



November 5, 2018

Mr. Cyrus Parker, L.G., P.E.
Geotechnical Engineering Unit
State of N.C. Department of Transportation – Division of Highways
P.O. Box 25201
Raleigh, NC 27611-5201

**RE: PRELIMINARY SITE ASSESSMENT OF PARCEL 342– Revision 1
ESP Project No. CS34.366**

WBS: 34839.1.8
TIP: U-2579AB
County: Forsyth
Description: Winston-Salem - Northern Beltway Eastern Section (Future I-74) From I-40 to I-40
Business/US 421
Parcel No.: 342
Owner: Taylor Family Properties
Address: 4401 Kernersville Road, Winston-Salem, NC

Dear Mr. Parker:

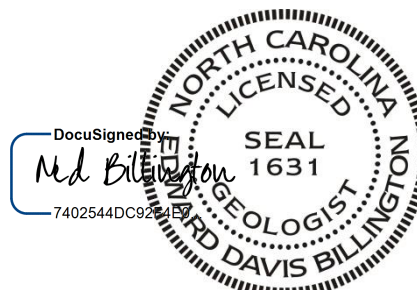
ESP Associates, Inc. (ESP) is pleased to submit this report on our Preliminary Site Assessment of the subject parcel. This work was performed in accordance with your Request for Proposal dated April 17, 2018 and our Cost Proposal dated May 3, 2018.

We appreciate the opportunity to assist you during this phase of the project. If you should have any questions concerning this report, or if we may be of further assistance, please contact us.

Sincerely,

ESP Associates, Inc.

Edward D. Billington, PG
Senior Geologist/Geophysicist
DMN/EDB/CJW



not considered Final unless all signatures are completed

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1.0 INTRODUCTION

The North Carolina Department of Transportation (NCDOT) is planning to construct the Winston-Salem - Northern Beltway Eastern Section (Future I-74) From I-40 to I-40 Business/US 421 (Figure 1). The NCDOT requested that ESP Associates, Inc. (ESP) perform a Preliminary Site Assessment (PSA) of Parcel 342 within the proposed Right of Way (ROW) and/or easement to locate possible underground storage tanks (USTs), sample soil, and delineate potential contaminated soil.

2.0 HISTORY

This parcel is owned by Taylor Family Properties and is currently occupied by an active gas station/convenience store. The facility is listed in the North Carolina Department of Environmental Quality's (NCDEQ's) UST Section Registry with Facility ID #: 0-032502 and was assigned Ground Water Incident #: 44687.

3.0 SITE OBSERVATIONS

During our May 2018 field work, the site was operating as an active gas station/convenience store (Figure 2). There are currently four 12,000 gallon USTs in use. Four monitoring wells are on site at each corner of the tank pit and appear to be active but are locked with padlocks; therefore, ESP was unable to sample these wells (Figure 3). The ground in the study area was covered by asphalt, concrete, and grass.

4.0 METHODS

ESP performed a geophysical study of the area designated by the NCDOT on May 23, 2018. We performed direct-push drilling and sampling of subsurface soils within the proposed easement on September 6, 2018. A photoionization detector (PID) was used to screen subsurface soils in the field and select soil samples to send for laboratory analysis.

4.1 Geophysics

ESP performed a metal detector study over the accessible areas of the site using a Geonics EM61 MK2 with a line spacing of about three feet (Figures 3 and 4). Location control was provided in real-time using a differential global positioning system (DGPS). We collected ground-penetrating radar (GPR) data over selected EM61 anomalies and reinforced concrete areas using our Sensors and Software Noggin 250 GPR system. The GPR data were collected using a line spacing of one to two feet.

4.2 Borings

ESP performed direct-push drilling activities within the easement of Parcel 342 using a subcontractor, SAEDACCO of Fort Mill, South Carolina. Six borings were drilled, designated B342-1 through B342-6 (Figure 3). The soil borings were advanced using a GeoProbe 7822DT drill rig. Continuous soil samples were obtained to a depth of approximately ten feet using five-foot long Macro Cores®. Soil cores had a recovery of four to five feet. The sampling equipment was decontaminated prior to drilling and between borings by the driller using a Liquinox® detergent solution.

4.3 Soil Sample Protocol

Representative soil samples were taken from the Macro-Core tubes at approximate one-foot intervals by the ESP field geologist while wearing nitrile disposable gloves. Each sample was placed in a sealed plastic bag and then kept in a sunny area for at least 5 minutes prior to measuring volatile organic compound (VOC) levels in the head space with the PID. All of the soil samples obtained had a PID reading of less than 10 parts per million (ppm).

Soil samples selected for laboratory analysis were Sample S-9 (corresponding depth of 9.0-9.5 feet) from each of Borings B342-1, B342-2, B342-3, B342-4, and B342-5; Sample S-5 (5.0-5.5 feet) from Boring B342-4; and Sample S-3 (3.0-3.5 feet) from Boring B342-6. For each selected sample, an approximate 10-gram soil sample was collected from the Macro-Core tube using a Terra Core Sampler and placed into a laboratory-supplied 40-milliliter volatile organic analysis (VOA) vial containing methanol. Once sealed, the vial was labeled with the sample identification number and then shaken vigorously for about one minute. The samples were packed on ice and sent via overnight delivery to RED Lab, LLC (RED Lab), located in Wilmington, North Carolina, following proper chain-of-custody procedures (Appendix C).

RED Lab used a QED Hydrocarbon Analyzer to quantitatively analyze the soil samples using the ultraviolet fluorescence (UVF) method for benzene, toluene, ethylbenzene, and xylene (BTEX); gasoline range organics (GRO); diesel range organics (DRO); total petroleum hydrocarbons (TPH); total aromatics; polycyclic aromatic hydrocarbons (PAHs); and benzo(a)pyrene (BaP).

4.4 Groundwater

Groundwater was not encountered in the six borings drilled on the site.

5.0 RESULTS

5.1 Geophysics

The EM61 early time gate data show the response from both shallow and deeper metallic objects (Figure 3). The differential response reduces the effect of shallow anomalies and emphasizes

anomalies from larger and more deeply buried metallic objects, such as USTs (Figure 4). The EM61 differential results indicated several anomalies (response above background) that did not correspond to known site features.

GPR data were collected over the EM61 anomalies. The GPR data collected did not indicate the presence of unknown USTs within the study area.

The EM61 early time gate response and differential response are shown on the plan sheet on Figures 5 and 6, respectively.

5.2 Sample Data

The soil sample UVF hydrocarbon analysis results for BTEX, GRO, DRO, and PAHs are presented in Table 2. The RED Lab laboratory report, which includes results for TPH, total aromatics, and BaP, is provided in Appendix B. Values are provided in milligrams per kilogram (mg/kg or ppm).

