



**PROTOCOL FOR THE CONTAMINATED SITES REGULATION
UNDER THE ENVIRONMENT ACT**

**PROTOCOL No. 13:
Adaptive Management**

Prepared pursuant to Part 6 – Administration, Section 21,
Contaminated Sites Regulation, OIC 2002/171

ADAPTIVE MANAGEMENT

1.0 Introduction

Adaptive management is the process of planning a response to circumstances or events that may not be fully predictable or expected. Adaptive management identifies in advance actions that must be taken to gather information and respond appropriately in the event of an unanticipated or unpredictable circumstance.

Section 21(1) of the *Contaminated Sites Regulation*, O.I.C. 2002/171 (CSR), authorizes the Minister or his/her delegate to approve or adopt protocols. In accordance with Section 21(1), this protocol has been designed to ensure a consistent approach to identify and respond to impacts from activities that may adversely impact water quality, including operation of a land treatment facility or a solid waste disposal facility.

2.0 Background-water quality monitoring requirements

All landfill waste disposal facilities and some modified transfer station waste disposal facilities, as well as all land treatment facilities that accept special waste material or have a capacity of greater than 3000 m³ are required to conduct a hydrogeological assessment and ongoing groundwater monitoring. Other permitted activities may be required to conduct a hydrogeological assessment and ongoing groundwater monitoring in accordance with their permit. The hydrogeological assessment and water quality monitoring must be conducted in accordance with the permit issued to the facility and all applicable protocols pursuant to the CSR.

Collecting and analyzing samples of groundwater and surface water near the facility is important to detect potential impacts to water quality from the permitted activity. Analytical results are compared to standards specified in Schedule 3 of the CSR, which identify acceptable limits for contaminant concentrations in groundwater and surface water, depending on the applicable water use(s) of the site, in accordance with CSR Protocol 6: Application of Water Quality Standards.

3.0 Adaptive management plans for permitted activities

The purpose of this protocol is to outline requirements for adaptive management plans for permitted activities that have created impacts on water quality as observed through ongoing monitoring.

An adaptive management plan must describe the current water quality at and near the site and predict a number of possible future scenarios. Each scenario is associated with a series of specific actions that will be taken if that scenario becomes true.

Initial actions associated with any scenario may be simple, such as additional water quality monitoring, while later actions may be more complex, such as delineating, containing, reducing, or assessing the risk of the contamination observed. The actions proposed must reflect site-specific considerations, including the concentration and types of contaminants observed, the groundwater flow speed and direction, and the distance to receptors. An adaptive management plan must also describe how progress will be measured, including water quality monitoring locations and sampling frequency and the statistical methods that will be used to analyse the data gathered.

The permit holder is responsible for actions to assess, reduce, contain and mitigate contamination on the site to ensure that offsite migration of contaminants and associated offsite impacts are minimized.

4.0 Triggers for plans for Land Treatment Facilities

Land treatment facility permit holders must develop an adaptive management plan if hydrocarbons are detected in any monitoring well at their facility during any sampling event. Detection of hydrocarbons may indicate a breach in the liner system designed to contain contaminants within the land treatment facility.

5.0 Triggers for plans for Solid Waste Disposal Facilities

Solid waste disposal facility permit holders must develop an adaptive management plan if there is evidence of any contaminant at a concentration equal to or greater than the appropriate standards specified in the CSR, for a sustained period of time as outlined below.

Environmental Programs Branch recognizes that a one-time exceedance of standards may not indicate long-term deterioration of water quality. Thus, an adaptive management plan will be required if one of the following triggers is met in any groundwater monitoring well or surface water body potentially impacted by the facility, based on the permit requirement for sampling in spring and fall each year:

- Four consecutive exceedances of a parameter (e.g. exceedances in all sampling events in a two year period); or
- Exceedances in five out of six sampling events (e.g. five exceedances in a three-year period); or
- Three seasonally-consecutive exceedances (e.g. three spring exceedances in a three year period or three fall exceedances in three year period).

6.0 Triggers for plans for other activities

Permit holders for other activities where water quality is monitored may be required to develop an adaptive management plan in accordance with the permit issued for their activity.

7.0 Adaptive Management Plan Approval

An adaptive management plan must be submitted to an environmental protection analyst for approval within 90 days of becoming aware that such a plan is required in accordance with sections 4.0 and 5.0 of this protocol. The adaptive management plan must be prepared by a qualified professional.

The permit holder must incorporate any changes to the adaptive management plan as requested by an environmental protection analyst and implement the adaptive management plan as of the date it is approved. The permit holder must not undertake any of the actions described in the adaptive management plan prior to the plan being approved, with the exception of additional water

quality monitoring. If some actions in the proposed adaptive management plan should be undertaken immediately, the proponent must obtain permission from an environmental protection analyst for that portion of the plan, prior to the entire plan being approved, in order to undertake those actions.

If an environmental protection analyst requests in writing and with reasons that an approved adaptive management plan be amended, the permit holder must prepare the required amendment and submit the revised adaptive management plan for approval to an environmental protection analyst within the period of time specified in the request.

8.0 Effective Date

The effective date of this protocol shall be September 2, 2015, and it shall remain in effect until replaced or rescinded by the Environmental Programs Branch.

9.0 Additional Information

For more information on contaminated sites, please contact:

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Approved:



Date: September 2, 2015

Manager, Standards and Approvals Section
Environmental Programs Branch
Department of Environment