasoline and other petroleum products. All spills must be reported to the environmental emergencies reporting system telephone number at 1-800-563-9089. 4. Equipment maintenance activities must be completed in a manner that prevents the deposit of foreign materials into the environment. <p>EXCAVATION</p> <ol style="list-style-type: none"> 1. Work practices must prevent the movement of dust and fines into any surface water. 2. Loose material at excavation or stockpile sites must be managed (silt fences, tarpaulins, catch basins, etc.) to

VEC	Potential Environmental Effects	Mitigative Measures
		<p>avoid migration of silt and debris to nearby waters. Erosion control structures are to be left in place until vegetation is re-established and/or all exposed soils are stabilized.</p> <ol style="list-style-type: none"> 3. Heavy rainfall events must be avoided by monitoring weather forecasts and scheduling work accordingly. 4. Any accumulation of water in an excavation must be pumped into a truck or container and treated for silt and contaminants before release. 5. Any material or debris lost as a result of wave or storm action must be immediately recovered by the operator when safe to do so. 6. Contaminated material must not be placed in a non-contained area. 7. All debris deposited throughout the life of the project must be removed from the site. 8. A buffer zone of 2 meters must be maintained between the work area and water bodies. 9. For work within 5 metres of a water body; excavation machinery must be positioned to pull soils and contaminants away from the water body. If rainfall occurs tarpaulins must be placed over the excavation and disturbed soils to prevent migration of silt and debris to nearby waters. 10. Refer to the Water Resources Act SNL2002 CHAPTER W-4.01 and associated Regulations. 11. Application for Permit to Alter a Body of Water, as required under Section 48 of the Water Resources Act, must be obtained prior to commencement of work (Contact: Water Resources Management Division by telephone (709) 729-2563; or by fax (709) 729-0320. <p>REMEDIATION</p> <ol style="list-style-type: none"> 12. Activities must be managed (silt fences, tarpaulins, catch basins, etc.) to prevent fines and organic debris entering nearby aquatic environments. <p>DEMOBILIZATION</p> <ol style="list-style-type: none"> 1. All tools, pumps, pipes, hoses and trucks used in the project must be washed off in such a way as to prevent the wash off water from entering the environment. The wash water must be contained and disposed of upland in an environmentally acceptable manner. 2. Equipment must not be washed within 30 meters of any watercourses. 3. All debris deposited throughout the life of the project must be removed from the site.

VEC	Potential Environmental Effects	Mitigative Measures
LAND RESOURCES	<p>Soil erosion, compaction, and settling, and changes in stability may result from machinery operation.</p> <p>Disposal of contaminated soils from site clean-up/remediation.</p>	<p>GENERAL</p> <ol style="list-style-type: none"> 1. All construction, operational, and maintenance wastes must be recycled where possible or otherwise disposed of in a provincially approved manner. Any hazardous material (i.e., fuels, lubricants) must be stored in sealed, labelled, containers and disposed of in accordance with applicable regulations. <p>SITE ACCESS</p> <ol style="list-style-type: none"> 1. Site access practices must avoid damaging terrestrial, wetland or aquatic habitats. Cross-country access should be in winter when habitats are frozen and can bear weight. <p>REMEDIATION</p> <ol style="list-style-type: none"> 1. All hydrocarbon contaminated material with levels of TPH 1000mg/kg (ppm) or greater must be disposed of in accordance with the Provincial Department of Government Services requirements. Written authorization from the Department of Government Services is required before disposal of contaminated soil in an approved landfill, soil treatment facility or other sites. 2. Refer to the Environmental Protection Act SNL2002 CHAPTER E-14.2 and associated Regulations for the control and disposal of waste generated by the clean-up. 3. Refer to the Guidance Document for the Management of Impacted Sites (Version 1.01), September 2005 for the Province of Newfoundland and Labrador. 4. Contaminated material must be properly handled and contained, and disposed of at an approved treatment or disposal facility. <p>MACHINERY OPERATION</p> <ol style="list-style-type: none"> 1. All equipment must be maintained in proper running order to prevent leaking or spilling of potentially hazardous or toxic products. This includes hydraulic fluid, diesel, gasoline and other petroleum products. 2. Vehicles must never be operated in the intertidal zone (below the line of Highest High Water) or in wetlands. 3. Operations should only occur where entirely necessary to complete the works to reduce effects to nearby soils, vegetation, and resident species. Respect should be given to the natural environment to minimize the footprint of the project. 4. Refueling must be done at least 30m from any water body or wetland and on an impermeable surface. Petroleum spill clean-up equipment, adequate for the activity involved, must be on-site. Spill equipment will include, as a minimum, at least one 250L (i.e., 55 gallon) overpak spill kit containing items to prevent a spill from spreading; absorbent booms, pillows, and mats; rubber gloves; and plastic disposal bags. All spills or leaks should be promptly contained, cleaned up, and reported to the 24-Hour Environmental Emergencies Report System (1-800-565-1633).

