

DIY Sustainability Assessment: Social, Environmental, and Economic Impact and Benefit Sustainability Analysis

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Background/Objectives. All remediation approaches have desirable and undesirable environmental, economic and social impacts. Since some of these are not considered in traditional regulatory decision frameworks, there is an increasing call for comparative assessments using tools that consider all risks, benefits, and costs of alternatives. The evolution of information to assist in decision making at contaminated sites can be viewed as expanding the perspective on appropriate endpoints, costs, and beneficiaries, moving toward a systems-based perspective assessing gains from risk reduction and mass removal alongside broader environmental, economic, and social risks, throughout the lifetime of a project, at a range of spatial and temporal scales. This has led to an increasing number of frameworks applying sustainability concepts in decision making. However, few have addressed sediment issues, and most are largely qualitative, focus on a narrow range of issues or regulatory objectives, and are data-hungry or proprietary. The focus of this project was on information needs at “Tier 2” sites (i.e., moderately complex sites with less quantitative data than many Superfund megasites), with the objective of developing a broad-based, transparent, publicly available tool that allows users to evaluate the sustainability of sediment remedial alternatives using information on stakeholder/community knowledge and site data that is generally available during Tier 2 assessments.

Approach/Activities. Detailed empirical assessments developed to evaluate remedial alternatives for the Portland Harbor Superfund Site were adapted for use in Tier 2 assessments, leading to three integrated modules. The regulatory criteria module scores alternatives in terms of environmental and other common remedy selection criteria, and is customizable to a range of state, federal or regional regulatory frameworks. The economic module uses information on costs and financing considerations to evaluate impacts to local jobs and gross regional product—using the user-friendly and available IMPLAN model—as well as cost-effectiveness assessments using various effectiveness measures. The value criteria module links these and other metrics to impacts on stakeholders’ environmental, economic and social values, allowing stakeholder groups to weight impacts based upon differing priorities. Most metrics within these tools provide quantitative scores based on generally available data, and formalized scoring approaches are developed for the more qualitative metrics. The framework is being validated using case studies from different regions and regulatory frameworks.

Results/Lessons Learned. Not all impacts are addressed in many current assessments. As an example, while remediation project expenditures are acknowledged to result in more local jobs, the net regional economic impact also depends upon how projects are financed; costs borne by local businesses and governments lead to fewer local jobs and economic activity. In the environmental and social arenas, whether the greater ecological and social footprint of larger projects justifies an incremental risk reduction depends upon the priorities, concerns and vulnerabilities of various community members, as well as the degree of certainty of various assumptions. It is essential to evaluate remedial alternatives using a wide range of potential criteria, but complex evaluations using custom tools can be confusing and met with suspicion

from some parties. This relatively transparent set of tools allows various stakeholder groups to examine how their differing priorities affect the ranking and selection of remedial alternatives, and to understand the various trade-offs. Use of this set of tools is designed to allow for early and collaborative engagement, and, ideally, optimization of remedial approaches to address community priorities. The results of case study-based validation, and the path forward, will be discussed.