



Ministry of  
Environment

# ***PROTOCOL 12*** ***FOR CONTAMINATED SITES***

Site Risk Classification, Reclassification and Reporting

Version 2.0

Prepared pursuant to Sections 63 and 64 of the  
*Environmental Management Act*

Approved:

Michael W. Macfarlane  
Director of Waste Management

March 12, 2013  
Date

**Effective date: April 1, 2013**

## 1.0 Definitions

The following words, acronyms and expressions used in this document are defined in the ministry procedure "Definitions and Acronyms for Contaminated Sites":

Act	mobile LNAPL
Approved Professional	NAPL
aquatic habitat	nonaqueous phase liquid
complete exposure pathway	non-high risk site
contaminant	numerical standards
contaminated sites legal instrument	parcel
dense nonaqueous phase liquid	receptor
Director	Regulation
DNAPL	risk-based standards
EPQ	risk managed high risk site
exposure pathway	soil
Exposure Pathway Questionnaire	sediment
exposure zone	sensitive habitat
high risk pathway	Site Risk Classification Report
high risk site	SRCR
high risk site condition	soil surface
high water mark	source site
independent remediation	terrestrial habitat
institutional control	UC
light nonaqueous phase liquid	undeveloped land
LNAPL	upper cap concentration
ministry	wildlands land use
mobile DNAPL	wildlife corridors

## 2.0 Introduction

This protocol provides procedures for classifying sites and parts of sites based on their risks to the environment and human health. Sites which have the high risk site conditions identified in this protocol are classified "high risk". They require high standards of care and responsiveness in investigation and remediation and warrant involvement of the ministry to ensure that appropriate and timely action takes place. The protocol also identifies:

- conditions for classifying sites as high risk sites under Section 64 (2) (i) of the Act;
- notification procedures for all sites;
- reporting and reclassification requirements for high risk sites pursuant to Section 64 (1) (d) of the Act.

Risk classifications under this protocol apply to toxicological risks associated with substances listed in the Contaminated Sites Regulation. Risks of flammability, explosivity, corrosivity or other safety hazards are not addressed.

This protocol and its procedures should not be confused with the process of conducting detailed risk assessment under the Regulation and associated protocols and guidance. The performance of detailed risk assessment for determining site-specific risk levels and developing risk-based remediation strategies is an acceptable approach for all sites where immediate risks to human health and the environment have been controlled.

This protocol does not apply to oil and gas sites administered by the Oil and Gas Commission classified as “not a priority” under the current version of the Oil and Gas Commission’s document “Upstream Oil and Gas Site Classification Tool”.

Scientific background information and procedural recommendations that guided the development of this protocol are contained in the report *Recommended Procedures for Identification of High Priority Contaminated Sites in British Columbia*, prepared by the Science Advisory Board for Contaminated Sites in British Columbia.

### **3.0 Site information needs**

The conditions in this protocol for classifying site risk require simple, objective measurements for characterizing primary contributors to environmental and human health risk (contaminant toxicity, exposure pathways and receptors). They are intended to enable sites to be classified on the basis of limited and readily obtainable site data.

The level of information necessary to determine the risk classification of a site will vary on a site-by-site basis depending on the nature and extent of contamination, site geology and hydrogeology and site proximity to receptors. In general, information needed to classify site risk may be obtained at any stage of the investigation and remediation process. When required, further detailed site information should be obtained at the earliest opportunity to enable a risk classification to be determined.

Risk classifications determined under this protocol must be supported by appropriate, satisfactory site information obtained in accordance with ministry procedures, protocols, guidance and standard professional practice.

### **4.0 Site risk classification**

#### **4.1 High risk site conditions**

A site is classified as a high risk site under this protocol if mobile nonaqueous phase liquids (NAPLs) are present or exposure to specified concentrations of contaminants is likely. The potential for both of these conditions to occur must be satisfactorily evaluated in the site risk classification process. If either of these conditions exists, the site is classified as high risk.

A flowchart showing the high risk site condition evaluation process is presented in Figure 1.

#### **4.1.1 Condition 1. Mobile nonaqueous phase liquids (NAPL) are present**

Mobile LNAPL and mobile DNAPL sources lead to contaminant spreading and potential for current and future high risks as well as increased complexity, cost, and effort of remediation. Mobile NAPL is defined and discussed in detail in the ministry's Protocol 16, "Determining the Presence and Mobility of Nonaqueous Phase Liquids and Odorous Substances". If mobile NAPL is present at a site, the site is classified high risk.

#### **4.1.2 Condition 2. Potential high risk exposure exists**

For a site to qualify as high risk under condition 2, the site must exhibit two features:

- a) upper cap concentrations must be exceeded, and
- b) one or more complete exposure pathway(s) must be present.

