



SC DEPARTMENT *of*  
**ENVIRONMENTAL  
SERVICES**

# Using Targeted Corrective Action Approach to Expedite Site Closure

September 24, 2025

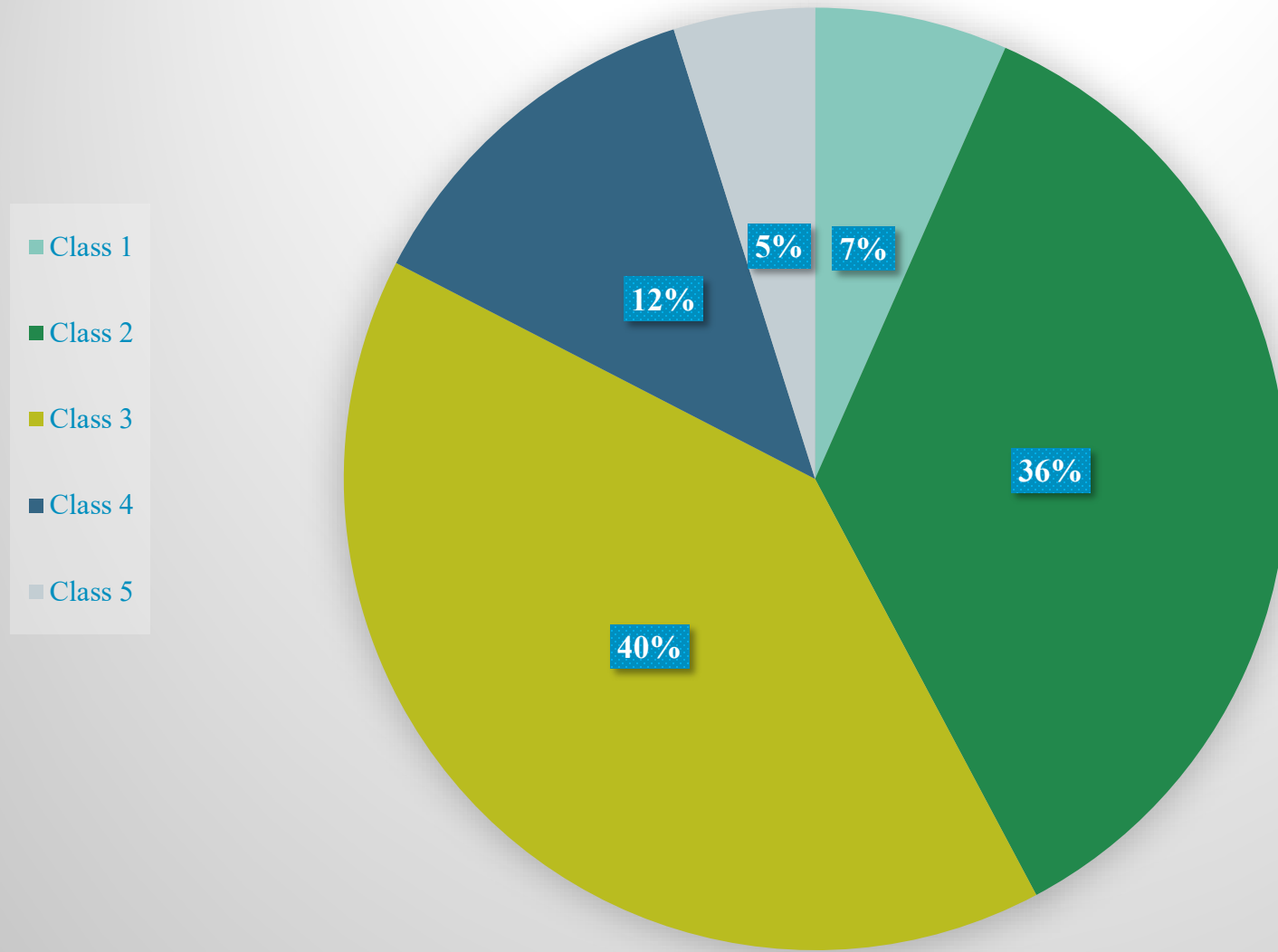
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# Underground Storage Tank Program

- RBCA Program
- Free Product <0.01 feet
- State fund for viable RPs and unwilling/unable parties
- No allowances for deed restrictions/restrictive covenances
- Conditional Closure of Releases



# SC RBCA Classification Site Distribution



# Challenges with Low-Risk Closures

- Time, Funding, Resources
- Current supply issues and inflation
- Sites that have recurring free product
- Access issues/redevelopment issues

# History of Corrective Action

- Pay-for-Performance
  - Site-Specific Target Levels Established
  - Environmental Contractor selected remedial strategy
  - Payment based on achieving reduction milestones
- AS/SVE, Pump & Treat
- Bioremediation (microbial or nutrient injections)
- Often “stuck” in specific technology.
- Sometimes used multiple technologies but not effective in long-term

# Implementation of Targeted Corrective Action

- Pay-for-Performance contracts that had failed for various reasons
- Utilized excavation at number of sites that resulted in closures
- Have a large population of sites were have viable responsible parties
- Large number of lower rank sites that had recurring free product or high dissolved concentrations.
- Began in 2022. To date, 24 have been approved and 9 have received closure.
- Excavation: (7), Enhanced AFVR (7), Injections (10)

