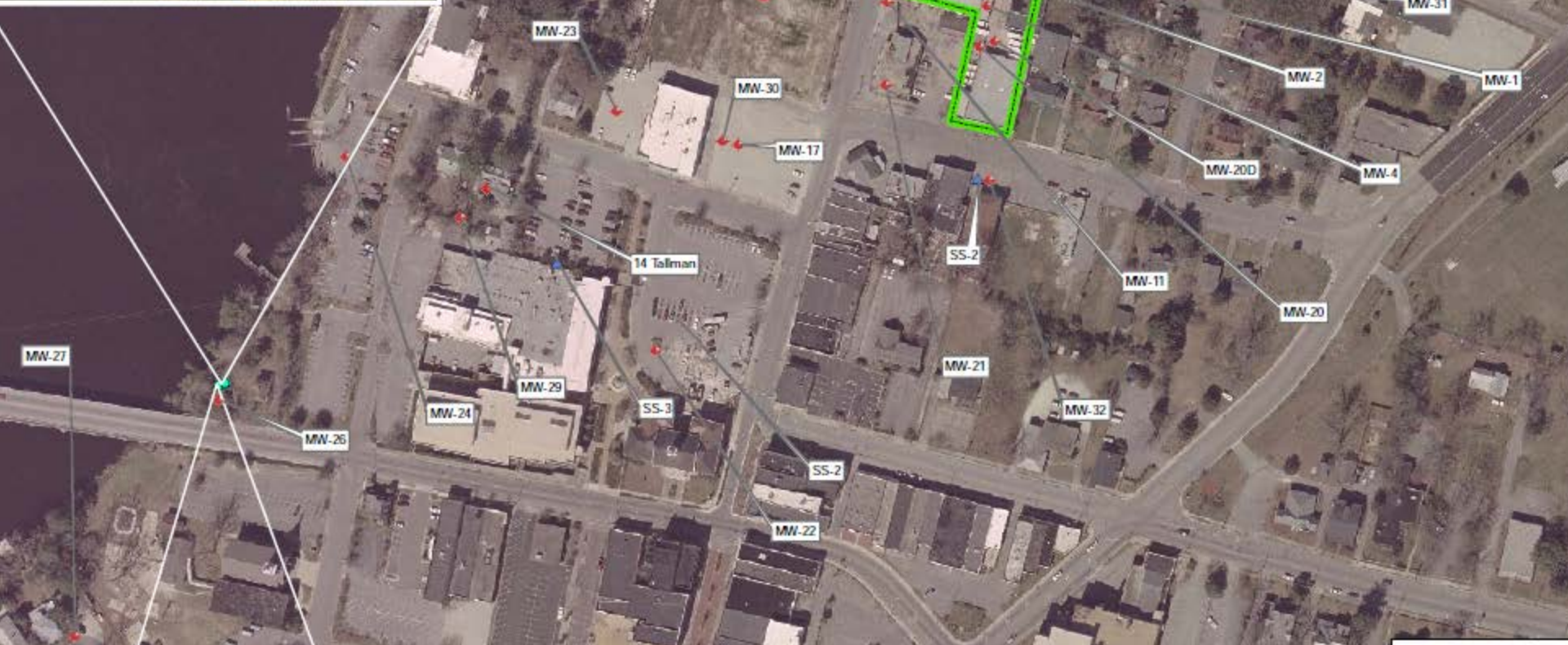


NCDENR – DSCA Program  
Southern Cleaners and Laundry, Jacksonville, Onslow County, NC





