Minor Remediation Projects

Replacement Class Screening Report

Fisheries & Oceans Canada
Maritimes & Gulf Regions

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Acronyms

BMP – Best Management Practices

CCG – Canadian Coast Guard

CCME – Canadian Council of Ministers of the Environment

COSEWIC – Committee on the Status of Endangered Wildlife in Canada

DFO –Fisheries & Oceans Canada – Maritimes and Gulf Regions

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

RPSS – Real Property, Safety and Security

SARA – *Species at Risk Act*

SCH – Small Craft Harbours

the Act – *Canadian Environmental Assessment Act*

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 number of contaminated sites among federal government departments. These sites generally include harbours administered by Small Craft Harbours (SCH), light stations administered by Real Property Safety and Security (RPSS) and fixed aids, including minor shore lights and harbour ranges under the jurisdiction of the Canadian Coast Guard (CCG). The number of contaminated sites under DFO's management is partially attributable to the substantial number of properties that are owned (~8000 nationally) as well as the historic use of lead-based paint, the use and disposal of batteries, burning or dumping of waste, the use of mercury baths as part of the light rotation system at light station sites and the use of petroleum storage tanks.

DFO, as the proponent 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 environmental assessment at the screening level.

Each year approximately 10 individual screening reports are conducted for the remediation of contaminated soil at DFO properties in the Maritimes and Gulf Regions. Environmental assessments (EAs) to date have identified similar mitigation measures for all projects. These mitigation measuress 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.

The RCSR has evolved from previous remediation projects and follow-up programs that include proven design standards, best management practices, and effective mitigation that are supported by regulations and industry.

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 level 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 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 the likely adverse environmental effects. The *Canadian Environmental Assessment Agency* (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 conclusion regarding significance of environmental effects for all projects assessed by the replacement class screening. Once the Agency declares an RCSR no further environmental assessment regarding the significance of the environmental effects is required for projects within the class, provided 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 petroleum hydrocarbon contamination around petroleum storage tanks at many DFO sites. This contamination is usually the result of improper waste oil disposal procedures or spills during tank fill-up. 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). Typical volumes of contaminated soil for these sites range from 1 m^3 to 500 m^3. 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. The remediation work will be consistent among sites as would the time period associated with remediation. For example, 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 facility, backfilling the excavated area with clean fill and re-vegetating the impacted area. Nine environmental screenings were completed in 2006/07 for remediation projects in the Maritimes and Gulf regions.

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 at each proposed remediation site; therefore, the environmental settings are well documented and the nature and extent of contamination are well delineated. There is a common set of valued ecosystem components and a common understanding of project – environment interactions

3. *Unlikely to Cause Significant Adverse Environmental Effects, Taking into Account Mitigation Measures:* Due to the small amounts of impacted soil at each site, significant adverse effects are unlikely to occur when mitigation measures are in place. Recent remediation work has resulted in no significant adverse environmental effects identified during the remediation phase or post-remediation. All screenings completed in 2006/2007 shared the same mitigation measures.

4. *No Project-specific Follow-up Program Required:* Previous monitoring and follow-up programs have provided knowledge that has contributed to the current design criteria and construction methods, thus, further follow-up programs are unnecessary. Nevertheless, DFO - RPSS (Environmental Management) conduct quality assurance/quality control (QA/QC) checks to ensure mitigation measures are correctly implemented. Also, soil samples are extracted post project to ensure contamination is removed or contained and a walk-around is done to ensure proper re-vegetation after the project has been completed.

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 and priorized for remediation. 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 and with Environment Canada (EC), Public Works and Government Services Canada (PWGSC) and the Canadian Environmental Assessment Agency (the Agency). 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 conducted a 30-day public consultation on the RCSR. All comments received were taken into consideration and incorporated into the RCSR, as appropriate, before its declaration by the Agency.

Internal consultation with DFO - RPSS (Environmental Management) and SCH 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.

1.4 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 of assessments in a timely manner. The Registry consists of two components – an Internet site and a project file.

The 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 an RCSR.

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

- the title of each project for which the RCSR was used;
- the location of each project;
- contact information (name or number); 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 a statement is:

- July 15 – (for projects assessed from April 1 to June 30)
- October 15 – (for projects assessed from July 1 to September 30)
- January 15 – (for projects assessed from October 1 to December 31)
- April 15 – (for projects assessed from January 1 to March 31)

The project file must include a copy of the RCSR. The RA must maintain the file, ensure convenient public access, and respond to information requests in a timely manner.

Further sources of information regarding the Registry can be found in "*The Guide to the Canadian Environmental Assessment Registry*", prepared by the Agency (http://www.ceaa-acee.gc.ca/012/012/overview_e.htm).

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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 this regulation 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 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 two methods of remediation of contaminated soils: capping of small areas of contamination and extraction and back-filling of areas of contamination. Projects subject to the RCSR are those undertaken within the three Maritime Provinces of Canada, namely Nova Scotia, New Brunswick and Prince Edward Island.

