Remedial Action Plan Protocol

Adopted by the Minister of Environment

Pursuant to the Contaminated Sites Regulations

Adopted by the Minister of Environment,
Hon. Sterling Belliveau, on July 3, 2013, effective as of July 6, 2013

Document No.: PRO-600

Revision: July 6, 2013

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1 OBJECTIVES

This *Remedial Action Plan Protocol* is applicable to the requirements of a remedial action plan (RAP) to be filed as part of the Limited Remediation option or the Full Property Remediation option under clause 13(1) (b) or clause 15(1) (c) of the *Contaminated Sites Regulations.*

The RAP is a plan that identifies site-specific remedial objectives for a site. It describes a preferred conceptual remediation plan to reduce the risks of contamination to acceptable levels. It provides a performance monitoring plan, and, if appropriate, requirements for long term site management.

The selection of limited remediation or full property remediation as defined in Section 2 of the *Contaminated Sites Regulations* must be made prior to the preparation of a remedial action plan. The environmental site assessment requirements for limited or full property remediation vary depending on the selected remediation category. Considering this variability, the applicability of the L1, L2 and L3 environmental site assessment categories are presented under protocol PRO-200, *Environmental Site Assessment for Limited Remediation Protocol*.

Section 5 of protocol PRO-500, *Remediation Levels Protocol*, defines unconditional and conditional closures.

For limited and full property remediation, unconditional closure can be achieved by demonstrating that the objectives of the remedial action plan and the closure monitoring have been achieved without further requirement for exposure management controls and on-going site management. Unconditional closure places no restrictions on the use of the property.

For limited remediation, conditional closure may be used on a site, with the exception of sites that have undergone an L1 Environmental Site Assessment (ESA). In cases where exposure management controls and long term site management are used for conditional closure a risk management plan documenting these measures must be prepared.

This protocol details the requirements for developing and implementing a remedial action plan related to either regulatory pathway chosen, including completed checklist CHK-600: Remedial Action Plan Checklist.

The *Remedial Action Plan Protocol* is intended for the use a site professional, the qualifications for which are as defined in Section 5 of the *Contaminated Sites Regulations*

2 DEFINITIONS

Atlantic RBCA: means the current versions of Atlantic Risk Based Corrective Action guidance documents including the Petroleum Hydrocarbon Impacted Sites User Guidance and software modelling tool, Guidance for Soil Vapour and Indoor Air Monitoring Assessments from Atlantic RBCA

and Guidelines for Laboratories as published by the Atlantic Partnership in RBCA Implementation committee.

L1 Limited Remediation: means the process used to assess contamination of soil following a release from a single source with single or multiple contaminants of concern.

L2 Limited Remediation: means the process used to assess contamination of soil, groundwater, sediment and surface water from a single source with single or multiple contaminants of concern.

L3 Limited Remediation: means the process used to assess contamination of soil, groundwater, sediment and surface water associated with single or multiple sources and/or contaminants of concern. Upon completion of the L3 environmental site assessment process the site professional has assessed the presence and extent of contaminants associated with all sources identified on the property.

Tier 1 Environmental Quality Standards (EQS): means the comprehensive tables in protocol PRO-100, *Notification of Contamination Protocol* which provide substance generic environmental quality standards that may be used for remediation levels. These standards represent a standardized level of risk for contributing pathways, based on land use and other factors.

Tier 2 Pathway Specific Standards (PSS): means the comprehensive tables with individual standards identified to assess all contributions to substance risk in all applicable exposure pathways, based on land use and other factors. The Tier 1 EQS are produced from the Tier 2 PSS. The Atlantic RBCA PSSL (pathway specific screening level) information for petroleum hydrocarbons is included in the Tier 2 PSS tables.

Tier 2 Site Specific Risk Assessment (SSRA): means an environmental risk assessment that is based on conditions at a particular site. The SSRA evaluates actual site risks and produces remediation site specific target levels (SSTLs) as alternate remediation criteria. For petroleum hydrocarbons, the Tier 2 SSRA is modelled using Atlantic RBCA. For other substances, additional computer models or calculation methodologies can be used.

3 REMEDIAL ACTION PLAN REQUIREMENTS

The person responsible, in conjunction with the site owner, must determine whether to use Tier 1 EQS criteria (found in protocol PRO-100, *Notification of Contamination Protocol)*, Tier 2 (unconditional or conditional) criteria (found in protocol PRO-500, *Remediation Levels Protocol*), or exposure management measures (for long-term site management) to direct necessary remedial action to meet the remedial objectives.

