BURGESS BROTHERS LANDFILL SUPERFUND SITE
WOODFORD AND BENNINGTON, VERMONT

PROPOSED PLAN

August 16, 2011

Overview

- Summarize the remedy selected in 1998
- Present the results of the work since 1998
- Present the new remedy to augment the 1998 ROD
  - Barrier System at Landfill Compliance Boundary to contain contaminant source from moving beyond landfill cap
  - Barrier System downgradient of highly contaminated groundwater
  - Natural Attenuation for remainder of plume
  - Continued monitoring, institutional controls, and periodic reviews

Remedy Selected in 1998 Record of Decision

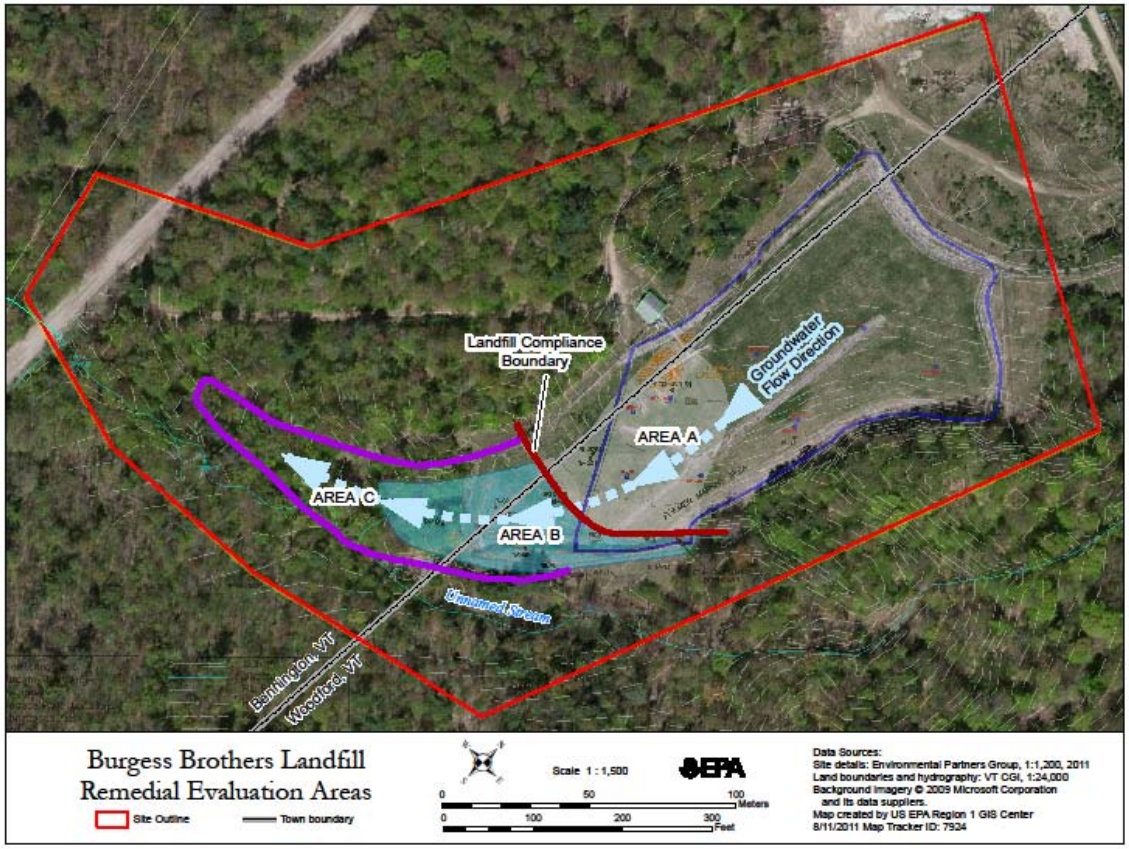
- Cap over landfill and adjacent marshy area to prevent further leaching of landfill waste into the groundwater
- Soil Vapor Extraction and Air Sparging (SVE/AS) of the two former lagoons to address source area
- Natural Attenuation of groundwater beyond landfill
- Institutional controls
- Monitoring of groundwater, surface water and sediments to ensure that remedy is effective

