

# Conquering a Busy Intersection to Install Horizontal Remediation Wells and Protect Indoor Air



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**DIRECTIONAL**  
Technologies, Inc  
Horizontal Directional Drilling Services



# Site History

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- Former retail gas station and auto repair in Tallahassee next door to Governor's mansion
- 3 UST's abandoned in place in 1984
- Assessments began in 1992
- 4<sup>th</sup> undocumented tank found in 1995
- On-site AS/MPE system installed in 2007
- Abandonment methods found to be improper during system installation
- Discovery led to more investigations and more contamination off site



# Site Location Tallahassee, FL





# Upfront Challenges

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- Petroleum Plume migrated diagonally across a busy intersection, making it virtually impossible to gain access to plume through vertical wells
- If plume continued to migrate, indoor air quality would be threatened in several commercial buildings
- Curved path of the plume required curved horizontal wells to effectively remediate
- Multiple buried utility lines would interfere with locating equipment
- Resistance of commercial property owners across the intersection to have exit pits excavated in their front of back lawns

# Site Plan



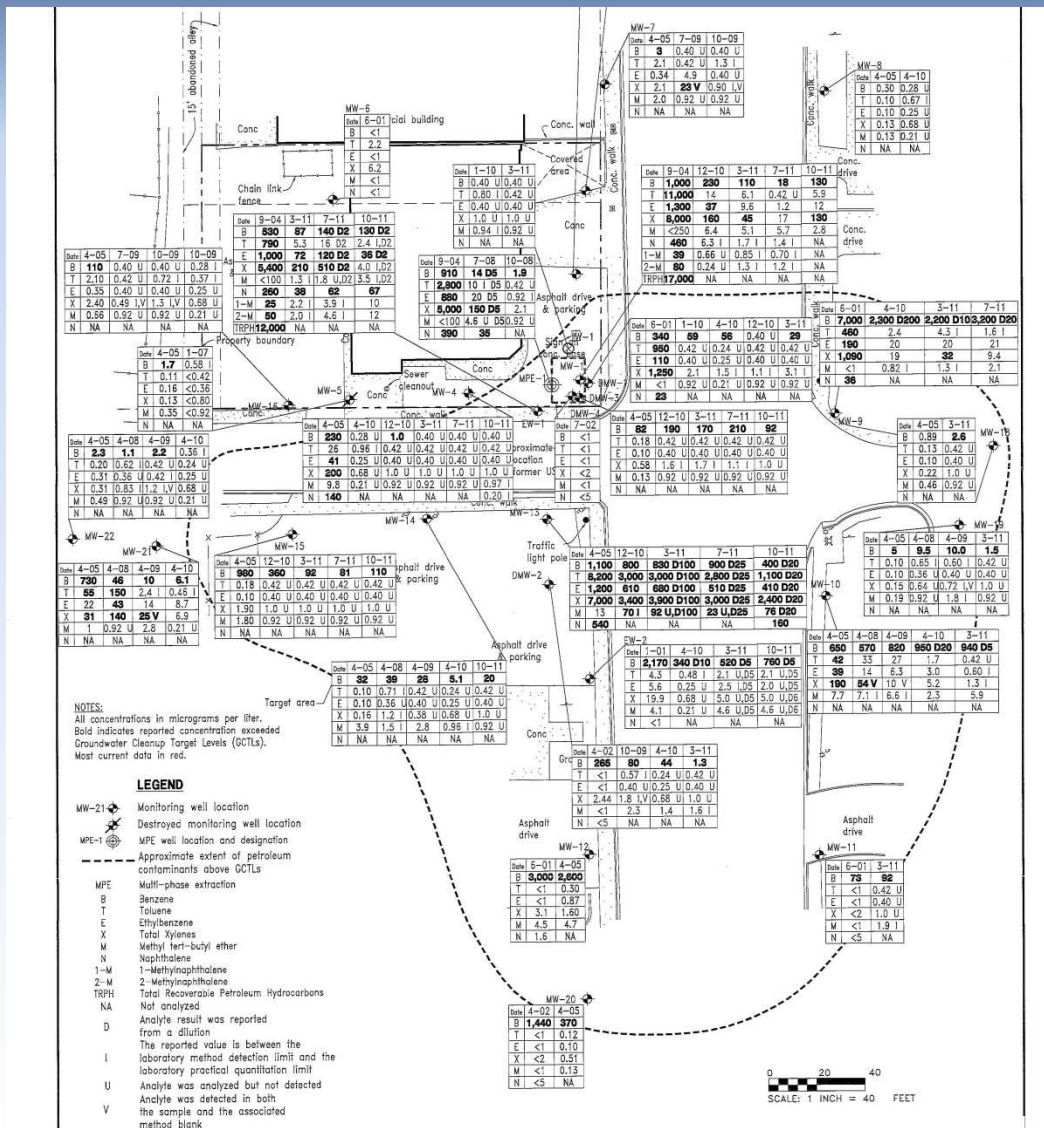


# Site Characteristics

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- Depth to water – 26 ft bls
- Sandy clay and clayey sand
- Confining clay layer at 35 ft bls
- Groundwater plume – 102,000 ft<sup>2</sup>

