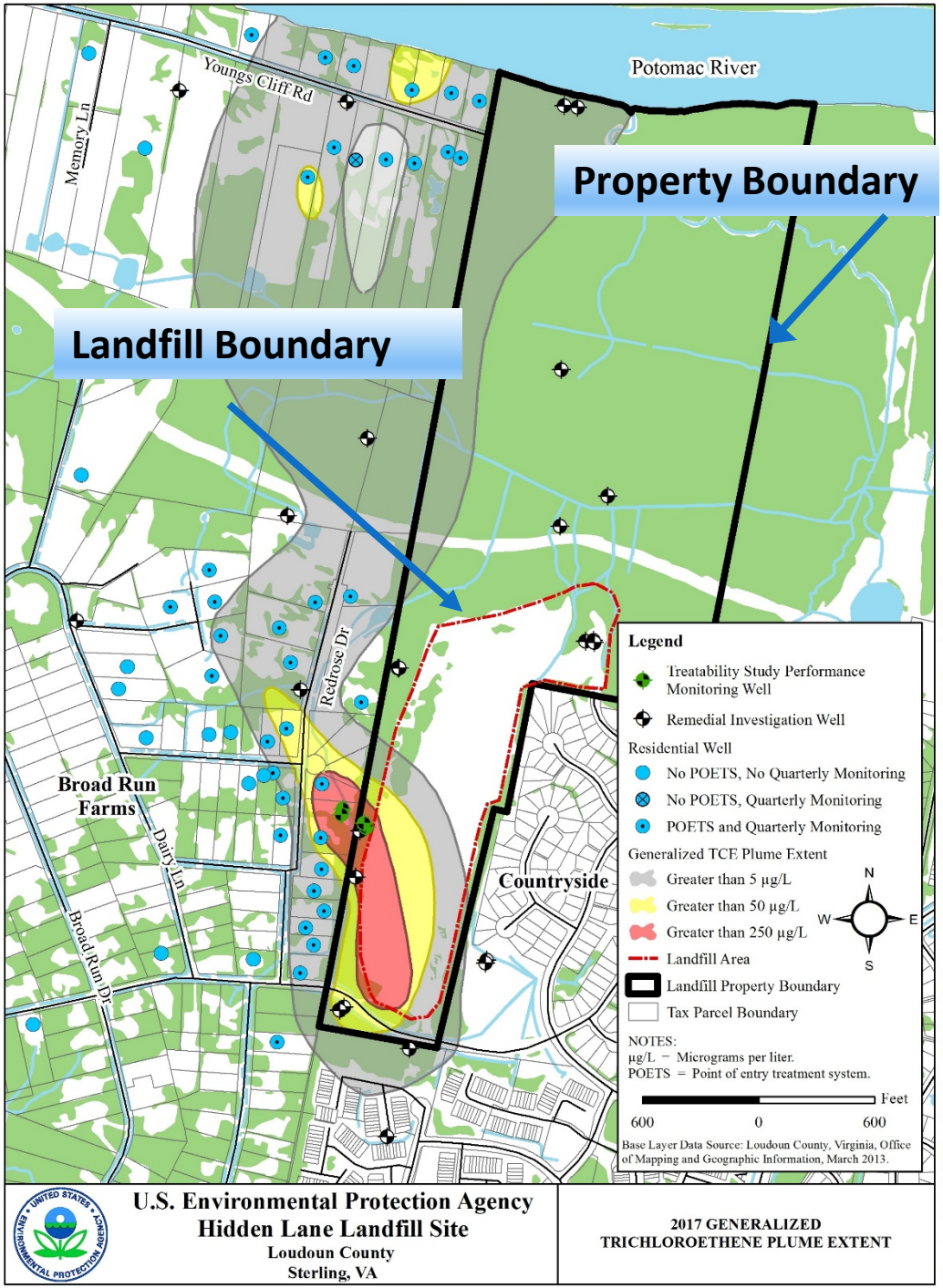
Site Update
Hidden Lane Landfill Superfund Site
Sterling, Loudoun County, VA
June 15, 2017

Agenda

- Review of Site History
- Discussion of Remedial Investigation
- Review of the Bioremediation Pilot Study
- Next Steps: Proposed Plan & Record of Decision

Hidden Lane Landfill

Site Map


Potomac River
Youngs Cliff Rd
Memory Ln
Property Boundary
Landfill Boundary
Redrose Dr
Broad Run Farms
Dairy Ln
Broad Run Dr
Countryside
Legend
Treatability Study Performance Monitoring Well
Remedial Investigation Well
Residential Well
No POETS, No Quarterly Monitoring
No POETS, Quarterly Monitoring
POETS and Quarterly Monitoring
Generalized TCE Plume Extent
Greater than 5 µg/L
Greater than 50 µg/L
Greater than 250 µg/L
Landfill Area
Landfill Property Boundary
Tax Parcel Boundary
N
W
E
S
NOTES:
µg/L = Micrograms per liter.
POETS = Point of entry treatment system.
Feet
600
0
600
Base Layer Data Source: Loudoun County, Virginia, Office of Mapping and Geographic Information, March 2013.
U.S. Environmental Protection Agency
Hidden Lane Landfill Site
Loudoun County
Sterling, VA
2017 GENERALIZED
TRICHLOROETHENE PLUME EXTENT
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Superfund Process

1. Site Discovery
2. Site Evaluation
3. National Priority Listing (NPL)
4. Remedial Investigation
5. **Feasibility Study** **<– We are Here**
6. Proposed Plan
7. Record of Decision
8. Remedial Design
9. Remedial Construction
10. Long Term Operation and Maintenance
11. NPL Deletion
12. Reuse can occur anytime

