Monitoring of a ZVI PRB at the Somersworth Superfund Site Two Years After Installation

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Outline

• Site History & Objectives
• Construction Test
• PRB Construction Monitoring
• Post-Construction Monitoring
  - sampling of installed iron
  - GW levels
  - hydraulic testing
  - GW chemistry
Site History

- Landfill accepted municipal & industrial waste 1930s to early 80s
- TCE found in groundwater
- Superfund Site in 1982
- ROD allowed for innovative PRB with cost sharing
Objectives for PRB

- treat overburden groundwater flowing beyond edge of waste
- reduce chlorinated ethenes (CEs) to below interim clean-up levels (ICLs)
PRB to Intercept Natural Groundwater Flow

- wetland
- peat
- stratified sands with silt and gravel
- municipal & industrial landfill waste mid 1930s to 1981
- bedrock
System Configuration

- Funnel and Gate considered
- Continuous Wall selected
  - less potential to alter GW flow patterns
Bio-Polymer Trench Excavation

Backhoe Excavates Trench

- Water table
- Soil
- Biopolymer Slurry holds trench open
- Granular Iron
- I-Beam End Stop
- Bedrock
Bio-Polymer Trench Backfilling

- Granular Iron/Sand Mixture Added to Open Trench
- I-Beam End Stop
- Biopolymer Slurry holds trench open
- Bedrock
- Soil
- Water Table
- Soil
Full-Scale Construction

• August – September 2000
• 8 Sections with different amounts of sand in sand/iron mix
• 23 separate panels
• Primary panels then alternate secondary panels
Construction Monitoring

- Grain size analysis of iron and sand
- Iron content of iron/sand mix
- Depth of trench
- BP slurry and trench stability
Construction Monitoring

- Primary panels excavated one day and backfilled the next
- BP stable in primary panels
- BP lost viscosity in secondary panels overnight and some excess material in bottom of 2 secondary panels
- Remaining secondary panels excavated and backfilled same day
Excavator and Bucket
Trench Excavation
Mixing Iron & Sand
Backfilling Trench
Water Spray to Wet Iron