VEC	Potential Environmental Effects	Mitigative Measures
	Excavation/filling may physically change soil or rock structure	<p>EXCAVATION</p> <ol style="list-style-type: none"> 1. Excavation activities must be conducted conservatively so that physical changes to soils or rock remain small and localized. 2. Stockpiles must be placed to avoid burying or destroying vegetation or wildlife or bird habitat and to avoid silt washing into water bodies or wetlands. 3. Clean fill must be tamped appropriately to prevent post-project subsidence of the surface horizon. 4. Activities must be managed (silt fences, tarpaulins, catch basins, etc.) to prevent fines from excavation or stockpiles and organic debris from entering nearby terrestrial, wetland and aquatic environments. 5. Equipment maintenance activities must be completed in a manner that prevents the deposit of foreign materials to the environment. 6. Refuse must be disposed of properly.
ATMOSPHERIC QUALITY	Noise, dust, and fumes result from project activities.	<p>MACHINERY OPERATION</p> <ol style="list-style-type: none"> 1. Machinery must be operated efficiently, to ensure that noise and air quality issues are short-term and local. Local noise by-laws or community norms must be observed to reduce disturbance to nearby residents.
SPECIES AND POPULATIONS/ COMMUNITIES AND HABITATS	<p>Short term disturbance from project activities to terrestrial and aquatic habitats and species. (Silt coming from site).</p> <p>Invasive plants may disrupt local populations.</p>	<p>GENERAL</p> <ol style="list-style-type: none"> 1. Project must be conducted quickly and efficiently, to ensure the least disruption possible. 2. Site access, remediation, and stockpiling practices must avoid damaging terrestrial, wetland and aquatic habitats and be undertaken with regard to not harming resident flora and fauna. 3. Revegetation must be with seed mixes of local species of plants. Seed mixes that include invasive species must not be used. 4. All machinery and vehicles must be cleaned before being brought to the site to ensure no plant matter or seeds from invasive species are introduced to the site. 5. Mitigation presented for water and land resources is also applicable for Species and Populations and Communities and Habitats and implementation of the mitigation measures listed below will ensure compliance with the <i>Migratory Birds Convention Act</i> (MBCA). 6. If a nest is found during vegetation clearing activities, the nest site and neighboring vegetation will be left undisturbed until nesting is completed. Construction activities will also be minimized in the immediate area until nesting is completed. 7. If construction activities require access to the site by water, main channels must be used, where feasible. Any watercourse crossing must be approved by DFO HMP and the province. 8. Concentrations of seabirds, waterfowl, or shorebirds must not be approached when approaching the project area, accessing wharves, or ferrying supplies. 9. Wetlands or sensitive coastal habitats (i.e., any area in which plant or animal life or their habitats are either rare or especially valuable) must not be accessed nor used as staging areas.

