

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

Thomas Krug<sup>1</sup>,  
Karen Berry-Spark<sup>1</sup>, Suzanne O'Hara<sup>1</sup>,  
Carl Elder<sup>1</sup>, Michael Jordan<sup>1</sup>,  
and Tim Sivavec<sup>2</sup>

GeoSyntec Consultants<sup>1</sup>, General Electric Company<sup>2</sup>



# Outline

- Site History & Objectives
- Construction Test
- P R B Construction Monitoring
- Post-Construction Monitoring
  - sampling of installed iron
  - GW levels
  - hydraulic testing
  - GW chemistry

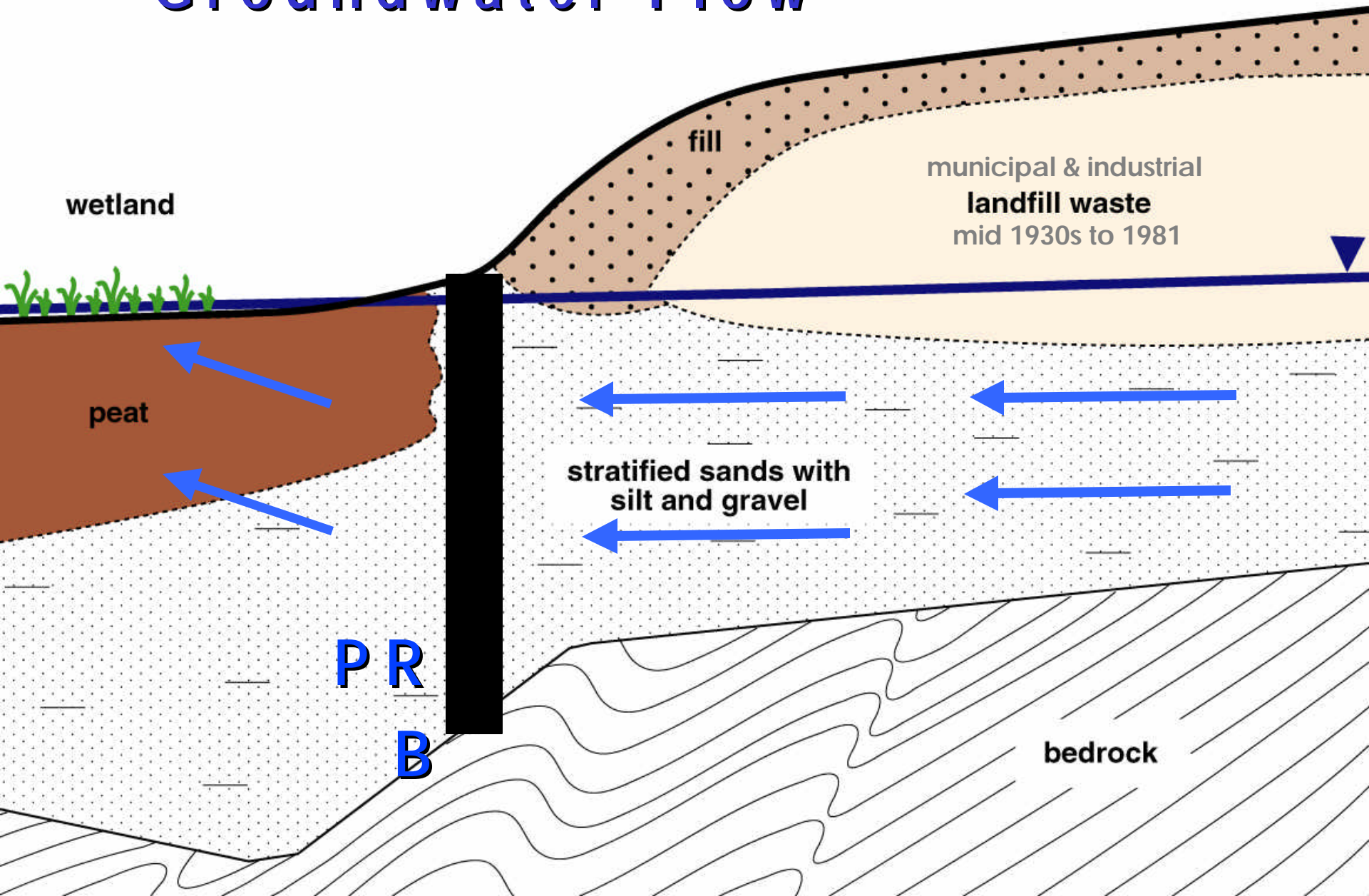
