

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

- 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
- 4th 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

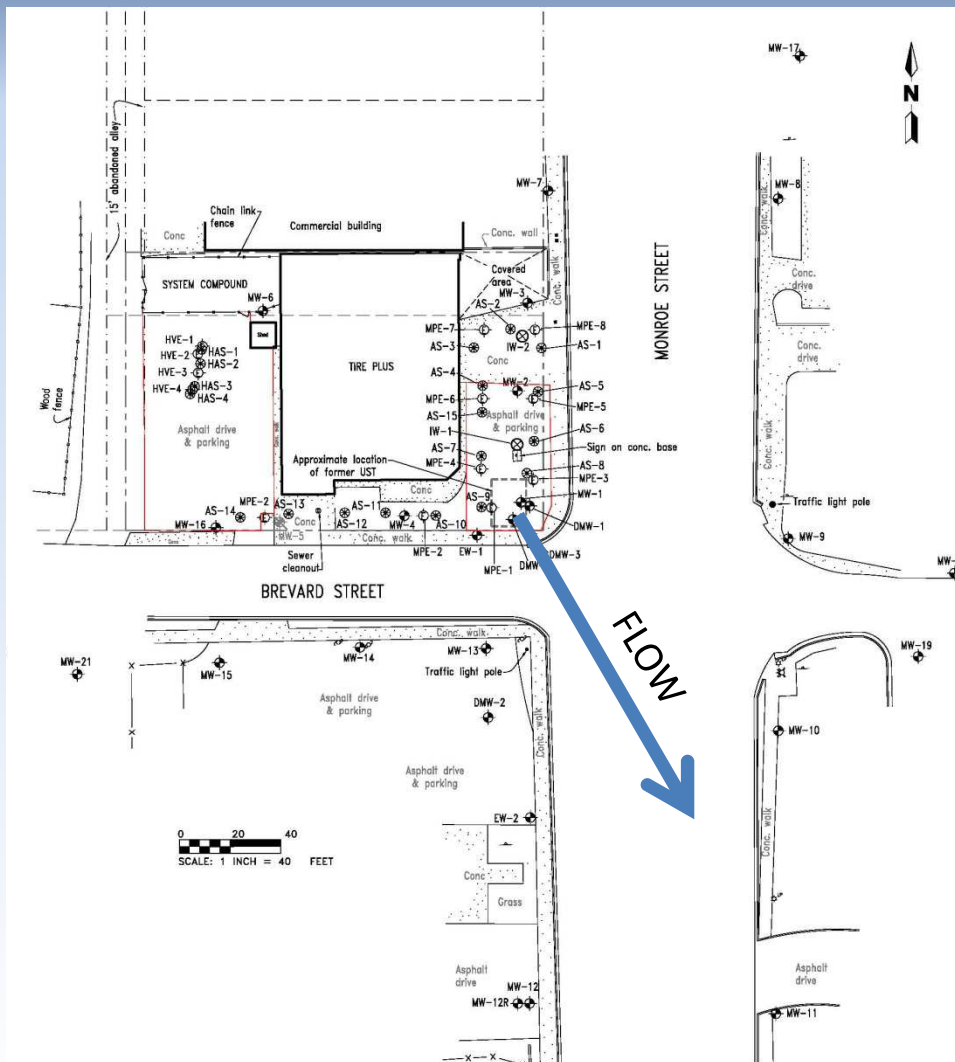




Upfront Challenges

- 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



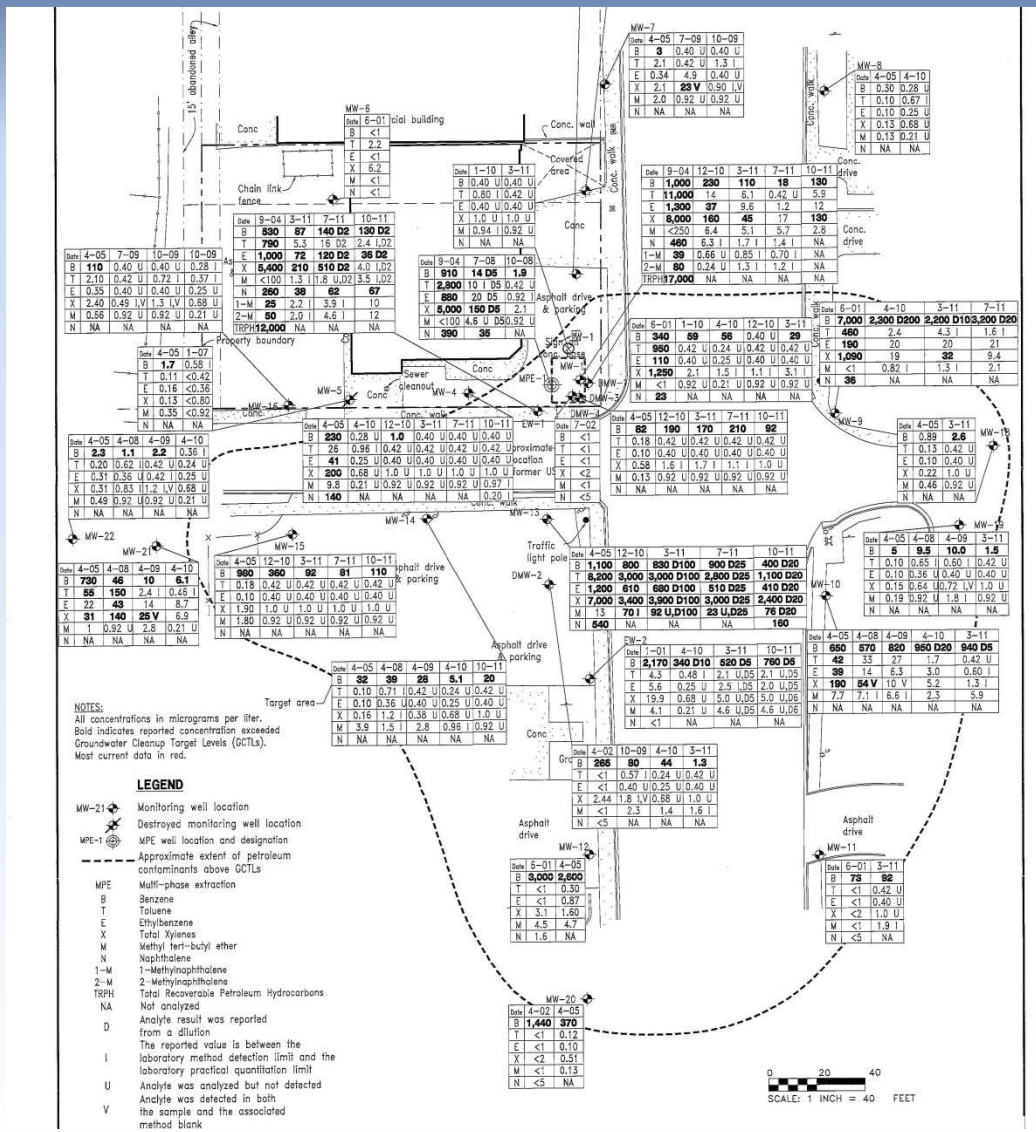


Site Characteristics

- Depth to water – 26 ft bls
