

2022 Americas Site Solutions Technology Transfer Conference

Title: Design of a Treatability Study to Assess Sediment Remedial Technologies

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Key Topic: Sediment Management/Shoreline Stabilization

PDP Manager/Managing Principal's Name: Tim Olean

Client Name: Confidential Client

Project Name: Sediment Remediation Treatability Study

Project Location: New York City

Primary Ramboll Project Staff (Office): Chicago, Illinois; Milwaukee, Wisconsin; Syracuse, New York; and others

ABSTRACT

Background/Objectives:

The subject Superfund site is advancing through the Remedial Investigation process into the Feasibility Study (FS) stage. To better assess remedial technologies as part of the FS, the client and other stakeholders wanted to develop a field treatability study (TS) with a focus on capping and *in situ* solidification/stabilization (ISS) of soft sediments. Ramboll developed a detailed design package, which includes: a structural bulkhead evaluation; an ISS treatability assessment; a chemical cap model; surface water velocity and cap material sizing evaluations; geotechnical assessments of cap placement and stability; construction drawings; technical specifications; and a construction quality assurance/quality control plan.

Approach/Activities:

Once the scope of the TS was established in coordination with the client and regulators, Ramboll developed a comprehensive pre-design investigation (PDI) work plan. The PDI was performed from late 2019 through early 2020, which included: sonic, vibracore, piston core, and hollow-stem auger drilling methods; passive and active porewater sampling using solid-phase microextraction (SPME), dialysis membrane cells, and temporary wells; hydrographic and terrestrial surveying; and seepage/hydraulic measurements using Distributed Temperature Sensing (DTS) as well as pressure transducers. The techniques for measuring seepage were of particular interest, utilizing a combination DTS, hydraulic gradient rods, and assessment of hydraulic conductivity using traditional methods and a recently developed method of monitoring gravity drainage from vibracore samples. With the robust PDI dataset, the design efforts commenced in 2020, with collaborative support from over 15 engineers and scientists from six Ramboll offices. The design package is a work plan that lays out the basis of design and how the TS will be implemented. The work plan was developed so that it could be included as part of the bid package for selecting a contractor and includes the detailed technical evaluations as appendices to support development of the design and approach, in addition to technical specifications, construction drawings, and monitoring plans. The work plan was completed within the approved budget and delivered to regulators on time, meeting an aggressive schedule.

Results/Lessons Learned:

This project provided an opportunity to utilize innovative investigation techniques and source a wide range of technical expertise from multiple Ramboll offices. This project is an example of how Ramboll's broad technical knowledge can be applied to develop a comprehensive design package to test remedial technologies at a complicated sediment site.

Aspect of Work that Relates to Sustainability:

The focus of the TS is to evaluate the implementability of capping and ISS at the project site. Both of these technologies provide opportunities to more sustainably address impacted sediments by generating less greenhouse gas emissions than traditional dredging approaches that would be considered for a site of this nature.