VEC	Potential Environmental Effects	Mitigative Measures
		10. All vessels and machinery should be well muffled, and maintained in proper working order and must be regularly checked for leakage of lubricants or fuel. 11. Public roads must be used to access the project area, where feasible. 12. Helicopter use near seabird breeding colonies must be avoided from May 1 st to August 31 st . Helicopter use outside this temporal window must include an adjustment to altitude and pattern of flight lines in order to minimize disturbance to migratory birds.
ANTHROPOGENIC EFFECTS	<p>Project crews are vulnerable to health risks from exposure to fumes from machinery, dust from contaminated soils. Safety risks may result from machinery operation, accidental falls, and site access. In addition, the public may be affected by temporary disruptions during works.</p>	<p>GENERAL</p> <ol style="list-style-type: none"> 1. Activities must be completed in such a way as to minimize the amount of fines and organic debris. 2. Ensure all personnel involved with activities are adequately trained and utilize appropriate personal protective equipment. 3. Storage of fuels and petroleum products must comply with safe operating procedures, including containment facilities in case of a spill. 4. Onsite crews must have emergency spill equipment available. 5. Site access must be restricted to construction personnel and authorized visitors. Workers must be provided with appropriate personal protective equipment. 6. Operations must only occur where entirely necessary to complete the works to reduce effects to nearby soils, vegetation, and resident species. Respect must be given to the natural environment to minimize the footprint of the project. <p>MACHINERY OPERATION</p> <ol style="list-style-type: none"> 1. Machinery must be operated efficiently, to ensure that noise and air quality issues are short-term and local. 2. Storage of fuels and petroleum products must comply with safe operating procedures, including containment facilities in case of a spill. 3. Onsite crews must have emergency spill clean-up equipment, adequate for the activity involved, must be on-site. Spill equipment will include, as a minimum, at least one 250L (i.e., 55 gallon) overpak spill kit containing items to prevent a spill from spreading; absorbent booms, pillows, and mats; rubber gloves; and plastic disposal bags. All spills or leaks must be promptly contained, cleaned up, and reported to the 24-Hour Environmental Emergencies Report System (1-800-565-1633).

VEC	Potential Environmental Effects	Mitigative Measures
	The aesthetic of construction, operation, and decommissioning could be perceived to be negative.	<p>GENERAL</p> <ol style="list-style-type: none"> 1. Aesthetic effects created by activities will be short-term and localized. Sites must be kept in a tidy manner during activities and left in a good condition at the end of the project. Areas near the project must be protected from physical disturbance. 2. All debris deposited throughout the life of the project must be removed from the site.
	Archaeological sites could be inadvertently disturbed or damaged by project activities	<p>GENERAL</p> <ol style="list-style-type: none"> 1. Archaeological sites in remote locations may not have been previously identified. Care should be taken to observe archaeological deposits while work is being completed. Work must be stopped if evidence shows a potential archaeological artifact or deposit and a provincial representative contacted:– Martha Drake (709) 729-2462. 2. All laws, regulations, guidelines, and best practices from federal, provincial, or municipal governments or their officers must be strictly followed. Any apparent conflicts or discrepancies must be successfully resolved before the pertinent work can proceed.

4.8 Analysis and Prediction of Significance of Residual Environmental Effects

Residual environmental effects are “environmental effects that remains, or are predicted to remain, even after mitigation measures have been applied.” (CEAA, 2006). Under the Act, the significance of residual environmental effects must be considered. This section provides criteria for evaluating the significance of potentially adverse residual environmental effects. Analysis of the significance of residual environmental effects is based on several criteria including magnitude, geographic extent, duration, frequency and reversibility (see Table 4). This table was developed in accordance with the November 1994 Agency Reference Guide, *Determining Whether a Project is Likely to Cause Significant Adverse Environmental Effects*, and the *Responsible Authorities Guide to the Environmental Assessment Act* (CEAA, 2004). The criteria were assessed using past experience and professional judgment and are combined to determine whether or not an activity’s effect is significant.

Table 4: Rating System Used to Determine the Significance of Residual Environmental Effects

Criteria	Negligible	Minor	Major
Magnitude	Minute levels of disturbance and/or damage (i.e. within natural variation)	Low levels of disturbance and/or damage (i.e. temporarily outside range of natural variation)	High levels or disturbance and/or damage (i.e. outside the range of natural variation)
Geographic Extent	Limited to direct project site	Extends beyond direct project site but remains within the project boundaries	Extends beyond the project boundaries
Duration of Effects	Less than one day	Days to weeks	A month or longer
Frequency of Effects	Occurs on a monthly basis or less frequently	Occurs on a weekly basis	Occurs on a daily basis or more frequently
Reversibility	Effects reversible over short term without active management	Effects reversible over short term with active management	Effects reversible over extended term with active management or effects are not reversible

The above rating system was used to determine whether or not a residual environmental effect was significant based on the following definitions:

Significant: A residual environmental effect is considered *significant* when it introduces frequent, major levels of disturbance and/or damage and when the effects last longer than a month and extend beyond the project boundary following the application of mitigation measures. It is either reversible with active management or over an extended term or irreversible. A *significant* effect would not be consistent with well-defined environmental protection outcomes such as no degradation of shorelines, no loss of fish or aquatic habitat, etc. and as defined would be in violation of the *Canadian Environmental Protection Act* and/or the *Fisheries Act*.

