

2019 ITRC Project Proposal

Green and Sustainable Remediation Update with Resiliency to Extreme Weather Events

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Proposal Summary

Since SURF published its Sustainable Remediation white paper "Integrating sustainable principles, practices, and metrics into remediation projects", (Remediation Journal, 19(3), pp 5 - 114, editors P. Hadley and D. Ellis, Summer 2009) nearly 10 years ago (Summer of 2009) and ITRC published Green and Sustainable Remediation: State of the Science and Practice (GSR-1) in May of 2011 and Green and Sustainable Remediation: A Practical Framework (GSR-2) in November of 2011, there have been many lessons learned in implementing GSR. These learnings and additional updates are proposed to be included in an update to these documents in a new GSR document. Lessons learned from the implementation of Green and Sustainable Remediation would include a review of state and federal Green and Sustainable Remediation policies and regulatory progress. Additional material will include a significant section on resiliency to impacts from extreme weather events including sea level rise, storm surge, increased precipitation, increased temperature, and other extreme events.

Resiliency

Starting in 2016 SURF has led an effort to assess the challenges occurring at cleanups due to extreme weather events. Leveraging this research along with State and Federal initiatives this proposed ITRC team will work to develop solutions to address the following ITRC state environmental technical issues:

- Risk Assessment Guidance: new methods for evaluating risk (especially from cross-program perspectives)
- Guidance, policy and principles for improving Cleanup Regulations, Standards and Measures: Resiliency considerations for at-risk proposed and existing remedy projects
- Vulnerability Assessment, Resiliency and Disaster Planning (Best Management Practices)

The Problem

When introduced in 2009, Green and Sustainable Remediation (GSR) was a fresh look at how to best manage environmental assessment and remediation to maximize the benefits of such efforts. As a relatively new framework with new tools, it was an introduction to the concept. After 10 years, many lessons have been learned about GSR and these lessons need to be captured and shared with stakeholders to allow more effective implementation of the concepts. In addition to these lessons learned, resiliency has begun to play a more important role in planning for solutions.

Hurricane Harvey showed us the impacts of extreme weather events on contaminated land, public health, and the environment. Sites were inundated by floodwaters, releasing contaminants and exposing residents, first responders, and the region's fragile ecosystems to harmful levels of toxins. After Harvey made landfall, 13 Superfund sites in Houston, Texas were flooded. At one site, the EPA measured dioxin at levels that were more than 2,300 times the level requiring cleanup actions. Extreme weather events can undermine the effectiveness of the original site remediation design and can also impact contaminant toxicity, exposure, organism sensitivity, fate and transport, and long-term operations, management, and stewardship of remediation sites. In 2017 The Federal Government reported that "extreme weather events have cost the United States \$1.1 trillion since 1980."

According to another recent analysis, nearly two million people, the majority in low income communities, live within one mile of one of 327 Superfund sites in areas prone to flooding or vulnerable to sea-level rise (Associated Press 2017). These 327 sites are part of a much larger universe of U.S. sites that need to be assessed regarding impacts caused by these types of events.

The Solution Updating the ITRC GSR documents with lessons learned will bring the frameworks, tools, and implementation to a state of the art status and help support further acceptance and use of GSR principles and resiliency strategies.

With respect to resiliency, research spearheaded by SURF examines the long-term sustainability of site remediation and reuse from the impacts of extreme weather and sea rise events. Recommendations include (1) integrated vulnerability and GSR assessments and adaptation strategies, and (2) best practices such the New Jersey guidance "Planning for and Response to Catastrophic events at Contaminated Sites." or Massachusetts's effort to evaluate regulated sites and their vulnerability to events such as coastal flooding and sea level rise.

SURF TI research also includes the benefits of rehabilitated land in strengthening community,

economic and ecosystems resilience. For example a former brownfield site now an East London wetland park saved £15.4M in flood prevention and public health benefits while linking underserved communities to historic green space (Land Trust 2016).

Springboarding from work accomplished to date, this proposed ITRC Team will (1) compile available principles, procedures, tools and case studies, and (2) examine the technical, statutory and regulatory barriers and opportunities to advance sustainable, resilient cleanup approaches and reuse of hazardous waste sites, focusing on the following:

- Guidance and procedures to address resiliency planning for flooding and coastal flooding (and extreme weather events)
- Guidance on sustainable infrastructure, including international summaries of existing decision frameworks for municipal and state regulators
- BMPs on incorporating disaster preparedness into long-term institutional and engineering controls to maintain remedy resiliency
- BMPs & guidance on establishing and maintaining vegetative CAP coverage in high drought areas

Proposed Team Composition

SURF's Technical Initiatives' partners include states, global businesses, entrepreneurs, academics, NGOs, and state and international sustainable remediation leaders: DOE contractor Lawrence Berkeley Laboratory, ASTM, Commonwealth of Massachusetts, State of California, Wactor & Wick LLP, Farallon Consulting for the State of Washington, GHD, EcoAdapt, the Mystic River Watershed Association, r3 environmental technology, University of Southern California, University of Brighton, UK, and the International Sustainable Remediation Alliance. These partners will likely continue their collaboration on an ITRC project.

Proposed state team leaders: New Jersey and Massachusetts

Coastal states including New York, Florida and Texas will likely also have an interest in this project.

Summary and Schedule of Deliverables (primary project product(s))

Indicate the ITRC product(s) to be produced and a general timeline of project schedule.

- Propose Updates to Existing ITRC Green and Sustainable Remediation Guidance (1 year)
- Fact Sheets (1.6 years from project start)
- Internet webinars & other direct speaking/teaching opportunities such as AEHS workshops (as appropriate and funded)

Identification of Potential Funding Sources

SURF has already committed to providing seed money in a climate resiliency pilot project in MA. SURF is also completing the necessary requirements to raise funds in key states such as NJ, CA, NY, and MA. If a follow-on pilot stage is considered for an ITRC project, these potential funding sources might be available.