##### Upper cap concentrations must be exceeded

First, one or more substances at the site must have concentrations greater than the upper cap (UC) concentration for those substances in soil, water, sediment or vapour. The ministry's UC concentrations are established in Protocol 11, "Upper Cap Concentrations for Substances Listed in the Contaminated Sites Regulation". UC concentrations are evaluated in relation to their presence in the exposure zone in the exposure pathway evaluation section below.

Where notifications to the Director are triggered under the reporting procedures of this protocol and detailed investigations have not yet been completed, the presence or absence of UC concentrations if known must be indicated. If UC concentrations are exceeded, exposure pathways must be evaluated. If UC concentrations are not exceeded, then the following exposure pathway analysis need not be done.

##### Complete exposure pathways must be present

This step must be carried out if UC concentrations are exceeded at a site. The analysis involves a simple pathway assessment for each of the eight exposure pathways considered. The eight exposure pathways include:

#### Human health

- Soil exposure
- Vapour exposure
- Water exposure

#### Environmental health

- Soil exposure – terrestrial life
- Water exposure – aquatic life
- Sediment exposure – aquatic life
- Water exposure – livestock watering
- Water exposure – irrigation of crops

Each exposure pathway consists of a series of risk criteria that are evaluated in a step-wise fashion. The risk criteria vary by exposure pathway, but generally relate to contaminant concentrations, contaminant extent, and proximity to the exposure zone. All exposure pathways for which UC concentrations have been identified must be evaluated. Where all the risk criteria of one or more exposure pathways are met at a site the site is classified high risk.

Figure 1 shows the eight exposure pathways and associated exposure risk criteria. The exposure risk criteria are also provided in the Exposure Pathway Questionnaire and are further explained in questionnaire notes which are both provided in Appendix 1 Part 2.

## **4.2 High risk site classification**

Sites at which one or more high risk site conditions are present are *high risk sites*. Contaminated sites where high risk site conditions 1 and 2 are not present are *non-high risk sites*.

Site risk classifications are based on current land, water, vapour and sediment use except where there is an active application for a change in use or where a change in use is proceeding in the absence of an application. Risk classifications for sites in the application process or proceeding towards a change in use must be based on the proposed use.

On a site-specific basis, a Director may designate a site as high risk if the Director considers that site conditions and risks warrant oversight of remediation by the ministry.

## **5.0 Reporting requirements**

### **5.1 Notification triggers and timing for submission of site risk classification information**

Site risk classification reports and additional information must be provided to a Director if the notification triggers shown in Column II of Table 1 occur. The timing for these submissions is shown in Column III for each notification trigger. Tables 2 and 3 provide details of the reporting requirements for each notification trigger.

## **5.2 Reporting format**

Reporting for non-high risk sites must include a satisfactorily completed Site Risk Classification Report (see Appendix 1 Part 1) and, where exposure pathways were evaluated to reach a site risk classification, a satisfactorily completed Exposure Pathway Questionnaire (see Appendix 1 Part 2). For sites classified as high risk, in addition to the information required above for a non-high risk site, the information must include a Summary of Site Condition (Schedule 1.1 of the Regulation), a summary of remedial methods and a schedule for remediation (for high risk conditions only). The Director may require submission of interim reports for high risk sites. The form and schedule for interim reporting will be as determined by the Director based on individual site conditions and circumstances.

Tables 2 and 3 present the site risk classification information that must be submitted for each notification trigger.

## **5.3 Reporting exemptions**

### ***5.3.1 Duplicate site risk classification information — simultaneous triggers exemption***

If there are two or more notification triggers for the submission of site risk classification information to the Director that apply at the same time, the submission of duplicate information specified in Table 2 is not required. Only one of each of the items specified need be submitted.

### ***5.3.2 Duplicate site risk classification information — previous submissions exemption***

If site risk classification information required under Table 2 has been submitted to the ministry within the past 5 years and a subsequent submission is required under a new notification trigger, any information for the subsequent submission already provided in the original submission need not be submitted. However, if new site information is available at the time of the subsequent submission which differs in the detail or content from the original submission, the new information must be provided. This exemption does not apply if the original information was submitted more than 5 years before the time the current site risk classification information must be submitted.

**Table 1. Notification triggers and timing for submission of site risk classification information**

<b>Column I</b>	<b>Column II</b>	<b>Column III</b>	<b>Column IV</b>	<b>Column V</b>
<b>No.</b>	<b>Notification Trigger</b>	<b>Timing for Submission of Site Risk Classification Information</b>	<b>Persons with the Duty to Submit Site Risk Classification Information</b>	<b>Notes</b>
1	Submission of a Notification of Initiation of Independent Remediation to a Director	At the time the Notification of Initiation of Independent Remediation initiation is submitted	The person with the duty to submit the associated Notification of Initiation of Independent Remediation	1
2	Submission of a site investigation report required or ordered by a Director	At the time the site investigation report is submitted	The person required or ordered by the Director to submit the associated site investigation report	1
3	Submission of a Notification of Likely or Actual Migration to a Director	At the time the Notification of Likely or Actual Migration is submitted	The person with the duty to submit the associated Notification of Likely or Actual Migration	1
4	Application to a Director for a contaminated sites service in Table 2 or 3 of Schedule 3 of the Regulation	At the time the application for a contaminated sites service is submitted	The applicant for the associated contaminated sites service	2
5	Imposition by a Director of the requirement for a Site Risk Classification Report submission	At the time the Director has specified for the submission	The person on whom the Director imposes the requirement for the Site Risk Classification Report	
6	Potential or actual high risk conditions at a neighbouring parcel are indicated in the Site Risk Classification Report submitted to a Director for a parcel under any of the preceding triggers	At the time the Site Risk Classification Report is submitted for the source site	The person who has the duty to submit a Site Risk Classification Report under any of triggers 1 - 5	1, 3