5.3 Sample Observations

The results of the laboratory testing indicated that BTEX and GRO were below the detection limits for all samples. DRO was detected in 1 of the 7 soil samples tested but below the NCDEQ action level of 100 ppm. The highest DRO reading was 20.2 ppm in Sample S-5 (5.0-5.5 feet) from Boring B342-4. PAHs were detected in 1 of the 7 soil samples tested. The highest PAH reading was 0.54 ppm in Sample S-5 (5.0-5.5 feet) from boring B342-4.

6.0 CONCLUSIONS

6.1 Interpretation of Results

The results of the PSA for Parcel 342 of NCDOT Project U-2579AB do not indicate the presence of abandoned USTs. No petroleum hydrocarbon soil contamination at or above NCDEQ action levels was detected within the proposed construction easement on Parcel 342.

6.2 Geophysics

The geophysical data do not indicate the presence of abandoned USTs.

6.3 Soil

The results of the PID field screening readings and off-site UVF hydrocarbon analyses do not indicate the presence of contaminated soil at or above the NCDEQ action levels within the proposed construction easement on Parcel 342 (Figure 7).

7.0 RECOMMENDATIONS

The four known USTs are within the proposed ROW on Parcel 342 and should be removed prior to property acquisition. Other than the known USTs, no limitations on construction activities or special handling of excavated soil are recommended for Parcel 342.

8.0 LIMITATIONS

ESP's professional services have been performed, findings obtained, and recommendations prepared in accordance with customary principles and practices in the fields of environmental science and engineering. ESP is not responsible for the independent conclusions, opinions, or recommendations made by others based on the data presented in this report.

The passage of time may result in a change in the environmental characteristics at this site and surrounding properties. ESP does not warrant against future operations or conditions, or against operations or conditions present of a type or at a location not investigated. ESP does not assume responsibility for other environmental issues that may be associated with the subject site.

TABLES

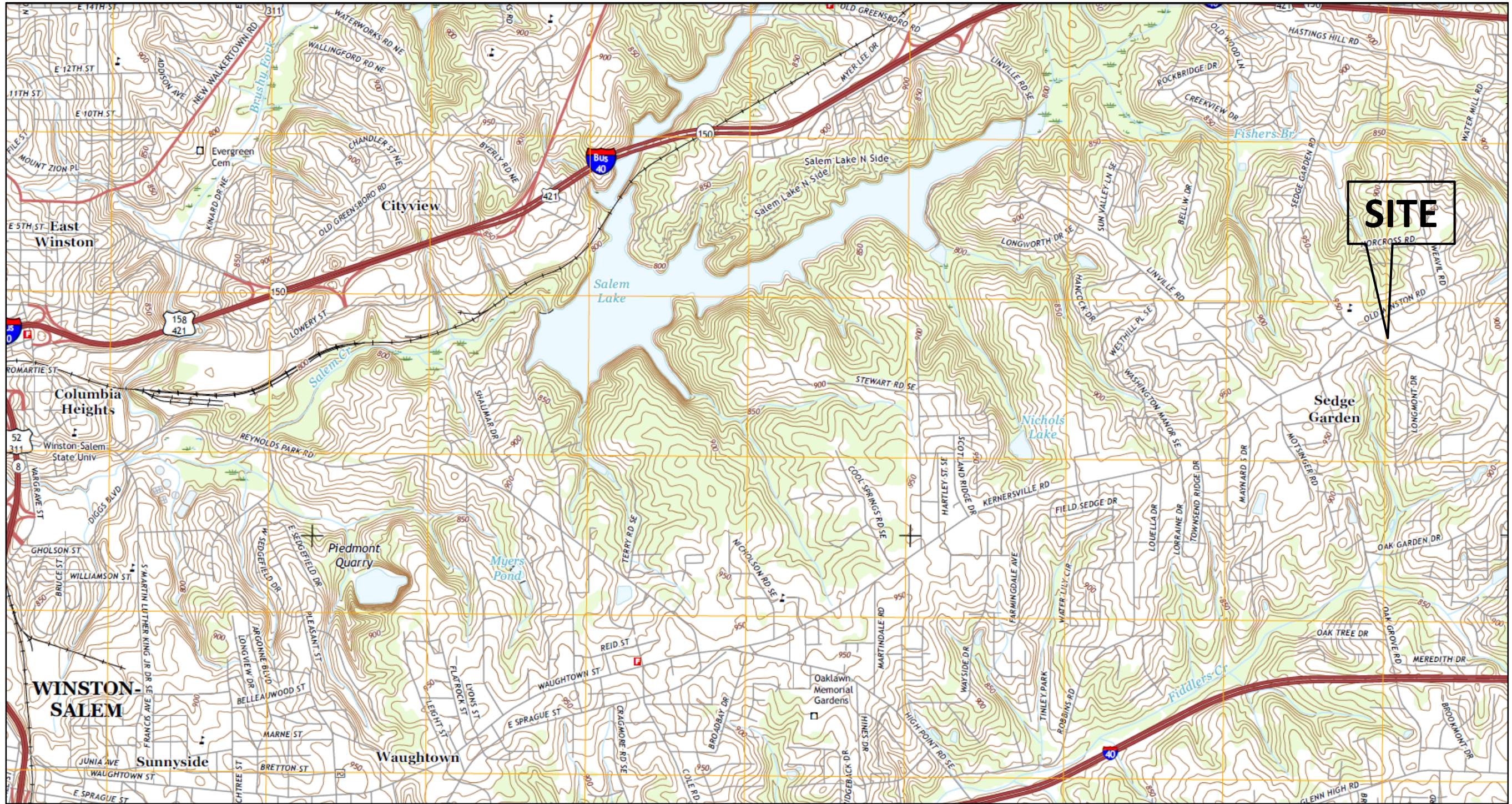
TABLE 1
SOIL SAMPLE PID READINGS

| Boring | Sample Depth Range with PID > 10 ppm (feet bgs) | Maximum PID Reading (ppm) and Sample Depth (feet bgs) |
|---------------|---|--|
| B342-1 | none | 4.3 (5.0-5.5) |
| B342-2 | none | 3.9 (9.0-9.5) |
| B342-3 | none | 5.9 (7.0-7.5) |
| B342-4 | none | 7.0 (5.0-5.5) |
| B342-5 | none | 2.5 (1.0-1.5) |
| B342-6 | none | 2.9 (2.0-2.5) |