- Sandy clay and clayey sand
- Confining clay layer at 35 ft bls
- Groundwater plume – 102,000 ft²



Baseline Groundwater Plume

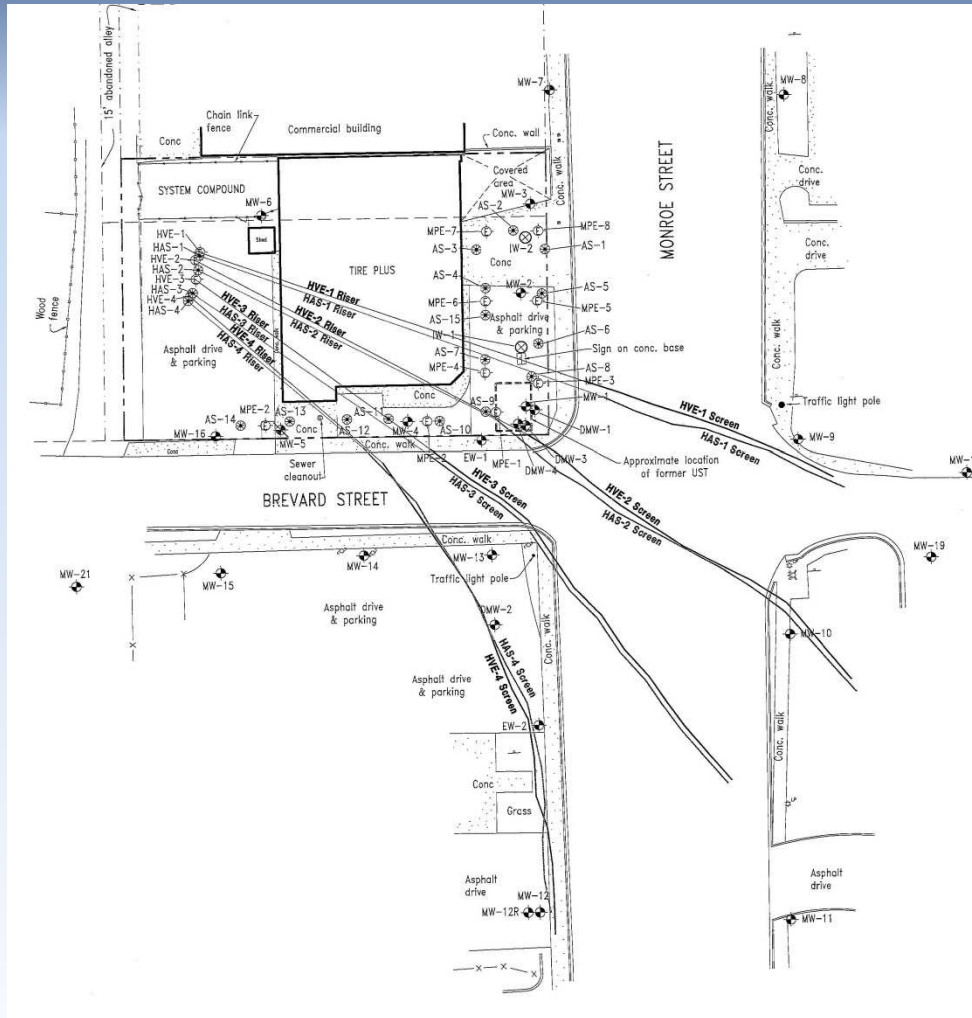




Remedial Design

- 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

- 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



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

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