**Notes**

1. This notification trigger does not apply to oil and gas sites administered by the Oil and Gas Commission classified as “non-priority” under the Oil and Gas Commission’s document “Upstream Oil and Gas Site Classification Tool”.
2. This notification trigger applies to service applications for Approved Professional review (item 4 (a)) and service applications for ministry review (item 4 (b)) of Table 2.
3. This notification trigger could apply, depending on the circumstances, to any of the preceding five notification triggers. If the migration or likely migration of substances from a source site results in actual or potential high risk conditions being identified in a Site Risk Classification Report received for the source site or an affected site, a separate Site Risk Classification Report and, where exposure pathways were evaluated in reaching a site risk classification, an Exposure Pathway Questionnaire, must be submitted to the Director for each neighbouring site which would be, or would likely be classified as high risk. The timing of submissions for the neighbouring sites is the same as those for the applicable notification triggers 1 through 5.

**Table 2. Reporting requirements for sites by notification trigger**

<b>Column I</b>	<b>Column II</b>	<b>Column III</b>	<b>Column IV</b>	<b>Column V</b>
<b>No.</b>	<b>Notification Trigger</b>	<b>Non-high Risk Site Additional Reporting Requirements</b>	<b>High Risk Site Additional Reporting Requirements</b>	<b>Notes 1, 2, 3, 4</b>
1	Submission of a Notification of Initiation of Independent Remediation a the Director	Site Risk Classification Report Exposure Pathway Questionnaire	Refer to Table 3	
2	Submission of a Site investigation report required or ordered by a Director		Site Risk Classification Report Exposure Pathway Questionnaire Summary of Site Condition Summary of remedial methods Schedule for remediation Interim reporting as required by Director	
3	Submission of a Notification of Likely or Actual Migration to a Director			5, 6
4 (a)	Application to a Director for a contaminated sites service in Table 2 or 3 of Schedule 3 of the Regulation – Approved Professional review		Not applicable	7
4(b)	Application to a Director for a contaminated sites service in Table 2 or 3 of Schedule 3 of the Regulation – ministry review		Site Risk Classification Report Exposure Pathway Questionnaire Summary of Site Condition Summary of remedial methods Schedule for remediation Interim reporting as required by Director	7
5	Imposition of the requirement for a Site Risk Classification Report submission by a Director			
6	Potential or actual high risk conditions at a neighbouring site are indicated in the Site Risk Classification Report submitted to a Director for a site under any of the preceding triggers		8	



**Notes (Please note that footnotes 1 to 4 apply to all line items)**

1. Satisfactorily completed Site Risk Classification Reports and additional information other than interim reports must be provided at the time of submission for the notification triggers listed in Column II.
2. Reports for notification triggers required elsewhere in the contaminated sites legal regime (e.g., Summaries of Site Condition with contaminated sites service applications required under section 7.1 of the Regulation) are not included in this table.
3. Satisfactorily completed Exposure Pathway Questionnaires must be submitted only if substances exceeding upper cap concentrations are present.
4. Where a summary of remedial methods or a schedule for remediation is required in this table, the requirement only refers to the remediation of high risk conditions at the site.
5. Reporting requirements refer to those for the source site.
6. Summary of Site Condition should include current tables and figures for all investigated media.
7. Service applications refer to contaminated sites service applications listed in Table 2 and 3 of Schedule 3 of the Regulation. Service applications eligible for review by Approved Professionals are as specified in Protocol 6, "Eligibility of Applications for Review by Approved Professionals". All other service applications are subject to review by the ministry.
8. If the migration or likely migration of substances from a source site results in actual or potential high risk conditions being identified in a Site Risk Classification Report submitted for a site, separate site risk classification information must be submitted to the Director as specified under Columns III or IV, Item 6 in Table 2, for each neighbouring site associated with that substance migration which would be, or would likely be classified as high risk.