# Conditions for Targeted Corrective Action

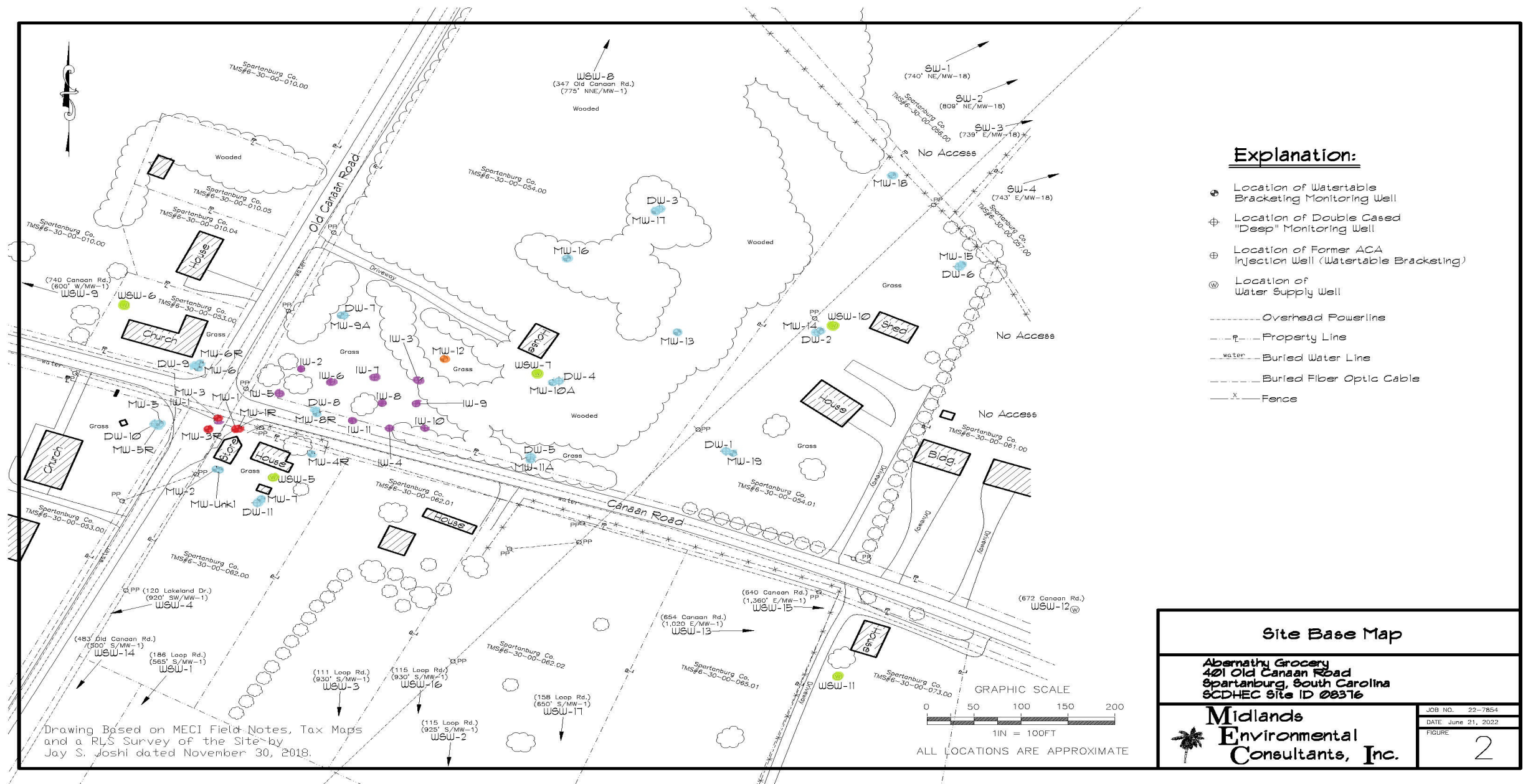
- Must meet the following conditions:
  - Plume must be contained to the site
  - Must be able to achieve site closure within 2 years.
  - Must not have any impacted receptors (i.e. WSWs, surface water, etc.)
- Contractor submits a Strategy to Closure proposal
- Contractor submits a Corrective Action Plan
- Allowable technologies: Enhanced AFVR, Excavation, Injection