Site History

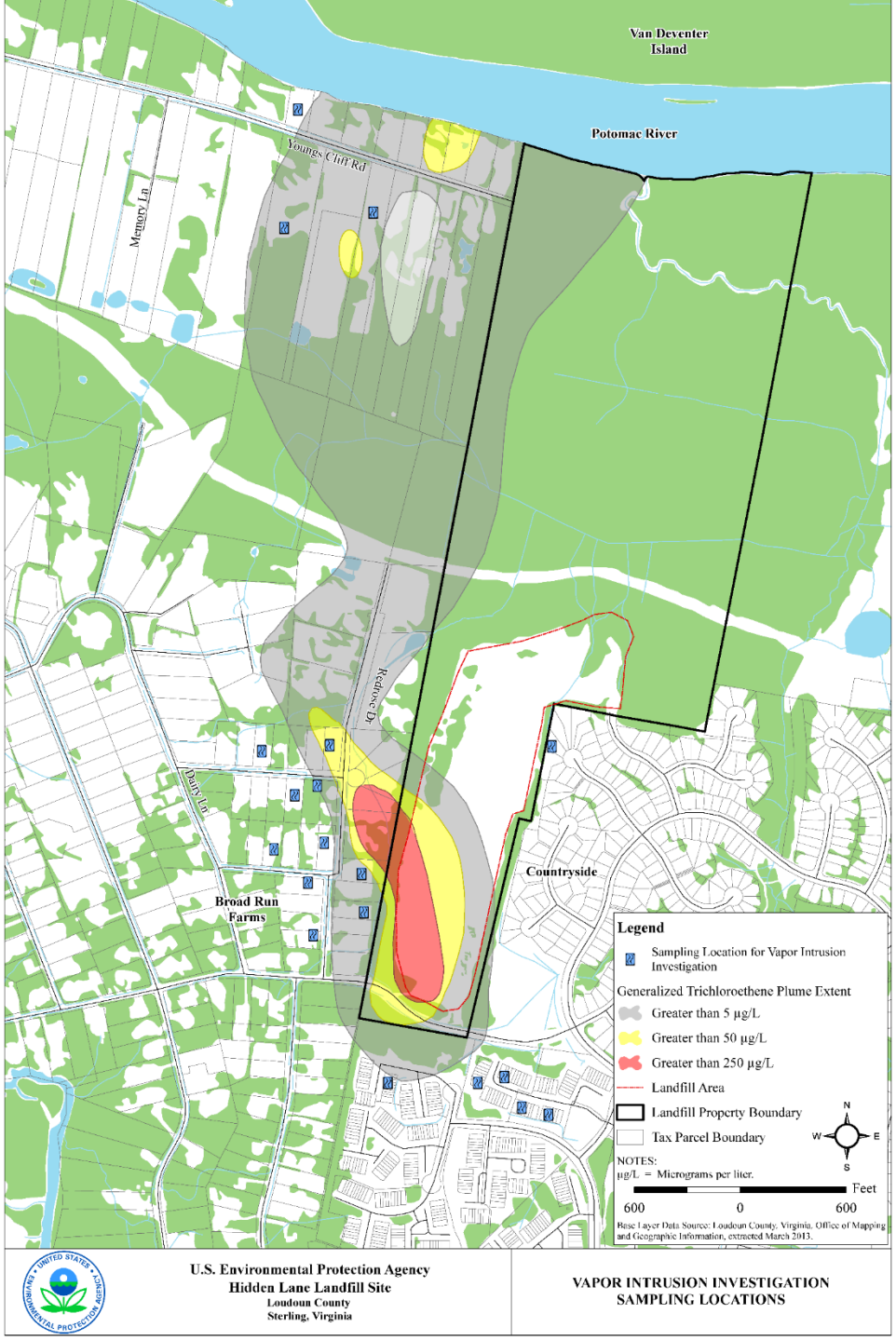
- 30 Acre Landfill - Operated from 1971-1984
- 1986: Landfill closed with 2 ft. clay cover
- 1988: EPA conducts Site Investigation (SI) w/ limited findings

Site History (continued)

- 2005: TCE discovered in 25 residential wells in Broad Run Farms. State installed treatment systems
- 2005-07: EPA conducts Supplemental Site Assessment
- **2008: Site listed on National Priority List (NPL)**
- 2008 – present: EPA conducts Remedial Investigation
- EPA currently maintains 36 carbon units on residential water systems

Findings of Remedial Investigation

Media	Remedial Investigation	Finding
Landfill Cap	15 borings across landfill	**2 ft. clay cap present**
Methane gas	22 landfill gas wells	Methane not detected since 2011, EPA still monitoring
Soils	22 Surface and subsurface soil Collected 2005 during SI Analyzed for Metals, Pesticides, PCBs, VOCs, and SVOCs	No detections above EPA Human Health or Ecological Risk
Surface water sediment	24 location, including springs ponds, streams and Potomac River Analyzed for Metals, Pesticides, PCBs, VOCs, and SVOCs	No detections above EPA Human Health or Ecological Risk



So, what did we find?

Significant **low concentration TCE plume** w/ likely source southern end of landfill

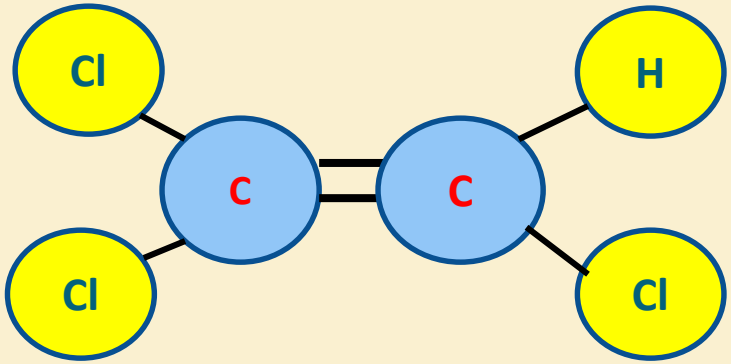
TCE is determined to be the primary human health risk