**Table 3. Reporting requirements for high risk sites undergoing independent remediation**

Column I	Column II	Column III	Column IV
Type of Requirement	Reporting requirements for elimination of high risk conditions within 90 days	Reporting requirements for elimination or risk management of high risk conditions taking more than 90 days	Notes 1, 2, 3
Reporting at initiation of independent remediation	Confirmation that elimination of high risk conditions will occur within 90 days Site Risk Classification Report Exposure Pathway Questionnaire	Site Risk Classification Report Exposure Pathway Questionnaire Summary of Site Condition Summary of remedial methods Schedule for remediation	3, 4, 5, 6
Interim reporting	Not required	Interim reports as required by a Director	
Reporting at completion of remediation of high risk conditions	Site Risk Classification Report confirming that site is no longer high risk Approved Professional signoff	Site Risk Classification Report confirming that site is no longer high risk Summary of Site Condition Approved Professional signoff	5, 6

**Notes**

1. Reports for notification triggers required elsewhere in the contaminated sites legal regime (e.g., Notifications of Likely or Actual Migration) are not included in this table.
2. The Director, as authorized under the Act, may set conditions and timelines differing from those set out above as appropriate and warranted by site conditions and circumstances.
3. Remedial methods and schedule refer to actions and timelines to address all site conditions leading to the reclassification of a high risk site.
4. Exposure Pathway Questionnaires are required only if upper cap concentrations of substances are present at the site.
5. If high risk conditions cannot be eliminated within 90 days of initiation of independent remediation, despite having indicated that intent in Section VIII of the Site Risk Classification Report, at 90 days the Director must be provided with a revised Site Risk Classification Report, updated schedule for remediation and all other reporting requirements specified in Column III
6. Summary of Site Condition should include current tables and figures for all investigated media.

### **5.3.3 Soil quantity exemption**

A person undertaking independent remediation is not required to submit the site risk classification information specified in Table 2 if the quantity of soil to be remediated does not exceed 5 cubic metres in volume during the entire course of remediation at the site.

### **5.3.4 Application for a Determination that a site is not contaminated exemption**

A person who submits an application for a Determination of Contaminated Site that the site is not contaminated is not required to submit the site risk classification information specified in Table 2.

### **5.3.5 Residential underground heating oil storage tank exemption**

A person undertaking independent remediation at a site meeting the criteria below is not required to submit the site risk classification information specified in Table 2, but this exemption applies only to independent remediation at sites:

- (a) where the person has no duty to submit a Notification of Likely or Actual Migration associated with the independent remediation of contamination at the site under subsection 57 (1) of the Regulation;
- (b) where the contamination is limited solely to petroleum hydrocarbons in residential heating oil;
- (c) which are not high risk sites;
- (d) which have land used for residential land use; and
- (e) where an underground heating oil storage tank with a volume less than or equal to 2 500 litres has been or will be removed.

### **5.3.6 Spill reporting exemption**

Section 57 (2) of the Regulation provides an exemption from the duty to submit a Notification of Initiation of Independent Remediation arising from an emergency response to a spill. That exemption is applicable only if the spill has been reported in accordance with the requirements of the Spill Reporting Regulation under the Act.

Under this Protocol a person undertaking independent remediation of a spill is not required to submit site risk classification information specified in item 1 of Table 2 at the initiation of independent remediation either for spills which are reportable under the Spill Reporting Regulation or for spills which are not reportable under that regulation. A Site Risk Classification Report for a spill may nevertheless be required under the other five triggers provided in Tables 1 and 2.

#### **5.4 Reporting for contaminant migration**

If the migration or likely migration of substances from a source site results in actual or likely high risk conditions being identified in a Site Risk Classification Report submitted for a site, separate site risk classification information must be submitted to the Director as specified under Columns III or IV, Item 6 in Table 2, for each affected site associated with that substance migration which would be, or would likely be classified as high risk.

Where insufficient information is available to provide a site risk classification for an affected site, the Director may impose the requirement for a Site Risk Classification Report, which may require additional site investigations.

#### **5.5 Reporting for high risk sites for independent remediation**

The reporting requirements for high risk sites undergoing independent remediation are provided in Table 3. Notifications of Initiation of Independent Remediation where remediation will be completed in less than 90 days must indicate in the Site Risk Classification Report that all high risk conditions will be eliminated within 90 days of initiating independent remediation.

Independent remediation is an option for sites classified as high risk under any of the notification triggers. Unless otherwise specified by a Director under section 54 (3) (d) of the Act, sites undergoing independent remediation are eligible for relief from some reporting requirements, as set out in Tables 2 and 3, where high risk conditions are eliminated within 90 days of initiating independent remediation.

If high risk conditions are encountered and not eliminated within 90 days, despite having indicated that intent in Section VIII of the Site Risk Classification Form, the Director must be provided a revised Site Risk Classification Report and an updated completion schedule at 90 days. This applies to any site undergoing independent remediation including sites where a site investigation was required or ordered by the Director or a Notification of Likely or Actual Migration or Site Risk Classification Report was submitted to the Director before or at the time independent remediation began.

If at any time during independent remediation activities at a site, a new high risk condition is identified, all information required at the Initiation of Independent Remediation under Column III of Table 3 must be provided to a Director within 30 days of the new condition being identified. This requirement does not apply to sites under independent remediation being remediated in less than 90 days of initiating independent remediation.