# Site History

- 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

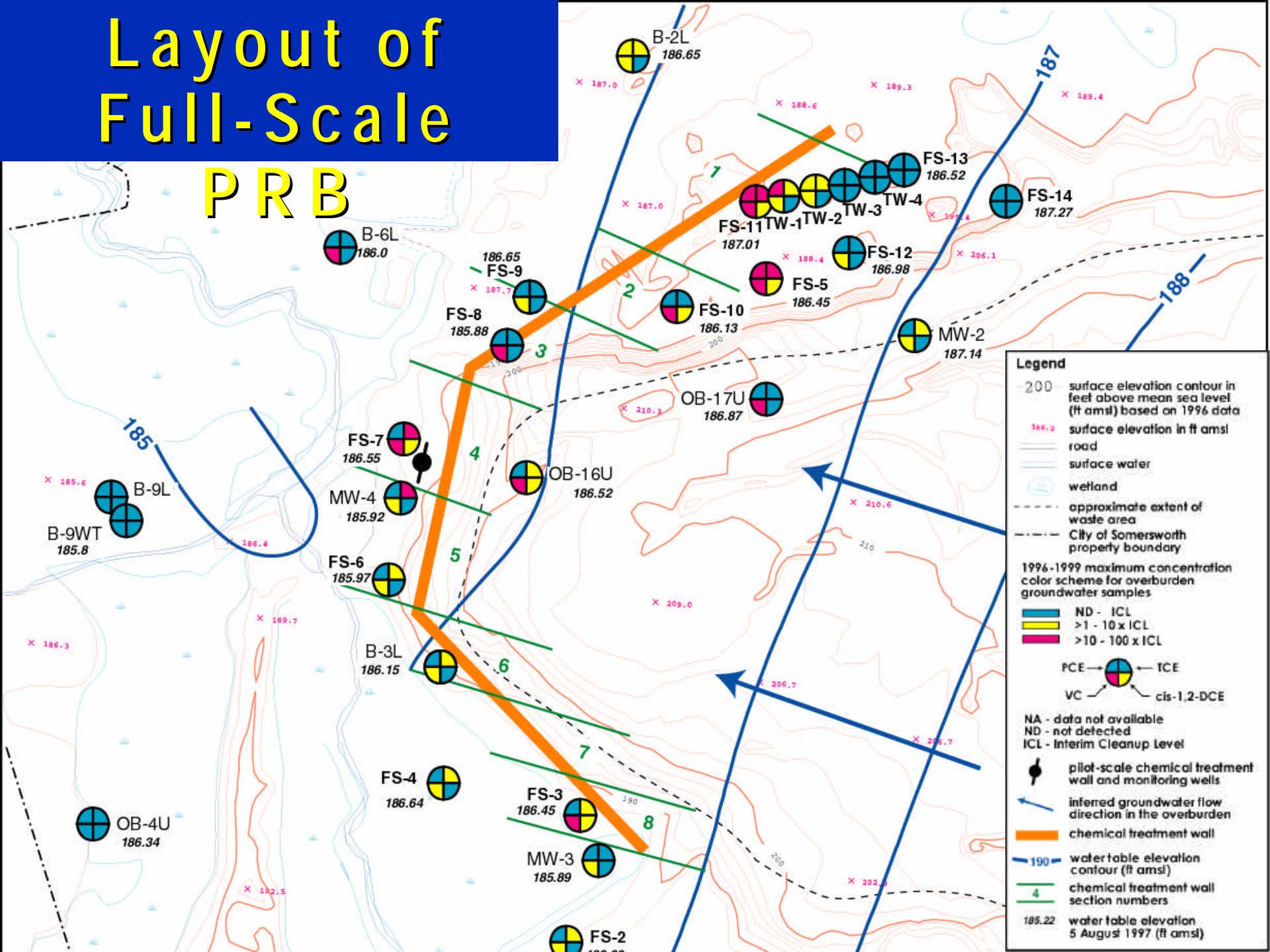


# System Configuration

- Funnel and Gate considered
- Continuous Wall selected
  - less potential to alter GW flow patterns



# Layout of Full-Scale PRB



**Legend**

- 200 surface elevation contour in feet above mean sea level (ft amsl) based on 1996 data
- 188.9 surface elevation in ft amsl
- road
- surface water
- wetland
- approximate extent of waste area
- City of Somersworth property boundary