Status of these Components

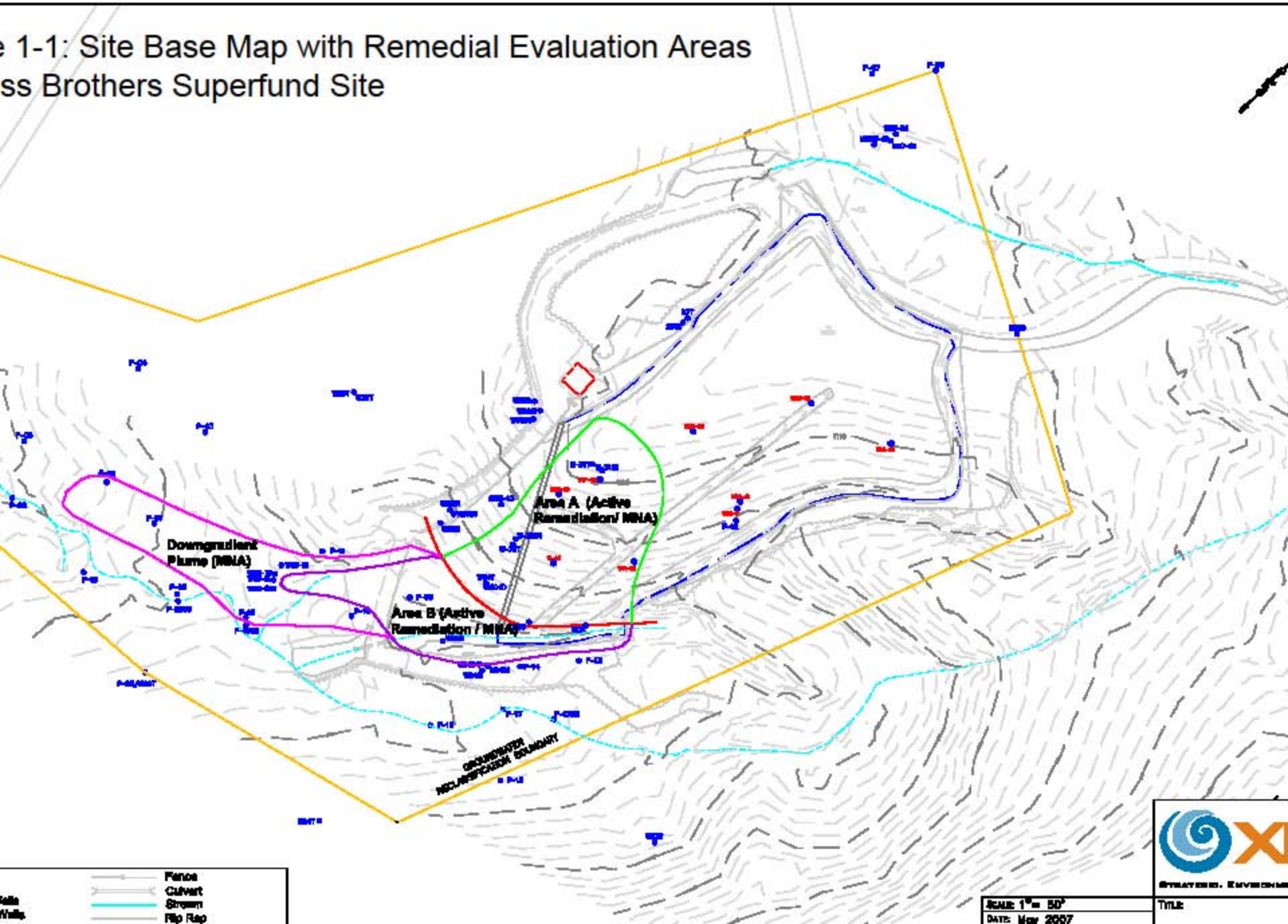
- Landfill and Marshy Area Cap constructed in 1999. Cap is stable with minimal annual maintenance
- Full-Scale operation of SVE/AS began in Jan 2001. AS discontinued in December 2002. Operation of SVE continues but typically with only two of the six extraction wells. Influent concentrations are stable.
- Vermont reclassified groundwater beneath Site to Class 4 in 2003; environmental covenants placed on property deed in 2005
- Monitoring of groundwater found concentrations greatly increased downgradient of landfill (opposite of what was projected) but extent of plume has not yet changed.
- Monitoring of stream found slightly elevated concentrations near landfill but non-detect prior to institutional control boundary

