

**Appendix A – Review Checklist for Risk Management Plans**

This checklist was designed to be used in conjunction with guidance provided in the *Risk Management Plan Guide*. The Risk Management Plan (RMP) Checklist is intended as a companion document to the Guide and must not be used as a substitute or on its own. The review checklist must be reviewed, completed and submitted by the environmental professional as an Appendix to the RMP.

**Site Name and Location:**

**Site File Info/Number:**

**Administrative Requirements**

Section of Guide	Query	Yes, No, N/A	Page # in report	Comments, Discussion, Description
<b>3.1 Completed Reviewer’s Checklist</b>	Was a completed reviewer’s checklist submitted by the professional in an appendix to the RMP?			
<b>3.2 Site Identification and Physical Location</b>	Is the legal address of the source site provided (Plan, Block, Lot and/or Legal Land Description)?			
	If it is a municipal site, is the civic/street address of the source site provided?			
	Are legal and/or municipal street addresses of all affected adjacent lands provided?			
	Is the site name provided?			
	Is the relevant file information provided? (e.g., AEP/AER CSU, PST or SCD file number, Approval number, Incident or Reference number.)			
<b>3.3 Proponent Information</b>	Is the name, address and other business card information of the registered owner or person(s) responsible, occupant, renter and lessee provided?			

<b>3.4 Consultant Information</b>	Is the key contact information provided? (Name, address and other relevant business card information)?			
	Did the consultant(s) who prepared the RMP provide verification of appropriate professional status (e.g., stamp, permit to practice, number demonstrating professional designation)?			
<b>3.5 Record of Site Condition</b>	Has a signed Record of Site Condition (RSC) form been submitted with Section 7 completed?			
<b>3.6 Outstanding Legal Requirements</b>	Are there any federal, provincial, or municipal requirements, charges, or orders that may be attached to the site that need to be considered in developing the RMP?			

## Site Investigation Requirements

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<b>4.1 Background Site Information</b>	Does the RMP provide background site information?			
	Are there references to all background reports detailing site history?			

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	<p>Does the background summary provide or reference detailed scale site maps including;</p> <ul style="list-style-type: none"> <li>• the location of previous, current and proposed buildings,</li> <li>• current operating status of the site,</li> <li>• any impacted offsite properties,</li> <li>• historic, current, future site and adjacent land uses,</li> <li>• soil type(s) and fill material type(s),</li> <li>• surface drainage directions,</li> <li>• depth to groundwater and groundwater flow direction,</li> <li>• natural features, including any permanent or seasonal surface water bodies to at least 300 m from the contaminant plume,</li> <li>• any existing well locations within 300 m of the APECs (or 100 m up-gradient and 300 m down-gradient if sufficient groundwater information is available),</li> <li>• all previous and current soil and groundwater monitoring locations,</li> <li>• surface and underground structures including utility services,</li> <li>• soil and groundwater sampling, delineation and remediation results</li> <li>• two-dimensional representation of all areas of potential concern, including relative concentrations of CoPCs, and</li> <li>• sufficient information to understand vertical distribution of the CoPCs?</li> </ul>			
	Where multiple risk management areas are proposed, are there vertical and horizontal representations of the various risk management areas?			
	Does the site summary provide sufficient information to understand risks to sensitive receptors if present?			

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	Where multiple land uses or development restrictions are considered over the area, is it clear what land uses are applicable to which area(s)?			
<b>4.2 Conceptual Site Model (CSM)</b>	Is a CSM provided?			
	Does the report summarize the CSM in a manner that it provides clear and unambiguous information regarding critical pathways and receptors?			
	Were any assumptions, calculations, statistical analyses and/or tables used? Was a worked example of any calculations or sufficient explanation of statistical analyses provided?			
<b>4.3 Contaminants of Potential Concern (CoPCs)</b>	Does the RMP information clearly identify the CoPCs?			
<b>4.4 Risks Associated with Site Condition</b>	Are there clear and unambiguous conclusions supported with technical information regarding risks associated with the current site condition?			
<b>4.5 Land Use and Zoning</b>	Where applicable, have any future land uses or potential changes to zoning been verified with the municipality in question?			
	Is surrounding land use provided (where applicable)?			
	Does land use zoning(s) described in the report conform to the Alberta Tier 1 land use descriptions?			
	If land use zoning(s) do not conform to the Alberta Tier 1 land use descriptions, has the consultant taken into account appropriate special considerations to account for differences in land use between the Alberta Tier 1 description and that described in the report?			