Not Significant: A residual environmental effect is considered *not significant* when it has minor or negligible levels of disturbance and/or damage and when the effect lasts less than a week and is contained within the project boundaries following the application of mitigation measures. An effect that is not significant is reversible with or without short-term active management.

Residual Effects and Significance

Identified VECs including water, land, atmosphere, species and populations/communities and habitats, and anthropogenic factors are affected by residual effects from project activities. Each of these residual effects has been examined according to the above criteria ratings and all of the residual effects were found to be not significant. Table 5, below, includes a summary of the criteria and significance of the residual environmental effects associated with minor remediation projects under this RCSR.

Table 5: Significance of Residual Environmental Effects

VEC	Project Phase/Elements	Residual Environmental Effects	Criteria Ratings					Significance
			Magnitude	Geographic Extent	Duration of Effect	Frequency of Effect	Reversibility	
WATER RESOURCES	Excavation, filling, capping	None expected	1	1	1	1	1	Not Significant
LAND RESOURCES	Excavation, filling, capping	Physical change: soil structure in a small, localized manner	1	1	1	1	2	Not Significant
ATMOSPHERIC QUALITY	Machinery operation	Chemical release of fumes and dust	1	1	1	1	1	Not Significant
	Machinery operation	Noise	1	2	1	1	1	Not Significant
SPECIES AND POPULATIONS/ COMMUNITIES AND HABITATS	Site access, machinery operation	Short term disturbance to terrestrial and aquatic species	2	2	1	1	1	Not Significant
ANTHROPOGENIC FACTORS	Disturbance of users	Improved environment. Reduced human health risks.	1	1	+3	+3	1	Not Significant

Legend: 1=Negligible, 2=Minor, 3=Major, + = positive effect

4.9 Cumulative Environmental Effects

The Act requires that the assessment of potential environmental effects also consider the potential for cumulative environmental effects. Cumulative environmental effects are defined as “changes to the environment that are caused by an action in combination with other past, present and future human activities” (CEAA, 1999). The concept of cumulative environmental effects recognizes that the environmental effects of individual activities can combine and interact with each other to cause aggregate effects that may be different in nature or extent from the effects of the individual activities (CEAA, 1994).

Under the Act, the identification of likely future projects takes into consideration projects that are certain (i.e. approved, under regulatory review, or officially announced to regulatory agencies) and reasonably foreseeable (i.e. identified in a development plan that is approved or under review, or conditional upon approval of a development plan that is under review). Hypothetical actions (i.e. conjectural or discussed on a conceptual basis) are not considered (CEAA 1999).

The potential environmental effects associated with minor remediation projects are short-lived, localized and reversible; their capacity to act in a cumulative manner is minimal. For the purposes of this RCSR, the cumulative effects assessment must consider the potential cumulative effects resulting from: (1) other projects addressed by this RCSR, (2) other project/activities within the site boundaries, and (3) projects and activities occurring outside the site boundaries.

Analysis of Cumulative Effects

The environmental effects associated with minor remediation projects, as defined by this RCSR, have been found to be negligible and limited to each individual project area. Project sites are isolated so it is not possible for interactions between projects to occur. Considering these factors, the environmental effects of individual minor remediation projects are not likely to contribute to cumulative effects.

Interactions between minor remediation projects and other projects/activities inside the site boundaries

The environmental effects of interactions between minor remediation projects and other projects/activities inside the site boundaries must be factored into the consideration of cumulative effects.

Due to the small size of each individual project’s boundaries, it is highly unlikely that other projects will occur while minor remediation projects are occurring. At Small Craft Harbours there are day to day operational activities to consider. There is potential that industrial or recreational activities may occur within the boundaries of some projects. These are routine activities (boat loading/unloading, launching, storage, facility maintenance) that typically have minimal or negligible environmental effects.

Given that the potential environmental effects resulting from minor remediation at a site are expected to be negligible and limited to the immediate area of each individual project, it is unlikely that the environmental effects of minor remediation projects will interact with the environmental effects of other project/activities inside the site boundaries and contribute to cumulative effects.

Interactions between minor remediation projects and projects/activities outside site boundaries

The environmental effects of interactions between minor remediation projects and projects/activities outside site boundaries must be considered during the assessment of cumulative effects.