Aerial Photo of Site

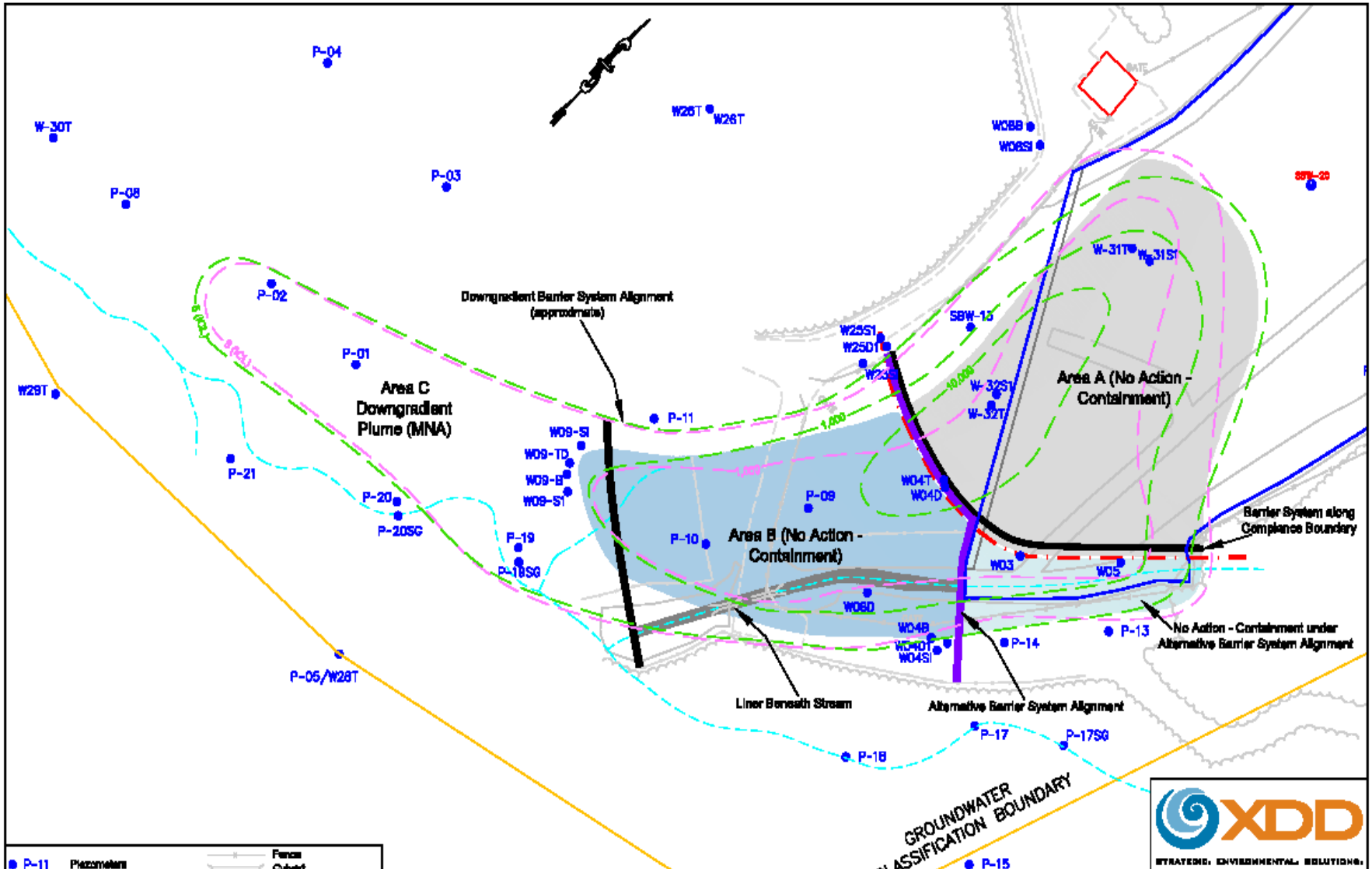
Site Areas of Remediation



e 1-1: Site Base Map with Remedial Evaluation Areas
ss Brothers Superfund Site



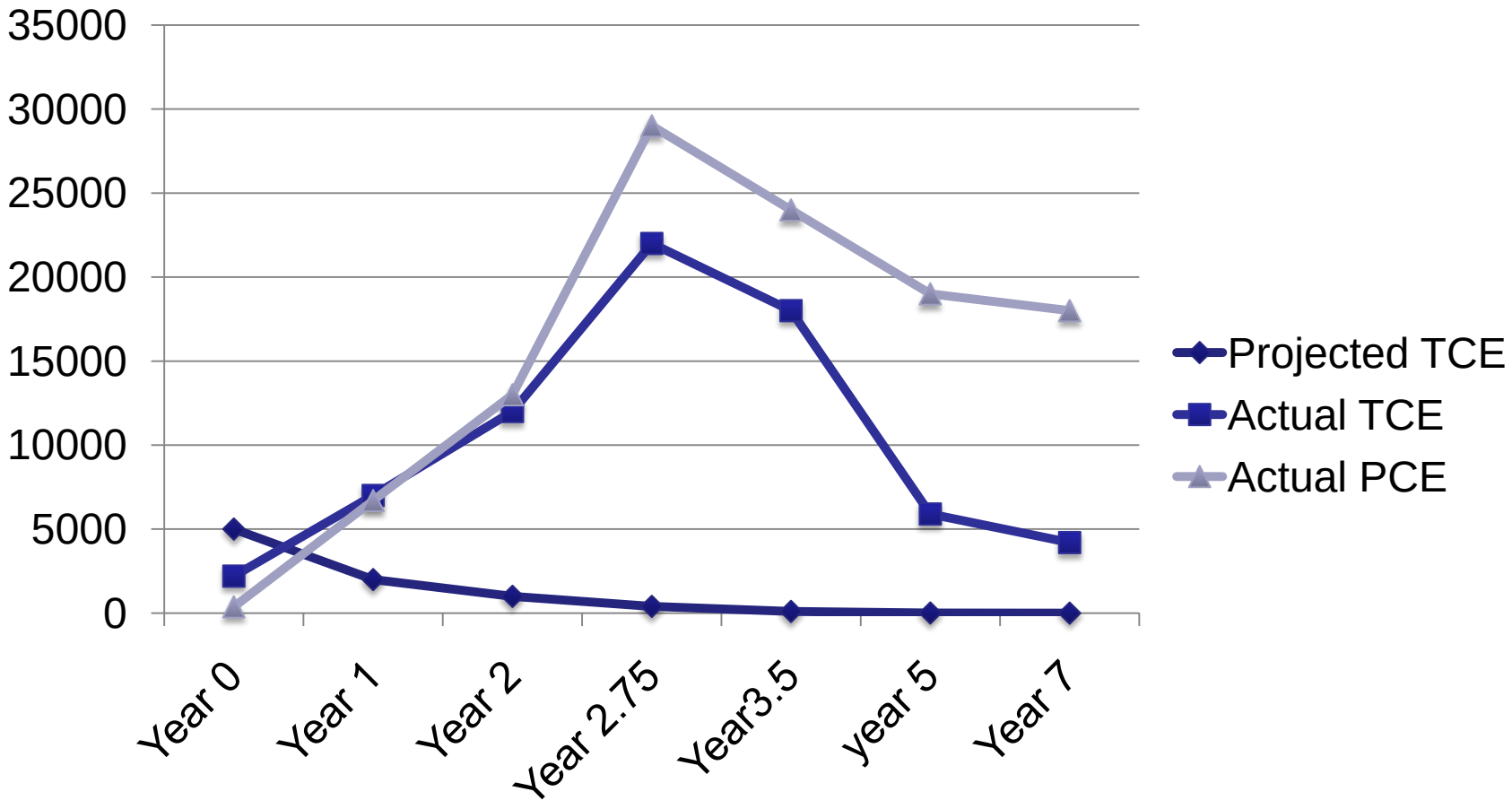
Site Remediation Areas



1998 ROD Response Action Objectives

- For the Landfill nine objectives were identified and included
  - Prevent to the extent practicable water infiltration into landfill
  - Prevent to the extent practicable creation of leachate seeps and migration of contaminated surface water to the site stream
  - Prevent to the extent practicable migration of contaminated groundwater by controlling the source of contaminants
  - Prevent to the extent practicable migration of contamination from the lagoons
- Beyond the Landfill seven objectives were identified and included
  - Prevent, to the extent practicable, the ingestion of landfill impacted bedrock groundwater exceeding drinking water standards
  - Protect off-site surface water by preventing the occurrence of landfill impacted seeps.
  - Prevent to the extent practicable ecological impacts

Projected TCE Concentrations Post-Capping versus Actual TCE Concentrations and PCE Concentrations



2011 ROD Amendment

Response Action Objectives

- One added to the 1998 objectives
  - Restore the overburden groundwater at the edge of the capped area of landfill/marshy area to drinking water standards. This was added because the 1998 ROD did not include an response action objective for the overburden groundwater. The expectation at the time of the 1998 ROD was that the capping and SVE/AS would meet the landfill objective of preventing migration of contaminated groundwater/ leachate beyond the landfill by controlling the source of the contamination.
- Carry over the 1998 objectives including
  - The landfill objective for controlling the source of contamination is carried forward in the FFS and this Proposed Plan.