TABLE 2
SOIL SAMPLE UVF RESULTS SUMMARY

| Boring | Sample ID (depth in feet bgs) | Date Collected | BTEX (C6-C9) (mg/kg) | GRO (C5-C10) (mg/kg) | DRO (C10-C35) (mg/kg) | PAHs (mg/kg) |
|---------------|--|---------------------------|-------------------------------------|-------------------------------------|--------------------------------------|-------------------------|
| B342-1 | S-9 (9.0-9.5) | 9/10/18 | <0.32 | <0.32 | <0.32 | <0.1 |
| B342-2 | S-9 (9.0-9.5) | 9/10/18 | <0.5 | <0.5 | <0.5 | <0.16 |
| B342-3 | S-9 (9.0-9.5) | 9/10/18 | <0.45 | <0.45 | <0.45 | <0.15 |
| B342-4 | S-5 (5.0-5.5) | 9/10/18 | <0.51 | <0.51 | 20.2 | 0.54 |
| | S-9 (9.0-9.5) | 9/10/18 | <0.44 | <0.44 | <0.44 | <0.14 |
| B342-5 | S-9 (9.0-9.5) | 9/10/18 | <0.43 | <0.43 | <0.43 | <0.14 |
| B342-6 | S-3 (3.0-3.5) | 9/10/18 | <0.65 | <0.65 | <0.65 | <0.21 |

FIGURES



From: USGS US Topo 7.5 - minute map for WINSTON-SALEM EAST, NC Date: 2016, Scale: 1:24,000

| | |
|-------------|----------|
| PROJECT NO. | CS34.366 |
| SCALE | AS SHOWN |
| DATE | 11/6/18 |
| BY | DMN |

**FIGURE 1 – PARCEL 342, TAYLOR FAMILY PROPERTIES
SITE VICINITY MAP**

**U-2579AB, WINSTON SALEM – NORTHERN BELTWAY EASTERN SECTION
(FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US421
FORSYTH COUNTY, NORTH CAROLINA**



7011 Albert Pick Rd.,
Suite E
Greensboro, NC 27409

336.334.7724

www.espassociates.com




a. Photo from northeast side of site looking southwest.

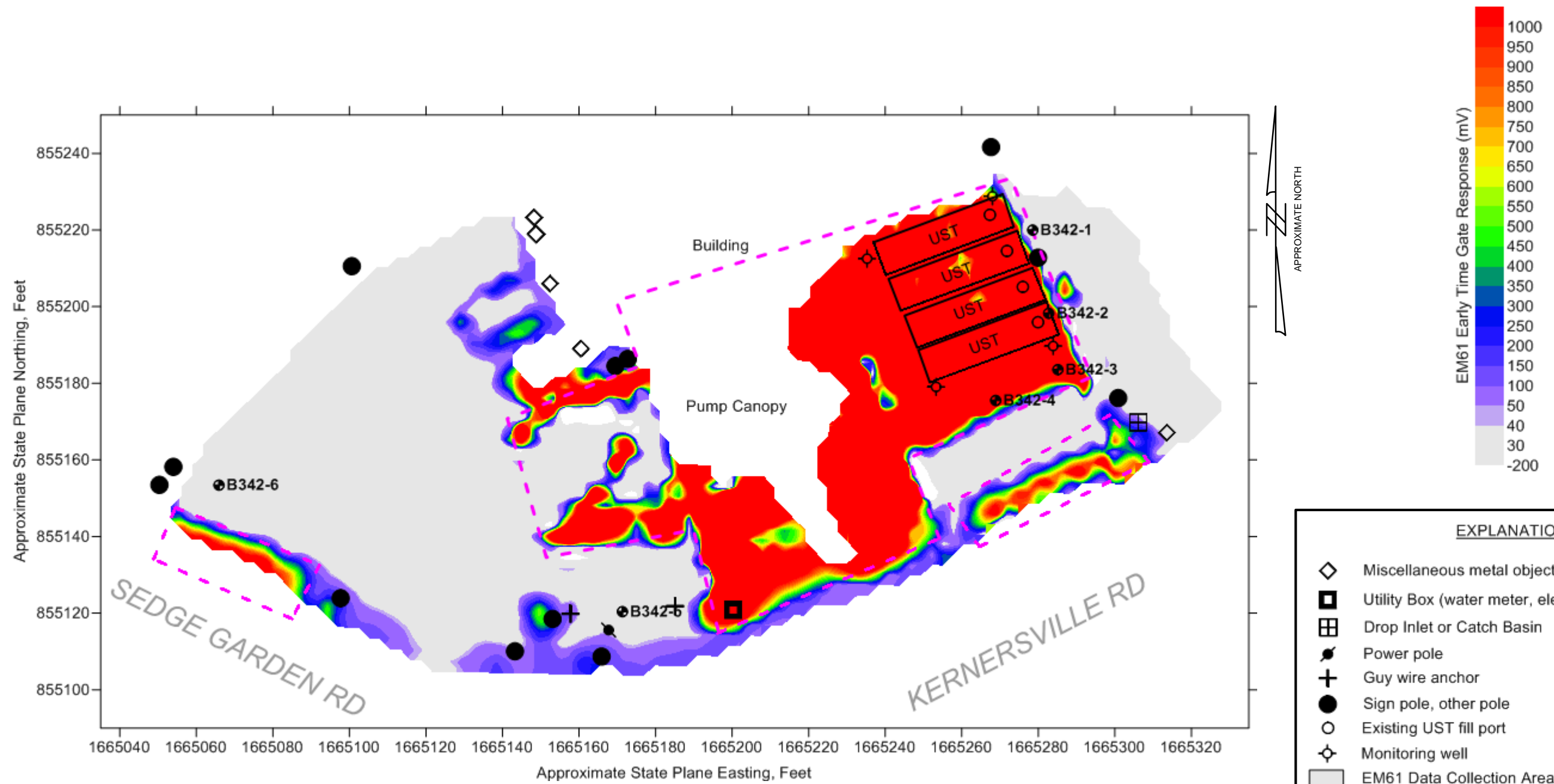


b. Photo from east side of site looking west.



c. Photo of marked known USTs.

| | | | |
|-------------------------|--|---|--|
| PROJECT NO. CS34.366 | FIGURE 2 – PARCEL 342, TAYLOR FAMILY PROPERTIES SITE PHOTOGRAPHS U-2579AB, WINSTON SALEM – NORTHERN BELTWAY EASTERN SECTION (FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US421 FORSYTH COUNTY, NORTH CAROLINA |  | 7011 Albert Pick Rd., Suite E Greensboro, NC 27409 |
| SCALE AS SHOWN | | | 336.334.7724 |
| DATE 11/6/18 | | | www.espassociates.com |
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| EXPLANATION | |
|-------------|--|
| | Miscellaneous metal object (pipe, debris, etc.) |
| | Utility Box (water meter, electrical outlet, etc.) |
| | Drop Inlet or Catch Basin |
| | Power pole |
| | Guy wire anchor |
| | Sign pole, other pole |
| | Existing UST fill port |
| | Monitoring well |
| | EM61 Data Collection Areas |
| | GPR Data Collection Areas |
| | Approximate location of known UST |
| | Approximate soil boring location |

Note: Locations of data and features are approximate and were collected using a DGPS instrument. ESP makes no guarantees as to the accuracy of these locations. Coordinates on the axes of the maps are approximate and provided for general reference only.

| | |
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| PROJECT NO. | CS34.366 |
| SCALE | AS SHOWN |
| DATE | 11/6/18 |
| BY | DMN |