There is potential for a wide range of activities/projects to occur outside of minor remediation project boundaries. Fishing, shipping, recreation, and residential are activities that may occur outside project boundaries. These are routine activities that typically have minimal or negligible environmental effects. Outside the immediate project area potential adverse cumulative environmental effects are considered improbable and insignificant.

Summary of Cumulative Effects on VEC

Taking the mitigation measures from section 4.7 of this RCSR into account, potential adverse environmental effects would be limited to each individual project site. Consequently, potential adverse cumulative environmental effects are unlikely to occur either inside or outside the project boundaries.

Proper project planning and design will take into account surrounding infrastructure and other projects or activities inside and outside project boundaries which could have the potential to act in a cumulative manner on affected VEC. Consequently, the potential for any cumulative effects to occur as a result of project interactions with other minor remediation projects, other projects or activities inside or outside the sites' boundaries are unlikely.

DFO will assess for cumulative effects on an annual basis. DFO will report on the continuing validity of cumulative environmental effects assessments on a yearly basis.

Summary of Significance of Residual Environmental Effects

All residual environmental effects remaining after the application of recommended mitigation measures were found to be negligible, not significant, and limited to the immediate project area. Although the potential exists for short term environmental effects during remediation and decommissioning, the implementation of recommended mitigation measures will result in impacts that are not significant. DFO concludes that projects under this RCSR will not contribute to significant adverse environmental effects.

5. Roles and Responsibilities

5.1 Responsible Authorities

DFO, as the proponent, is the lead RA for all components of the RCSR. It should be noted that since the RA is DFO, the RCSR can be applied, where appropriate, by all members of the department until such time as the Agency declares the RCSR not to be a class screening report or the declaration period expires. Structures and activities included in the report have been selected to minimize the potential for additional permitting and, therefore, the inclusion of other RAs.

It will be the responsibility of DFO to:

- ensure that projects are properly identified as class-applicable;
- ensure that applicable mitigation is implemented;
- place a regular statement on the Registry Internet site noting the extent to which the RCSR has been used, as identified in section 1.4;
- maintain the Registry project file, ensure convenient public access, and respond to information requests in a timely manner; and
- provide annual confirmation of the continuing validity of cumulative effects assessment conditions to the Agency.

5.2 Roles and Responsibilities of Other Responsible Authorities and Federal Authorities

If permitting or approval is required from an FA other than DFO this RCSR will not apply and an individual assessment under the Act may be required. Potential FAs of note include other entities that have been delegated with land management: Parks Canada, Port Authorities, Transport Canada, and Indian & Northern Affairs, for example. Also, if an additional approval is required from DFO Habitat Management in the form of a *Fisheries Act* authorization, this RCSR will not apply.

The following list includes FAs that have provided comments regarding this report's identification of potential environmental effects, suggested mitigation, and procedures. Comments have been incorporated as appropriate such that further referrals to these FAs will not be required except as outlined in this report:

- Environment Canada
- Fisheries & Oceans Canada – Habitat Management Program

Any project that requires further assessment by, or referral to, another FA will not be included in this RCSR.

5.3 Provincial Coordination

This RCSR is not designed to compensate for provincial requirements nor does it eliminate the need for provincial project specific approvals where required. This RCSR does not exempt DFO from complying with relevant provincial legislation.

6. Procedures for Revising the Replacement Class Screening Report

The RA will notify the Agency in writing of its interest to revise the RCSR as per the terms and conditions of the declaration. It will discuss the proposed revisions with the Agency and affected federal government departments and may invite comment from stakeholders on the proposed changes. For a re-declaration of the RCSR, a public consultation period will be required. The RA will then submit the proposed revisions to the Agency, along with a statement providing a rationale for each revision proposed as well as a request that the Agency amend or re-declare the RCSR.

6.1 Amendments

The purpose of an amendment is to allow for minor modifications to the RCSR after experience has been gained with its operation. Amendments do not require public consultation and do not allow for changes to the term of application. In general, amendments to the RCSR can be made if the Agency is satisfied that changes:

1. represent editorial changes intended to clarify or improve the document and procedures screening process;
2. streamline or modify the planning process and/or
3. do not materially alter either the scope of the projects subject to the RCSR or the factors to be considered in the assessment required for these projects.