## **5.6 Reporting for part site remediation**

Where a Notification of Initiation of Independent Remediation has been submitted for part of a site, the attached Site Risk Classification Report must be completed for the part of the site under remediation. All parts of the site where high risk conditions are known to be present must be identified in Section X of that Site Risk Classification Report along with a general schedule for remediating all high risk parts of the site.

## **6.0 Site risk reclassification**

A reclassification decision refers to a site's risk classification under this protocol. A person may apply to the Director to have a site reclassified either as a non-high risk site or a risk managed high risk site. A site where high risk conditions are eliminated (whether or not it continues to be contaminated) would be reclassified as a non-high risk site. A site where high risk conditions are risk managed would continue to be contaminated and would be reclassified as a risk managed high risk site.

Applications to the Director for a reclassification decision may occur at any time after high risk conditions have been removed or otherwise satisfactorily addressed. It is not necessary to wait until the remediation of all the contamination at the site is completed.

Reporting requirements for obtaining a reclassification decision are as follows:

- A Site Risk Classification Report confirming that high risk conditions have been remediated or risk managed;
- A Summary of Site Condition where remedial actions to address all high risk site conditions exceeded 90 days in duration; and
- Approved Professional signoff of the above reports.

The Director may, depending on site circumstances, require additional information to be provided in order to reach a decision on reclassification.

For a site where remediation is being carried out in parts, responsible persons may obtain a reclassification for parts of their site where high risk conditions have been addressed. However, they will not be eligible for a reclassification of the entire site until all site contamination has been properly investigated and classified and all high risk site conditions have been remediated to satisfy the requirements of this protocol.

*For more information, contact the Environmental Management Branch at [site@gov.bc.ca](mailto:site@gov.bc.ca).*