Characteristics of Capping projects subject to the RCSR:

- on previously developed land
- 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.

Characteristics of Excavation and Backfill projects subject to the RCSR:

- on previously developed land
- quantity of impacted soil limited to a maximum of $500m^3$
- 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 or innovative remediation methods planned or required
- Work would involve activities closer than 2 m from a water body.
- 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
- Requiring a provincial environmental assessment
- Requiring another permit, approval or authorization from another federal department
- Presence of a Species at risk, active breeding bird colony or bird migration staging area.

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, within 20 metres of the project site.
- 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, within 20 metres of the project site.

Project officers must review the project description using the RCSR and consult with DFO-RPSS resource personnel who will run a species at risk 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, project officers must not proceed using the RCSR.

Similarly, project officers must consult with DFO-RPSS personnel with regard to the location and seasonality of any nearby bird nesting colonies.

Project officers must consult with personnel at DFO-RPSS and DFO-Habitat and Species at Risk Branch if the project will require work between 2 and 5 metres of a water body.

Some DFO facilities are located within or adjacent to properties owned by the Parks Canada Agency. Parks Canada properties are often in sensitive areas. Parks Canada has a mandate to preserve ecological integrity in its parks and is a stakeholder in the “greater park ecosystem” surrounding parks. Any work to be done on properties within parks or in adjacent areas will (if deemed necessary after consultation with park authorities) undergo an EA independent of this replacement class screening.

Similarly, project officers or DFO-RPSS officers must consult with Environment Canada personnel with regard to projects located in or adjacent to National Wildlife Areas or Migratory Bird Sanctuaries.