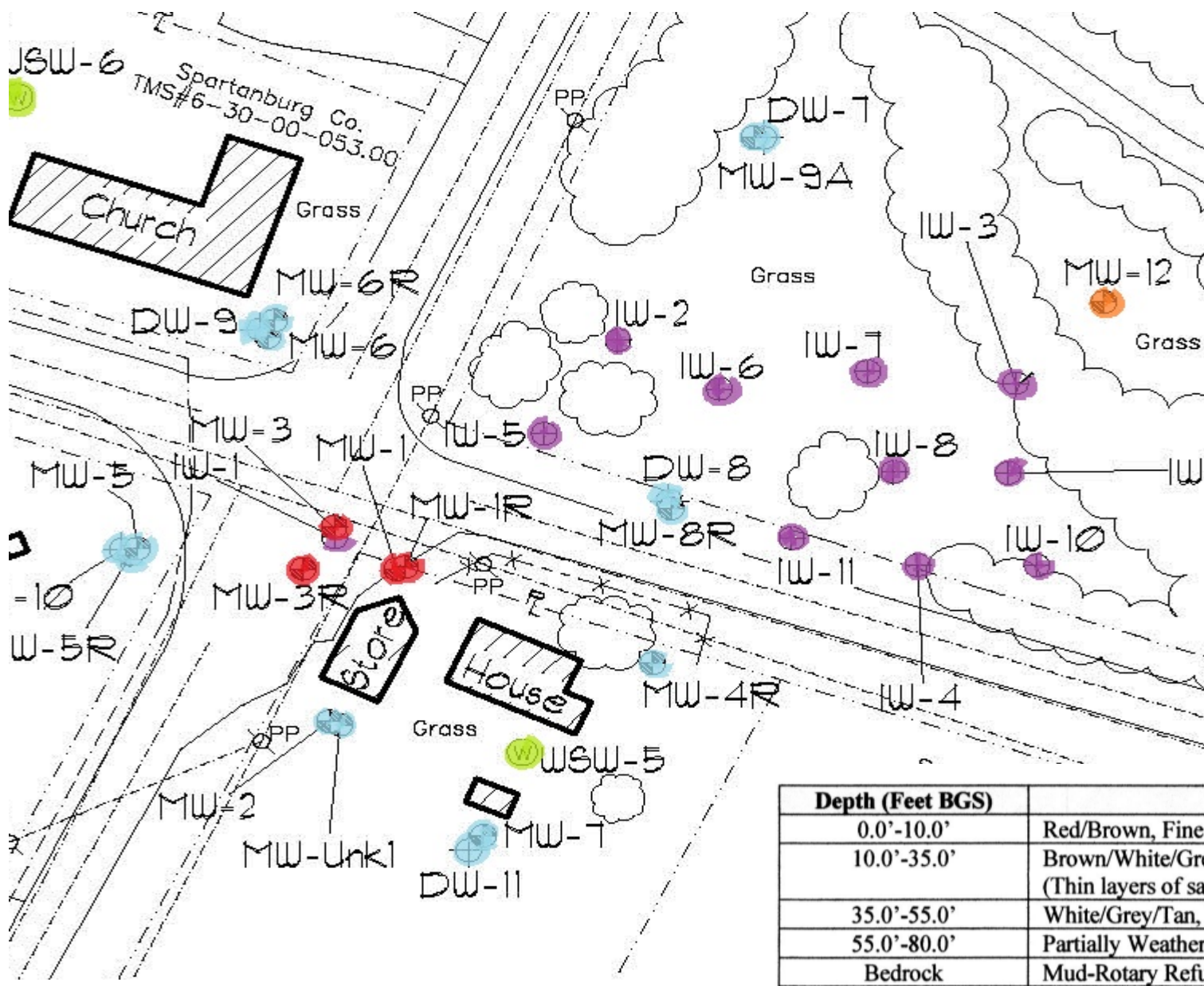
# Targeted Corrective Action Examples



# Site #1 - Spartanburg County





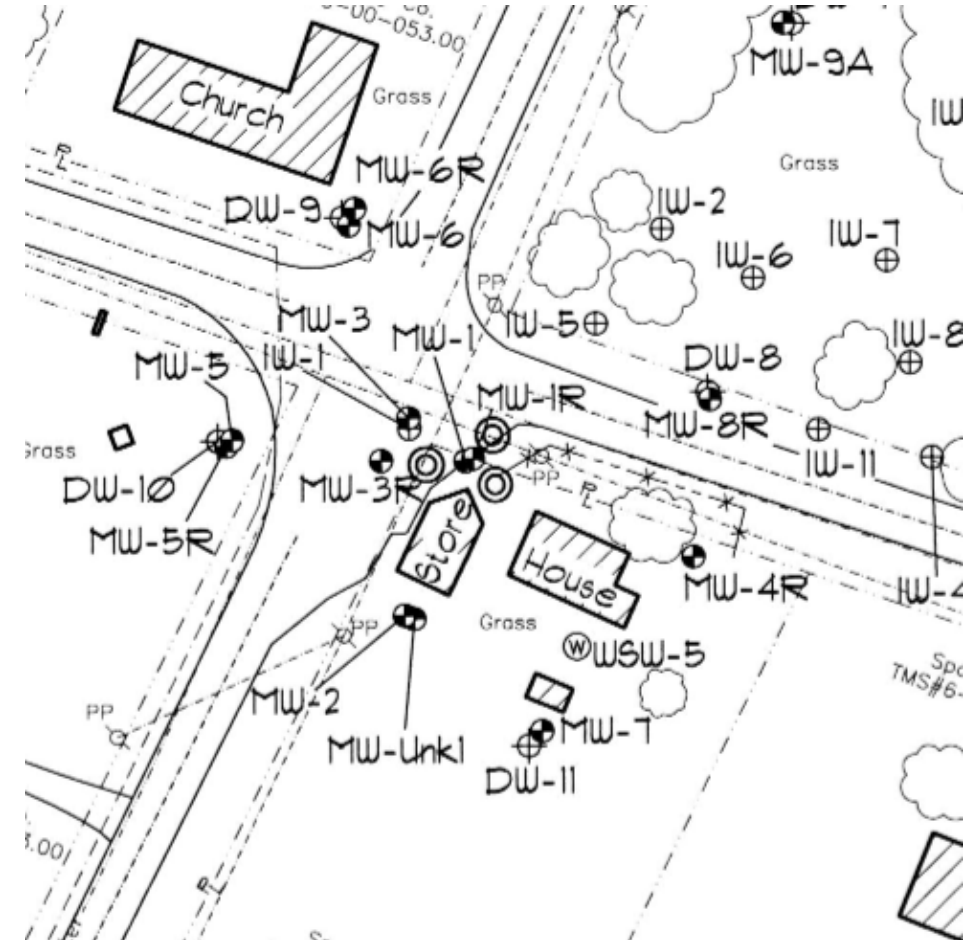


# Site History

- Release reported December 31, 1991
- Two tanks (1000 gal and 560 gal) gasoline – abandoned 12/1/91
- Assessment activities completed in 1996
- Corrective action implemented in 1997 and continued until 2009 when the contractor was decertified.
- 2009-2022 groundwater sampling, additional assessment, and aggressive fluid vapor recovery events conducted

## Proposed Targeted Corrective Action

- Installation of three injection/recovery wells
- Injections of Crystal Simple Green
- Followed by AFVR event & subsequent verification sampling
- Successfully achieved site target goals and a CNFA was issued in November 2024.



- 1<sup>st</sup> injection: 100 gallons Crystal Simple Green & 600 gallons water at 10-30 psi
- After 72 hours, 96-hour AFVR event conducted, 5856 gallons removed.
- Groundwater samples collected after 30 days.
- 2<sup>nd</sup> injection: 110 gallons Crystal Simple Green & 600 gallons water at 10-30 psi
- After 10-days, 96-hour AFVR event conducted. 5,192 gallons removed.
- Groundwater samples collected after 3 months.
- Groundwater sampled collected after 3 months.
- Conditional No Further Action Achieved.

# COSTS



Assessment: \$29,394.61



PfP Corrective Action: \$110,412.37



Long Duration AFVR & Sampling: \$271,019.