# Baseline Groundwater Plume





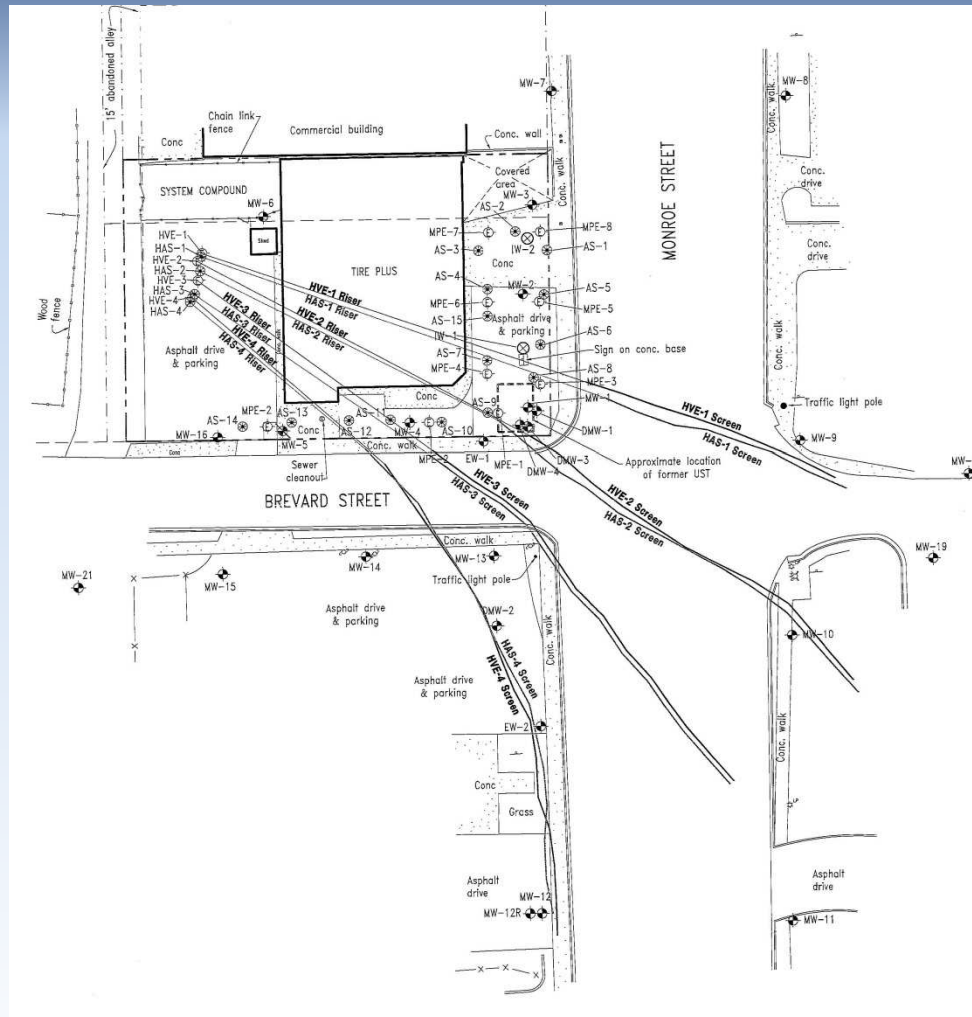
# Remedial Design

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- 4 horizontal AS wells with screens at 33 ft bls.
  - Screen lengths: 100, 170, 170, and 200 ft
- 4 horizontal SVE wells with screens at 20 ft bls
  - Screen lengths: 100, 170, 170, and 200 ft
- Source area: select on-site vertical AS/SVE wells remain active
- Horizontal wells run in cycles



# AS/SVE Well Layout



# Rapid Results

- HRW achieve rapid site closure due to the ability of the well screen to have maximum contact with the contaminant

Monitoring Well ID	Designation	Baseline BTEX (µg/l)	Year 1 BTEX (µg/l)	% Reduction from Baseline
MW-1	Source area	277.9	BDL	99.99
MW-9	Source area	3,232	28	99.13
MW-11	Source area	92	4.4	95.22
MW-13	Source area	4,310	1.1	99.97
EW-2	Source area	760	dry	NA
Totals		8,671.9	33.5	-



# Overcoming the Challenges

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- Horizontal wells accurately followed their compound curves by combining downhole sonde locating equipment with continuous calculation of wellbore depths and topographic survey points of the uneven ground surface
- Wells were placed along the top of a clay aquitard unit with the horizontal SVE wells being placed with the companion AS well. This allowed for total vapor recovery, thereby satisfying FDEP requirements for AS-SVE pairs
- Blind wells were installed without exit pits, keeping in compliance with the property owners requests



# Horizontal Remediation Wells

Horizontal Remediation Technologies • Installation • Design • Engineered Well Screens • Services



Founded in 1992, Directional Technologies, Inc. has installed over 1,000 horizontal remediation wells throughout the world.

Corporate Headquarters in Wallingford, CT  
Branches offices in Philadelphia, PA; Ashby, MA; Atlanta, GA; Destin, FL



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