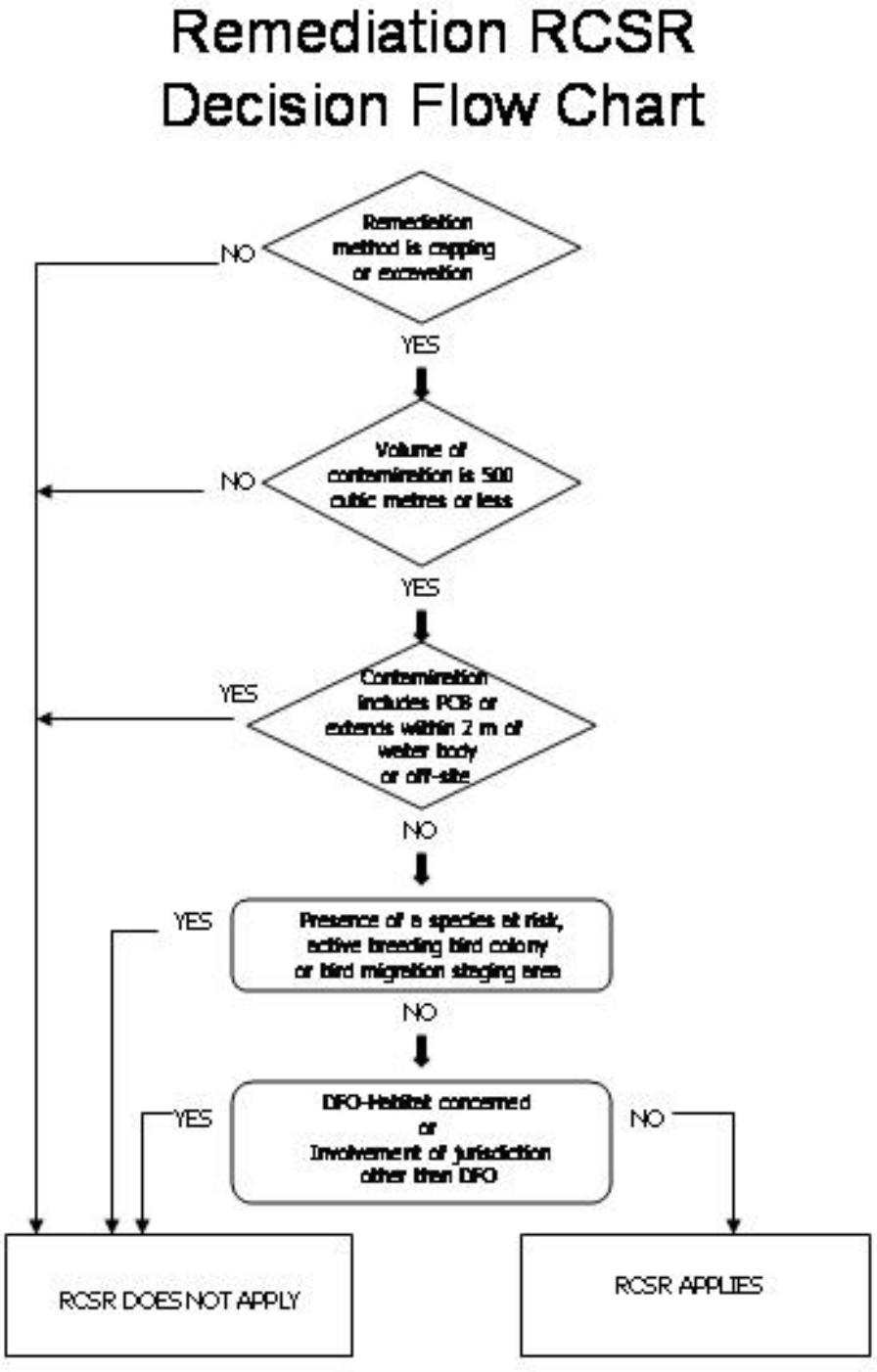


Figure 1: RCSR Decision Flow Chart

3. Project Class Description

The project class is characterized by a large geographic boundary. All DFO owned properties within the Maritimes and Gulf regions (covering Nova Scotia, New Brunswick, Prince Edward Island) are included in the project class. The Magdalene Islands and Newfoundland and Labrador are not included. The minor remediation projects are typically located at SCH and RPSS properties, although some may be located at fixed aids sites (minor shore lights or harbour ranges) or at currently vacant 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 disturbed terrestrial environment but often within 30 metres of marine waters.

Figure 2 shows the geographic area under consideration, and delineates the boundary between the Maritimes and Gulf Regions. Project sites will be in the yellow highlighted coastal areas. The blue line from west to east is the division between the Maritimes Region, to the south, and the Gulf Region, to the north.

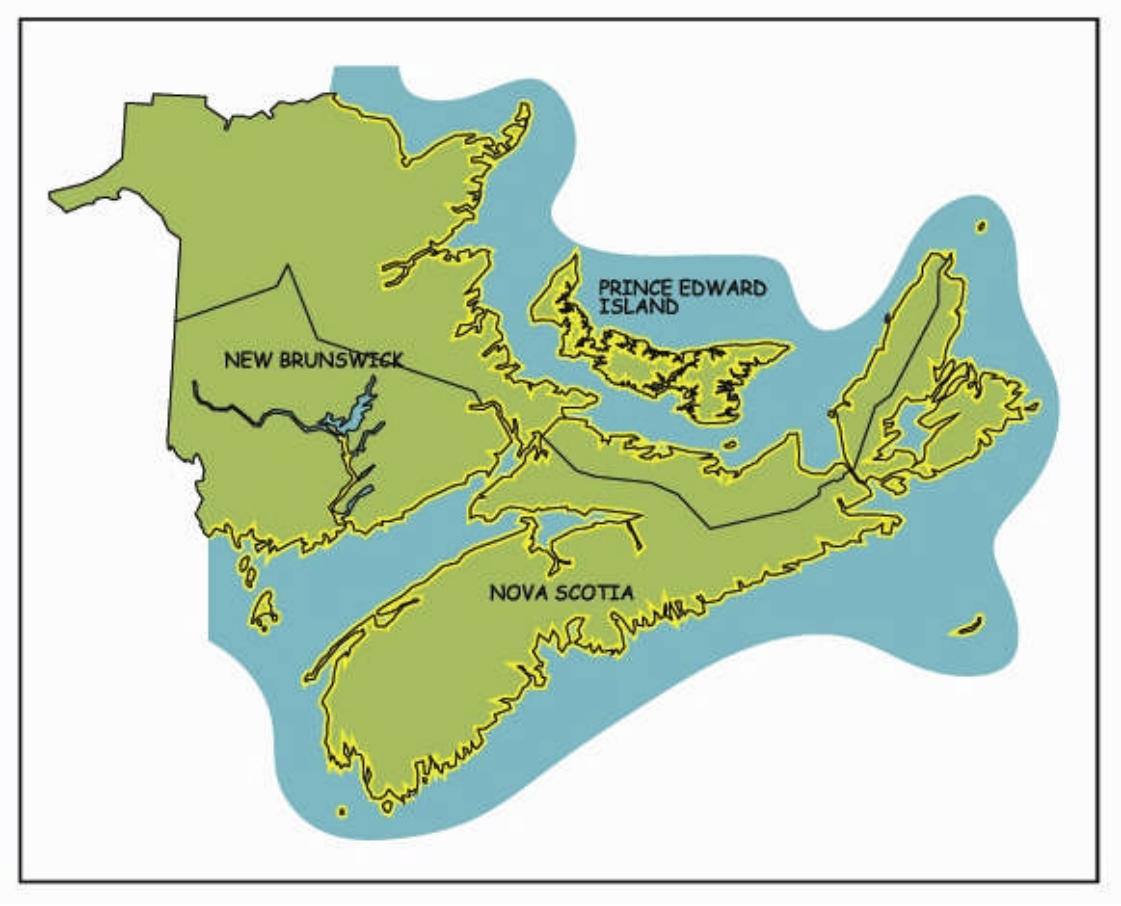


Figure 2: RCSR study area

Within the project class, the project scope is quite narrow, essentially confined to the upland service area of a harbour or the disturbed area around a light station or fixed aid property. The remediation work will be done directly on site by suitable machinery and, for remediation projects involving excavation and offsite disposal, the contaminated soil transported off site to a provincially approved landfill site and clean back fill or capping material transported to the site. The actual work site and adjacent area will be where the excavation, soil testing, and backfilling activities will occur.