Targeted Corrective Action & Closure: \$165,029.88



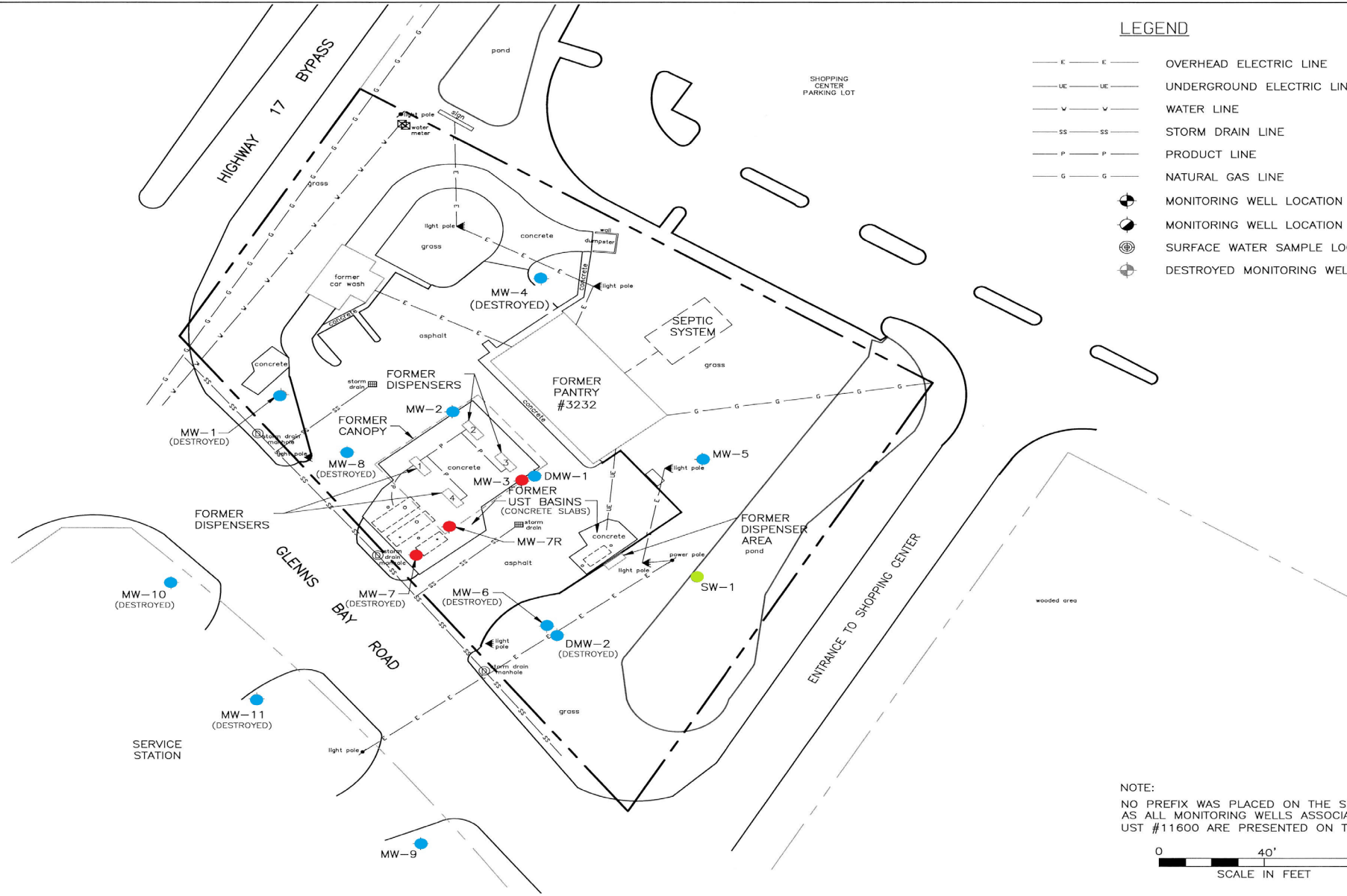
Total Cost: \$575,856.36

# Site #2 – Horry County

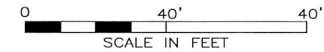


Image capture: Dec 2024 © 2025 Google United States Ter

09/18/2023 2:00pm - Admin - R:\125 - ATC - 1253968.dwg - 09-18-23.dwg



NOTE:  
NO PREFIX WAS PLACED ON THE SITE WELLS  
AS ALL MONITORING WELLS ASSOCIATED WITH  
UST #11600 ARE PRESENTED ON THE FIGURE.



### LEGEND

- E — E — OVERHEAD ELECTRIC LINE
- UE — UE — UNDERGROUND ELECTRIC LINE
- V — V — WATER LINE
- SS — SS — STORM DRAIN LINE
- P — P — PRODUCT LINE
- G — G — NATURAL GAS LINE
- MONITORING WELL LOCATION (TYPE II)
- MONITORING WELL LOCATION (TYPE III)
- ⊙ SURFACE WATER SAMPLE LOCATION
- ⊙ DESTROYED MONITORING WELL