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<b>4.6 Remediation Guideline Selection</b>	Does the RMP state which remediation guidelines are being used and why? What receptors and pathways have been identified for this site?			
	Is it clear which remediation guidelines are being applied to which areas?			
	Have the relevant Alberta Tier 1 guidelines been documented and compared against the site condition in this or previous reports?			
	Where an Alberta Tier 2 option has been employed for any CoPC, has sufficient justification for the Alberta Tier 2 option been documented in this or previous reports?			
	Where an Alberta Tier 2 site-specific risk assessment process has been used for any CoPCs, has this been reviewed?			
	Have the conclusions of the risk assessment been accepted by the Department and/or Regulator?			
	For sites where there is a more sensitive land use adjacent to the site, has the 30 m buffer zone been applied for contaminants that may be laterally mobile in the groundwater or vapour media?			
<b>4.7 Complete Delineation</b>	Is delineation of contamination in soil complete vertically and horizontally? Where contamination has entered the bedrock, delineation must be complete for bedrock as well.			
	Where impact to the groundwater has not been ruled out, is delineation of contamination in groundwater both vertically and horizontally complete?			
<b>4.8 Evaluation and Management of Source and Heavily Impacted Media</b>	For soil or groundwater contamination, have all sources of contamination, as defined in Alberta Tier 1 guidelines been identified, removed and properly disposed of or remediated and/or controlled as per Alberta Tier 2, Section 2.3.1?			

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	Where a source area is being managed rather than remediated, is delineation sufficient to define the boundaries of the source areas or heavily impacted soils and to estimate potential mass and volume of contamination? It is important to understand the highest concentration and spatial distribution of the source and plume.			
<b>4.8.1 Source Removal and Control</b>	Is there a timeline for source removal and source control? Does it seem feasible?			
	If source control is proposed, does information provide detail that the control measure will: <ul style="list-style-type: none"> <li>• prevent the contaminant from spreading to adjacent areas (i.e. offsite) causing the soil or groundwater to exceed Alberta Tier 1 or Tier 2 guidelines?,</li> <li>• operate until the source area meets remediation guidelines?,</li> <li>• be supported by a monitoring program that demonstrates its efficacy?,</li> <li>• identify any site management or use restrictions to protect acute, sub-chronic and chronic risks to human and environmental health?, and</li> <li>• include a contingency plan to be implemented if monitoring indicates unacceptable risks?</li> </ul>			
<b>4.8.2 Contaminant Concentrations above Management Limits</b>	Are contaminant concentrations above applicable management limits?			
	Are there any areas of active risk management or technical solutions that require ongoing maintenance, such as source control plans (or other)?			
	Will the site be managed in the future to ensure that the source area will continue to be appropriately managed?			

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	For any source(s) of contamination in the soil or groundwater, are there sufficient lines of evidence provided in the RMP to demonstrate that the risks associated with the contaminated area will remain stable or will decrease with time and ensure against further contaminant migration to any area outside the managed area?			
<b>4.8.3 Evidence of Non-Aqueous Phase Liquids (NAPLs)</b>	Does investigation provide enough information to demonstrate that NAPL is absent?			
	Are DNAPLs and/or LNAPLs described?			
	If free-phase NAPL remains, is information related to mobility, volatility (potential to migrate to a human receptor at ground surface), solubility (potential to enter the groundwater pathway) and toxicity included?			
	Is a monitoring program proposed to demonstrate contaminant plume stability or decreasing contaminant plume size?			
	Has the proponent identified special considerations (e.g. vapour barriers, vapour monitoring, restricted development, etc.) for NAPLs/source areas?			
	Has the proponent identified how access to the source area will be attained in the event that it is required in the future, including any hindrances to access from infrastructure or development?			
<b>4.8.4 Identification of Heavily Impacted Media</b>	Has the proponent indicated the presence of heavily impacted media in the RMP proposal?			
	Are administrative controls required to ensure activities are not conducted within the management areas?			