6.2 Re-declaration

The purpose of a re-declaration is to allow substantial changes to the RCSR after experience has been gained with its operation. Re-declarations require a public consultation period. A re-declaration of an RCSR may be undertaken for the remaining balance of the original declaration period or for a new declaration period if the changes:

- extend the application of the RCSR to projects or environmental settings that were not previously included, but are similar or related to projects included in the class definition;
- represent modifications to the scope of the projects subject to the RCSR or the factors to be considered in the assessment required for these projects;
- reflect new or changed regulatory requirements, policies or standards;
- introduce new design standards and mitigation measures;
- modify the federal coordination notification procedures;
- extend the application of the RCSR to RA(s) who were not previously declared users of the report;
- remove projects that are no longer suitable for the class; and/or
- extend the term of application of the RCSR.

6.3 Term of Application

This report will be in effect for five years from its date of declaration. Near the end of the RCSR declaration period, and at other times as necessary, DFO will review content and usage to allow for report updates and the preparation for potential re-declaration.

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8. Appendices

1. Environmental Information Resources
2. Standard Mitigation Organized by Project Activity

Appendix 1

Environmental Information Resources

Environmental Information Resources

Fisheries and Oceans Canada	<ul style="list-style-type: none"> • Home page (http://www.dfo-mpo.gc.ca/) • Newfoundland and Labrador Region Operational Statements (http://www.dfo-mpo.gc.ca/habitat/what-quoi/os-ec/nl/index-eng.asp)
Environment Canada	<ul style="list-style-type: none"> • Atlantic Region (http://www.atl.ec.gc.ca)
Canadian Environmental Assessment Agency	<ul style="list-style-type: none"> • Canadian Environmental Assessment Agency (http://www.ceaa-acee.gc.ca) • Canadian Environmental Assessment Registry (http://www.ceaa-acee.gc.ca/050/index_e.cfm)
Parks Canada	<ul style="list-style-type: none"> • Terra Nova National Park: Resource Conservation Manager Kevin Robinson (709) 533-3124 Kevin.Robinson@pc.gc.ca • Gros Morne National Park: Resource Conservation Manager Peter Deering (709) 458-3542 Peter.Deering@pc.gc.ca • http://www.pc.gc.ca
Province of Newfoundland and Labrador	<ul style="list-style-type: none"> • Home page (http://www.gov.nl.ca) • Water Resources (http://www.env.gov.nl.ca/env/waterres/index.html) • Natural Resources (http://www.nr.gov.nl.ca/nr/) • Heritage/Archaeology (http://www.heritage.nf.ca/home.html) • Species at Risk (http://www.env.gov.nl.ca/env/wildlife/wildlife_at_ri_sk.htm)
Species at Risk data	<ul style="list-style-type: none"> • Atlantic Canada Conservation Data Centre home page (http://www.accdc.com) Species at Risk Public Registry (http://www.sararegistry.gc.ca/default_e.cfm) • Committee on the Status of Endangered Wildlife in Canada (http://www.cosewic.gc.ca) • Species at Risk Canadian Wildlife Service (http://www.sis.ec.gc.ca/ec_species/ec_species_e.phtml)

Appendix 2

Standard Mitigation by Project Activity

Project Activity	Mitigative Measures
GENERAL	<ol style="list-style-type: none"> 1. Any and all stipulations of federal, provincial, or municipal authorities or their officers must be strictly followed. Any discrepancies must be successfully resolved before the pertinent work may begin. 2. All construction, operational, and maintenance wastes must be recycled where possible or otherwise disposed of in a provincially approved manner. Any hazardous material (i.e., fuels, lubricants) must be stored in sealed, labelled, containers and disposed of in accordance with applicable regulations. 3. Project must be conducted quickly and efficiently, to ensure the least disruption possible. 4. Site access, remediation, and stockpiling practices must avoid damaging terrestrial, wetland and aquatic habitats and be undertaken with regard to not harming resident flora and fauna. 5. Revegetation must be with seed mixes of local species of plants. Seed mixes that include invasive species must not be used. 6. All machinery and vehicles must be cleaned before being brought to the site to ensure no plant matter or seeds from invasive species are introduced to the site. 7. Mitigation presented for water and land resources is also applicable for Species and Populations and Communities and Habitats and implementation of the mitigation measures listed below will ensure compliance with the <i>Migratory Birds Convention Act</i> (MBCA). 8. If a nest is found during vegetation clearing activities, the nest site and neighboring vegetation will be left undisturbed until nesting is completed. Construction activities will also be minimized in the immediate area until nesting is completed. 9. If construction activities require access to the site by water, main channels must be used, where feasible. Any watercourse crossing must be approved by DFO HMP and the province. 10. Concentrations of seabirds, waterfowl, or shorebirds must not be approached when approaching the project area, accessing wharves, or ferrying supplies. 11. Wetlands or sensitive coastal habitats (i.e., any area in which plant or animal life or their habitats are either rare or especially valuable) must not be accessed nor used as staging areas. 12. All vessels and machinery should be well muffled, and maintained in proper working order and must be regularly checked for leakage of lubricants or fuel. 13. Public roads must be used to access the project area, where feasible. 14. Helicopter use near seabird breeding colonies must be avoided from May 1st to August 31st. Helicopter use outside this temporal window must include an adjustment to altitude and pattern of flight lines in order to minimize disturbance to migratory birds. 15. Activities must be completed in such a way as to minimize the amount of fines and organic debris. 16. Ensure all personnel involved with activities are adequately trained and utilize appropriate personal protective equipment. 17. Storage of fuels and petroleum products must comply with safe operating procedures, including containment facilities in case of a spill. 18. Onsite crews must have emergency spill equipment available. 19. Site access must be restricted to construction personnel and authorized visitors. Workers must be provided with appropriate personal protective equipment.