### FIGURE 2

UST PERMIT No. 11600



6004 North Main Street, Suite 107  
Columbia, South Carolina 29203  
(803) 735-0003 FAX (803) 741-2444

SITE MAP  
PANTRY #3232  
2590 GLENN'S BAY ROAD  
SURFSIDE BEACH, SOUTH CAROLINA

CAD FILE  
1253968.DWG

TYPE CODE

PREP. BY  
WH

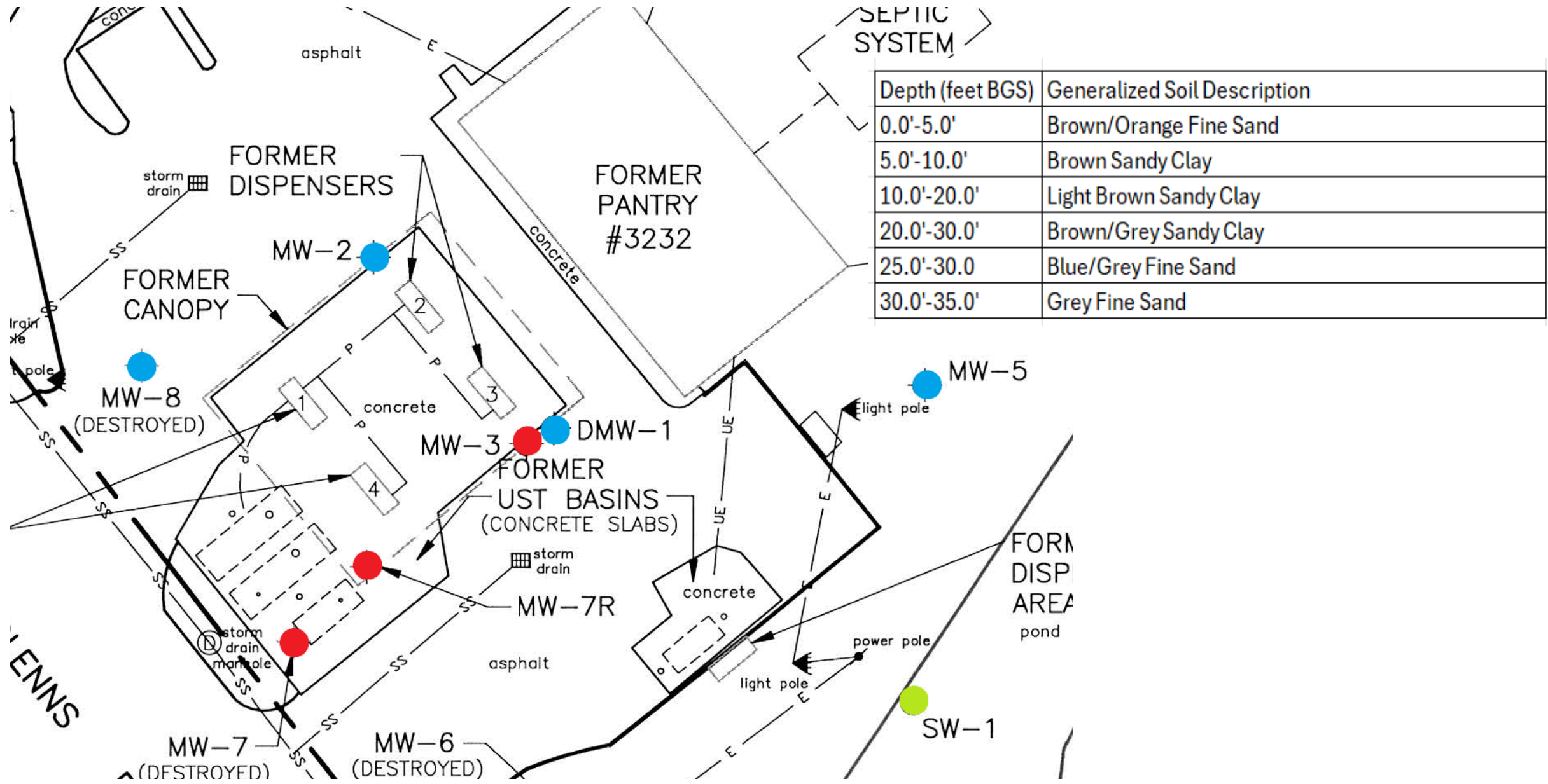
REV. BY  
FL

SCALE  
1" = 50'

DATE  
09-18-2023

PROJECT NO.  
DHEC323209

NOTES:

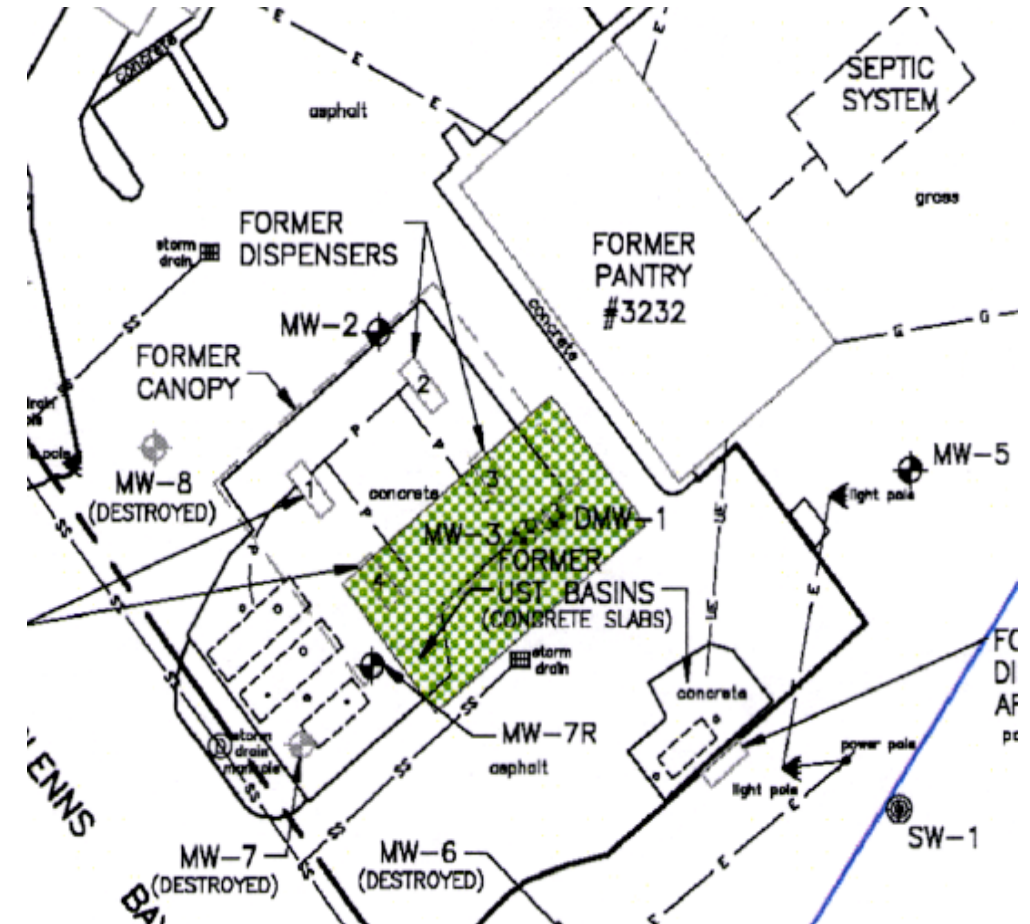


# Site History

- Releases reported October 21, 2013
- Four tanks (2-10k gasoline, 8k gasoline, & 3k diesel) – abandoned 2013
- Assessment completed 2015.
- 2016-2023 groundwater sampling, and aggressive fluid vapor recovery (AFVR) events.

# Proposed Targeted Corrective Action

- Excavation of area – 20'x50'x12' in area of MW-3.
- Backfilled with layer of Regenesis ORC
- Followed by subsequent verification sampling
- Successfully achieved site target goals and a CNFA was issued in January 2025



- Concrete pavement removed
- Electrical conduit located and removed'
- Sheet pilings installed to 15 feet
- Soil excavated to 7 feet
- Powdered ORC (20 40-pound bags) applied in base of excavation
- Geotextile fabric installed and covered with two feet #2 stone
- Another layer of ORC applied on top of stone and remaining excavation backfilled with silty sand and stone to grade.
- MW-3 was reinstalled in center of excavation
- Four quarterly groundwater sampling events conducted to verify attainment of goals
- Conditional No Further Action Achieved.