3.1 Seasonal Scheduling and Duration of Projects

Excavation, soil testing, backfilling, and revegetation 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.

3.2 Effects of the Environment on the Project

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.
- 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.

3.3 Remediation

Site remediation is a series of progressive and logical steps developed by the Contaminated Sites Management Working Group of the Government of Canada (Government of Canada, 1999) (http://www.federalcontaminatedsites.gc.ca/publications/fa_af/fa_af-eng.pdf). 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) on 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 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.

Step 8: The Remediation Process

Site remediation is intended to return a contaminated site to a state in which there is no 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 future land use.

Remediation is intended to eliminate or sequester contaminants so that there is no 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; or excavation and backfilling with clean fill, with the contaminated soils placed in a safe storage location or processed to extract the contaminants. Site-specific remediation action plans (RAPs) are designed by environmental professionals taking 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.

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 soil to be replaced. For the purposes of

this RCSR, soil capping and soil excavation, removal and back filling with clean fill are considered, where the volume of contaminated soil is less than 500 cubic metres.

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 soils or groundwater. Capping is also an effective risk management strategy as it limits exposure to the contaminants, and reduces health risks. Caps can be clay, geotextile, pavement or a combination of these. Caps are meant to be permanent and must remain undisturbed or be protected from disruption. Caps can be covered with topsoil and revegetated with shallow rooting plants that will not penetrate the cap.

Soil excavation is the removal of contaminated soil with an excavator or by another suitable method. Removal is usually by trucks which are sealed and covered to prevent contaminated material from leaking or blowing onto the transport route and surrounding area. Contaminated materials are transported to provincially approved landfill disposal sites. 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 revegetated with local vegetation or repaved depending on the context of the site.

Step 9: Verification Sampling and 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 is conducted to verify removal of all impacted soil. The imported backfill can also be sampled to ensure its acceptability. Monitoring wells can be installed to check for mobilization of contaminants from capped sites or from neighbouring sites. The data from these samplings are documented and the resulting reports are held in the project file for reference or 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.

4. Environmental Review

DFO has recently conducted several remediation projects involving soil capping or excavation. Individual screenings 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 then an individual EA will be conducted.

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

4.1 Environmental Assessment Boundaries

The environmental assessment boundaries for the RCSR have been defined by the terrestrial boundaries of Nova Scotia, New Brunswick, and Prince Edward Island and the adjacent coastal portion of Canada's territorial waters in the Atlantic Ocean. Within the RCSR boundary, DFO manages over 9,300 km of coastline (Natural Resources Canada 2005). 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 or fixed aid 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.

Minor remediation projects usually require from one day to one week for completion.

4.2 Environmental Setting

Contaminated sites generally occur in small craft harbours, at light stations or at sites of fixed navigation aids.

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. The location of many of these harbours tends to be in sheltered bays, inlets, or behind promontories giving access to adjacent fishing grounds, however some harbours are almost entirely human made.

The primary purpose of fixed aids to navigation is to "facilitate the safe and expeditious movement of maritime traffic" (CCG-ANP 2005). The locations selected for light station 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.

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 Maritime Provinces is included.

Environmental Settings of Small Craft Harbours, Light Stations and Terrestrial Fixed Aids

Sites may be located on any of the substrates that occur across the Maritimes in terrestrial and aquatic environments. Typical substrates within project boundaries include bedrock, rock, cobblestone, sand, or mudflats. Strictly terrestrial areas may also be characterized by the presence of soils or organic overburden.

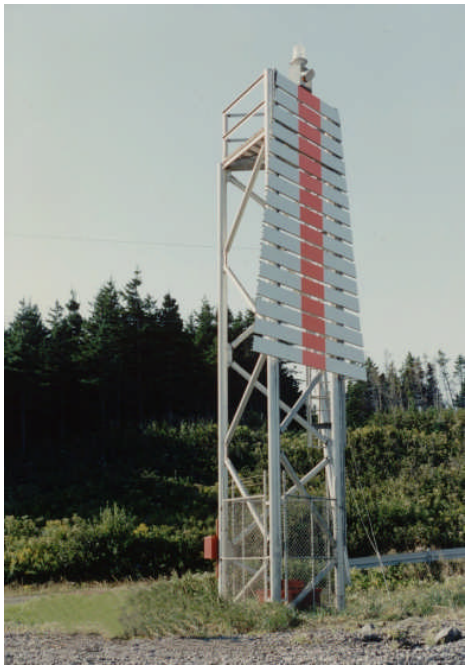
SCH is a branch of DFO that is responsible for the management of a national system of harbours that accommodates primarily commercial fishing vessels, including approximately 320 harbours in the Maritimes and Gulf Regions. The harbours also serve a wide range of other interests including recreational boaters, 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.