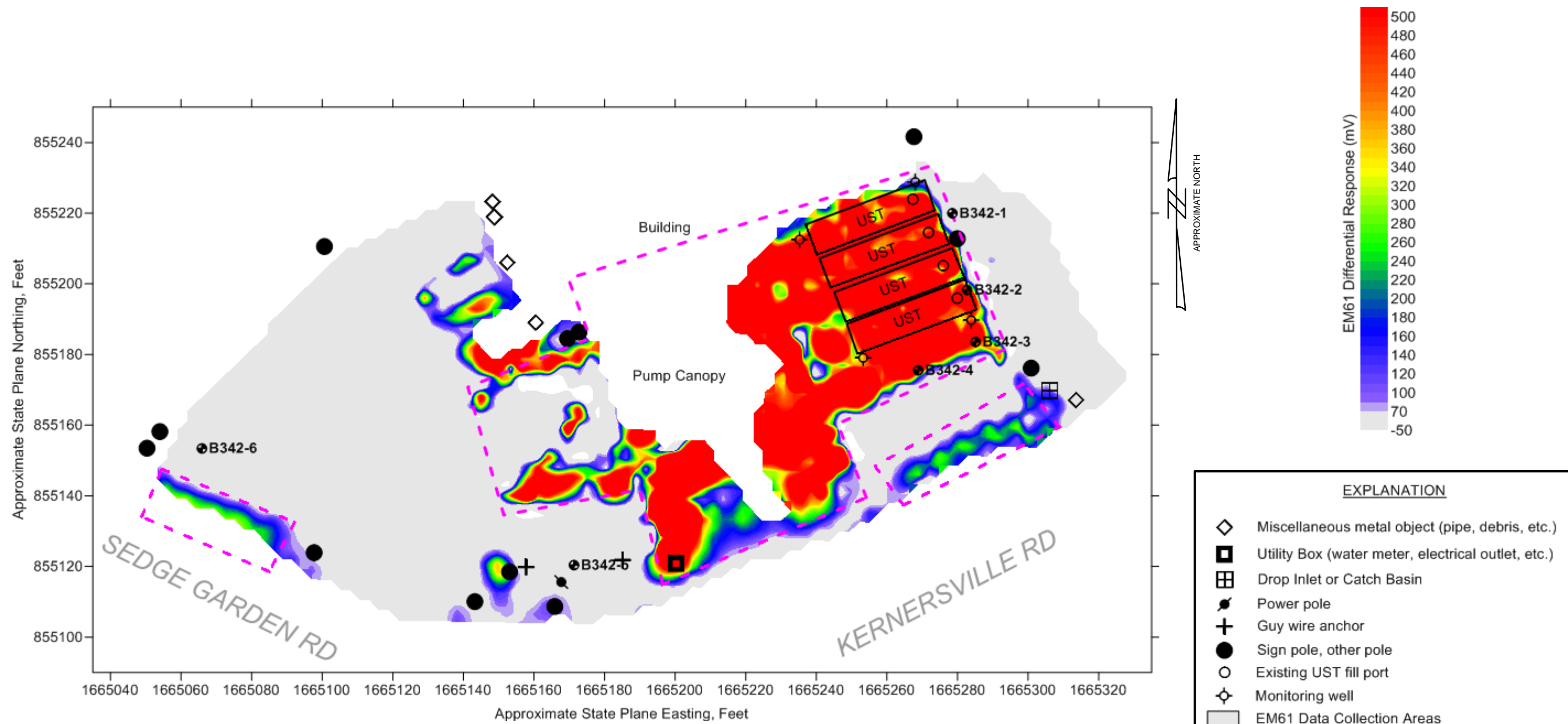
**FIGURE 3 – PARCEL 342, TAYLOR FAMILY PROPERTIES
EM61 EARLY TIME GATE RESPONSE**

*U-2579AB, WINSTON SALEM – NORTHERN BELTWAY EASTERN SECTION
(FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US421
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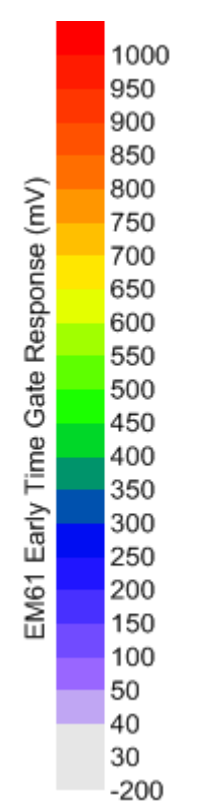
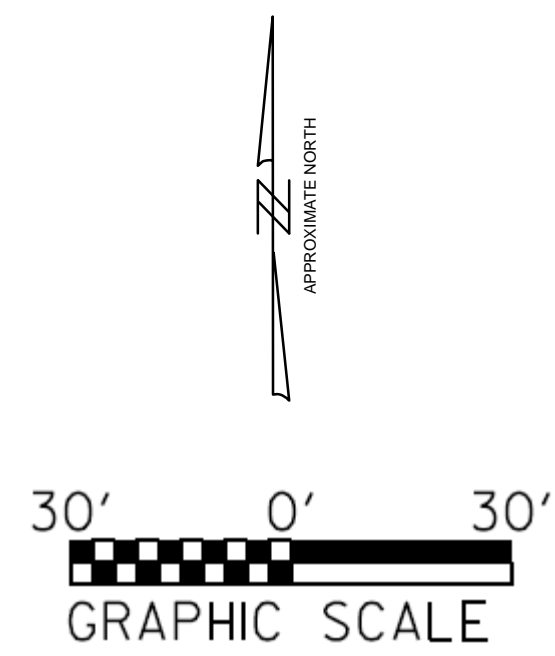
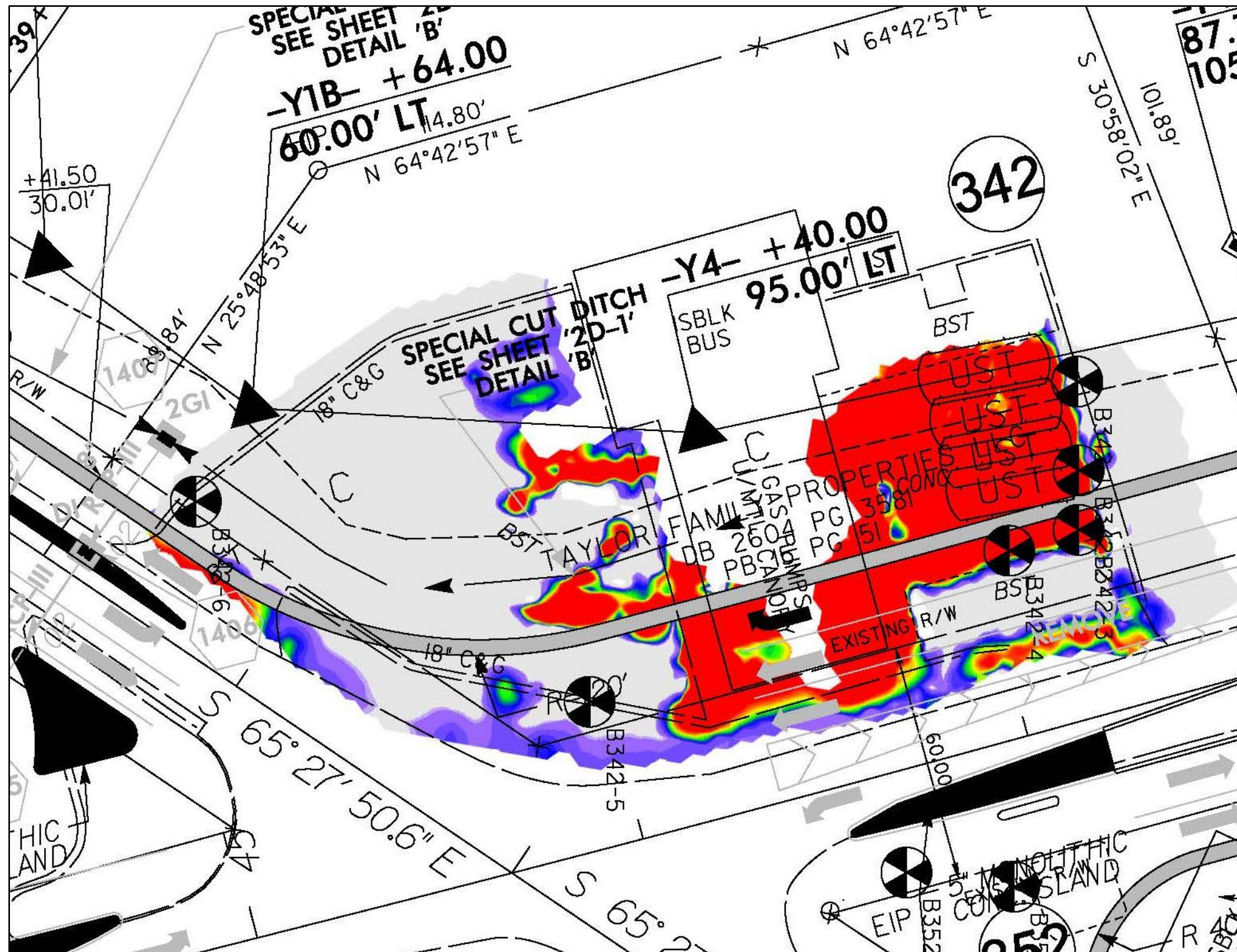