Evaluated 18 homes for vapor Intrusion. No Risk due to Vapor Intrusion

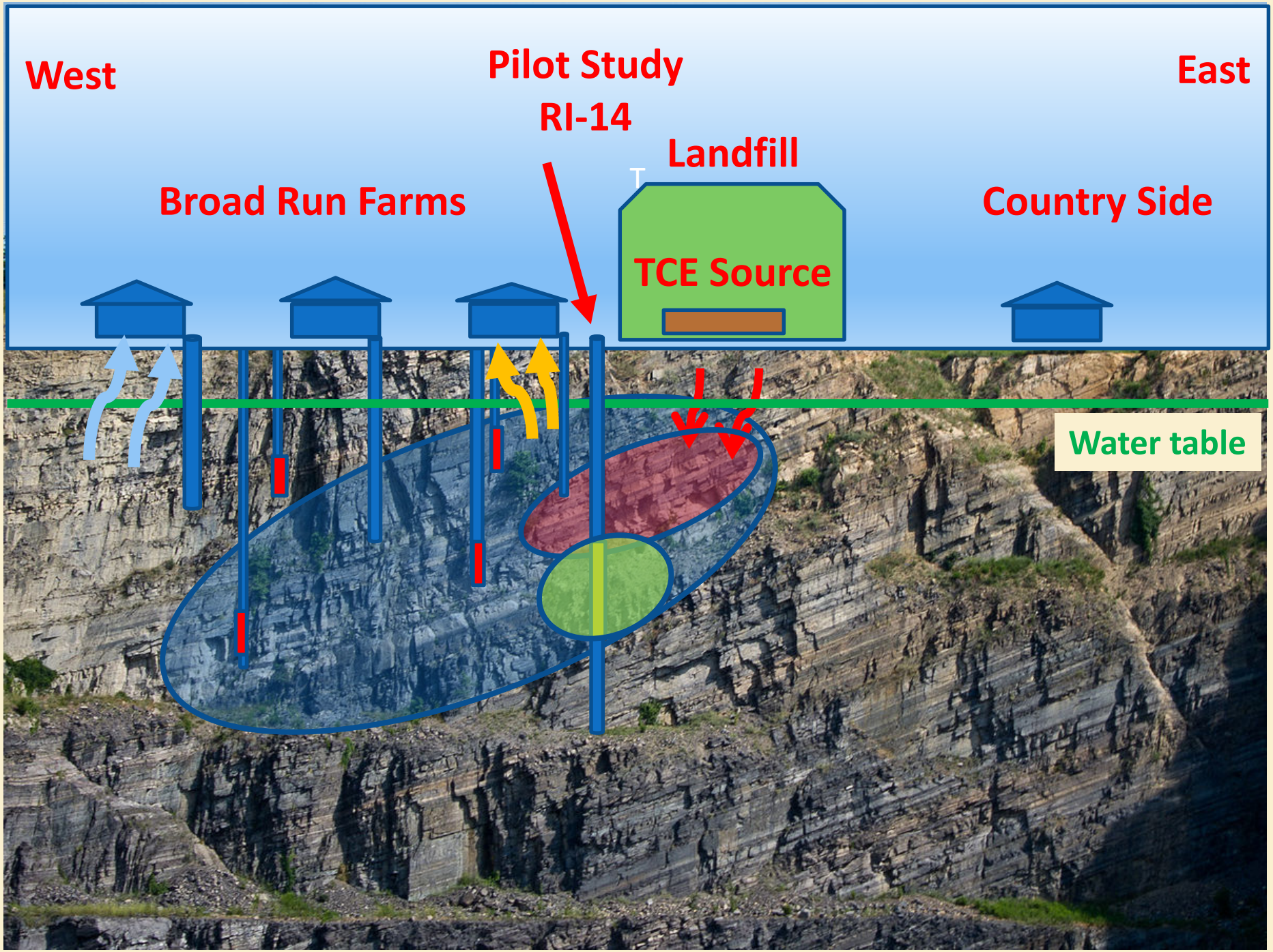
EPA Consent Order With Property Owner

- Legal settlement with Estate that allows US and State to recover some clean-up costs
- Settlement requires property owner market the property for development and/or wetlands mitigation credits
- Proceeds of any sale are split between the US and State, and the owner.
- Settlement restrictions use to ensure it doesn’t negatively impact the site cleanup.

TCE (Trichloroethylene)

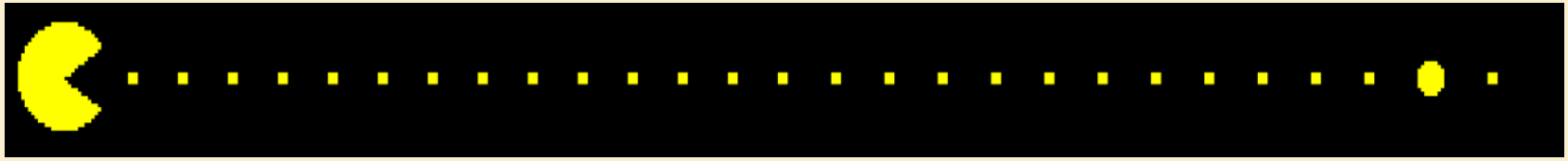


- Chlorinated Volatile Organic Compound, soluble in water
- Common industrial solvent used as a metals degreaser, a dry cleaning compound, in paint removers, etc.
- Exposure causes irritation to skin and eyes
  - affects the central nervous system, heart, liver, kidney and lungs
- Exposure can occur by direct contact, ingestion or inhalation
- Is a likely human carcinogen for liver, kidney, and lung


West
Pilot Study
RI-14
East
Landfill
Broad Run Farms
Country Side
TCE Source
Water table

Biological, and Geochemical Reduction Processes

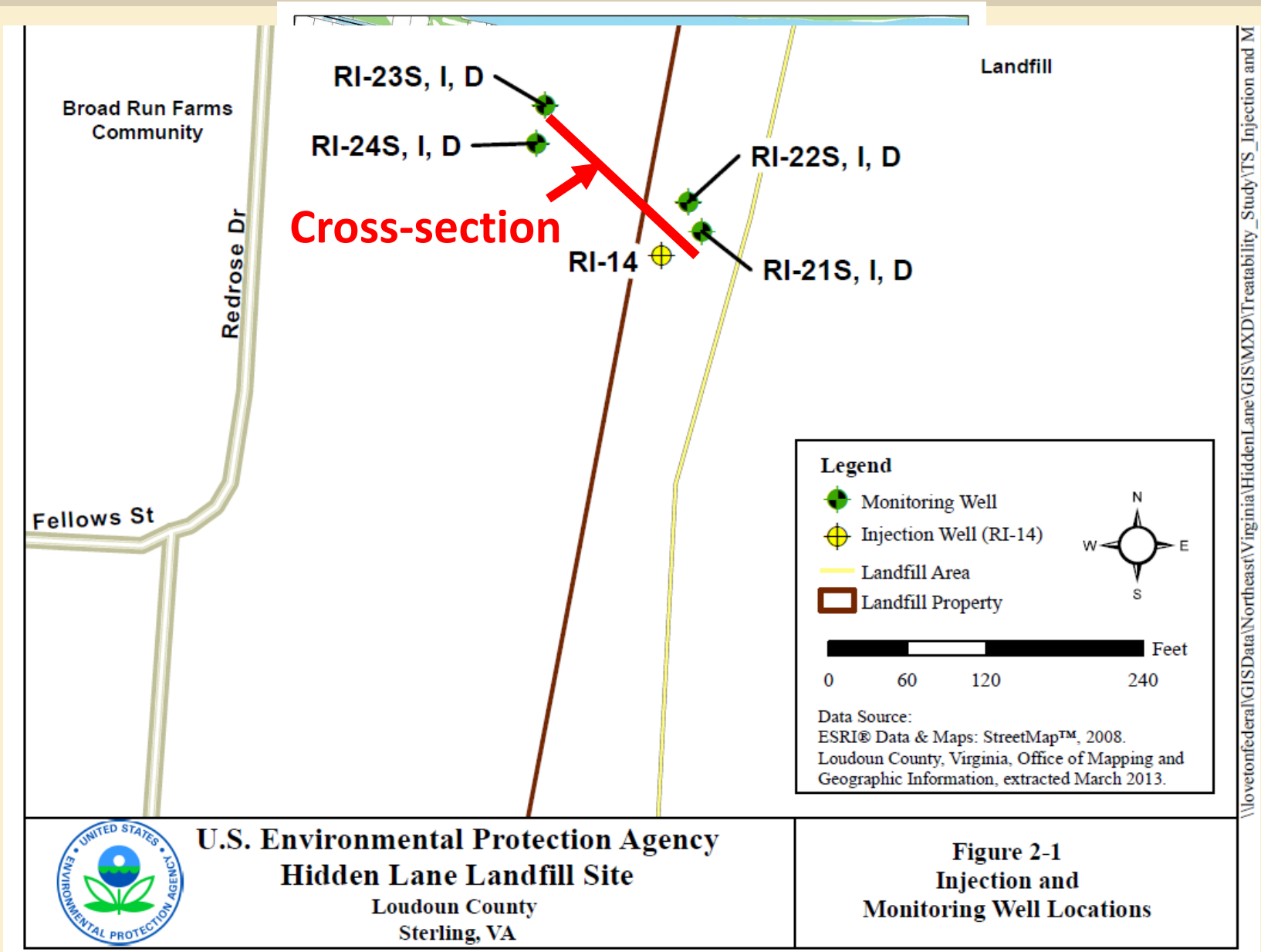
- Biological Reduction: utilize natural bacteria to degrade contaminants
  - **Pac-Man eats contaminants expels nontoxic stuff**



