



Protocol for the *Contaminated Sites Regulation* under the *Environment Act*

Protocol no. 12:
Risk Assessment Methods

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





Risk Assessment Methods

1. Introduction

Section 21(1)(j) of the *Contaminated Sites Regulation* authorizes the Minister or his/her delegate to approve or adopt protocols for carrying out risk assessments. This protocol outlines the acceptable methods for carrying out risk assessments at contaminated sites, for approval pursuant to the *Contaminated Sites Regulation*.

Risk assessments are conducted when the numerical standards in the *Contaminated Sites Regulation* are exceeded, but it is not economically or technically feasible to remediate the site to those standards. They may also be conducted if there is reason to believe that the numerical standards are not sufficiently protective, based on site-specific factors.

The goal of a risk assessment is to determine whether the contaminants present at a site pose an unacceptable risk to the humans, plants and animals that may be exposed to those contaminants. If an unacceptable risk is found, it may be possible to mitigate the risk to an acceptable level by using risk management measures. For example, containing the contaminants, reducing exposure to the contaminants, or installing engineering controls such as ventilation systems may all reduce risk levels, depending on the nature of the site and the contaminants.

Comprehensive, or quantitative, risk assessments are generally divided into human health and ecological components, which use different standard methods. Additionally, some sites may be suitable for evaluation through a screening level risk assessment, or SLRA. An SLRA is used to determine whether or not there is a likelihood of unacceptable risks by looking for active pathways by which receptors (humans, plants, or animals) can be exposed to contaminants. Not all sites are suitable for evaluation by an SLRA due to precluding site conditions such as the presence of non-aqueous phase liquids.

Once a risk assessment has been conducted and a report prepared, a permit for risk-based restoration must be obtained under the *Contaminated Sites Regulation*. The risk assessment report must be approved by Environment Yukon before the permit will be issued.



2. Screening Level Risk Assessment

Screening level risk assessments (SLRAs) must be conducted in accordance with the following document:

- “Protocol 13: Screening Level Risk Assessment”, published by the British Columbia Ministry of Environment, as amended from time to time. Available at http://www2.gov.bc.ca/assets/gov/environment/air-land-water/site-remediation/docs/protocols/protocol_13.pdf

Since this document is designed to be used within BC’s regulatory regime, certain elements may be inconsistent with the Yukon *Contaminated Sites Regulation*. In particular, the site risk classification and soil vapour procedures do not apply in the Yukon, but the presence of conditions that would lead to a high risk designation may nevertheless make a site unsuitable for assessment using an SLRA. For site-specific advice on the application of the BC protocol in a Yukon context, consult the Standards & Approvals section of the Environmental Programs Branch.

The SLRA will be reviewed by a third party expert according to the fee schedule and timeline set out in the [Technical Review process](#), and the fee for this review is paid for by the applicant. If no active exposure pathways are found, a site is said to “pass” the SLRA and a permit for risk-based restoration can be issued. Depending on the findings of the SLRA, this permit may contain mitigation measures such as prohibiting changes in land use or requiring ongoing maintenance or monitoring.

If there are any active exposure pathways, the site “fails” the SLRA – in that case, the site must be remediated to the numerical standards, or a comprehensive risk assessment must be conducted.



3. Comprehensive Risk Assessment

Unlike SLRAs, comprehensive risk assessments may be used at any site, and are the most thorough means of characterizing risks posed by contamination. Human health and ecological impacts are assessed separately, although they typically rely on the same assessment data and the results are normally compiled in a single report. In accordance with the Technical Review process, comprehensive risk assessment reports must be reviewed by a third-party expert, with fees for this review to be paid by the applicant.

3.1. Human Health Risks


Human health risk assessments must be conducted in accordance with the following documents:

- Federal Contaminated Site Risk Assessment in Canada”, published by Health Canada, as amended from time to time. Available at http://www.hc-sc.gc.ca/ewh-semt/pubs/contamsite/part-partie_i/index-eng.php . See specifically:
 - Part I: Guidance on Human Health Preliminary Quantitative Risk Assessment (PQRA)
 - Part V: Guidance on Complex Human Health Detailed Quantitative Risk Assessment for Chemicals (DQRAchem)

The guidance on PQRA is suitable for most sites; some sites may require more detailed risk calculations, in which case the DQRA guidance is appropriate. Users must follow the instructions in these guidance documents regarding when each document should be used.

3.2. Risks to Ecological Receptors

Ecological risk assessments must be conducted in accordance with one of the following documents:

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- “A Framework for Ecological Risk Assessment: General Guidance”, publication number 1195, and “A Framework for Ecological Risk Assessment: Technical Appendices”, publication number 1274, published by the Canadian Council of Ministers of the Environment (CCME), as amended from time to time. Available at http://www.ccme.ca/en/resources/contaminated_site_management/remediation-objectives.html; or
 - “Recommended Guidance and Checklist for Tier 1 Ecological Risk Assessment of Contaminated Sites in British Columbia”, published by the British Columbia Ministry of Environment, as amended from time to time. Available at https://www2.gov.bc.ca/assets/gov/environment/air-land-water/site-remediation/docs/protocols/protocol_1.pdf

4. Special considerations

Environment Yukon may approve the use of alternate methods on a case-by-case basis. Proposed alternative methods should be endorsed by a Canadian or United States regulatory agency or standards development organization, and any deviations from established methods must be justified.

5. Effective date

The effective date of this protocol shall be December 20, 2017 and it shall remain in effect until replaced or rescinded by the Standards and Approvals Section.



6. Additional information

For more information about contaminated sites, please contact:

Email: envprot@gov.yk.ca

Phone: 867- 667-5683 or toll free in Yukon: 1-800-661-0408, ext. 5683.

Approved:

Date: December 20, 2017

Manager, Standards and Approvals Section

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Environment Yukon