EXPLANATION

- ◇ Miscellaneous metal object (pipe, debris, etc.)
- Utility Box (water meter, electrical outlet, etc.)
- ▣ Drop Inlet or Catch Basin
- Power pole
- + Guy wire anchor
- Sign pole, other pole
- Existing UST fill port
- ⊕ Monitoring well
- EM61 Data Collection Areas
- ▭ GPR Data Collection Areas
- ▭ UST Approximate location of known UST
- Approximate soil boring location

Note: Locations of data and features are approximate and were collected using a DGPS instrument. ESP makes no guarantees as to the accuracy of these locations. Coordinates on the axes of the maps are approximate and provided for general reference only.

| | | | |
|-------------------------|---|---|--|
| PROJECT NO. CS34.366 | FIGURE 4 – PARCEL 342, TAYLOR FAMILY PROPERTIES EM61 DIFFERENTIAL RESPONSE |  | 7011 Albert Pick Rd., Suite E Greensboro, NC 27409 |
| SCALE AS SHOWN | | | |
| DATE 11/6/18 | U-2579AB, WINSTON SALEM – NORTHERN BELTWAY EASTERN SECTION (FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US421 FORSYTH COUNTY, NORTH CAROLINA | 336.334.7724 | www.espassociates.com |
| BY DMN | | | |



List of NCDOT reference files

- u2579ab_rdy_dsn.dgn
- SS, u2579ab_rdy_ss.dgn
- ROW, u2579ab_rdy_row.dgn
- FinalSurvey\U2579AB_ncdot_fs.dgn
- U2579AB_hyd_dm.dgn