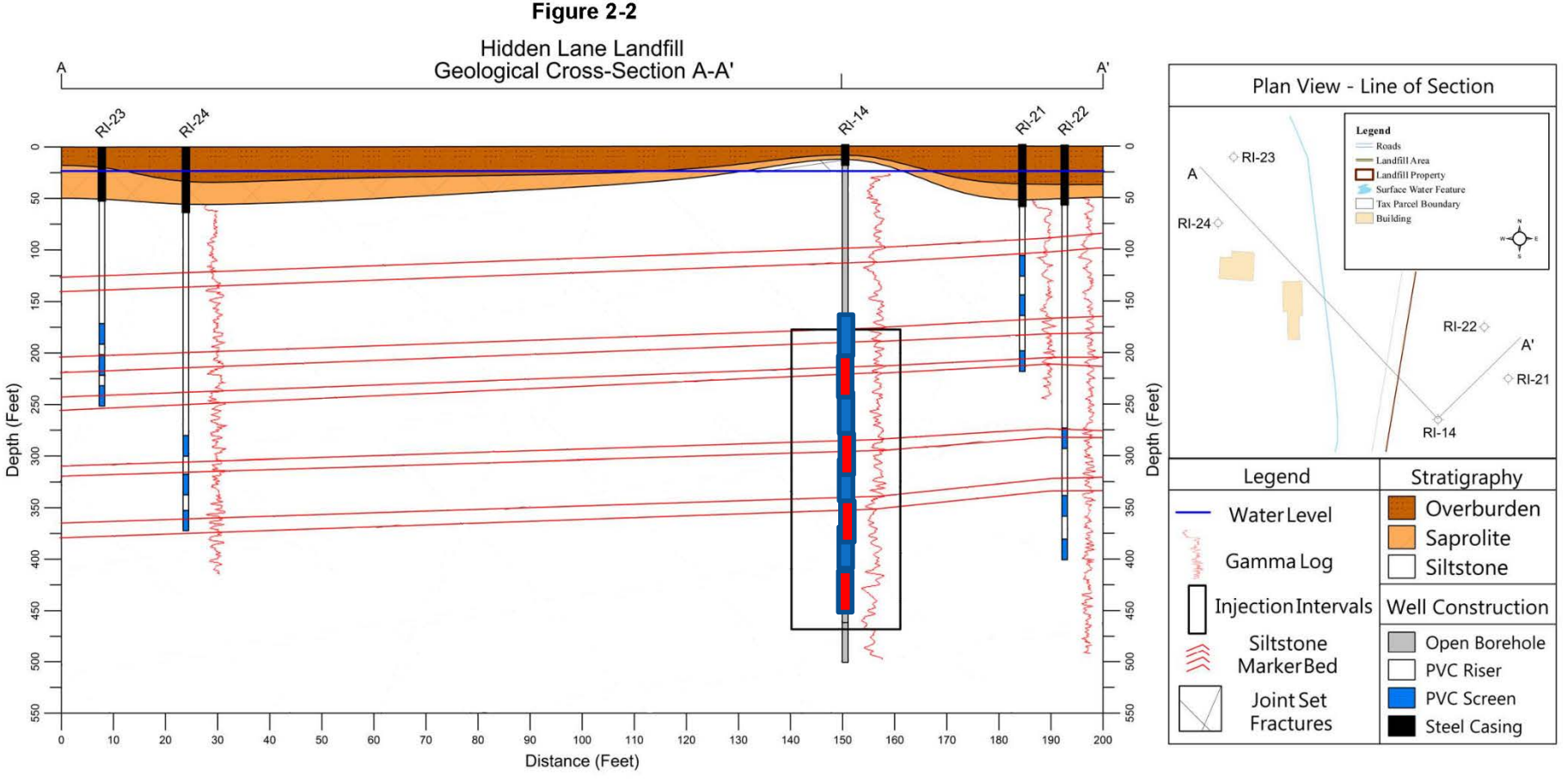
- Geochemical Reductions: utilizes changes in rock mineral chemistry to degrade contaminants
  - **Rusting of Iron**

- These processes occur in distinct identifiable pathways. Some known, **many unknown**

Bioremediation Pilot Study Area



Cross-Section of Pilot Study Area



Pilot Study Findings

- Transformed TCE to DCE and limited VC
- Uneven distribution of amendments (bugs & food)
  - Up to 150 feet away
- Limited geochemical reactions (Rusting of Iron)
- Residential wells not impacted

What's next?

- Complete Pilot Study Report and Feasibility Study
  - Due for completion Summer 2017
- Proposed Plan with Public Meeting and 30 Day Comment Period
  - Due Fall 2017
- Record of Decision (ROD)
  - Due Spring 2018