Project Activity	Mitigative Measures
	<ol style="list-style-type: none"> 20. Operations must only occur where entirely necessary to complete the works to reduce effects to nearby soils, vegetation, and resident species. Respect must be given to the natural environment to minimize the footprint of the project. 21. Aesthetic effects created by activities will be short-term and localized. Sites must be kept in a tidy manner during activities and left in a good condition at the end of the project. Areas near the project must be protected from physical disturbance. 22. All debris deposited throughout the life of the project must be removed from the site. 23. Archaeological sites in remote locations may not have been previously identified. Care should be taken to observe archaeological deposits while work is being completed. 24. Work must be stopped if evidence shows a potential archaeological artifact or deposit and a provincial representative contacted:– Martha Drake (709) 729-2462. 25. All laws, regulations, guidelines, and best practices from federal, provincial, or municipal governments or their officers must be strictly followed. Any apparent conflicts or discrepancies must be successfully resolved before the pertinent work can proceed.
SITE ACCESS	<ol style="list-style-type: none"> 1. Site access practices must prevent machines from entering watercourses at all times. 2. Vehicles must not be operated below the Highest High Water mark. 3. Equipment must be in proper running order and operated in a responsible manner. 4. Site access practices must avoid damaging terrestrial, wetland or aquatic habitats. Cross-country access should be in winter when habitats are frozen and can bear weight.
EXCAVATION	<ol style="list-style-type: none"> 1. Work practices must prevent the movement of dust and fines into any surface water. 2. Loose material at excavation or stockpile sites must be managed (silt fences, tarpaulins, catch basins, etc.) to avoid migration of silt and debris to nearby waters. Erosion control structures are to be left in place until vegetation is re-established and/or all exposed soils are stabilized. 3. Heavy rainfall events must be avoided by monitoring weather forecasts and scheduling work accordingly. 4. Any accumulation of water in an excavation must be pumped into a truck or container and treated for silt and contaminants before release. 5. Any material or debris lost as a result of wave or storm action must be immediately recovered by the operator when safe to do so. 6. Contaminated material must not be placed in a non-contained area. 7. All debris deposited throughout the life of the project must be removed from the site. 8. A buffer zone of 2 meters must be maintained between the work area and water bodies. 9. For work within 5 metres of a water body; excavation machinery must be positioned to pull soils and contaminants away from the water body. If rainfall occurs tarpaulins must be placed over the excavation and disturbed soils to prevent migration of silt and debris to nearby waters. 10. Refer to the Water Resources Act SNL2002 CHAPTER W-4.01 and associated Regulations. 11. Application for Permit to Alter a Body of Water, as required under Section 48 of the Water Resources Act, must be obtained prior to commencement of work (Contact: Water Resources Management Division by telephone (709) 729-2563; or by fax (709) 729-0320. 12. Excavation activities must be conducted conservatively so that physical changes to soils or rock remain small and localized.