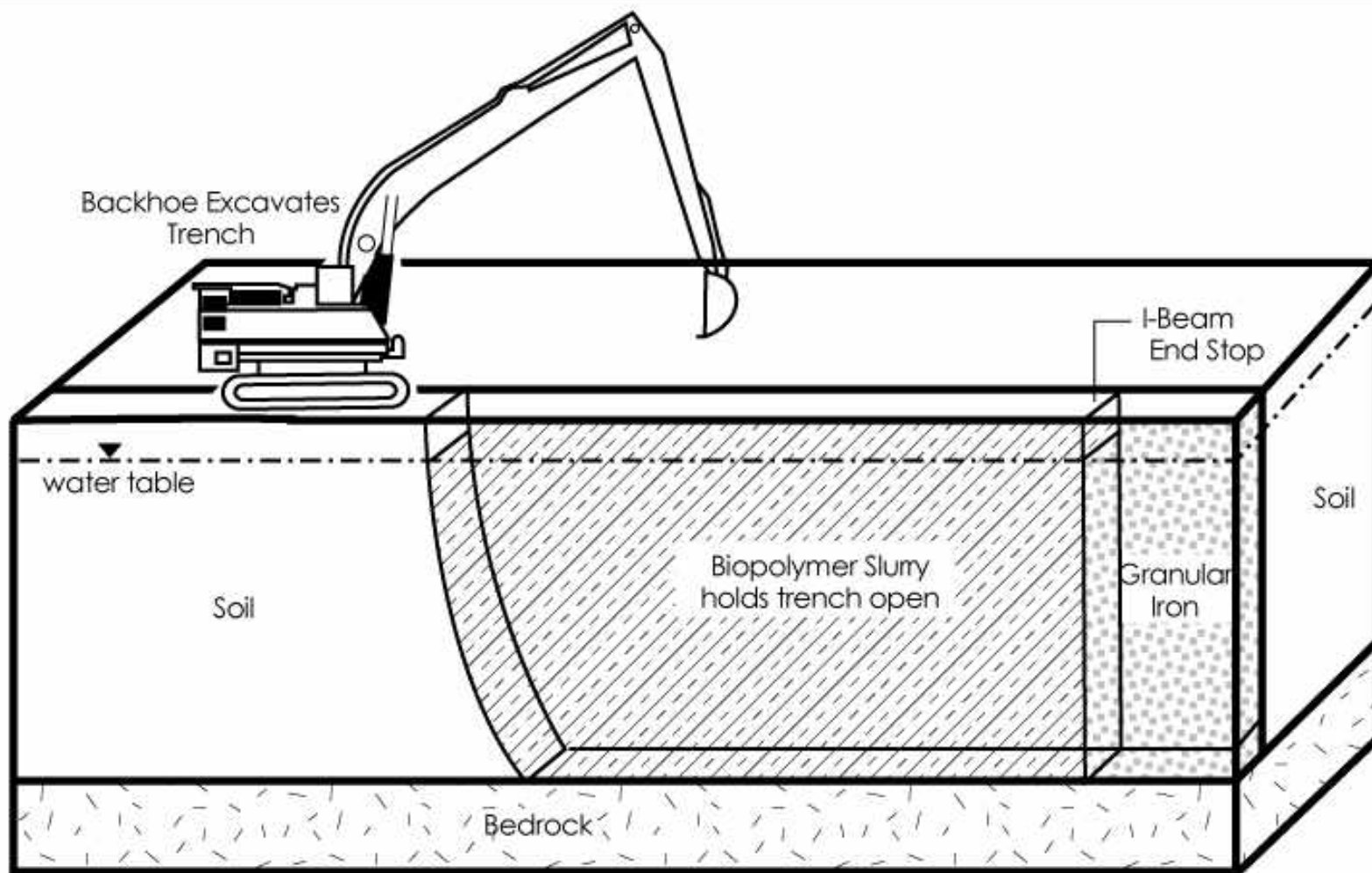
1996-1999 maximum concentration color scheme for overburden groundwater samples