Remedial Alternatives Under Consideration

Residential Wells

1. Continued O&M of Carbon Units
2. Construction of Public Waterline

Groundwater Restoration

1. Pump and Treat
2. Chemical Oxidation
3. Enhanced Bioremediation

Thanks You for Attending

Contact Information

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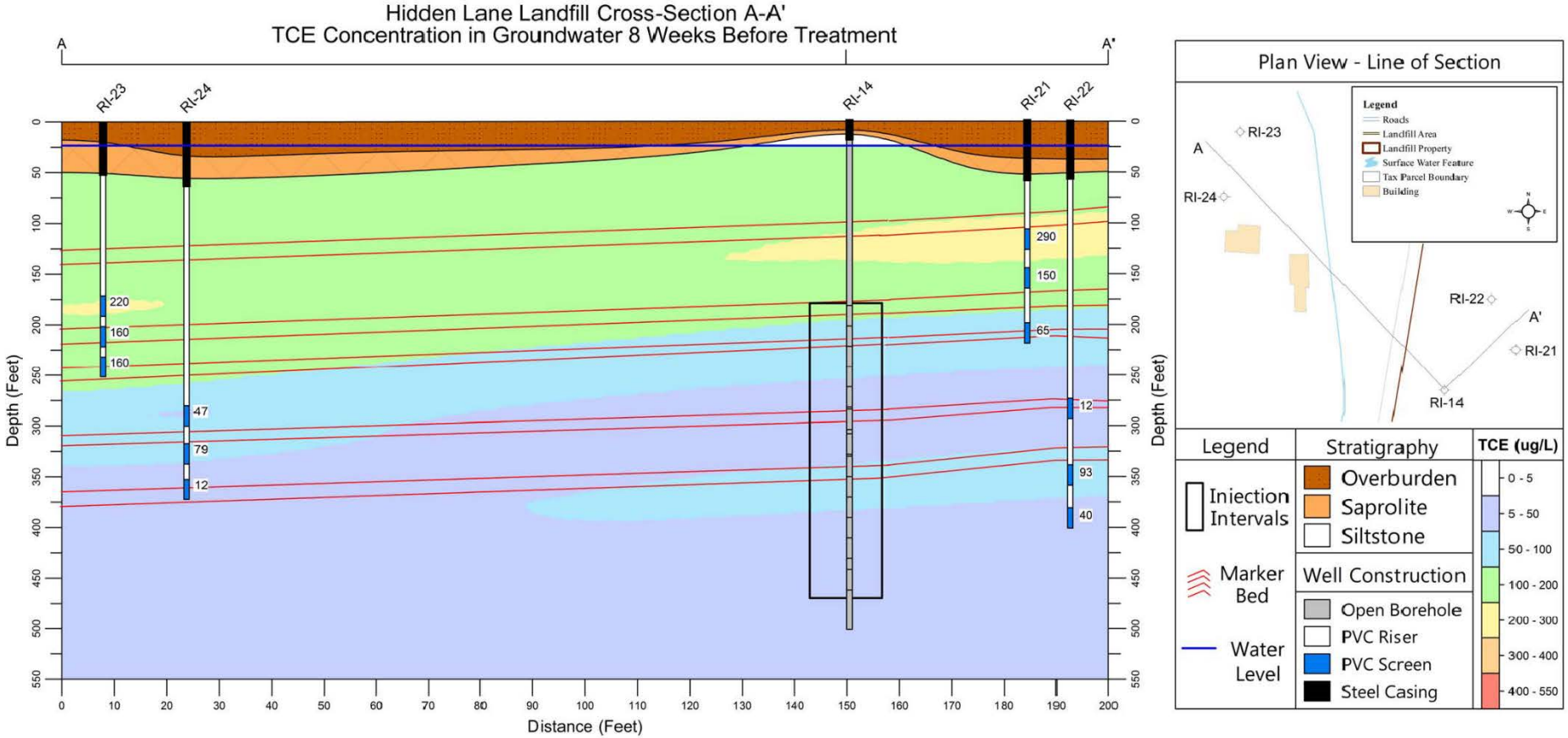
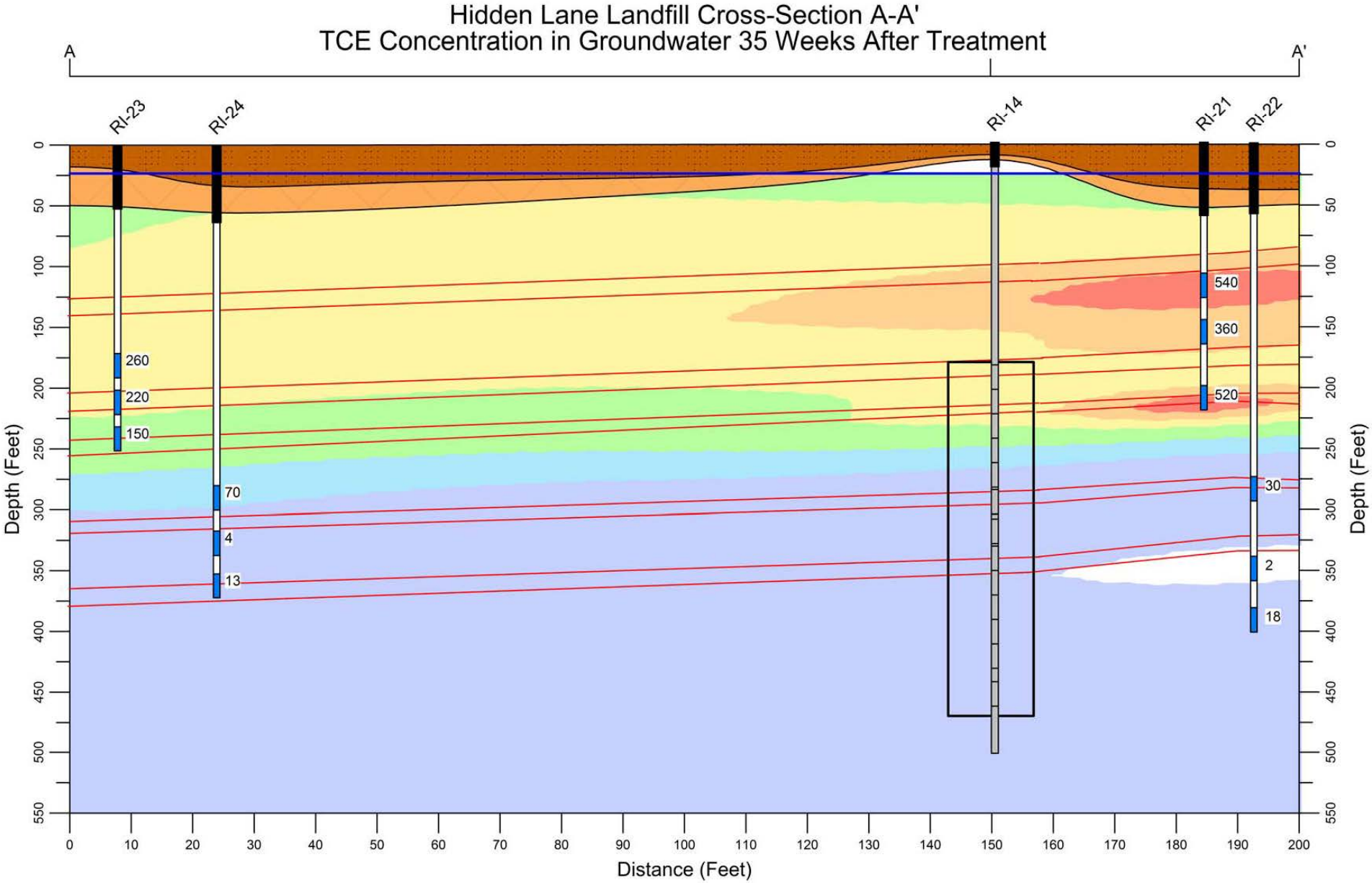
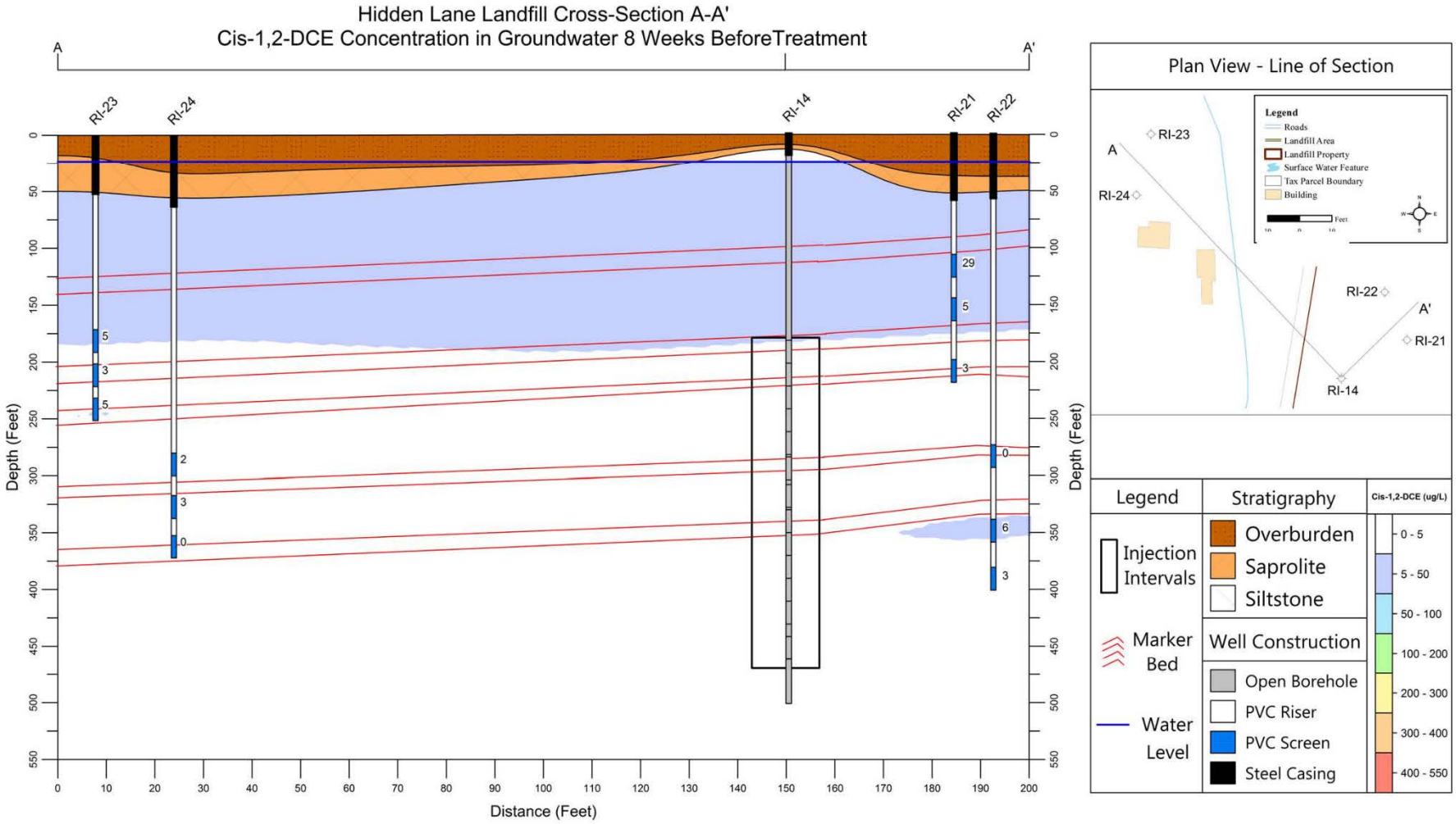
Questions