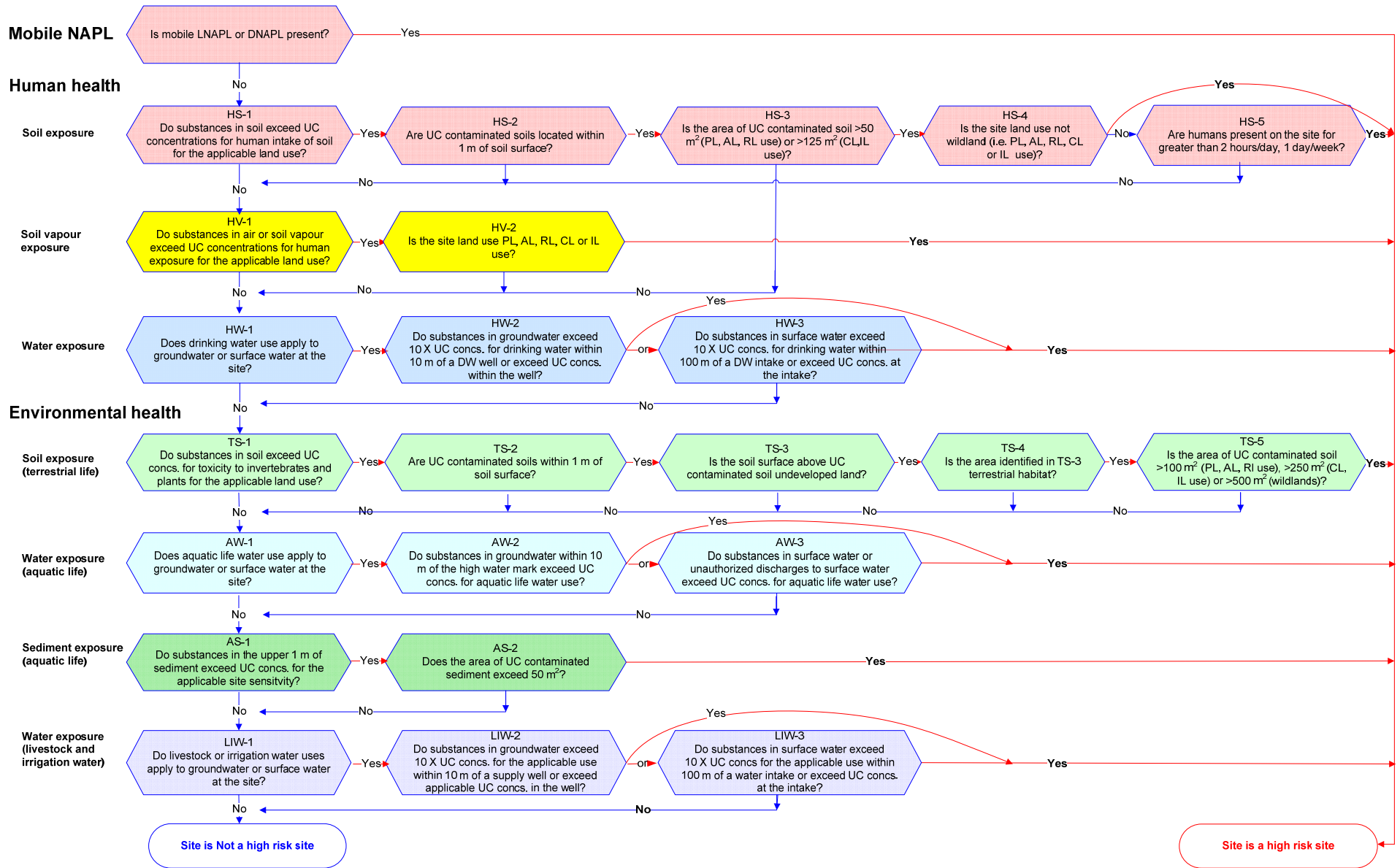


Figure 1. High risk site condition evaluation (see Exposure Pathway Questionnaire for detailed notes)

## **Appendix 1 Part 1**

### **Site Risk Classification Report**



Ministry of  
Environment

## SITE RISK CLASSIFICATION REPORT

Land Remediation Section  
PO Box 9342 Stn Prov Govt  
Victoria B.C. V8W 9M1  
Telephone: (250) 387-4441  
Fax: (250) 387-8897

Submission of this report is required by Protocol 12, "Site Risk Classification, Reclassification and Reporting" under the *Environmental Management Act*.

### Part 1. Land, owner and agent information

#### Section I Land Description

Site ID Number (if known)

PID

or

PIN

Is the land part of a site?

yes

no

If the answer is "yes" please provide details:

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Legal Description

Latitude

Degrees

Minutes

Seconds

Longitude

Degrees

Minutes

Seconds

Site Civic Address

Street

City

Postal Code

#### Section II Property Owner and/or Operator (if applicable)

Name

Address

Street

City

Province/State

Country

Postal /Zip Code

Phone

Fax

#### Section III Environmental Consultant / Contractor / Agent Contact (if applicable)

Name

Address

Street

City

Province/State

Country

Postal /Zip Code

Phone

Fax



## Part 2. Site risk classification notification triggers

### Section IV Applicable triggers

Check the applicable triggers for the submission of this Site Risk Classification Report to the Director:

- Notification of Initiation of Independent Remediation
- Site investigation report ordered or required by the Director
- Notification of Likely or Actual Migration
- Ministry service application with the recommendation of an Approved Professional
- Ministry service application without the recommendation of an Approved Professional
- Site Risk Classification Report for a neighbouring site under section 5.4 of Protocol 12
- Site Risk Classification Report otherwise required by a Director

## Part 3. Site investigation status

### Section V Source and affected parcel investigation status

#### A. Adequacy of completed site investigations

Is site information appropriate and satisfactory to determine a site risk classification?  yes  no\*

If no, indicate the scheduled completion date of investigations needed to complete classification below.

#### B. Source parcel investigation status

#### Scheduled Completion Date

- |   |                              |                             |       |
|---|------------------------------|-----------------------------|-------|
| 1. Stage I preliminary site investigation completed?  | <input type="checkbox"/> yes | <input type="checkbox"/> no | _____ |
| 2. Stage II preliminary site investigation completed? | <input type="checkbox"/> yes | <input type="checkbox"/> no | _____ |
| 3. Detailed site investigations completed?            | <input type="checkbox"/> yes | <input type="checkbox"/> no | _____ |
| 4. Migration of contamination identified?             | <input type="checkbox"/> yes | <input type="checkbox"/> no | _____ |

#### C. Affected parcel investigation status

- |   |                              |                             |       |
|---|------------------------------|-----------------------------|-------|
| 1. Stage I preliminary site investigation completed?  | <input type="checkbox"/> yes | <input type="checkbox"/> no | _____ |
| 2. Stage II preliminary site investigation completed? | <input type="checkbox"/> yes | <input type="checkbox"/> no | _____ |
| 3. Detailed site investigations completed?            | <input type="checkbox"/> yes | <input type="checkbox"/> no | _____ |

\* If site information is insufficient to determine the site risk classification, indicate the date by which a completed Site Risk Classification Report will be submitted:

## Section VI High risk conditions details

1. Is mobile NAPL present at the parcel?  yes  no

If yes, describe the mobile NAPL substances and their general location.

2. Are upper cap concentrations exceeded?  yes  no

If yes, what substances exceed upper cap concentrations, in what media? Attach Exposure Pathway Questionnaire

3. Exposure pathways – are the risk criteria for any exposure pathway exceeded?  yes  no  n/a

If yes, which exposure pathways indicate high risk?