Technologies for Burgess Brothers Site

- Before cleanup alternatives were developed to be evaluated per the Superfund law, various technologies were researched. These included *in-situ* and *ex-situ* treatment approaches. Six were considered viable against the screening criteria – effectiveness, implementability, and cost.
- The six technologies were natural attenuation, *in-situ* biological, *in-situ* chemical, groundwater collection trench, zero-valent iron permeable reactive barrier, and excavation.
- These technologies were then combined into five alternatives to be evaluated

Alternatives

- Alternative 1, No Further Additional Action

(required by Superfund law)

  - Areas A and B: No new source control or groundwater technologies, continued operation of SVE as necessary
  - Area C: Monitored Natural Attenuation
  - Continued long-term monitoring and institutional controls
  - Five-year reviews

- Alternative 2, *In-Situ* Biological or Chemical Action
  - Areas A and B: *In-situ* application of materials beneath landfill cap and in highly contaminated portion of groundwater plume
  - Area C: Monitored Natural Attenuation
  - Continued long-term monitoring and institutional controls
  - Five-year reviews

Alternatives, Continued

- Alternative 3, Landfill Containment, *In-Situ* Treatment for Downgradient Groundwater, and Monitored Natural Attenuation
  - Area A: PRB at landfill compliance boundary with collection trench as contingency for source control
  - Area B: *In-situ* treatment for highly contaminated groundwater
  - Area C: Monitored Natural Attenuation
  - Continued long-term monitoring and institutional controls
  - Five-year reviews
- Alternative 4, Landfill Containment, Downgradient PRB, and MNA
  - Area A: PRB at landfill compliance boundary with collection trench as contingency for source control
  - Area B: PRB at downgradient edge of highly contaminated groundwater plume
  - Area C: Monitored Natural Attenuation
  - Continued long-term monitoring and institutional controls
  - Five-year reviews

Alternatives, Continued

- Alternative 5, Landfill Containment, Excavation of Saturated Soils , and Monitored Natural Attenuation
  - Area A: PRB at landfill compliance boundary for source control
  - Area B: Excavation and offsite disposal of saturated soils
  - Area C: Monitored Natural Attenuation
  - Continued long-term monitoring and institutional controls
  - Five-year reviews

Comparison of Alternatives

Nine Criteria	Burgess Brothers Remedial Alternatives				
	Alt 1	Alt 2	Alt 3	***Alt 4***	Alt 5
Protects Human Health & Environment	N	Y	Y	Y	Y
Meets Federal & State Requirements	N	Y	Y	Y	Y
Provides Long-Term Protection	N	Y	Y	Y	Y
Reduces Mobility, Toxicity & Volume through Treatment	N	Y	Y	Y	Y
Provides Short-Term Protection	Y	Y	Y	Y	Y
Implementable	Y	Y	Y	Y	Y
Cost (Millions of Dollars)	1.193	5.399 – 10.315	4.655 – 6.797	3.48 – 3.957	12.376
State Agency Acceptance	To be determined after the public comment period				
Community Acceptance	To be determined after the public comment period				

Why EPA Recommends Alternative 4

- First and foremost, it is protective of human health and the environment
  - Through the use of permeable reactive barriers, it contains the source of contamination so there is no further migration from the landfill. The second barrier treats what has already moved out beyond the landfill
- Second, upon completion, it will meet all federal and state requirements
- Third, it provides a timeframe for restoring the water quality for the groundwater beyond the landfill,
- Fourth, it contain contingencies and optimization options to ensure that it remains protective, and
- Fifth, it is cost-effective

Projected Site Schedule

- Public Comment Period: July 29 to August 29, 2011
- Public Information and Hearing: August 16, 2011
- Late Summer: Response to all Comments and signing of Record of Decision Amendment
- Spring 2012 - Spring 2013: Consent Decree and Statement of Work Amendments
- 2012 -2013: Pre-Design Bench Scale Tests and Field Work
- Spring 2014: Final Design for PRBs
- Summer-Fall 2014: Construction of PRBs