

# Green Best Management Practices

**The following list should be considered, when appropriate, during all phases of work for OPS projects. For more information, please visit our website at [www.colorado.gov/cdle/remediation/green](http://www.colorado.gov/cdle/remediation/green)**

Applicable?

Implemented?

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<b>Assessment</b>	Utilize real-time measurement tools [Membrane Interface Probe (MIP), Electrical Resistivity Imaging (ERI), Laser-Induced Fluorescence (LIF), Cone Penetration Testing (CPT), mobile labs] for high resolution data collection for source area and plume delineation. These technologies can cost effectively identify contamination and aid in the development of a Conceptual Site Model (CSM).		
	Utilize direct push instead of auger drilling when technically feasible.		
	Collect data necessary for site specific risk assessment and/or remedial alternative evaluations [hydrogeologic parameters, Monitored Natural Attenuation (MNA) parameters, bioremediation parameters, In-situ Chemical Oxidation (ISCO) parameters].		
	Utilize local subcontractors when appropriate.		
	Dispose of Investigation-Derived Waste (IDW) at the nearest permitted facility.		
	Identify reuse/recycling options for IDW. This includes not only soil, asphalt, or concrete, but also used bailers, boxes, etc.		
	Use fate and transport modeling to help determine monitoring well placement if release characteristics are known.		
	Develop a Conceptual Site Model (CSM) for the project. An accurate CSM supports project decisions about exposure to contaminants, site cleanup and monitoring.		
<b>Design</b>	Complete pilot testing likely or probable remedial alternative.		
	Complete Life Cycle Analysis (to estimate the carbon footprint) of considered remedial approaches.		
	Identify cleanup goals, including milestones to evaluate the performance (i.e., update the CSM).		
	Verify power requirement calculations and performance curves to ensure properly sized blowers, compressors, etc. are being used.		
	Incorporate individual flow control to each system well for adjustments to improve efficiency.		
	Cycle the mechanical system components to increase removal efficiency and decrease energy usage.		
	Review emissions calculations to evaluate the need for thermox or catox inclusion.		
	Utilize carbon vessels or regenerative Optipore adsorbent for emissions capture. Emissions capture should particularly be considered during the initial purge of vapors.		
	Utilize carbon emissions capture on mobile vacuum events (Enhanced Fluid Recovery (EFR), mobile air sparge/soil vapor extraction (AS/SVE)).		
	Utilize renewable energy when available. Most often, this may be in the form of wind energy credits from the utility provider.		
	Consider stand alone renewable energy systems for electrical needs when power drops and electrical supply upgrades are costly and/or when feasible (i.e., solar sipper).		
Develop a materials management plan. Identify reuse/recycle opportunities (e.g., process concrete onsite for fill, reuse clean soil for fill or local reuse, avoid dry runs for hauling trucks)			
<b>Construction and Startup</b>	Obtain the full specifications and serial numbers of all durable equipment (blowers, compressors, product pumps, control panels, sheds, etc.) for future reuse.		
	Utilize local subcontractors when appropriate.		
	Implement materials management plan.		
	Review the CSM and cleanup milestones following system startup and modify as necessary.		
<b>O&amp;M</b>	Review the CSM and cleanup milestones throughout system operation and maintenance (O&M). Modify the system (remediation process optimization) as necessary and document decisions/analysis.		
	Use telemetric system operation when feasible.		
	Assess surface seals and accessible piping joints quarterly to ensure efficiency.		
<b>Monitoring</b>	Utilize local subcontractors when appropriate.		
	Conduct periodic measurements and interpretation of MNA parameters (Monitoring and Remediation Report Table 2 info) for ongoing assessment of biodegradation.		
	Review and modify the sampling plan on an annual basis during system O&M. If the plume is stable, are there point of compliance (POC) wells that could be sampled annually?		