How to Fill Out the AER Record of Site Condition Form

Contents

This document is provided solely to assist users in preparing and submitting the AER's Record of Site Condition form and was designed to be used in conjunction with applicable requirements in legislation, regulations, guidelines, standards, and other regulatory instruments (the regulatory requirements). This document must not be used as a substitute for the regulatory requirements or on its own. It is not intended to replace, modify, or supplement the regulatory requirements. The user remains responsible for complying with all applicable regulatory requirements. Completing the form in accordance with this document does not relieve a user from complying with the regulatory requirements.

Site Information

General Guidance: Defining a Site

A user can define a site as a single licence, approval, registration, spill, etc. or combine multiple licences, approvals, registrations, or spills into one "site" if they share a common footprint with a single licensee. Typically a user would define a site as any applicable licences, approvals, registrations, and spills that would be assessed and reported on together.

Licence Number

Enter applicable *Directive 056* licence numbers for the primary and (if applicable) associated or secondary assets at the site or the *Directive 056* licence number that is most relevant to the operation at the site. Put in the full licence numbers with the associated letter (W, F, or P) and use commas to separate multiple licence numbers.

Associated Incident or FIS No.

Enter in all known incident or FIS numbers associated with the site separated by a comma.

Activity

Current Operating Status

Select the current operating status of the site. Where more than one type of operation may have existed on a site, include the status of only the most recent operation. Available categories are described below:

- Proposed: an application for the site has been submitted for regulatory approval, construction has not started.
- Construction: a site where necessary approvals have been received and construction has begun.
- Active: a site that is active under an operating licence, approval or registration.
- Inactive: a site that is not operating, whether temporarily (operation may resume at any time) or permanently (operation will not resume). Note that sites that are suspended, decommissioned or abandoned; or are in the process of being suspended, decommissioned or abandoned are considered

inactive until the site is reclaimed and all regulatory obligations are fulfilled (e.g., a reclamation certificate has been issued).

- Reclaimed: a site that has been fully decommissioned and all regulatory obligations in respect of the site are fulfilled. For specified land, this status would indicate that a reclamation certificate has been issued.

Site Characterization Information

Refer to Alberta Tier 1 guidelines for explanation of land uses and soil particle size.

If "Fine and Coarse (detailed)" is selected for soil particle size, refer to the Detailed Characterization section of the form and this user guide. Are any of the following conditions met:

- Concentrations above applicable guidelines at existing water well receptors (these are domestic, industrial, irrigation and livestock watering water supply wells.)
- Concentrations above applicable guidelines in surface water/wetland.
  - Includes current water, sediment or soil samples collected at a known or potential freshwater aquatic life receptor (e.g., surface water body, wetland). .
- Concentrations above applicable guidelines in dugout.
  - Includes current water, soil, or sediment samples collected from a dugout.

If there are contaminants of concern in a water well, surface water body, or dugout that do not have an associated Tier 1 guideline or an AER-approved guideline and have concentrations greater than background concentrations, also select yes.

Guidelines

Guidelines Applied

- Tier 1 with background: In cases when background concentrations are demonstrated to be greater than Alberta Tier 1 guidelines, the remediation levels can be set to background. See sections 2.4.2 and 2.5.4 of the *Alberta Tier 1 Soil and Groundwater Remediation Guidelines* (https://open.alberta.ca/publications/1926-6243).
- Approved variance: Variances are requested when justification/evidence is provided to support leaving contaminants above applied guidelines in situ without further action or impediment to certification.
- D050 equivalent salinity guidelines: Refer to *Assessing Drilling Waste Disposal Areas: Compliance Options for Reclamation Certification* (https://aer.ca/regulating-development/project-closure/remediation/contamination-management-tools-and-resources) and AER *Directive 050*

Drilling Waste Management (https://aer.ca/regulating-development/rules-and-directives/directives/directive-050).