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<b>4.8.5 Preferential Flow Paths</b>	If the CoPC has entered or has potential to enter preferential flow paths such as fractured bedrock, deposits comprised dominantly of medium, coarse sands and/or gravel, or coarse-grained materials along utility rights-of-way, has the RMP addressed increased risk to the groundwater or vapour phases along these exposure routes?			
	Is modeling being used to address the layers encountered and flow movement among layers? If modelling has been used, has sufficient information explaining the modelling been provided?			
<b>4.9 Soil Vapour Evaluation and Management</b>	For volatile or semi-volatile CoPCs, has the applicant included an evaluation of the potential for contaminant migration in the vapour phase beyond the risk managed area or along preferential flow paths?			
	For volatile or semi-volatile CoPCs, has the applicant appropriately considered restrictions required for surface receptors, future development, buried infrastructure, fire, explosive hazards and potential for exposures during excavation?			
	For volatile CoPCs, does the RMP ensure monitoring of vapour concentrations near buildings, within the building and near the source of vapours?			
	If necessary, are the soil vapour probes located in the appropriate areas to monitor the near building and/or near source vapour concentrations?			
	If necessary, have the soil vapour probes been properly installed and tested prior to use?			
	Has the applicant used proper QA/QC protocols to ensure that samples collected are representative of the vapour in the soil?			

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	Has the applicant used appropriate attenuation charts or protocols to estimate attenuation coefficients to calculate soil vapour guidelines for the CoPCs? Has the applicant provided sufficient information on how the attenuations were derived?			
	Have the appropriate site-specific soil vapour guidelines been used in the assessment of the contaminants?			
<b>4.10 Observation of Adverse Effects</b>	Were adverse effects observed?			
	Was the RMP re-evaluated and/or amended after adverse effects were observed?			
	Can further adverse effects be anticipated for the RMP?			
<b>4.11 Acute, Sub-chronic, or Chronic Exposure</b>	Are there acute, sub-chronic, or chronic exposure concerns that need to be considered?			
	If so, does the RMP indicate how short term exposure of critical receptors will be prevented?			
<b>4.12 Human Health Exposure via Direct Contact or Ingestion Pathways</b>	Is there the potential for exposure of a sensitive receptor to high levels of CoPCs through multiple or single exposure events based on direct contact or ingestion pathways (e.g. pica child exposure, populations with high reliance on game or locally grown food products)?			
	For human health direct contact or ingestion pathways, has the applicant considered risks from potential acute, short-term, sub-chronic, or chronic effects within the risk managed area (e.g. effects to the “pica” child or other high exposure incidents that may result in acute, short-term, sub-chronic, or chronic health effects, concentrations that may cause acute, short-term, sub-chronic, or chronic health effects in general populations)?			

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	Has the applicant appropriately considered risks of surface exposure for human health direct contact or ingestion exposure pathways, within heavily impacted areas and proposed acceptable methods to prevent or mitigate exposure via this route?			
<b>4.14 Sufficient Concentrations to alter Physical or Chemical Properties</b>	Is the CoPC concentration sufficient to alter the physical or chemical properties of the soil or groundwater? If so, outline special considerations to address potential changes in the surrounding medium, transport mechanisms, pH value, redox conditions, or biological conditions.			