# COSTS



Assessment: \$57,297.48



AFVR Events & Sampling: \$52,683.11



Soil Excavation, Post Monitoring, &  
Closure: \$337,084.76

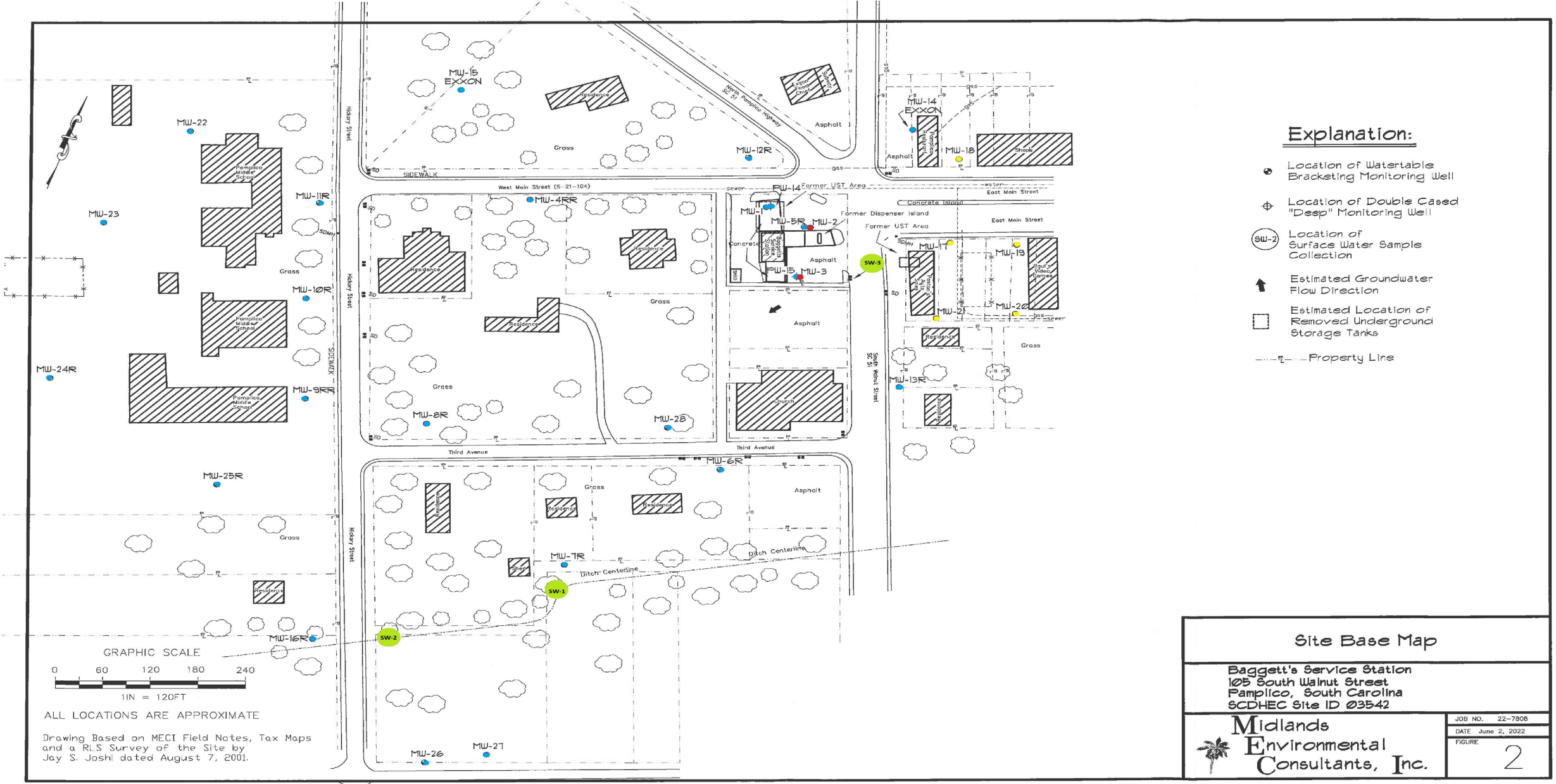


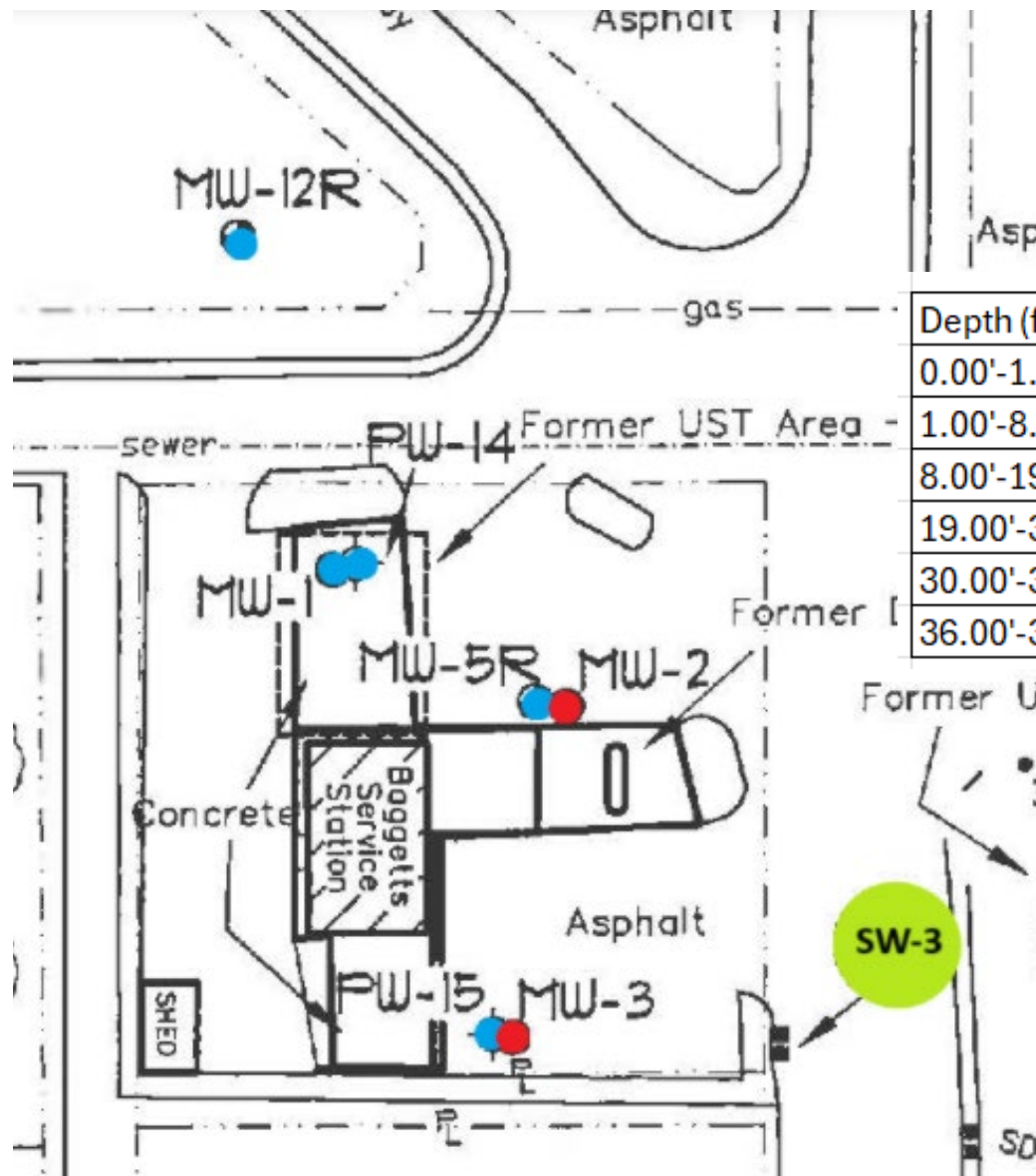
Total Cost: \$447,065.35

# Site #3 - Florence County



Image capture: Jul 2024 © 2025 Google United States Terms Pr





| Depth (feet BGS) | Generalized Soil Description                                             |
|------------------|--------------------------------------------------------------------------|
| 0.00'-1.00'      | Sand, quartz, gray to dark gray, very fine to coarse                     |
| 1.00'-8.00'      | Sand, quartz, dark brown, very fine to coarse                            |
| 8.00'-19.00'     | Sand, quartz, light brown, well sorted, very fine to fine                |
| 19.00'-30.00'    | Clayey silt, dark greenish gray, trace clay, trace very fine quartz sand |
| 30.00'-36.00'    | Sand, macrofossilerous, 1/4 to 1/2 inch, very fine to coarse sand        |
| 36.00'-37.00'    | Clay, very dark gray, very hard, slightly plastic                        |

# Site History

- Releases reported December 28, 1989, and September 13, 1999
- Six tanks (4-3k gasoline, 4k gasoline, 550-gal waste oil, 550-gal heating oil, 550-gal kerosene) – abandoned 1982 and 1985.
- Assessment completed 2006
