

EPA Session 1: Investigation Process Optimization
Presenters: Dan Powell (US EPA) and Jody Edwards (Tetra Tech)

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 investigation phase of an environmental cleanup project is subject to significant uncertainties and other influences that can effect the successful execution and results of the project. The U.S. EPA has developed an Investigation Process Optimization (IPO) methodology to ensure investigation projects are designed and performed effectively to ensure successful remedial decisions and outcomes, regardless of the regulatory program driving the execution of the project.

IPO is comprised of a series of integrated BMPs used to optimize the investigation process, including five key BMPs: Independent Project Review (IPR), conceptual site models (CSM), systematic project planning (SPP), dynamic work strategies (DWS), and real-time measurement technologies. IPO draws on science and technology advancements and practitioner experience to develop strategies for making investigations more scientifically-defensible, resource-effective, adaptive to changing project needs, and responsive to stakeholder concerns. Applied to new or active projects, IPO can be used to significantly reduce data collection costs, expedite project schedules, enhance stakeholder communication, and improve project and site decision quality.

An IPR involves a team of expert scientists and engineers, independent of the project, who conduct a third-party evaluation of an investigation project. It is an in-depth evaluation that considers site understanding, project planning and design, uncertainty management, technology use, decision-making goals, metrics and methods and other factors that comprise the myriad actions that must be completed effectively to ensure project success. The IPR ensures that project integrity is maintained to ensure protectiveness, cost-effectiveness and maximizing the use of data to make robust project and site decisions.

Projects are framed in the context of a CSM life cycle which is linked to the major stages of environmental cleanup with expected levels of maturity defined to support specific project decision needs. Well-constructed CSMs used in the context of robust SPP efforts are highly-effective in driving data gap identification; exit strategies; characterization strategies; sampling plan design; data collection, analysis and management; risk assessment; remedial technology evaluation and selection; and design basis development.

DWS and real-time measurement technologies enable the use of innovative strategies and technologies to collect collaborative data sets and use of field-based decision logic to enable stakeholders to perform real-time decision-making.

Case studies will highlight the benefits of using IPO concepts at hazardous waste sites within a variety of programmatic and regulatory frameworks.