In-Stream Remediation of Coal-Tar-Impacted Sediments and Fractured Bedrock

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Background and Objectives

Site Description/Background

- Manufactured gas plant (MGP) site in urban area in upstate NY
- Soils and sediments above limestone, dolomite, and shale bedrock
- Coal tar non-aqueous phase liquid (NAPL) impacted sediments in stream
- Opposite stream bank is a maximum security prison wall



Sediments and fractured rock removed. Prison wall on left.

Objective

- Remove coal-tar NAPL impacted stream sediments
- Sediment removal "in the dry" to facilitate removal and verification



Temporary dam and pumped bypass diverted stream flow for "in-the-dry" remediation















Coal tar NAPL discovered in fractured bedrock

 Sediment removal exposed fractured bedrock with coal tar NAPL seeping from numerous fractures.

• Unexpected change of conditions requiring excavation modification

 Fractured bedrock overlies competent bedrock with few fractures. • Natural barrier for coal tar NAPL flow

• Excavation terminated on top of competent bedrock layer

Competent bedrock surface provided opportunity

- Observations of water flow on competent bedrock surface indicated fluid flow to a corner • Survey showed smooth competent bedrock surface
- with consistent slope
- Coal tar NAPL can be collected at downgradient end • Only bank on MGP site needs collection system
- Access on client property
- No interaction with prison

Design of fractured bedrock containment and collection system

- Collection trench along toe of fractured bedrock in bank
- Collection sumps installed at downgradient end
- Concrete wall sealed to competent bedrock to prevent lateral coal tar NAPL migration
- Seal coat of concrete placed on fractured bedrock in stream channel to seal fractures

Competent bedrock slope



EXCAVATED TO COMPETENT ROCK



Pouring concrete seal on bedrock up to containment wall

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Using site geology to your advantage







Collection sump and containment wall design





Conclusions/Lessons Learned

- Delineation of NAPL, especially in fractured rock, is difficult
- negative impacts
- More attention needs to be paid to logging soil and bedrock structure during investigations
- Unanticipated site conditions require immediate response during construction, especially if they concern unknown foundations of structures

Group 1

Final restoration successfully completed

- Difficulties of site access often hide impacts during RI/FS/RD
- Minor geologic details can play an outsize role in positive and