See Figure 8 for explanation of symbols and line types

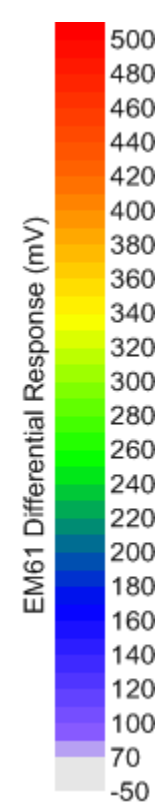
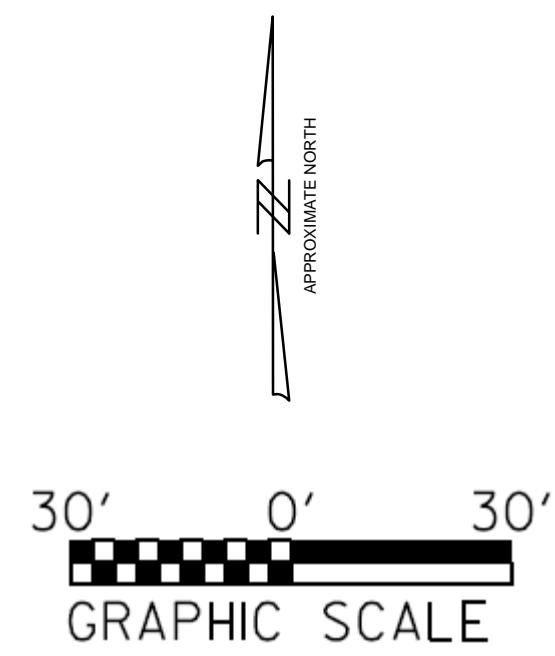
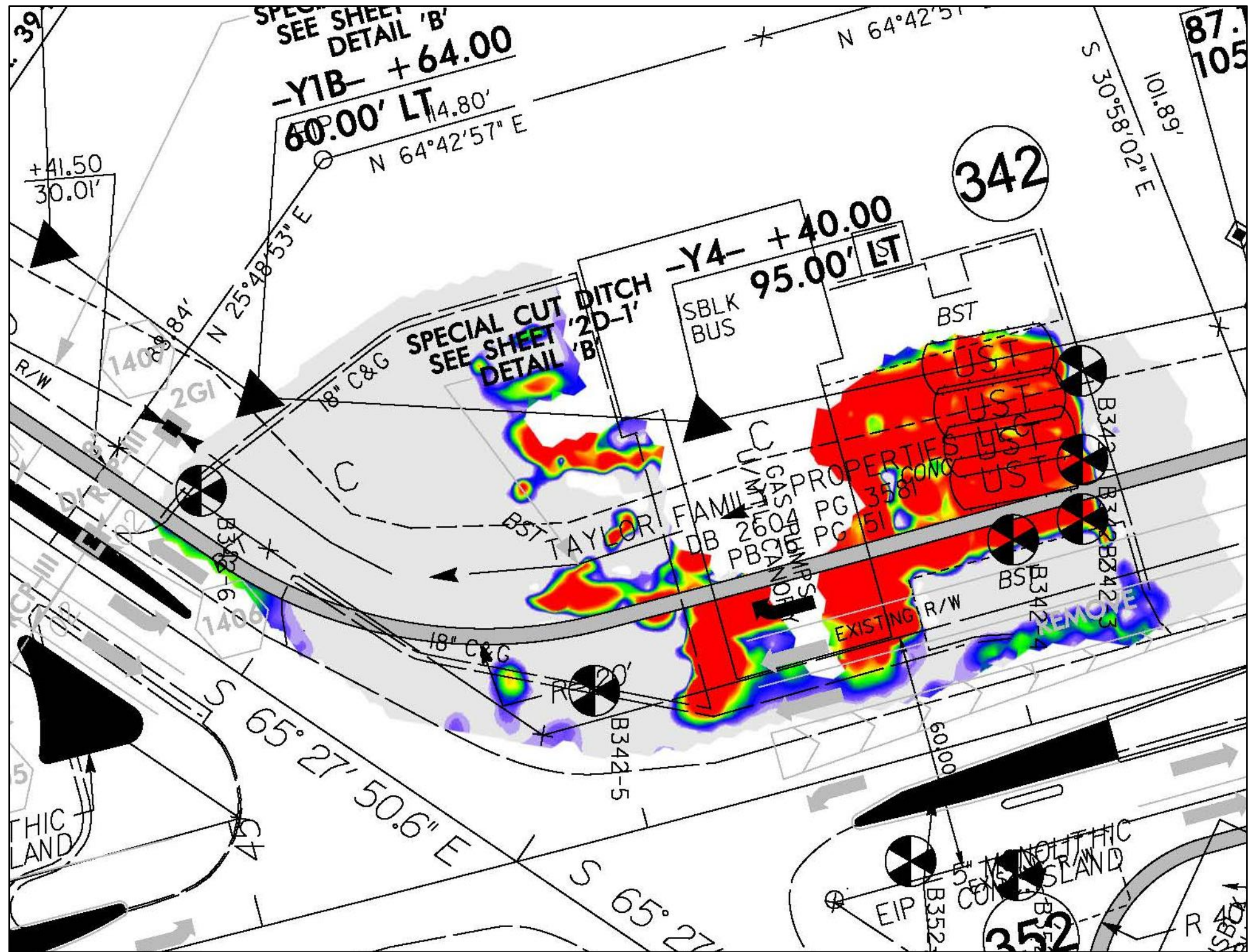
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| PROJECT NO. | CS34.366 |
| SCALE | AS SHOWN |
| DATE | 11/6/18 |
| BY | DMN |

**FIGURE 5 – PARCEL 342, TAYLOR FAMILY PROPERTIES
EM61 EARLY TIME GATE RESPONSE ON PLAN SHEET**

U-2579AB, WINSTON SALEM – NORTHERN BELTWAY EASTERN SECTION
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List of NCDOT reference files

- u2579ab_rdy_dsn.dgn
- SS, u2579ab_rdy_ss.dgn
- ROW, u2579ab_rdy_row.dgn
- FinalSurvey\U2579AB_ncdot_fs.dgn
- U2579AB_hyd_dm.dgn

See Figure 8 for explanation of symbols and line types

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| PROJECT NO. | CS34.366 |
| SCALE | AS SHOWN |
| DATE | 11/6/18 |
| BY | DMN |

**FIGURE 6- PARCEL 342, TAYLOR FAMILY PROPERTIES
EM61 DIFFERENTIAL RESPONSE ON PLAN SHEET**

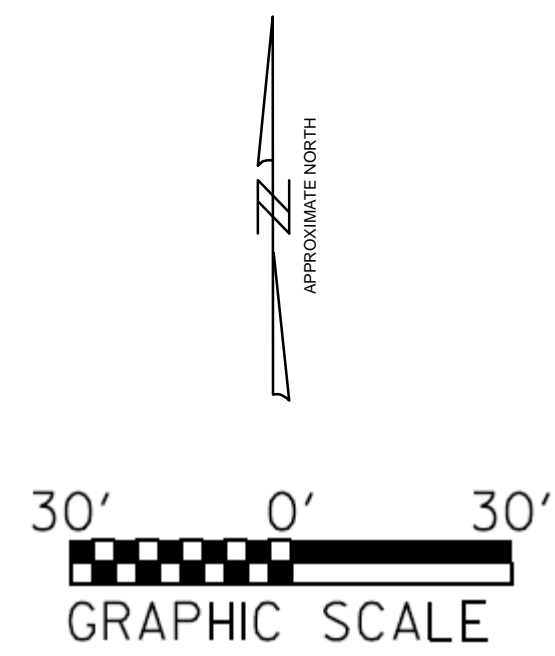
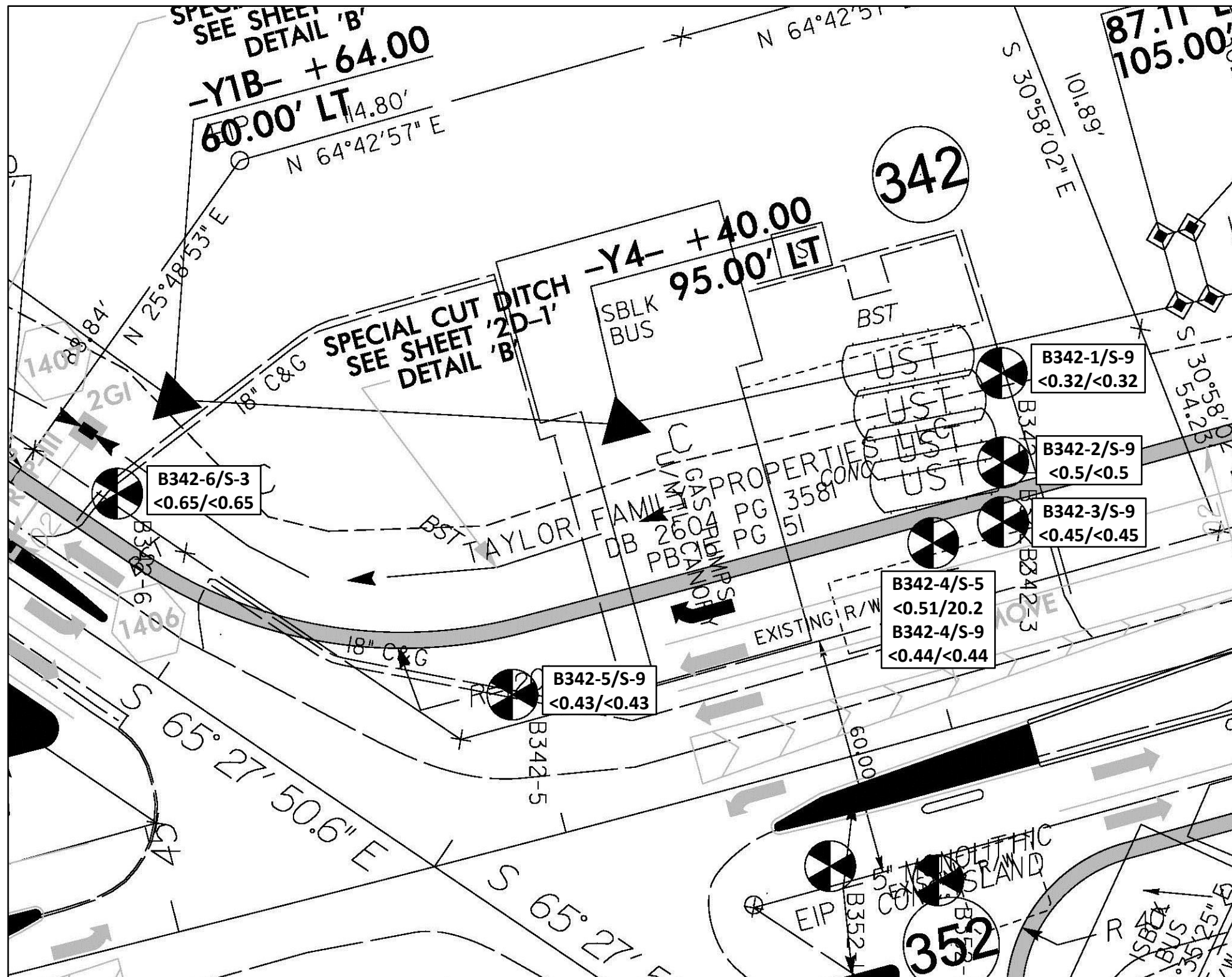
U-2579AB, WINSTON SALEM – NORTHERN BELTWAY EASTERN SECTION
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| Explanation | |
|--|---|
| <div style="border: 1px solid black; padding: 2px; display: inline-block;"> B342-1/S-9 <0.32/<0.32 </div> | Maximum Analytical Results per Boring Boring No./Sample No. GRO/DRO (mg/kg, ppm) |