Cribbon's Point Small Craft Harbour, NS

There are 86 major shore lights (light stations) in the Maritimes and Gulf Regions. 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 on the following page.

Carter's Island Light Station, NS

Terrestrial fixed aids, apart from light stations, can be shore ranges, lattice towers, beacons, posts or other configurations. There are about 500 of these in the Maritimes and Gulf Regions. They are built to be highly visible to vessels. They 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.



Eddy Point Range Light, NS

Ecozones

All of the sites under consideration are located within the Atlantic Maritime Ecozone of Canada (Environment Canada 2005), which includes the three Maritime Provinces of Nova Scotia, New Brunswick and Prince Edward Island.

The Atlantic Maritime Ecozone describes a cluster of peninsulas and islands which form the northeastern end of the Appalachian mountain chain that runs from Newfoundland to Alabama.

Over 9000 kilometres of coastline are deeply indented by tidal inlets and impressive sand dunes. Almost 4000 offshore islands dotted with lagoons and extensive marshes ring Nova Scotia. Red sandstone cliffs and hard volcanic rocks in the Bay of Fundy tower over intertidal beaches up to 5 kilometres wide.

The proximity of the Atlantic Ocean creates a moderate, cool, and moist maritime climate. Most of the ecozone experiences long, mild winters (averaging about -4°C in January) and cool summers (the mean daily July temperature is 18°C). Coastal communities are generally several degrees warmer in winter and slightly cooler in summer.

During late spring and early summer, the mixing of the cold Labrador Current and the warm Gulf Stream produces frequent banks of sea fog over coastal areas. Average precipitation varies from 1000 mm inland to 1425 mm along the coast. The average annual growing season ranges from 1500 to over 1750 growing degree days above 5°C. Frost-free days, on average, fluctuate from 80 in the New Brunswick highlands to 180 along the coast. With a storm frequency higher than anywhere else in Canada, sunshine can be a rare commodity (Environment Canada 2005).

Heritage Resources

The Maritime Provinces are rich with heritage resources from historic and pre-historic times, dating back 500 and 1,200 years respectively. The most frequently recorded archaeological sites include shell middens, lithic scatters, pictographs and petroglyphs, and rock formation sites including fish weirs and traps, canoe runs and cairns.

Light stations occupy a prominent position in the heritage consciousness of Maritime 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.

Species at Risk

There are numerous species at risk within the RCSR boundary due to the large area that it encompasses. Species include marine and terrestrial mammals, birds, amphibians, fishes, arthropods, mollusks, 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 accessed through DFO-RPSS personnel.

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 corporate knowledge.

A Valued Ecosystem Components (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. 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.

Table 1: Project - Environment Interaction Matrix

		Valued Ecosystem Components																																									
		PHYSICAL – CHEMICAL EFFECTS																	ECOLOGICAL EFFECTS												ANTHROPOGENIC EFFECTS												
		WATER RESOURCES						LAND RESOURCES					ATMOSPHERIC QUALITY						SPECIES AND POPULATIONS								COMMUNITIES AND HABITATS				HEALTH AND SAFETY		SOCIAL AND ECONOMIC STABILITY										
																			TERRESTRIAL				AQUATIC																				
PROJECT PHASE	PROJECT ACTIVITIES	WATER TABLE ALTERATION	GROUND WATER FLOW	GROUND WATER QUALITY CHANGES	SHORELINE AND BOTTOM ALTERATION	SURFACE FLOW VARIATION	SURFACE WATER QUALITY CHANGES	SOIL EROSION	UNIQUE PHYSICAL FEATURES	COMPACTION AND SETTLING	STABILITY (SLIDES AND SLUMP)	GEOLOGY	AIR QUALITY	WIND	INVERSION/ FOGGING	TEMPERATURE	NOISE	DUST	TERRESTRIAL VEGETATION	BIRDS AND MAMMALS	AMPHIBIANS AND REPTILES	INVERTEBRATES	AQUATIC VEGETATION	BIRDS AND MAMMALS	AMPHIBIANS AND REPTILES	FISH AND INVERTEBRATES	TERRESTRIAL COMMUNITIES	TERRESTRIAL HABITATS	AQUATIC COMMUNITIES	AQUATIC HABITATS	HEALTH RISKS (Chemical)	SAFETY RISKS (Physical)	DEMOGRAPHY	LOCAL ECONOMY	REGIONAL TRANSPORTATION	COMMUNITY INFRASTRUCTURE	HEALTH EDUCATION AND SOCIAL SERVICES	HERITAGE RESOURCES	LIFESTYLE AND QUALITY OF LIFE	LABOUR	REGIONAL ECONOMY	LAND/ RESOURCE USE	AESTHETIC
MOBILIZATION	**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 of Waste Materials					•	•				•						•	•	•	•	•	•						•	•	•	•				•			•		•			•
DEMOBILIZATION	**UPSETS** (incl. operation of all equipment required for operations above)						•	•		•	•		•				•	•	•	•	•	•	•	•	•	•					•	•		•	•			•		•	•		•
	DECOMMISSIONING						•										•						•	•	•	•				•		•											

VECs 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 that contain several ecosystem components. Table 2 provides a summary of the VEC categories.