A remedial action plan must include:

a) names and contact information of all key personnel

b) a summary of all data collected on contaminants identified during the environmental site assessments

c) description of contaminants of concern and the affected media (e.g. soil, groundwater, sediment or surface water)

d) the selected remediation pathway, either limited remediation or full property remediation; in the case of limited remediation, including the appropriate environmental assessment category (L1, L2, or L3), as defined in Section 2.0 of this protocol

e) identification of the remediation criteria in accordance with protocol PRO-500, *Remediation Levels Protocol* which will form the basis for confirming completion of remediation

f) detailed description of the remediation to be conducted, including consideration of physical/chemical limitations, construction requirements, and environmental implications

g) description of any control measures and contingency plans to mitigate potential adverse effects to adjacent and on site receptors

h) documentation and derivation of any site specific target levels calculated in a risk assessment in accordance with protocol PRO-500 *Remediation Levels Protocol*, including use of Atlantic RBCA methodology for petroleum hydrocarbons

i) where soil vapour and indoor air sampling are conducted, confirmation that the latest version of the Atlantic RBCA "Guidance for Soil Vapour and Indoor Air Monitoring Assessments", as referenced in protocol PRO-500, *Remediation Levels Protocol* has been followed

j) any intended subsurface injections, including microbial solutions, oxygen release chemicals, chemical oxidizing solutions, etc.

k) remedial verification and long-term monitoring plans (if required) to measure the progress of restoring the environment to the goals identified

l) in cases of conditional closure, a Risk Management Plan (Section 5) describing long-term exposure management measures.

m) any impacted soil, sediment, groundwater or surface water not treated on-site under the RAP must be sent to an approved treatment or disposal site.

n) any backfill material that is used must be of acceptable quality and must meet remediation criteria for the site.

4 THIRD PARTY PROPERTIES

In cases where contamination extends off-site, clean-up on the third party properties must be conducted to meet Protocol PRO-100 *Notification of Contamination Protocol* Tier 1 EQS criteria or unconditional Tier 2 criteria from protocol PRO-500, *Remediation Levels Protocol*. A plan must be included in the RAP to identify the planned remediation associated with the work.

a) Unless Section 4.1 applies, remedial work on an affected third party property will be required before filing form FRM-700, Record of Site Condition, or form FRM-701, Declaration of Property Condition.

b) The written consent of a third party property owner is required for application of Tier 2 conditional criteria.

4.1 Access to Third Party Properties

If the person responsible is prevented from accessing a potentially impacted third party property and wishes to file a Record of Site Condition form (FRM-700) or Record of Site Condition form (FRM-701), for the source property, the person responsible must:

a) identify all potentially impacted third party properties based on analytical data collected from the closest applicable property lines

b) compare the data to the applicable protocol PRO-100, *Notification of Contamination* Tier 1 EQS criteria for the third party property

c) provide evidence of all reasonable efforts to gain access to the third party property, including a copy of form FRM-600, Third Party Access Denial (Appendix 1) provided to the third party property owner.

5 RISK MANAGEMENT PLAN REQUIREMENTS

In cases of conditional closure, a Risk Management Plan is required to be included with the RAP submission. A Risk Management Plan provides information on the long-term measures that are

needed to properly manage the health and environmental risks of a site, where contamination remains on the site.

The Risk Management Plan must include a description of the long-term exposure management measures appropriate for a contaminated site. Long-term exposure management measures may include monitoring pathway exposures as well as acceptable controls for reducing or eliminating contaminated site exposures. Monitoring is intended to confirm that receptor exposure does not occur over time, despite the existence of contamination on a site. Exposure controls may involve engineering or physical controls as well as administrative receptor access controls.

To ensure information is linked to properties, conditions associated with site monitoring, inspection and maintenance of exposure management controls must be documented in a Risk Management Plan. These must be included as part of the Remedial Action Plan, meeting the specifications that follow. A similar description is also found in protocol PRO-500, *Remediation Levels Protocol*.

5.1 Exposure Management using Monitoring to Confirm No Exposure to Receptors

When monitoring is used as a means to verify exposure management of a contaminated site, a detailed long-term monitoring plan is required including the following:

a) sufficient initial monitoring to verify that site contaminants in any affected media are not mobile

b) identification of pathways of concern that need to be monitored

c) long-term monitoring plan preparation showing the contaminants to be monitored, which media are to be sampled and the frequency of monitoring

d) establishment of monitoring action target levels

e) description of actions to be taken if monitoring results exceed action levels

5.2 Exposure Management with Engineering or Physical Controls

Soil or groundwater contamination exceeding remedial objectives for a site (Tier 1 EQS or Tier 2 levels) may be left in place if appropriate engineering or physical controls ensure that receptors are not exposed to the contaminant hazards. This includes such controls as fencing, caps, covers, barriers, vapour removal systems, indoor ventilation, liners and groundwater hydraulic barriers, among others. Requirements by the Minister

regarding engineering or physical controls that must be included in the Risk Management Plan are:

a) physical controls must be appropriately designed, or otherwise determined by site professionals

b) demonstrated effectiveness of physical controls prior to closure

c) ongoing monitoring and inspection of proper physical control function

d) proper consideration of the physical controls used since they will affect the type of site closure as well as requiring long-term exposure management requirements.

5.3 Exposure Management Using Administrative Restricted Access Controls

As an alternate to physical controls, exposure to site contaminants may be managed by administrative controls that effectively restrict access to contamination. This includes such controls as building restrictions and covenants, security programs, activity prevention programs, changes to land use through zoning or by-laws, and contingency plans. Requirements by the Minister regarding administrative controls that must be documented in the Risk Management Plan are as follows:

a) administrative controls must be properly determined by a site professional and implemented

b) the effective use of administrative controls must be demonstrated prior to site closure

c) monitoring and inspection measures must be in place to ensure administrative controls remain effective over time.

APPENDICES

Checklist CHK-600: Remedial Action Plan Checklist

Form FRM-600: Third Party Access Denial