Change in TCE Concentrations



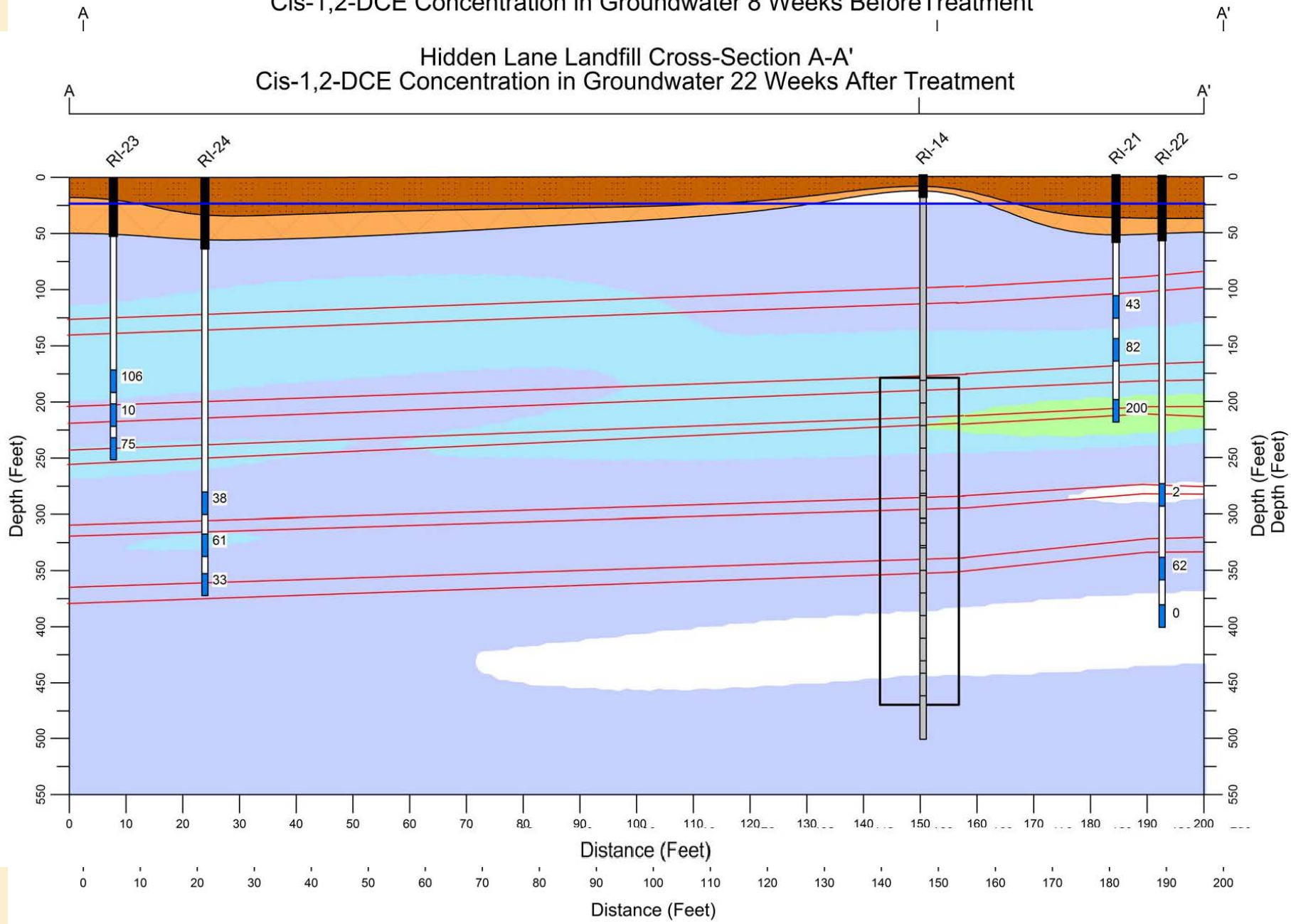

Hidden Lane Landfill Cross-Section A-A'
TCE Concentration in Groundwater 35 Weeks After Treatment
A
A'
RI-23
RI-24
RI-14
RI-21
RI-22
260
220
150
70
4
13
540
360
520
30
2
18
Depth (Feet)
Depth (Feet)
Distance (Feet)
0
50
100
150
200
250
300
350
400
450
500
550
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200