Table 2: Valued Ecosystem Components

VEC Category	Ecosystem Components
Physical - Chemical	• Water Resources • Land Resources • Atmospheric Quality
Ecological	• Species and Populations • Habitat and Communities
Anthropogenic	• Health and Safety • Social and Economic Stability

VECs 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 3.

Table 3: 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. - supports anthropogenic uses such as fishing, recreation, and transportation.	- 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. - anthropogenic values include recreation, archaeological, and industrial	- 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 - anthropogenic values include health, recreation, and aesthetic	- remediation	- chemical/physical interactions from machinery operation

Ecological			
Species and Populations	- indicator for ecosystem health and resiliency - anthropogenic values include recreation, industry, education, and health	- remediation	- chemical/physical interactions from machinery operation, excavation, filling, and capping
		- operation	- potential for re-contamination of the site during activities of site users
Communities and Habitats	- contribute to species survival and biodiversity - anthropogenic values include recreation, industry, education, and health	- 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 - components for the building of strong families and communities	- all phases	- potential accidents and health repercussions from physical dangers including machinery operation and contact with chemicals
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 4.

Physical-Chemical Effects

Water: Changes in surface water 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.

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.

Ecological Effects

Minor remediation projects are 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.

Anthropogenic Effects

Project crews are vulnerable to health risks from exposure to fumes from machinery, and contaminated soils. Safety risks may result from machinery operation, accidental falls, and site access. Further effects include potential disruption of heritage resources such as archaeological sites and artefacts.

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 4 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 Mitigation

Mitigation measures that address the environmental effects associated with remediation activities are based on existing Best Management Practices (BMP) and procedures. These documents are 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.

A full copy of the RCSR mitigation measures is included in Table 4, which includes a summary of the potential environmental effects and mitigation measures that address these effects organized by VEC. Standard mitigation organized by project activity is included in Appendix 2 with the intention of providing a convenient reference for crews to access the mitigation to be implemented.

The “Federal Approach for Contaminated Sites” 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 and related BMPs 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.

Table 4: 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.	SITE ACCESS 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. EXCAVATION 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. 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. 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 1-800-565-1633. 6. A buffer zone of 2 meters must be maintained between the work area and water bodies. 7. 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. REMEDIATION 1. Activities must be managed (silt fences, tarpaulins, catch basins, etc.) to prevent fines and organic debris entering nearby aquatic environments. 2. Equipment maintenance activities must be completed in a manner that prevents the deposit of foreign materials into the environment. DEMOBILIZATION 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	Soil erosion, compaction, and settling, and changes in stability may result from machinery operation.	SITE ACCESS 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. MACHINERY OPERATION 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.
	Excavation/filling may physically change soil or rock structure	EXCAVATION 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.	MACHINERY OPERATION 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	Short term disturbance from project activities to terrestrial and aquatic habitats and species. (Silt coming from site). Invasive plants may disrupt local	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

VEC	Potential Environmental Effects	Mitigative Measures
	populations.	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.
ANTHROPOGENIC EFFECTS	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 affected by temporary disruptions during works.	GENERAL 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.
		MACHINERY OPERATION 1. Machinery must be operated efficiently, to ensure that noise and air quality issues are short-term and local.
	The aesthetic of construction, operation, and decommissioning could be perceived to be negative.	GENERAL 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	GENERAL 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.

4.7 Analysis and Prediction of Significance of Residual Environmental Effects

Residual effects are "those environmental effects that remain after the application of design standards and the implementation of mitigation measures" (Virtue 2005). 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 5). 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-RA 2003). 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 5: 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 insignificant. Table 6, below, includes a summary of the criteria and significance of the residual environmental effects associated with minor remediation projects.

Summary of Significance of Residual Environmental Effects

All residual environmental effects remaining after the application of recommended mitigation measures were found to be negligible, insignificant, 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 insignificant impacts. DFO concludes that projects under this RCSR will not likely contribute to significant adverse environmental effects.

Table 6: Significance of Residual Environmental Effects

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

			Criteria Ratings					
VEC	**Project Phase/Elements**	**Residual Environmental Effects**	**Magnitude**	**Geographic Extent**	**Duration of Effect**	**Frequency of Effect**	**Reversibility**	**Significance**
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	1	1	+3	+3	1	**Not Significant**

4.8 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.