Project Activity	Mitigative Measures
	<ol style="list-style-type: none"> 13. Stockpiles must be placed to avoid burying or destroying vegetation or wildlife or bird habitat and to avoid silt washing into water bodies or wetlands. 14. Clean fill must be tamped appropriately to prevent post-project subsidence of the surface horizon. 15. Activities must be managed (silt fences, tarpaulins, catch basins, etc.) to prevent fines from excavation or stockpiles and organic debris from entering nearby terrestrial, wetland and aquatic environments. 16. Equipment maintenance activities must be completed in a manner that prevents the deposit of foreign materials to the environment. 17. Refuse must be disposed of properly.
REMEDIATION	<ol style="list-style-type: none"> 1. All hydrocarbon contaminated material with levels of TPH 1000mg/kg (ppm) or greater must be disposed of in accordance with the Provincial Department of Government Services requirements. Written authorization from the Department of Government Services is required before disposal of contaminated soil in an approved landfill, soil treatment facility or other sites. 2. Refer to the Environmental Protection Act SNL2002 CHAPTER E-14.2 and associated Regulations for the control and disposal of waste generated by the clean-up. 3. Refer to the Guidance Document for the Management of Impacted Sites (Version 1.01), September 2005 for the Province of Newfoundland and Labrador. 4. Contaminated material must be properly handled and contained, and disposed of at an approved treatment or disposal facility. 5. Activities must be managed (silt fences, tarpaulins, catch basins, etc.) to prevent fines and organic debris entering nearby aquatic environments.
MACHINERY OPERATION	<ol style="list-style-type: none"> 1. Equipment and vehicle refueling must be done at least 30m from any water body or wetland and on an impermeable surface. Petroleum spill clean-up equipment, adequate for the activity involved, must be on-site. Spill equipment will include, as a minimum, at least one 250L (i.e., 55 gallon) overpak spill kit containing items to prevent a spill from spreading; absorbent booms, pillows, and mats; rubber gloves; and plastic disposal bags. All spills or leaks should be promptly contained, cleaned up, and reported to the 24-Hour Environmental Emergencies Report System (1-800-565-1633). 2. Vehicles must remain on stable, hardened surfaces and not be operated below the line of Highest High Water (never in the intertidal zone). 3. All equipment must be maintained in proper running order to prevent leaking or spilling of potentially hazardous or toxic products. This includes hydraulic fluid, diesel, gasoline and other petroleum products. All spills must be reported to the environmental emergencies reporting system telephone number at 1-800-563-9089. 4. Equipment maintenance activities must be completed in a manner that prevents the deposit of foreign materials into the environment. 5. Vehicles must never be operated in the intertidal zone (below the line of Highest High Water) or in wetlands. 6. Operations should only occur where entirely necessary to complete the works to reduce effects to nearby soils, vegetation, and resident species. Respect should be given to the natural environment to minimize the

Project Activity	Mitigative Measures
	<p>footprint of the project.</p> <ol style="list-style-type: none"> 7. Refueling must be done at least 30m from any water body or wetland and on an impermeable surface. Petroleum spill clean-up equipment, adequate for the activity involved, must be on-site. Spill equipment will include, as a minimum, at least one 250L (i.e., 55 gallon) overpak spill kit containing items to prevent a spill from spreading; absorbent booms, pillows, and mats; rubber gloves; and plastic disposal bags. All spills or leaks should be promptly contained, cleaned up, and reported to the 24-Hour Environmental Emergencies Report System (1-800-565-1633). 8. Machinery must be operated efficiently, to ensure that noise and air quality issues are short-term and local. Local noise by-laws or community norms must be observed to reduce disturbance to nearby residents. 9. Machinery must be operated efficiently, to ensure that noise and air quality issues are short-term and local. 10. Storage of fuels and petroleum products must comply with safe operating procedures, including containment facilities in case of a spill. 11. Onsite crews must have emergency spill clean-up equipment, adequate for the activity involved, must be on-site. Spill equipment will include, as a minimum, at least one 250L (i.e., 55 gallon) overpak spill kit containing items to prevent a spill from spreading; absorbent booms, pillows, and mats; rubber gloves; and plastic disposal bags. All spills or leaks must be promptly contained, cleaned up, and reported to the 24-Hour Environmental Emergencies Report System (1-800-565-1633).
DEMOBILIZATION	<ol style="list-style-type: none"> 1. All tools, pumps, pipes, hoses and trucks used in the project must be washed off in such a way as to prevent the wash off water from entering the environment. The wash water must be contained and disposed of upland in an environmentally acceptable manner. 2. Equipment must not be washed within 30 meters of any watercourses. 3. All debris deposited throughout the life of the project must be removed from the site.