# Site Area



# Site History

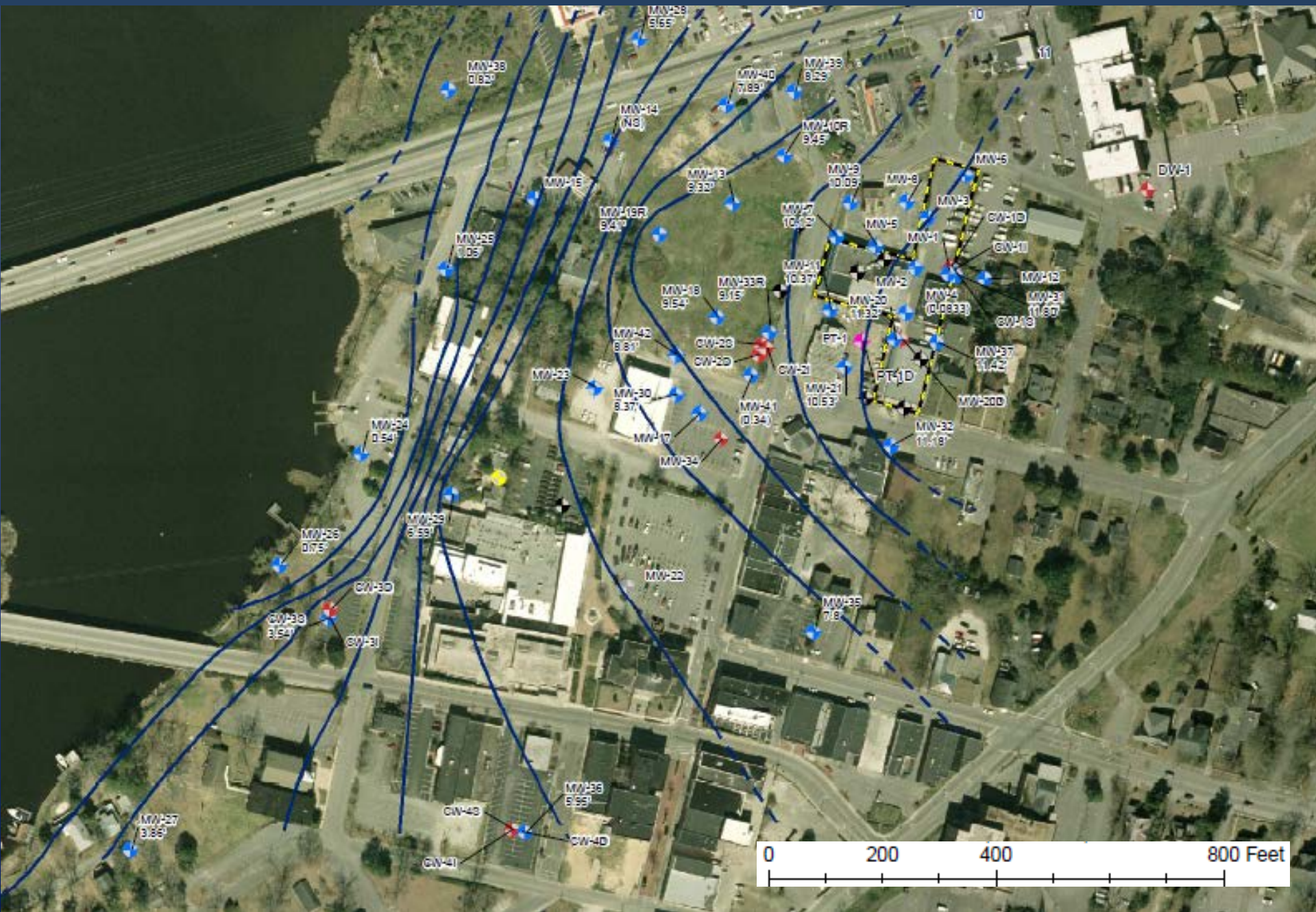
- Operated as a commercial dry cleaning and laundering service from 1948 to approximately 2009
- Used PCE from approximately 1952 to 1995
- Also used Varsol as a dry cleaning solvent
- Maintain various petroleum USTs (gasoline, heating oil, varsol)
- PCE plume identified during UST removal

# Summary of Investigation Activities

- Indoor Air and Soil Gas Investigation
- Indoor Air Risk Calculations
- Source Soil Assessment
- MIP
- Rotasonic Drilling – Nested Cluster Wells
- Surface Water and Storm Water System Sampling
- DPT Groundwater Delineation
- Monitoring Well Installation
- Geotechnical Sampling



# April 2011 Shallow Groundwater Flow Map





# April 2011 PCE Plume Map





# Area Land Use / Assessment Remediation Drivers

## Mixed Use Properties:

- Residential (2 houses)
- City & County Government
- Commercial

## Site Drivers:

- Potential IA Concerns
- City & County Government
- Surface Water
- Accessibility of Soils





# VI Investigation

Site Indoor Air:

PCE – 60 ug/m<sup>3</sup>

TCE – 1.5 ug/m<sup>3</sup>

Site Soil Gas:

TCE - 17,000 ug/m<sup>3</sup>

PCE - 630,000 ug/m<sup>3</sup>

Site Subslab Soil Gas:

TCE- 8500 ug/m<sup>3</sup>





# Surface Water Investigation

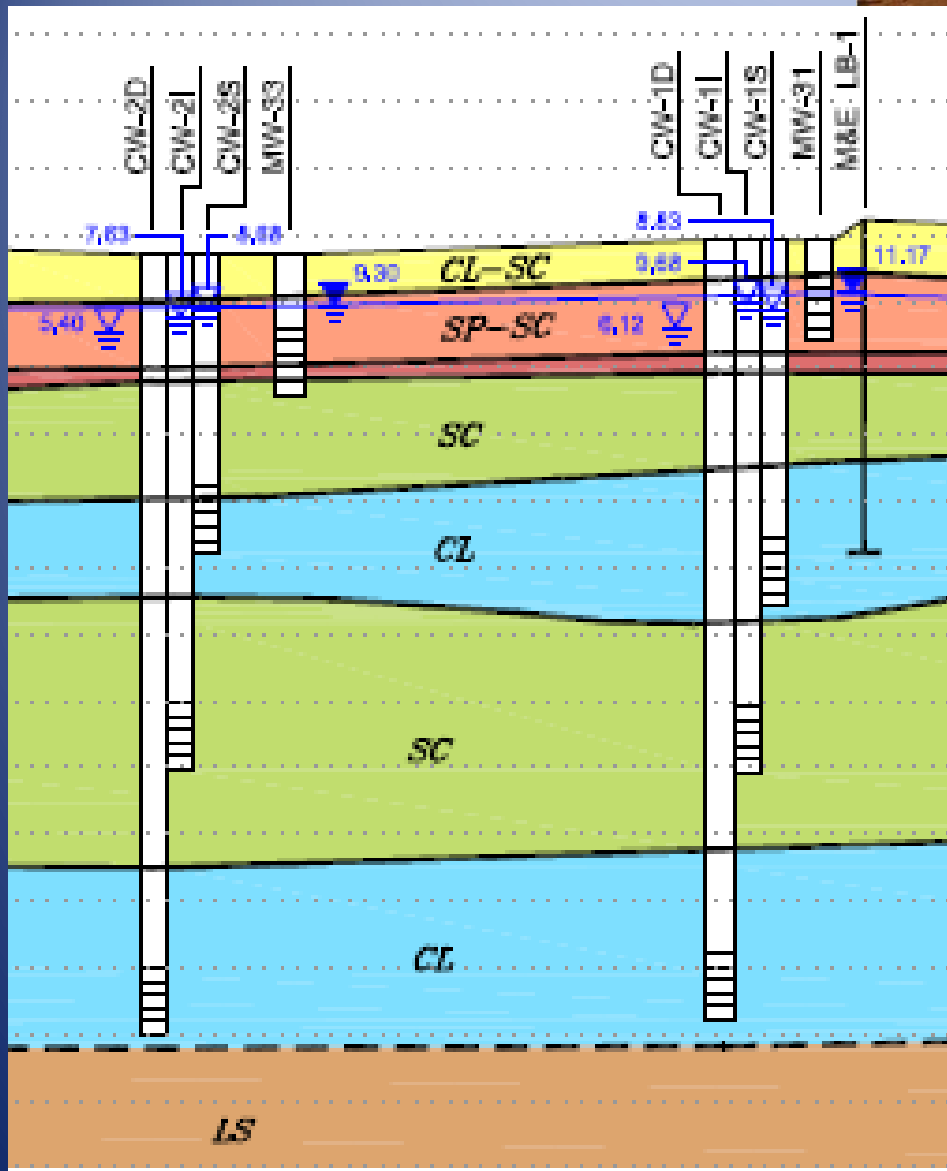


SP-1		12/05/2006
VOC	RESULTS	
cis-1,2-DCE	15	
Methyl t-butyl ether (MTBE)	2.9	
PCE	33	
TCE	15	

SP-2		12/05/2006
VOC	RESULTS	
Methyl t-butyl ether (MTBE)	7.0	
Isopropyl ether (IPE)	1.9	

SP-3		12/05/2006
VOC	RESULTS	
Acetone	11	
cis-1,2-DCE	3.6	
Methyl t-butyl ether (MTBE)	2.7	
p- Isopropyltoluene	1.1	
TCE	2.4	