## Implementation Requirements

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<b>5.1 Summary of Requirements and Conditions</b>	Is a written summary (executive summary or management summary) of requirements and/or conditions for the RMP provided?			
	Is the summary clear, concise, and simple? Is information presented in such a way that all readers can rapidly become acquainted with the larger body of material contained within the RMP?			
	Does the summary contain a brief statement of the problem or proposal covered within the RMP? Are background information, a concise analysis of the problem and main conclusions presented?			
	Is there clear emphasis on the main risk management requirements, conditions, and exposure controls needed for the RMP to be effective?			
<b>5.2 Risk Evaluation</b>	Have all risks from APECs or CoPCs been considered in the scope of the RMP?			
	Does the RMP have clear and unambiguous conclusions that demonstrate protection of receptors that may be at risk during the life of the RMP?			

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	<p>Is the RMP supporting rationale sufficient to demonstrate that it will protect human health and environment?</p> <p>Would failure of the RMP result in any of the following:</p> <ul style="list-style-type: none"> <li>•Immediate risk of exposure of humans to CoPCs at levels likely to be above Alberta Tier 1 or Tier 2 guidelines for a pathway of concern?</li> <li>•Sudden discharge of CoPCs to aquatic environments?</li> <li>•Immediate risk to terrestrial or non-human receptors?</li> <li>•Risk of CoPCs spreading to media such as soil, sediment, air, surface water or groundwater at concentrations that exceed the regulatory guidelines?</li> </ul> <p>Where the failure of the RMP can result in more serious risks, such as immediate risks of exposure to humans or discharge into aquatic environments, more detailed monitoring, management and contingency plans will need to be included.</p>			
	Does the RMP provide sufficient details on the exposure barriers to be used?			
	Will the RMP prevent further deterioration of soil or groundwater conditions?			
	Does the RMP ensure appropriate management of CoPCs if disturbed or excavated in the future?			
<b>5.3 Monitoring Plan</b>	Does the RMP have a Monitoring Plan?			
	For mobile CoPCs, does the RMP monitor changes to on-site and off-site conditions that may result from transport of the CoPC in the vapour or groundwater media?			

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	Does the RMP include clearly defined monitoring requirements including reporting schedules to Alberta Environment and Parks and/or Alberta Energy Regulator and any affected stakeholders?			
<b>5.4 Contingency Plan</b>	Does the RMP have a Contingency Plan?			
	Does the RMP include measures to identify changes to site condition?			
	Does the RMP include clear triggers to identify whether risks associated with the managed area are not stable or decreasing with time?			
	Does the contingency plan include provisions to initiate renewed stakeholder consultations for any affected or potentially affected party?			
<b>5.5 Timelines and Plan Requirements</b>	Does the RMP include timelines, milestones, and/or monitoring to ensure that the effectiveness of the RMP is determined?			
	Is there a clear understanding of the time frame that will be required and does the RMP include commitments by appropriate parties for any long-term management or monitoring?			
<b>5.6 Communication Plan</b>	Does the RMP have a Communication Plan?			

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	Have all directly impacted landowners provided a signed copy of the <i>Affected Third Party – Risk Management Plan No Objection</i> form? These parties may include affected adjacent landowners, the municipality in which the contaminated site resides and potentially the Government of Alberta, if required.			
	Have <i>Affected Third Party – Risk Management Plan Notification</i> letters been sent to affected parties and are the letters included as an appendix in the RMP?			
	Does the communication plan ensure that all affected parties are aware of any restrictions on use required by the RMP?			
	Does the communication plan ensure that current and future land owners and other affected parties will be notified of any physical or administrative requirements to maintain the RMP?			
	Does the RMP include a mechanism for affected third parties, the proponent and the consultant to discuss and resolve third party concerns?			
	Does the RMP document concern(s) raised from third parties and methods used to address those concerns?			
<b>5.7 Obligations for Long-term Care and Control</b>	Does the RMP need long-term care and control to perform successfully?			
	Has the applicant submitted a signed copy of the <i>Person(s) Responsible – Risk Management Plan Commitment</i> form that indicates maintaining the RMP indefinitely or until compliance with the governing risk management objectives have been demonstrated?			
	For any RMP that requires ongoing administrative commitments to ensure against exposure along a particular pathway, have administrative commitments been made to ensure the requirement is communicated and enacted for the time required?			