Interactions between minor remediation projects

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) 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 of 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 VECS

Taking the mitigation measures from section 4.6 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 of project boundaries which could have the potential to act in a cumulative manner on affected VECs. 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.

5. Roles and Responsibilities

5.1 Responsible Authorities

DFO, as the proponent, can be considered the lead RA for all components of the RCSR. RPSS Environmental Management will represent DFO in application and management of this report. It should be noted that since the RA is DFO, the RCSR can be applied, where appropriate, by all members of the department. 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

It is highly unlikely that there will be other RAs for minor remediation projects at DFO facilities. The following sections describe the roles and responsibilities of other federal authorities that may be involved in minor remediation projects.

5.2.1 Transport Canada

This RCSR does not exempt DFO from the requirement to obtain approval in accordance with Federal laws such as the *Navigable Waters Protection Act* (NWPA). The NWPA requires that the proponent (DFO) apply for approval of any work located in, on, over, under, through or across any navigable water. However, the scope of the minor remediation projects included in this RCSR does not include any such work, so Transport Canada is not an RA.

5.2.2 Others

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 within DFO 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.

It should be noted that provincial permits are not required for minor remediation projects and that existing provincial regulations, when properly followed, cover the activities associated with remediation work.

6. Procedures for Amending the Replacement Class Screening Report

The purpose of an amending procedure is to allow for modification of the RCSR after experience has been gained with its operation. The reasons for such modification may include:

- clarification of the document and procedures;
- streamlining or modifying the planning process in areas where problems may have arisen;
- minor modifications and revisions to the factors to be considered in the assessment to reflect new or changed regulatory requirements, policies or standards;
- extension of the application of the RCSR to RA(s) who were not previously declared users of the report; and/or
- new procedures and environmental mitigation practices that have been developed over time.

The RA will notify the Agency in writing of its interest to amend the RCSR. It will discuss the proposed amendments with the Agency and affected federal government departments and may invite comment from stakeholders and the public on the proposed changes. The RA will then submit the proposed amendments to the Agency, along with a statement providing a rationale for each amendment proposed.

The Agency may amend the RCSR without changing the declaration period if the changes:

- are minor;
- represent editorial changes intended to clarify or improve the screening process;
- 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; and
- do not reflect new or changed regulatory requirements, policies or standards.

The Agency may initiate a new declaration for the RCSR for the remaining balance of the original declaration period or for a new declaration period if the changes:

- are considered to be substantial; or
- 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.

6.1 Term of Application

This report will be in effect for 5 years from its date of declaration. Near the end of the RCSR application period, DFO will review content and usage to allow for report update and preparation for a potential re-declaration.

7. Bibliography

Canadian Coast Guard Pacific Region, Technical Services. 1999. Fuel Spill Contingency Plan for Lightstations. Unpublished Report. Victoria, BC.

Canadian Coast Guard Pacific Region, Maritime Services.(CCG-MS) 2004. CCG Protocol for On-site Visits to Navigation Aids in Sensitive Bird Nesting Sites. Unpublished Report. Victoria, BC.

Canadian Coast Guard Aids to Navigation Program (CCG-ANP) [web page] 2005. http://www.ccg-gcc.gc.ca/atn-aln/main_e.htm.

Canadian Environmental Assessment Agency (CEAA-RA) [web page] 2003. Responsible Authority's Guide. http://www.ceaa-acee.gc.ca/013/0001/0008/intro_e.htm.

Canadian Environmental Assessment Act. 2004. http://laws.justice.gc.ca/en/C-15.2/text.html.

Canadian Environmental Assessment Act, *Exclusion List Regulations 2007*. [web page] http://laws.justice.gc.ca/en/ShowTdm/cr/sor-2007-108///en.

Canadian Environmental Assessment Agency. 1994. Reference Guide: Addressing Cumulative Environmental Effects.

Canadian Environmental Assessment Agency (CEAA). 2002. Screenings under the Canadian Environmental Assessment Act: Participant Guide. Unpublished report. Vancouver, BC.

Contaminated Sites Management Working Group [web page]. 1999. Government of Canada, (http://www.ec.gc.ca/etad/csmwg/pub/fed_aprch/en/toc_e.htm).

Department of Fisheries & Oceans, Pacific Region Operational Statements [web page] 2005. http://www-heb.pac.dfo-mpo.gc.ca/decisionsupport/os/operational_statements_e.htm

Dillon Consulting Limited, 1999. *A federal approach to contaminated sites.* for the Contaminated Sites Management Working Group of the Government of Canada. http://www.ec.gc.ca/etad/csmwg/index_e.html.

The Cumulative Effects Assessment Working Group and AXYS Environmental Consulting Ltd. for the Canadian Environmental Assessment Agency. 1999. Cumulative Effects Assessment Practitioners Guide.

Environment Canada. [web page] 2005. Narrative Descriptions of Terrestrial Ecozones and Ecoregions of Canada. http://www.ec.gc.ca/soer-ree/English/Framework/NarDesc.