- Remote Green Zone: Refer to *Subsoil Petroleum Hydrocarbon Guidelines for Remote Forested Sites in the Green Area* (https://open.alberta.ca/publications/subsoil-petroleum-hydrocarbon-guidelines-for-remote-forested-sites-in-the-green-area).
- Biogenic interference calculation (BIC): Refer to *BIC Scale for Delineating Petroleum Hydrocarbons in Organic Soils and Compost* (https://open.alberta.ca/publications/bic-scale-for-delineating-petroleum-hydrocarbons-in-organic-soils-and-compost).
- Tier 2 Pathway exclusion and modification: Refer to section 4 of the *Alberta Tier 2 Soil and Groundwater Remediation Guidelines* (https://open.alberta.ca/publications/1926-6251).
- Tier 2A, 2B or 2C SST: Refer to the SST help file available at ftp://ftp.gov.ab.ca/env/fs/SubsoilSalinityTool.
- Site-specific risk assessment: Refer to section 5 of the *Alberta Tier 2 Soil and Groundwater Remediation Guidelines* (https://open.alberta.ca/publications/1926-6251). Development of site-specific remediation objectives, including any guideline adjustment which is not specifically explained within the Tier 1 or 2 guidelines, should be considered SSRA. SSRA can include development of numeric concentration endpoints, similar to Tier 1 guidelines, and other measures that demonstrate that protection goals have been achieved. Consultation with the regulator must be sought when applying SSRA guidelines.
- Other: Specify the guidelines in the comment box provided, for example application of "grandfathered" guidelines, etc.

Guideline Details

General

This section is to clarify assumptions made regarding guidelines applied at the site. Specify whether the statement is true for the site (yes or no). Assumptions listed with each type of guideline, along with details and references, are provided in the form.

Screening Guidelines

Are screening guidelines being applied at the site?

- Specify if the guidelines applied for the site are likely to be the final guidelines/remedial objectives used at the site for closure or whether guidelines applied are for screening purposes. For example, if Tier 1 guidelines are currently applied at the site but the licensee plans on refining the guidelines by developing Tier 2 guidelines, then the answer to this input would be "Yes."

Detailed Characterization (Optional)

Soil Details

- If available enter the average soil organic carbon content, bulk density and water content for the shallow interval governing near surface lateral transport which has been calculated from laboratory analysis of soil samples representative of the shallow interval.

Groundwater Details

- Hydraulic Conductivity (non-aquifer)
  - Provide the hydraulic conductivity of the shallow interval governing near surface lateral transport. The calculated shallow hydraulic conductivity must have hydraulic conductivity data from a minimum of three monitoring wells (MW) installed in the identified shallow groundwater unit. If there is hydraulic conductivity data for only three MWs, enter the maximum hydraulic conductivity measurement. If there is hydraulic conductivity data for more than three MWs, input the geometric mean to represent the unit.
- Hydraulic Gradient (non-aquifer)
  - Enter in the seasonal average hydraulic gradient for the shallow groundwater interval calculated from the average hydraulic gradients from at least two monitoring events from two distinct seasons. Negative number indicates downward flow.
- Recharge
  - Enter in the calculated representative recharge value for the site. Negative number indicates discharge.
- Hydraulic Conductivity in a DUA
  - Provide the hydraulic conductivity of the most shallow domestic use aquifer (DUA). The calculated shallow hydraulic conductivity must have hydraulic conductivity data from a minimum of three monitoring wells (MW) installed in the identified domestic use aquifer. If there is hydraulic conductivity data for only three MWs, enter the maximum hydraulic conductivity measurement. If there is hydraulic conductivity data for more than three MWs, input the geometric mean to represent the DUA.
- Hydraulic Gradient in a DUA
  - Enter in the average hydraulic gradient for the most shallow DUA calculated from the average hydraulic gradients from at least two monitoring events from two distinct seasons. Negative number indicates downward flow.

- Thickness of a DUA
  - Enter the average thickness of the DUA which can be supported at a minimum by borehole logs.

