



Figure 1. Framework for remediation of complex sites

**Table 13. Periodic evaluation example checklist for specific topics**

<b>Source Characterization</b>	
	Does remedy operation data indicate that the source may not be fully characterized?
	Are contaminant properties known and considered?
	Are COCs site specific behavior patterns and conditions fully identified and understood?
	Has the level of uncertainty in the horizontal and vertical mapping of source area mass and lithology been identified?
	Has the mass been evaluated?
	Have distal plume portions been characterized, sufficiently?
	Evaluate the ability of current technology to effectively characterize the site (for example, bedrock geology)
<b>CSM</b>	
	Does the CSM reflect current understanding of site conditions? For example, how has land use changed?
	Does the current CSM adequately explain plume behavior and remedy performance?
	Based on the current CSM, are all receptors adequately protected?
	Is the site adequately characterized to support meaningful evaluation of remedy performance and remediation potential?
<b>Hydrogeology and Plume Behavior</b>	
	Are plume dynamics well understood? Is plume increasing, shrinking, or stable?
	Is the influence of any off-site extraction wells (pumping rates) well understood?
	Are contaminant concentrations decreasing at a rate that will achieve site objectives within the time defined by the decision document?
	Has the influence of uncertainty associated source mass, hydrogeology, mass flux, matrix diffusion, and other parameters been evaluated and accounted for in the time frame estimate?
	Is the evaluation of the mass balance sufficient to determine:
	<ul style="list-style-type: none"> <li>• original mass released</li> <li>• mass removed by remedial operations</li> <li>• remaining residual mass in the dissolved plume and immobilized within the soil lithology (lower permeability units in particular)?</li> </ul>
<b>Technology Performance – Evaluate Site Specific Challenges</b>	
	Evaluate intrinsic recalcitrant contaminants/complex hydrogeology or technology.
	Evaluate measurement methods (performance metrics) used to assess the technology performance.
	Evaluate level of technology performance needed to meet site objectives or interim objectives.
	Evaluate potential challenges for meeting site objectives and time frame based on appropriate technical factors and limitations (such as continued NAPL dissolution remaining immobilized residual mass in lower permeability or difficult to access lithology, capillary smear zone, or matrix back-diffusion limitations).
	Is achieving site objectives technically feasible?
<b>Technology Alternatives Cost Effectiveness Analysis</b>	
	Has a cost effectiveness analysis been conducted if an alternate technology is considered as a potential replacement of a technology currently in operation?
	Does a completed technology pilot test indicate that site objectives can be achieved?
	Is the proposed technology schedule to complete more favorable (based on time or resource consumption) than the current technology in operation, and is it acceptable to interested parties?
	Is the proposed alternative approach sustainable?
	Is an appropriate modification to the decision document required based on data gaps, source characterization, plume behavior and/or technology performance?