BC Ministry of Water, Land and Air Protection, Ecosystems and Biodiversity Branch. 2004. Standards and Best Practices for Instream Works.
http://wlapwww.gov.bc.ca/wld/documents/bmp/iswstdsbpsmarch2004.pdf

Natural Resources Canada. [web page] 2005. The Atlas of Canada: Coastline and Shoreline. http://atlas.gc.ca/site/english/learningresources/facts/coastline.html#c4.

8. Personal Communications/Consultations

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Guy Robichaud, DFO-Gulf Region, Habitat Protection and Sustainable Development Division

Tamara Skillen-Haynes: Class Screening Advisor. Canadian Environmental Assessment Agency.

Robyn-Lynne Virtue: Class Screening Advisor. Canadian Environmental Assessment Agency.

Appendix 1 - Environmental Information Resources

Environmental Information Resources

Fisheries and Oceans Canada	• Home page (http://www.dfo-mpo.gc.ca/) • Atlantic Region Operational Statements (http://www.dfo-mpo.gc.ca/oceans-habitat/habitat/modernizing-moderniser/epmp-pmpe/index_e.asp)
Environment Canada	• Atlantic Region (http://www.atl.ec.gc.ca/index_e.html)
Canadian Environmental Assessment Agency	• Canadian Environmental Assessment Agency (http://www.ceaa-acee.gc.ca) • Canadian Environmental Assessment Registry (http://www.ceaa-acee.gc.ca/050/index_e.cfm)
Province of Nova Scotia	• Home page (http://www.gov.ns.ca) • Natural Resources • Heritage/Archaeology • Species at Risk
Province of New Brunswick	• Home page (http://www.gov.nb.ca/) • Natural Resources • Heritage/Archaeology • Species at Risk
Province of Prince Edward Island	• Home page (http://www.gov.pe.ca/) • Natural Resources • Heritage/Archaeology • Species at Risk
Species at Risk data	• Atlantic Canada Conservation Data Centre home page (http://www.accdc.com) • Species at Risk (www.speciesatrisk.gc.ca) • Species at Risk Registry (http://www.sararegistry.gc.ca/) • Species at Risk, Search by Map English: (http://www.speciesatrisk.gc.ca/map/default_e.cfm) French: (http://www.speciesatrisk.gc.ca/map/default_f.cfm) • Committee on the Status of Endangered Wildlife in Canada (http://www.cosewic.gc.ca)

Appendix 2 - Standard Mitigation by Project Activity

PROJECT ACTIVITY	MITIGATION
GENERAL (to be incorporated into all activities below)	1. Ensure all personnel involved with activities are adequately trained and utilize appropriate personal protective equipment. 2. Storage of fuels and petroleum products must comply with safe operating procedures, including containment facilities in case of a spill. Onsite crews must have emergency spill equipment available. All spills must be reported to the 24 hour environmental emergencies reporting system phone number (1-800-565-1633). 3. Waste or any miscellaneous unused materials must be recovered for either disposal in a designated facility or placed in storage. Under no circumstances will materials be deliberately thrown into the marine or terrestrial environment. 4. 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. 5. 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. 6. 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. 7. Proper notice should be given to authorities to warn of potential disruptions during works. 8. 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.
MACHINERY OPERATION	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. 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. 3. Vehicles must not be operated below the Highest High Water mark or in wetlands. 4. Operations should 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. 5. Machinery must be operated efficiently, to ensure that noise and air quality issues are short-term and local.
SITE ACCESS	1. Site access practices must be undertaken with regard to resident terrestrial, wetlands and aquatic plants and animals. Cross country access may only occur in winter when habitats are solidly frozen and stable. 2. Vehicles must not be operated in the intertidal zone (below the Highest High Water mark).
REMEDIATION	1. Excavation activities must be conducted conservatively so that physical changes to soils remain small and localized. 2. Work practices must prevent the movement of dust and fines into any surface water or wetland. 3. 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. 4. Clean fill must be tamped appropriately to prevent post-project subsidence of the surface horizon.

PROJECT ACTIVITY	MITIGATION
	5. Loose material at excavation and stockpile sites must be managed (silt fences, tarpaulins, catch basins, etc.) to prevent migration of silt and debris to nearby waters or wetlands. 6. Heavy rainfall events must be avoided by monitoring weather forecasts and scheduling accordingly. 7. Any accumulation of water in an excavation must be pumped into a truck or container and treated for silt and contaminants before release. 5. Revegetation must be with seed mixes of local species of plants. Seed mixes that include invasive species must not be used. 8. Archeological 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. 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.
DECOMMISSIONING	1. All debris deposited throughout the life of the project must be removed from the site. 2. All tools, pumps, pipes, hoses, machines, trucks or other items used in the project must be washed off in such a way as to prevent the wash off water from entering the aquatic environment. The wash water must be contained and disposed of upland in an environmentally acceptable manner.