Tier 1 Fine and Coarse Detail (Optional)

This table can be filled out if the user selected “fine and coarse (detailed)” on the Site Information tab for soil texture. Typically this would be applicable when a user is looking to apply Tier 1 but determines through the conceptual site model that one soil texture isn't appropriate for all exposure pathways and therefore identifies the most appropriate guideline for the site by assigning a fine or course guideline to each exposure pathway. The most stringent guideline between fine and course soil textures will be assumed for each exposure pathway if a specific texture is not specified in the table. Use the drop downs beside each exposure pathway to specify the most appropriate soil texture that applies to the exposure pathway.

Contamination and Receptors

Background Detail

If applicable, identify background concentrations for contaminants of concern that exceed Tier 1 guidelines.

Receptor Detail

If analytical testing has been conducted at a dugout, DUA, water supply well, surface water body, or wetland or for vapour, provide the current maximum concentrations if above lab detection.

If not applicable leave blank.

Contaminated Areas

The contamination present at the entire site can be considered one area, or can be broken down into distinct subareas based on criteria such as contaminant type, contamination depth, site characteristics, source, area of potential environmental concern, or the presence of multiple distinct plumes on a site.

Contaminated Area Details

Area Name

- For tracking purposes. The area name should be consistent with historical reporting.

Receptors

Provide detailed information on receptors by contaminated area:

- Default Tier 1 information will be applied if site specific information is not entered.

- The edge of the contaminated area is where delineation has been achieved as defined in section 2.3.2 of the *Alberta Tier 1 Soil and Groundwater Remediation Guidelines*.

Provide details regarding potential receptors:

- Distance to surface water (m)
  - If direction of groundwater flow is known, provide the lateral distance from the edge of the contaminated area to the edge of the nearest surface water body in the direction of groundwater flow. If direction of groundwater flow is not known, provide the shortest lateral distance from the edge of the contaminated area to the edge of the nearest surface water body. If the distance to the surface water body varies seasonally, identify the distance to the high water mark. If it is available, use 1-in-100-year flood information.

    If contamination is confined within a lease boundary, a user may enter in the distance from the lease boundary to the nearest surface water body instead of from the edge of the contaminant plume.
- Transverse distance to surface water (m)
  - If direction of groundwater flow is known, provide the distance from the edge of the contaminated area to the edge of the nearest surface water body perpendicular to groundwater flow.
- Distance to closest water well (m)
  - If direction of groundwater flow is known, provide the lateral distance from the edge of the contaminated area to the nearest water well in the direction of groundwater flow. If direction of groundwater flow is not known, provide the shortest lateral distance from the edge of the contaminated area to the nearest water well.
  - If contamination limited to the site and it is appropriate a user may enter in the distance from the lease boundary to the nearest water well instead of from the edge contaminant plume.
- Transverse distance to water well (m)
  - Provide the distance from the edge of the contaminated area to the nearest water well perpendicular to groundwater flow. If direction of groundwater flow is not known then leave data field as 0 m.
- Distance to existing dugout (m)
  - If direction of groundwater flow is known, provide the lateral distance from the edge of the contaminated area to the edge of the nearest existing dugout in the direction of groundwater flow.

If direction of groundwater flow is not known, provide the shortest lateral distance from the edge of the contaminated area to the edge of the nearest existing dug out.

  - If contamination limited to the site and it is appropriate a user may enter in the distance from the lease boundary to the nearest existing dugout instead of from the edge contaminant plume.

- Transverse distance to existing dugout (m)
  - If direction of groundwater flow is known, provide the distance from the edge of the contaminated area to the edge of the nearest existing dugout perpendicular to groundwater flow.
- Distance to building or residential area (m)
  - Shortest distance from the edge of the contaminated area to the nearest building
- Depth to groundwater (m bgs)
  - The average depth to groundwater surface can be calculated by using data from three or more monitoring wells with a minimum of two monitoring events in two distinct seasons from each monitoring well. If there is seasonal fluctuation in the depth, use the shallowest measurements of the individual measurements. Where water wells may be dry, use the maximum screen depth as the measurement of the water table.
- Depth to domestic use aquifer (m bgs)
  - Enter in the depth of the domestic use aquifer (DUA) based on either
    - identification of the shallowest course-grained unit that has the potential to be a DUA,
    - identification of the shallowest unit of soil that meets the Alberta Tier 2 guidelines criteria to be considered a DUA, or
    - the maximum depth drilled at the site if no potential DUAs were identified.