List of NCDOT reference files

- u2579ab_rdy_dsn.dgn
- SS, u2579ab_rdy_ss.dgn
- ROW, u2579ab_rdy_row.dgn
- FinalSurvey\U2579AB_ncdot_fs.dgn
- U2579AB_hyd_dm.dgn

See Figure 8 for explanation of symbols and line types

| | |
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| PROJECT NO. | CS34.366 |
| SCALE | 1" = 30' |
| DATE | 11/6/18 |
| BY | DMN |

**FIGURE 7 – PARCEL 342, TAYLOR FAMILY PROPERTIES
SOIL ANALYTICAL RESULTS ON PLAN SHEET**

U-2579AB, WINSTON SALEM – NORTHERN BELTWAY EASTERN SECTION
(FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US421
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STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale *S.U.E. = Subsurface Utility Engineering

BOUNDARIES AND PROPERTY:

| | |
|---------------------------------------|---------|
| State Line | _____ |
| County Line | _____ |
| Township Line | _____ |
| City Line | _____ |
| Reservation Line | _____ |
| Property Line | _____ |
| Existing Iron Pin | ○ |
| Property Corner | ⊠ |
| Property Monument | ⊠ |
| Parcel/Sequence Number | ⊕ |
| Existing Fence Line | -x-x-x- |
| Proposed Woven Wire Fence | -o-o-o- |
| Proposed Chain Link Fence | -s-s-s- |
| Proposed Barbed Wire Fence | -d-d-d- |
| Existing Wetland Boundary | -w-w-w- |
| Proposed Wetland Boundary | -w-w-w- |
| Existing Endangered Animal Boundary | -a-a-a- |
| Existing Endangered Plant Boundary | -p-p-p- |
| Existing Historic Property Boundary | -h-h-h- |
| Known Contamination Area: Soil | -s-s-s- |
| Potential Contamination Area: Soil | -s-s-s- |
| Known Contamination Area: Water | -w-w-w- |
| Potential Contamination Area: Water | -w-w-w- |
| Contaminated Site: Known or Potential | -s-s- |

BUILDINGS AND OTHER CULTURE:

| | |
|-------------------------------|---|
| Gas Pump Vent or U/G Tank Cap | ○ |
| Sign | ⊕ |
| Well | ⊕ |
| Small Mine | ⊕ |
| Foundation | ⊠ |
| Area Outline | ⊠ |
| Cemetery | ⊠ |
| Building | ⊠ |
| School | ⊠ |
| Church | ⊠ |
| Dam | ⊠ |

HYDROLOGY:

| | |
|------------------------------------|--------|
| Stream or Body of Water | _____ |
| Hydro, Pool or Reservoir | _____ |
| Jurisdictional Stream | -js- |
| Buffer Zone 1 | -bz 1- |
| Buffer Zone 2 | -bz 2- |
| Flow Arrow | → |
| Disappearing Stream | → |
| Spring | ○ |
| Wetland | _____ |
| Proposed Lateral, Tail, Head Ditch | _____ |
| False Sump | _____ |

RAILROADS:

| | |
|--------------------|-------|
| Standard Gauge | _____ |
| RR Signal Milepost | ○ |
| Switch | ⊠ |
| RR Abandoned | _____ |
| RR Dismantled | _____ |

RIGHT OF WAY:

| | |
|---|-------|
| Baseline Control Point | ◆ |
| Existing Right of Way Marker | △ |
| Existing Right of Way Line | _____ |
| Proposed Right of Way Line | _____ |
| Proposed Right of Way Line with Iron Pin and Cap Marker | _____ |
| Proposed Right of Way Line with Concrete or Granite RW Marker | _____ |
| Proposed Control of Access Line with Concrete C/A Marker | _____ |
| Existing Control of Access | _____ |
| Proposed Control of Access | _____ |
| Existing Easement Line | _____ |
| Proposed Temporary Construction Easement | _____ |
| Proposed Temporary Drainage Easement | _____ |
| Proposed Permanent Drainage Easement | _____ |
| Proposed Permanent Drainage / Utility Easement | _____ |
| Proposed Permanent Utility Easement | _____ |
| Proposed Temporary Utility Easement | _____ |
| Proposed Aerial Utility Easement | _____ |
| Proposed Permanent Easement with Iron Pin and Cap Marker | _____ |