Change in Cis-DCE Concentrations

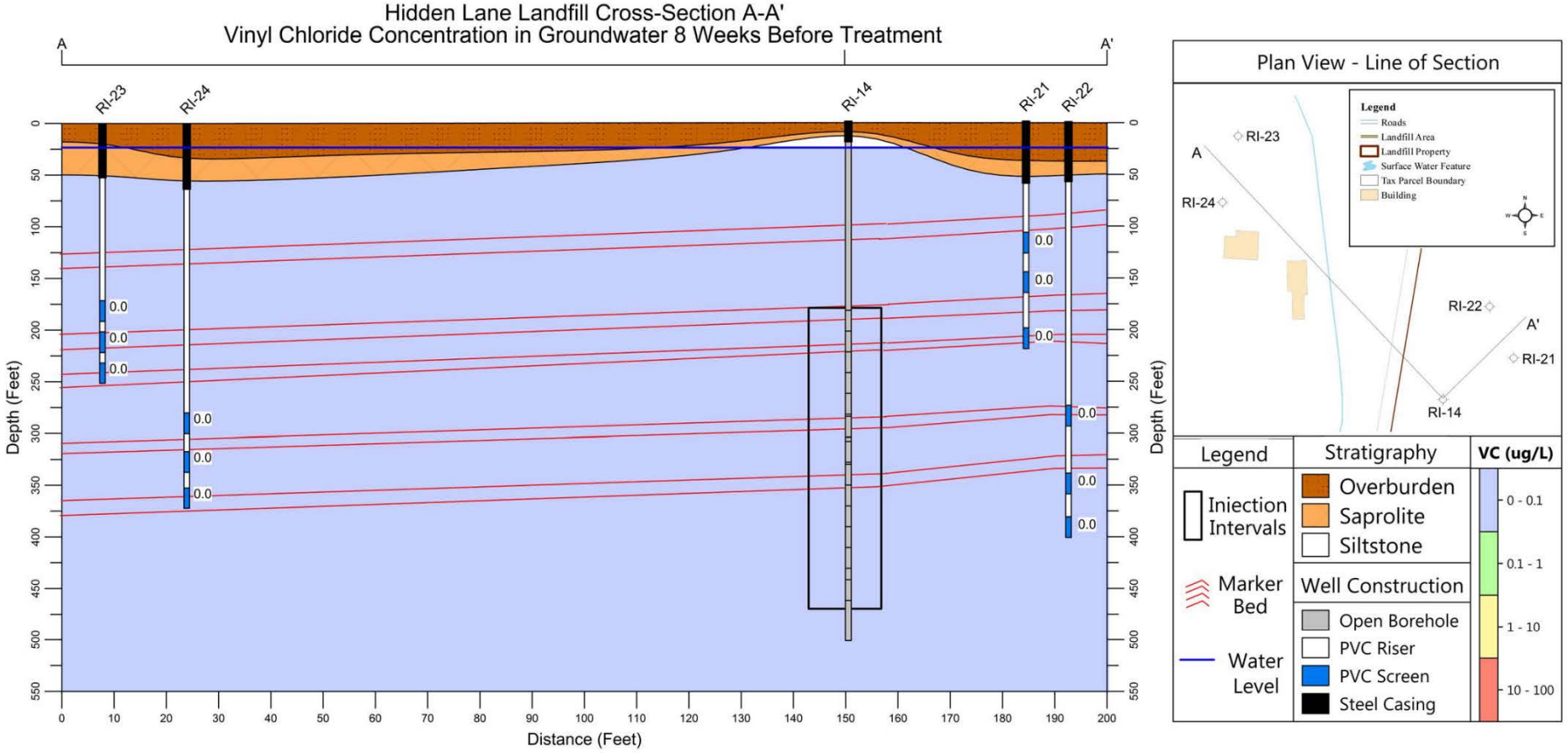


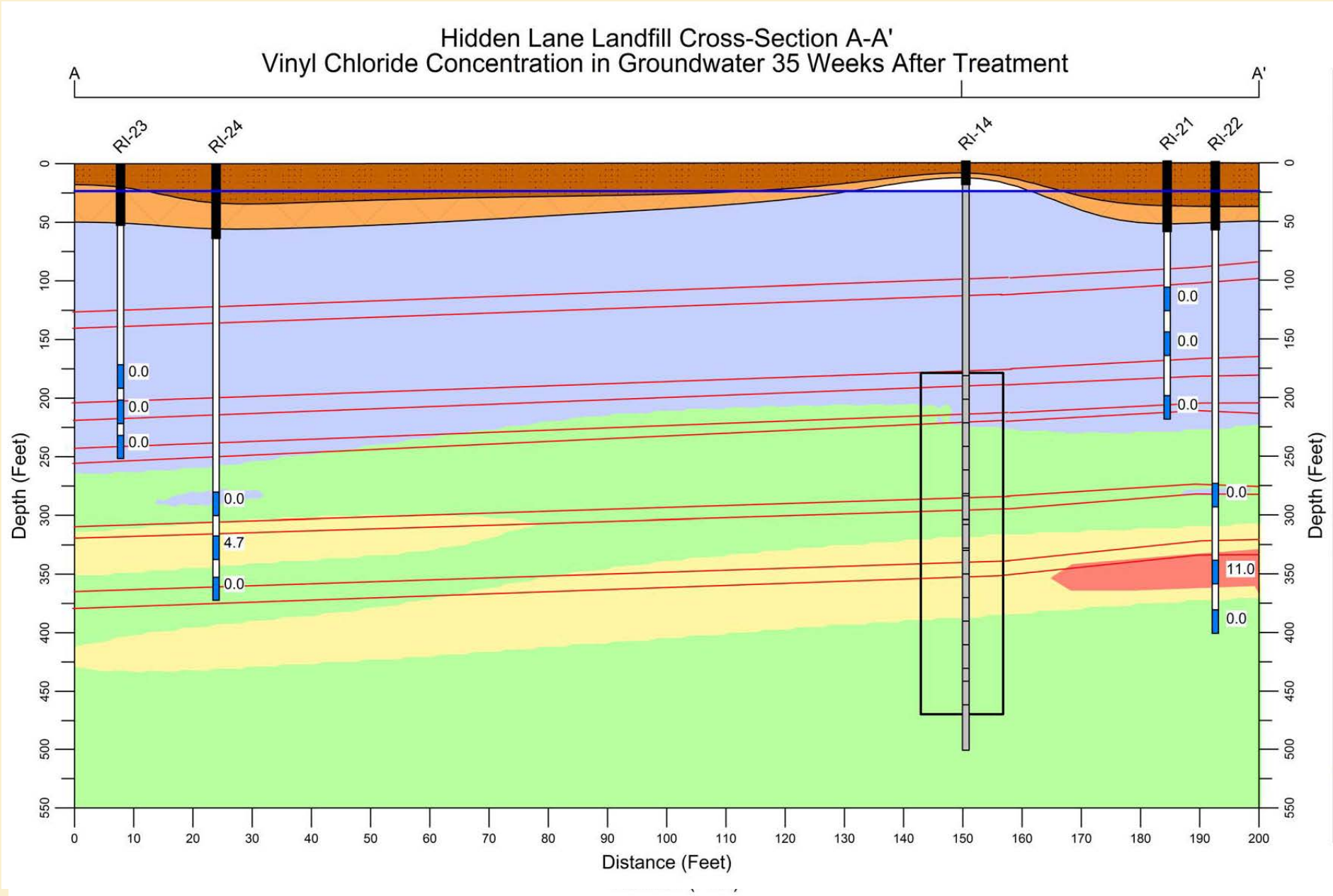
Hidden Lane Landfill Cross-Section A-A'
Cis-1,2-DCE Concentration in Groundwater 8 Weeks BeforeTreatment

Hidden Lane Landfill Cross-Section A-A'
Cis-1,2-DCE Concentration in Groundwater 22 Weeks After Treatment



Change in Vinyl Chloride Concentrations




Hidden Lane Landfill Cross-Section A-A'
Vinyl Chloride Concentration in Groundwater 35 Weeks After Treatment