Contaminated Area Dimensions

Default Tier 1 information will be applied if site specific information is not entered.

The edge of the contaminated area can be defined as the closest distance that meets the requirement for delineation defined in section 2.3.2 of the Alberta Tier 1 guidelines.

For the purpose of answering this section, in the absence of complete delineation, the AER may accept professional judgement based on laboratory data supported with field observations and geophysical surveys. Effort should be made to conservatively approximate any areas still under assessment.

Contamination length (m)

- As measured in the direction parallel to groundwater flow, or the longest extent of the contaminated area.

Contamination width (m)

- As measured perpendicular to the length at the widest point.

Depth to contamination top (m bgs)

- As measured, the vertical distance from the ground surface to the shallowest measurement of contamination.

Depth to contamination base (m bgs)

- As measured, the vertical distance from the ground surface to the deepest measurement of contamination.

Contaminant Details

List contaminants of concern that exceed Tier 1 guidelines, or the laboratory detection limit for any samples collected in a residential / parkland setting, or within 100 m of any dwelling.

If "other organic" is selected as the contaminant group, in the specific contaminant column, specify the contaminant.

If site specific guidelines have been developed for specific contaminants, the numeric guideline value can be entered. The units for the site specific guideline are assumed to be the same entered for maximum concentration.

Contamination Status

Select the statements that are applicable at the site. Guidance on each of the statements is provided below:

- Residual Free Product: Select if there are light non-aqueous phase liquid (LNAPL), dense non-aqueous phase liquid (DNAPL) or free product (e.g., crude oil, emulsion or condensate) currently present at the site.
- Contaminant concentrations increasing: Select if contaminant concentrations in soil or groundwater have shown increasing trends in locations that define the perimeter of the plume. For example: The plume is continuing to expand its spatial footprint.
- Contaminant concentrations decreasing: Select if contaminant concentrations in soil or groundwater have shown decreasing trends.
- Contaminant plume stable: Select if contaminant concentrations in soil or groundwater have shown stable trends. For example: The plume is not migrating.

Characterization / Delineation

- Refer to the Alberta Tier 1 guidelines for clarity on expectations regarding delineation. Select the most appropriate description for the current level of delineation at the site:
  - Complete: The contamination is vertically and laterally delineated and due consideration has been given to potential migration patterns.
  - Fair: There are some gaps in the delineation of the contamination but a reasonable assessment of the risk is possible.
  - Poor: There are major gaps in the delineation or the risk cannot be adequately assessed.
  - None: The contamination delineation is deficient or it is not possible to estimate the contamination risk.

Is the contaminant plume contained on site?

- With application of professional judgement, current information indicates that contamination (in soil and water) above applicable guidelines is or is not contained within the lease boundaries.

Is there a plan to further develop the conceptual site model and address data gaps?

- Refer to section 4.4.2 of the *Alberta Environmental Site Assessment Standard* (https://open.alberta.ca/publications/alberta-environmental-site-assessment-standard) for more detail on what a CSM should include and represent. Further assessment may be necessary for delineation purposes, to refine the CSM or to assist with the development of guidelines.

Remedial Action Plan

- A RAP summarizes completion or plans to complete (including timelines) source control, delineation, evaluation of known/potential receptors (CSM), guideline development, remediation, and risk management at a site.

Exposure Control

- Refer to the *Alberta Exposure Control Guide* (https://open.alberta.ca/publications/9781460114902) for more detail on types of controls which may be applicable as part of the Risk Management component of a RAP.

Has monitoring demonstrated that exposure prevention measures may be inadequate?

Indicators that control measures are inadequate include evidence of adverse effect, concentrations exceeding trigger thresholds or above guidelines in areas where control measures are not active. Identify if contingency plan implemented resulting from trigger conditions (e.g., additional monitoring, alternative remediation, or other risk management measure).