- 2006-2022 groundwater sampling, additional assessment, and AFVR events

# Proposed Targeted Corrective Action

- Injection of 6,000 pounds pulverized activated carbon, 1,500 pounds gypsum, 15 gallons microorganisms (BioREM-2000) with 6,000 gallons water. Injected at 2-foot intervals. Flow rate of 2-10 gpm and 10-60 psi.
- Quarterly verification sampling



- Direct injection of 6,000 pounds pulverized activated carbon, 1,500 pounds gypsum, 15 gallons microorganisms (BioREM-2000) mixed with potable water (10:1 ratio).
- Forty-four injection points, injected bottom-up at 15'-12', 12'-9', and 9'-6' at 100-200 psi.
- Groundwater sampling conducted after 90 days and then 3 quarterly groundwater sampling events.
- Conditional No Further Action Achieved.

# COSTS



Assessment: \$116,273.75



Additional Assessment, AFVR Events & Sampling: \$144,412.24



Injections, Post Monitoring, & Closure: \$120,805.47



Total Cost: \$381,491.46

# Conclusions



- Average Cost of Targeted: \$309,351.38
  - Excavation: \$355,120.13
  - Enhanced AFVR: \$322,001.36
  - Injections: \$258,829.17
- Average Time to Closure for Targeted: 15 months
- Effective source removal and long-term treatment solution where a long-term corrective action approach may not be feasible or cost effective.



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# Get in touch

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