

**EPA Session 3: Design Optimization Through Independent Design Review**  
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Environmental optimization best management practices (BMPs) encompass strategies, tools, and technologies that can be used at every phase of site cleanup from initial planning to site closure. These BMPs can reduce cost, schedule, and uncertainty by improving the effectiveness and efficiency of remedial strategies and monitoring activities that comprise environmental site cleanup.

The remedy implementation phase of an environmental cleanup project is typically more costly and longer-lasting than the preceding phases, and these costs are directly tied to the remedy design. As a result, U.S. EPA has developed the Independent Design Review (IDR) approach to incorporate third-party perspective during the remedy selection stage, design stage, or remedy “re-design” stage. IDRs are objective-based efforts to identify critical design flaws, leverage unexploited process efficiencies, and to reduce costs without altering remedial system performance.

An IDR involves a team of expert scientists and engineers, independent of the site, conducting a third-party evaluation of site operations. It is a broad evaluation that considers the goals of the remedy, conceptual site model (CSM), and cleanup objectives. The evaluation includes reviewing existing site documents and data, interviewing the site team, potentially visiting the site, and compiling a report that includes recommendations to improve the system. Recommendations with cost and cost savings estimates are provided to improve remedy effectiveness, remedy efficiency, and remedy duration.

The recommendations are intended to help the site team (the responsible party and the regulators) identify opportunities for improvements. In many cases, further analysis of a recommendation may be needed prior to implementation. EPA has utilized the IDR process at its own sites as well as at responsible party sites to provide a valuable additional technical perspective.

The fresh, unbiased perspective of an IDR team often results in a more efficient and effective remedy. The process and unbiased perspective also assists with building stakeholder consensus. Recommendations might suggest additional characterization to better focus source area remediation, additional characterization to refine pump and treat extraction rates, or bioremediation reagent injections, and focused pilot studies. Recommendations frequently include designing and implementing a remedy in stages so that information from the first stage can be used to inform decisions regarding later stages. This helps avoid over-design and improves the overall effectiveness of a remedy, reducing the chance of operational ineffectiveness and premature replacement.

This session will provide a primer on IDR, present case studies where IDR has been used to add value to cleanup efforts, provide an update on EPA's efforts to promote the use IDR, and provide specific examples of strategies, tools and technologies common to IDR efforts for various types of remedial programs that can be employed on projects.