## Section VII Site risk classification

high risk  not high risk

*Note that for parcels for which there is insufficient information to determine the site risk classification, additional information must be provided in Part 3 of this report on the scheduled dates for completion of site investigations and resubmission of a completed Site Risk Classification Report.*

## Part 4. Independent remediation status

### Section VIII Independent remediation

Has independent remediation been initiated at the site?  yes  no

Will the independent remediation of high risk conditions be completed within 90 days?  yes  no  n/a

*If independent remediation of high risk site conditions is being carried out and is not completed within 90 days the Director must be provided a revised Site Risk Classification Report and an updated completion of remediation schedule on or before the 90<sup>th</sup> day of independent remediation.*

**Part 5. Affected parcel conditions**

**Section IX Affected parcel high risk conditions details**

1. Is mobile NAPL present or likely present at an affected parcel?  yes  likely  no

If yes or likely, describe the mobile NAPL substances and their general location.

2. Are upper cap concentrations exceeded or likely exceeded?  yes  likely  no

If yes or likely, what substances exceed or are likely to exceed upper cap concentrations, and in what media?  
Attach Exposure Pathway Questionnaire.

3. Are high risk exposure pathways present or likely present?  yes  likely  no

If yes or likely, list the exposure pathways which impact or are likely to impact affected parcel receptors.

4. Are any affected parcels classified as high risk or likely classified as high risk?  yes  no

If yes, list the following for each affected parcel and attach a separate Site Risk Classification Report for each affected parcel that is high risk or likely high risk.

<b>Site ID (if known)</b>	<b>Affected parcel owner</b>	<b>Civic Address</b>
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## **Appendix 1 Part 2**

### **Exposure Pathway Questionnaire**

## Exposure Pathway Questionnaire

Property Owner (print name) \_\_\_\_\_ Site ID \_\_\_\_\_

Signature \_\_\_\_\_

		Yes	No	Notes
<b>Human Health Exposure</b>				2, 3, 4
<b>Soil Exposure</b>				
HS-1	Do substances in soil exceed upper cap concentrations (UCs) for human intake of soil for the applicable land use?	<input type="checkbox"/>	<input type="checkbox"/>	5, 6
HS-2	Are UC-contaminated soils located within 1 m of the <i>soil surface</i> ?	<input type="checkbox"/>	<input type="checkbox"/>	7
HS-3	Does the area of UC contaminated soil exceed 50 m <sup>2</sup> on urban park, agricultural or residential lands or 125 m <sup>2</sup> on commercial or industrial lands?	<input type="checkbox"/>	<input type="checkbox"/>	8
HS-4	Is the site land use urban park, agricultural, residential, commercial or industrial (i.e. not <i>wildlands</i> )?	<input type="checkbox"/>	<input type="checkbox"/>	
HS-5	If the site land use is <i>wildlands</i> , are humans present on the site for greater than 2 hours/day, 1 day/week?	<input type="checkbox"/>	<input type="checkbox"/>	9
<b>Vapour Exposure</b>				
HV-1	Do substances in air or soil vapour exceed UC concentrations for human inhalation for the applicable land use?	<input type="checkbox"/>	<input type="checkbox"/>	5, 6, 7, 10
HV-2	Is the site land use urban park, agricultural, residential, commercial or industrial?	<input type="checkbox"/>	<input type="checkbox"/>	
<b>Water Exposure</b>				
HW-1	Does drinking water use apply to groundwater or surface water at the site?	<input type="checkbox"/>	<input type="checkbox"/>	11
HW-2	Do substances in groundwater exceed 10 times UC concentrations for drinking water within 10 m of a drinking water well or exceed UC concentrations within the well?	<input type="checkbox"/>	<input type="checkbox"/>	6, 12
HW-3	Do substances in surface water exceed 10 times UC concentrations for drinking water within 100 m upstream of a drinking water intake or exceed UC concentrations at the intake?	<input type="checkbox"/>	<input type="checkbox"/>	6
<b>Environmental Health Exposure</b>				2, 3, 4
<b>Terrestrial Soil Exposure</b>				
TS-1	Do substances in soil exceed UC concentrations for toxicity to invertebrates and plants for the applicable land use?	<input type="checkbox"/>	<input type="checkbox"/>	5, 6
TS-2	Are UC contaminated soils within 1 m of the <i>soil surface</i> ?	<input type="checkbox"/>	<input type="checkbox"/>	7
TS-3	Is the soil surface above UC contaminated soil <i>undeveloped land</i> ?	<input type="checkbox"/>	<input type="checkbox"/>	
TS-4	Is the area identified in TS-3 <i>terrestrial habitat</i> ?	<input type="checkbox"/>	<input type="checkbox"/>	
TS-5	Does the area of UC contaminated soil exceed 100 m <sup>2</sup> on urban park, agricultural or residential lands or 250 m <sup>2</sup> on commercial or industrial lands or 500 m <sup>2</sup> on <i>wildlands</i> ?	<input type="checkbox"/>	<input type="checkbox"/>	8, 16
<b>Aquatic Life Water Exposure</b>				
AW-1	Does aquatic life water use apply to groundwater or surface water at the site?	<input type="checkbox"/>	<input type="checkbox"/>	11
AW-2	Do substances in groundwater within 10 m of the <i>high water mark</i> of an <i>aquatic habitat</i> exceed the UC concentrations for aquatic life water use?	<input type="checkbox"/>	<input type="checkbox"/>	12, 13
AW-3	Do substances in surface water or unauthorized discharges to surface water exceed UC concentrations for aquatic life water use?	<input type="checkbox"/>	<input type="checkbox"/>	14
<b>Aquatic Life Sediment Exposure</b>				
AS-1	Do substances in the upper 1 m of sediment exceed the UC concentrations for the applicable site sensitivity?	<input type="checkbox"/>	<input type="checkbox"/>	6, 15
AS-2	Does the area of UC-contaminated sediment exceed 50 m <sup>2</sup> ?	<input type="checkbox"/>	<input type="checkbox"/>	8
<b>Livestock and Irrigation Water Exposure</b>				
LIW-1	Do livestock or irrigation water uses apply to groundwater or surface water at the site?	<input type="checkbox"/>	<input type="checkbox"/>	9, 10
LIW-2	Do substances in groundwater exceed 10 times applicable UC concentrations within 10 m of the water supply well or exceed applicable UC concentrations in the well?	<input type="checkbox"/>	<input type="checkbox"/>	4, 11, 12
LIW-3	Do substances in surface water exceed 10 times applicable UC concentrations within 100 m upstream of a drinking water intake or exceed applicable UC concentrations at the intake?	<input type="checkbox"/>	<input type="checkbox"/>	

