

Speeding Up Brownfield Redevelopment

“How do we speed up Brownfield Redevelopment projects?” This is a common question that you may have been asked – or maybe you have asked it yourself. Non-brownfield development projects are typically performed over a matter of months, while brownfield projects often require years to complete. So just how do we speed these up? Stone Environmental (Stone) has worked with clients across Vermont to offer an alternative approach to one common cause of delay – the traditional iterative approach to Site Investigations and Phase II ESAs.

Traditional Site Investigations rely on static sampling plans and off-site analytical laboratory results, and often require multiple field deployments, each with a work plan and reporting cycle. Data are assessed after the field work is complete and results are back from the lab. Data gaps that result in uncertainty are identified only after the field work is complete. Data are processed, conclusions are drawn, and recommendations are made for further assessment or, if we're fortunate, remedy. Reports are reviewed, and more work is often requested to better define uncertainties. The cycle continues while the potential redeveloper waits – and waiting can be expensive.

Contrast this to the [Triad Approach](#) advocated by the US EPA, which speeds up the process, reduces life cycle costs and manages decision-making uncertainty through the triad of: 1) systematic planning, 2) dynamic work strategies, and 3) use of real-time measurement technologies.

Systematic Planning

Systematic planning is a process that identifies and involves stakeholders and key decision makers from the outset. The process establishes the critical decisions that need to be made on the path to redevelopment, as well as who will make the decisions and the process or rules by

which the decisions will be made. At the heart of Systematic Planning is the development of a conceptual site model (CSM) which synthesizes all that is known of the site into an all-encompassing “picture” of the site. Elements of the CSM which are critical to the redevelopment project (and protection of human health and environmental quality) and about which uncertainty exists become hypotheses to be tested by field investigation. In this way, the investigation is sharply focused, as well as both cost and time efficient. All projects could benefit from systematic planning, but it is particularly critical when using the Triad Approach, in which the use of real time measurement technologies allows the CSM to evolve and mature while field work is

underway. For such dynamic work strategies to be successful, active participation and regular communication by and with stakeholders is required. Defining communication channels and decision-making processes in the planning stage is a crucial aspect of the Triad Approach.

Dynamic Work Strategies

Dynamic work strategies incorporate the flexibility to change or adapt in response to information generated by real-time measurement technologies. As information is gathered it is used to make decisions about what subsequent activities will best resolve remaining data and decision

uncertainties, and/or meet cleanup goals. Dynamic work strategies are usually documented as pre-approved decision logic within appropriate planning documents.

Real-Time Measurement Technologies:

A variety of tools and techniques are available to the investigator for use in a dynamic work strategy framework, including the Waterloo^{APS}™, Membrane Interface Probe (MIP), Laser Induced Fluorescence (LIF) probes, detailed soil coring and subsampling coupled with



on-site analytical capabilities, FLUTE™ NAPL ribbon samplers, and others. Using these tools in combination provides a cost-effective means of developing a robust data set for hypothesis testing, CSM updating and, ultimately, site management decision-making. Real-time measurement technologies return results quickly enough to allow time and money-saving decisions to be made regarding the direction of the investigation while it is in process.

Benefits of Using the Triad Approach:

Using the Triad approach ensures that assessment projects are performed faster, done cheaper, and result in improved project outcomes.

Faster: To support timely decisions in the field, the Triad approach relies heavily on real-time and near real-time measurement technologies, which are inherently faster than fixed-based laboratories. In addition, as uncertainty is managed in the field through dynamic decision making, the Site Investigation can proceed to collect additional data to fill data gaps until the decision quality objectives are met without multi iterations of the workplan – fieldwork – report – regulatory review paradigm. Stone has had experience on Vermont brownfield Sites going from a poorly understood property to a full Corrective Action Feasibility Investigation (CAFI) stage within one mobilization to the Site.

Cheaper: While a Triad Approach investigation may at first glance appear more expensive than the next proposed phase of a traditional investigation, experience has shown that the life cycle or overall project costs are significantly lower when the Triad Approach is used. The use of collaborative data sets that combine data derived from less expensive field screening methods with a smaller number of more expensive definitive analytical techniques can produce robust data sets at a much reduced cost. In fact, Stone's NELAC accredited [MobiLab™](#) produces near real-time analytical results for volatile organic compounds in soil, air and water the same day that the samples are collected – sometimes within a matter of minutes – at a cost that is comparable to what a conventional laboratory would charge for a two week turn around.

Secondly, as the field program continues sampling, strategies can be refocused to assess those areas where uncertainty is greatest.

Lastly, because field work is performed within one field effort, excess costs for multiple mobilizations, reports, and work plans are avoided.

Better: Through the systematic planning process, projects using the Triad approach require that stakeholders sign off on the process of the work, rather than on a strict work plan. Stakeholder involvement and awareness is required during field efforts, and this ultimately results in better understanding and agreement within the stakeholder group.

In addition, because Site investigations are performed at a much higher resolution (i.e. more data are generated and provide a clearer picture of the contamination), remediation of Triad sites is better designed since Site heterogeneity is better understood.

Ultimately, the use of the Triad approach for Site Assessment and Phase II ESAs ensures that developers can move to the next stage of redevelopment more quickly – and often with more accurate results – than if traditional Site Investigation methods were used.

Helpful Links:

For more information regarding the Triad Approach, Brownfield Redevelopment, and the State of Vermont Brownfield Response Program, please refer to the following links:

[Brownfield Site Cleanup Roadmap](#)

[Vermont Brownfield Program](#)

[Triad Central](#)



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