A
A'
RI-23
RI-24
RI-14
RI-21
RI-22
0.0
0.0
0.0
0.0
4.7
0.0
0.0
0.0
0.0
11.0
0.0
Depth (Feet)
Depth (Feet)
0
50
100
150
200
250
300
350
400
450
500
550
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
Distance (Feet)

Changes in Molar Concentration

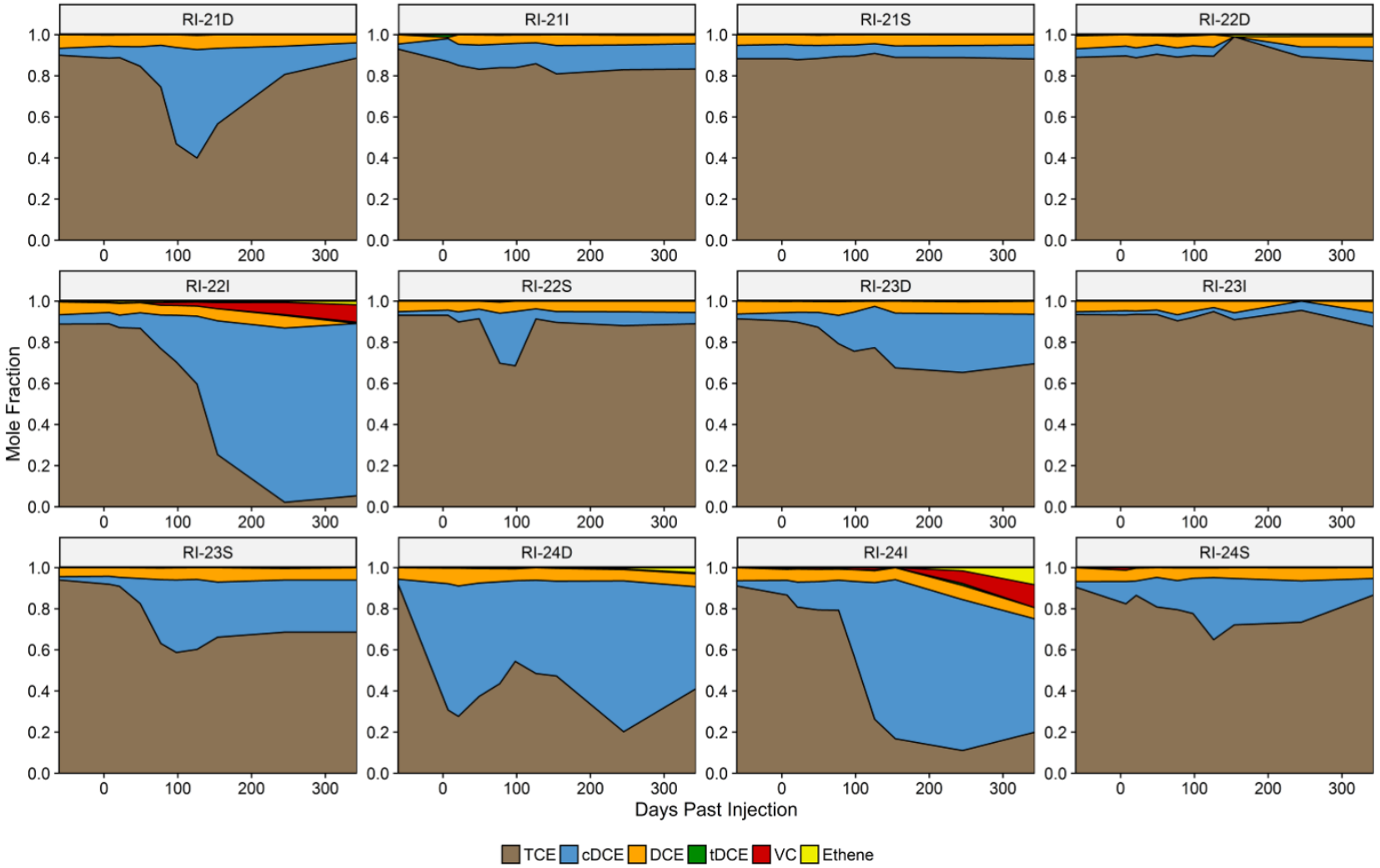


Figure 16. Mole fractions of TCE and daughter products in downgradient monitoring wells following injection of amendment in RI-14.