- ND - ICL
- >1 - 10 x ICL
- >10 - 100 x ICL

PCE → TCE  
VC → cis-1,2-DCE

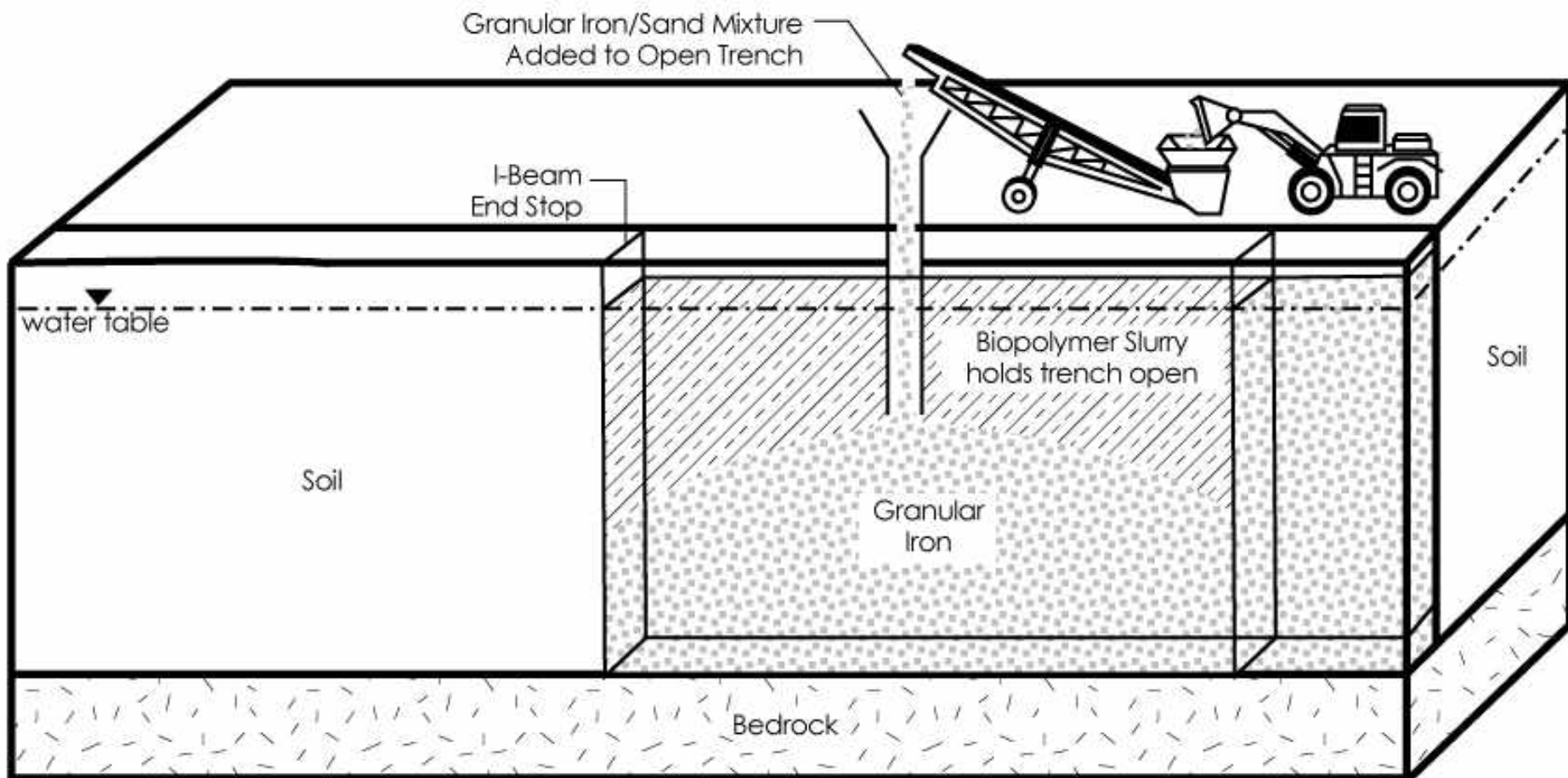
- NA - data not available
- ND - not detected
- ICL - Interim Cleanup Level
- pilot-scale chemical treatment wall and monitoring wells
- ← inferred groundwater flow direction in the overburden
- chemical treatment wall
- 190 water table elevation contour (ft amsl)
- 4 chemical treatment wall section numbers
- 185.22 water table elevation 5 August 1997 (ft amsl)

# Bio-Polymer Trench Excavation





# Bio-Polymer Trench Backfilling



# 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
- B P 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





# Trench Excavation



# Mixing Iron & Sand



2000. 8. 9



# Backfilling Trench



2000. 8. 3





**Water Spray to Wet Iron**