06/21/2007



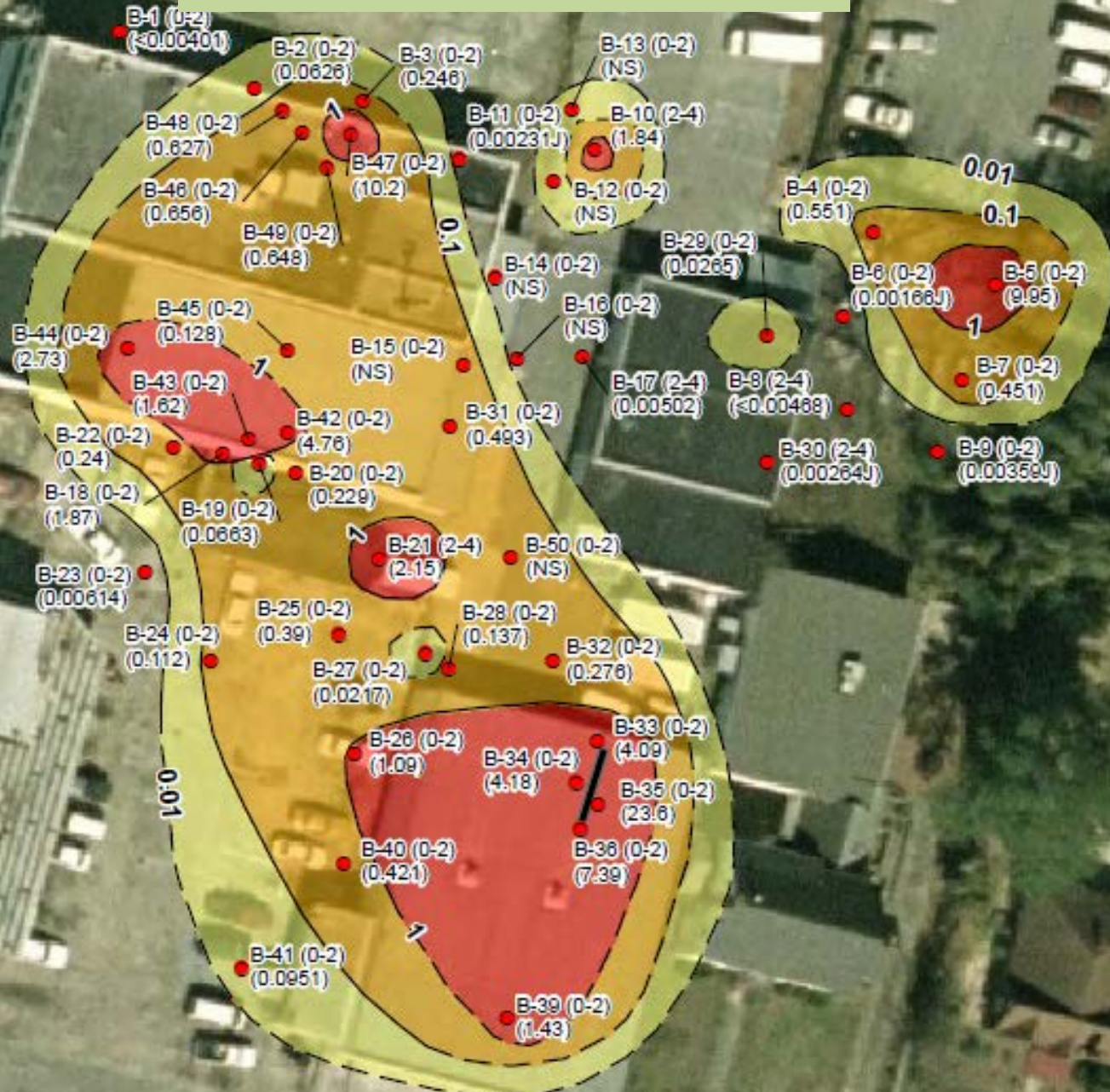
06/20/2007

Rotasonic Drilling



# DETAILED SOIL INVESTIGATION

Shallow Soil (0-2 ft) PCE Concentrations





# Summary of Remediation Activities

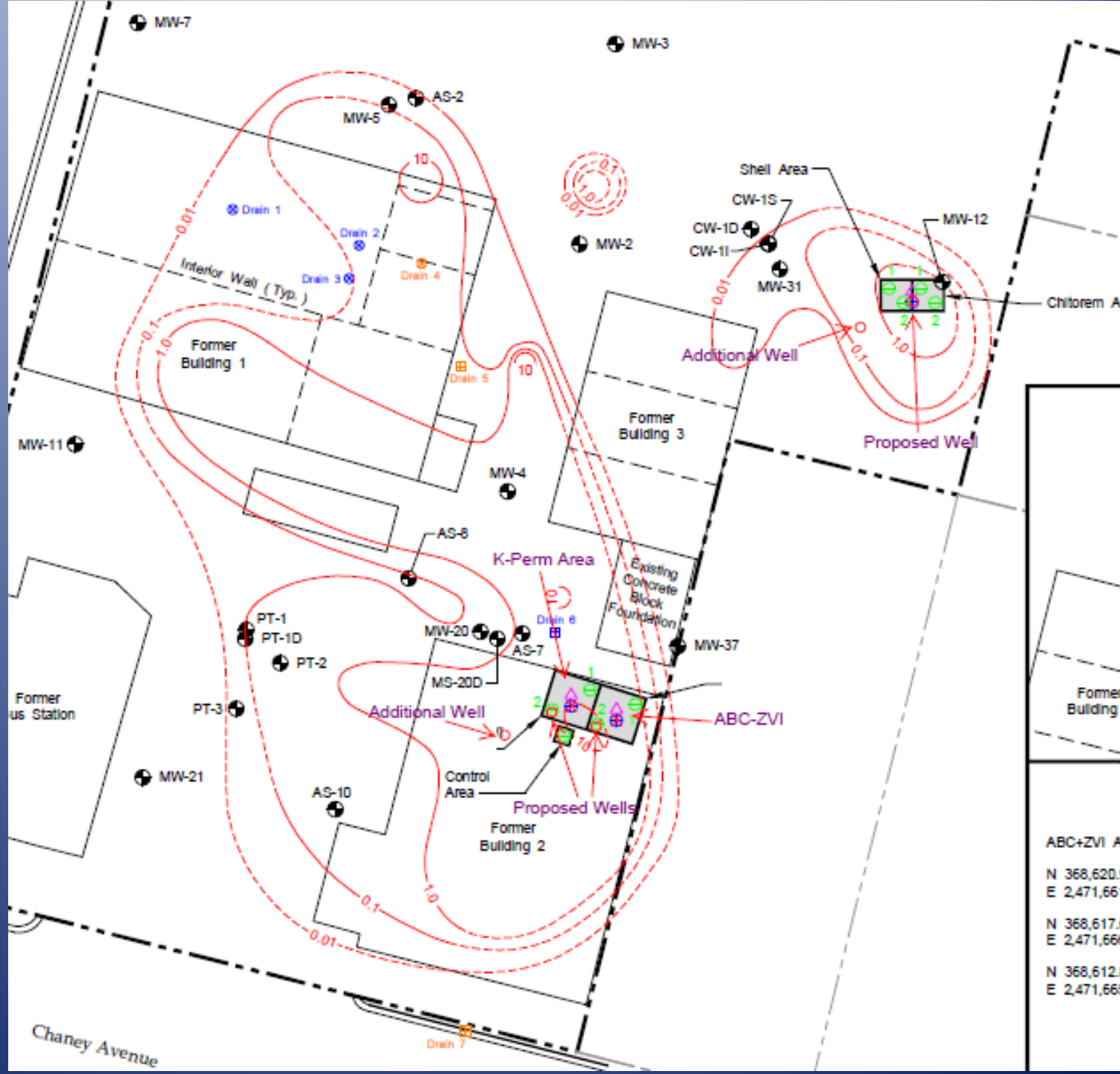
- Enhanced Reductive Dechlorination (ERD) Pilot Test [GW-ABC+]
- Soil Blending – 5 Test Cells
- Full-Scale Source Soil Remediation
- Full-Scale Groundwater Remediation using ERD (ABC+)



# Soil Blending Pilot

## Test Cells:

- K-Perm
- ABC-ZVI
- Chitorem
- Crab Shells
- Control





# Soil Blending Pilot





# Source Soil Remediation Results (in situ blending-protective of SW & IA)

Sample ID	Depth (ft)	Pre-Blending PCE Concentrations (mg/kg) (3/23/2009)	Post-Blending PCE Concentrations (mg/kg) (May-October 2012)
*B-4	0-2	0.551	0.365
	2-4 / 4-6	0.382	0.419
B-26	0-2	1.09	0.161
	2-4 / 4-6	0.267	0.0293
B-35	0-2	23.6	0.281
	2-4 / 4-6	4.85	1.41
B-42	0-2	4.76	0.0815
	2-4	NS	0.188 / 0.162 <sup>1</sup>
	4-6	2.57	0.635 <sup>1</sup>
B-47	0-2	10.2	0.0473
	2-4 / 4-6	6.06	0.2
B-51	0-2	1.81	0.112
	2-4	7.66	0.124 / 0.113 <sup>2</sup>
	4-6	NS	0.0865 <sup>2</sup>
B-62	0-2	0.989	0.175 / 0.0836
	2-4	0.108	0.16 / 0.167
B-69	0-2	3.71	0.314
	2-4	1.47	0.125