## Exposure Pathway Questionnaire Notes

1. Pathways leading to classification of high risk (where yes answer is given for sequential risk criteria, except where indicated otherwise):
  - HS-1* ⇔ *HS-2* ⇔ *HS-3* ⇔ *HS-4* = *HR*
  - HS-1* ⇔ *HS-2* ⇔ *HS-3* ⇔ *HS-4* (No) ⇔ *HS-5* = *HR*
  - HV-1* ⇔ *HV-2* = *HR*
  - HW-1* ⇔ *HW-2* = *HR*
  - HW-1* ⇔ *HW-3* = *HR*
  - TS-1* ⇔ *TS-2* ⇔ *TS-3* ⇔ *TS-4* ⇔ *TS-5* = *HR*
  - AW-1* ⇔ *AW-2* = *HR*
  - AW-1* ⇔ *AW-3* = *HR*
  - AS-1* ⇔ *AS-2* = *HR*
  - LIW-1* ⇔ *LIW-2* = *HR*
  - LIW-1* ⇔ *LIW-3* = *HR*
2. Environmental site investigations must be carried out in accordance with ministry procedures and guidance and standard professional practice.
3. The assessment of exposure pathways pertains to contamination arising from the parcel or parcels under investigation. Where contamination originating from the parcel under investigation has migrated off of the parcel the evaluation of exposure pathways pertains to contamination originating from the site under investigation. Co-contamination of affected lands that preclude the evaluation of exposure pathways associated with the source parcel must be identified in supporting technical reports.
4. Terms in italics are listed in section 1.0 (definitions) of this protocol.
5. Applicable land uses are as defined in the Contaminated Sites Regulation (agricultural, urban park, residential, commercial, industrial and wildlands).
6. Ministry's UC concentrations are provided in Protocol 11 "Upper Cap Concentrations for Substances Listed in the Contaminated Sites Regulation".
7. Where concentrations occur above UC concentrations, cross-sections are required to support conclusions that UC contamination is located at depths greater than 1 m below soil surface.
8. Where concentrations occur above UC concentrations, contour maps are required to support conclusions of the areal extent of UC contamination. "Areal extent" refers to the total combined areal extent of UC contaminated soil at a site, contiguous or non-contiguous.
9. Human exposure on wildlands sites during limited periods of the year (i.e. hunting camps) may be compared to the prescribed exposure threshold of 2 hours/day, 1 day/week by averaging total annual exposure over a 12 month period. Actual human exposure must be indicated in supporting technical reports.
10. Soil vapour investigations must follow Technical Guidance 4 for Contaminated Sites – Vapour Investigation and Remediation
11. Applicable groundwater use must be determined in accordance with Technical Guidance document 6, "Water Use Determination" and ministry procedures and guidance.
12. Where groundwater concentrations exceed UC concentrations near a groundwater receptor (e.g., drinking water well), contour maps and cross-sections are required to support conclusions of UC-contaminated groundwater located outside 10 m of the correspondent receptor.
13. Where groundwater concentrations exceeding UC concentrations for aquatic life have not been delineated to within 10 m of the high water mark of an aquatic habitat, groundwater concentrations at wells installed nearest 10 m from the high water mark are considered representative of concentrations at that point.
14. Unauthorized discharges are discharges of site surface water (including storm water and drainage ditches) above UC concentrations into an aquatic habitat that are not authorized under the Act.
15. Sediment sensitivity must be determined in accordance with Technical Guidance 19, "Assessing and Managing Contaminated Sediments".
16. Area threshold assumes site contamination is surrounded by the same land use.