ROADS AND RELATED FEATURES:

| | |
|----------------------------|-------|
| Existing Edge of Pavement | _____ |
| Existing Curb | _____ |
| Proposed Slope Stakes Cut | _____ |
| Proposed Slope Stakes Fill | _____ |
| Proposed Curb Ramp | _____ |
| Existing Metal Guardrail | _____ |
| Proposed Guardrail | _____ |
| Existing Cable Guiderail | _____ |
| Proposed Cable Guiderail | _____ |
| Equality Symbol | ⊕ |
| Pavement Removal | _____ |

VEGETATION:

| | |
|--------------|-------|
| Single Tree | ○ |
| Single Shrub | ○ |
| Hedge | _____ |
| Woods Line | _____ |

| | |
|----------|-------|
| Orchard | _____ |
| Vineyard | _____ |

EXISTING STRUCTURES:

| | |
|--|-------|
| MAJOR: | |
| Bridge, Tunnel or Box Culvert | _____ |
| Bridge Wing Wall, Head Wall and End Wall | _____ |
| MINOR: | |
| Head and End Wall | _____ |
| Pipe Culvert | _____ |
| Footbridge | _____ |
| Drainage Box: Catch Basin, DI or JB | _____ |
| Paved Ditch Gutter | _____ |
| Storm Sewer Manhole | _____ |
| Storm Sewer | _____ |

UTILITIES:

| | |
|--------------------------------|-------|
| POWER: | |
| Existing Power Pole | _____ |
| Proposed Power Pole | _____ |
| Existing Joint Use Pole | _____ |
| Proposed Joint Use Pole | _____ |
| Power Manhole | _____ |
| Power Line Tower | _____ |
| Power Transformer | _____ |
| U/G Power Cable Hand Hole | _____ |
| H-Frame Pole | _____ |
| U/G Power Line LOS B (S.U.E.*) | _____ |
| U/G Power Line LOS C (S.U.E.*) | _____ |
| U/G Power Line LOS D (S.U.E.*) | _____ |

TELEPHONE:

| | |
|--|-------|
| Existing Telephone Pole | _____ |
| Proposed Telephone Pole | _____ |
| Telephone Manhole | _____ |
| Telephone Pedestal | _____ |
| Telephone Cell Tower | _____ |
| U/G Telephone Cable Hand Hole | _____ |
| U/G Telephone Cable LOS B (S.U.E.*) | _____ |
| U/G Telephone Cable LOS C (S.U.E.*) | _____ |
| U/G Telephone Cable LOS D (S.U.E.*) | _____ |
| U/G Telephone Conduit LOS B (S.U.E.*) | _____ |
| U/G Telephone Conduit LOS C (S.U.E.*) | _____ |
| U/G Telephone Conduit LOS D (S.U.E.*) | _____ |
| U/G Fiber Optics Cable LOS B (S.U.E.*) | _____ |
| U/G Fiber Optics Cable LOS C (S.U.E.*) | _____ |
| U/G Fiber Optics Cable LOS D (S.U.E.*) | _____ |

WATER:

| | |
|--------------------------------|-------|
| Water Manhole | _____ |
| Water Meter | _____ |
| Water Valve | _____ |
| Water Hydrant | _____ |
| U/G Water Line LOS B (S.U.E.*) | _____ |
| U/G Water Line LOS C (S.U.E.*) | _____ |
| U/G Water Line LOS D (S.U.E.*) | _____ |
| Above Ground Water Line | _____ |

TV:

| | |
|---------------------------------------|-------|
| TV Pedestal | _____ |
| TV Tower | _____ |
| U/G TV Cable Hand Hole | _____ |
| U/G TV Cable LOS B (S.U.E.*) | _____ |
| U/G TV Cable LOS C (S.U.E.*) | _____ |
| U/G TV Cable LOS D (S.U.E.*) | _____ |
| U/G Fiber Optic Cable LOS B (S.U.E.*) | _____ |
| U/G Fiber Optic Cable LOS C (S.U.E.*) | _____ |
| U/G Fiber Optic Cable LOS D (S.U.E.*) | _____ |

GAS:

| | |
|------------------------------|-------|
| Gas Valve | _____ |
| Gas Meter | _____ |
| U/G Gas Line LOS B (S.U.E.*) | _____ |
| U/G Gas Line LOS C (S.U.E.*) | _____ |
| U/G Gas Line LOS D (S.U.E.*) | _____ |
| Above Ground Gas Line | _____ |

SANITARY SEWER:

| | |
|-------------------------------------|-------|
| Sanitary Sewer Manhole | _____ |
| Sanitary Sewer Cleanout | _____ |
| U/G Sanitary Sewer Line | _____ |
| Above Ground Sanitary Sewer | _____ |
| SS Forced Main Line LOS B (S.U.E.*) | _____ |
| SS Forced Main Line LOS C (S.U.E.*) | _____ |
| SS Forced Main Line LOS D (S.U.E.*) | _____ |

MISCELLANEOUS:

| | |
|--|--------|
| Utility Pole | _____ |
| Utility Pole with Base | _____ |
| Utility Located Object | _____ |
| Utility Traffic Signal Box | _____ |
| Utility Unknown U/G Line LOS B (S.U.E.*) | _____ |
| U/G Tank; Water, Gas, Oil | _____ |
| Underground Storage Tank, Approx. Loc. | _____ |
| A/G Tank; Water, Gas, Oil | _____ |
| Geoenvironmental Boring | _____ |
| U/G Test Hole LOS A (S.U.E.*) | _____ |
| Abandoned According to Utility Records | AATUR |
| End of Information | E.O.I. |

| | |
|-------------|----------|
| PROJECT NO. | CS34.366 |
| SCALE | N/A |
| DATE | 11/6/18 |
| BY | DMN |

**FIGURE 8
LEGEND FOR PLAN SHEET FIGURES**

**U-2579AB, WINSTON SALEM – NORTHERN BELTWAY EASTERN SECTION
(FUTURE I-74) FROM I-40 TO I-40 BUSINESS/US421
FORSYTH COUNTY, NORTH CAROLINA**



7011 Albert Pick Rd.,
Suite E
Greensboro, NC 27409
336.334.7724
www.espassociates.com

APPENDIX A
SOIL BORING LOGS



FIELD BORING LOG

BORING NO.

PROJECT NAME: NCDOT U-2579AB PSA PROJ. NO.: CS34.366
 LOCATION: East side of USTs
 TYPE OF BORING: Direct Push DATE STARTED: 9/6/18
 DRILLING FIRM: SAEDACCO DATE FINISHED: 9/6/18
 DRILLER: Brian Ewing SAMPLE METHOD: 5' Macro Core
 DRILL RIG: Geoprobe 7822 DT LOGGED BY: D. Nance

B342-1SHEET: 1 of 1TOTAL DEPTH: 10.0 ftDEPTH TO GW: Dry ft

COMMENT: _____

| DEPTH (ft) | SAMPLE NO. | SAMPLE DEPTH (ft) | PID READING (ppm) | FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION | REMARKS |
|------------|------------|-------------------|-------------------|---|----------------------|
| | | | | 0.0-0.2 Topsoil 0.2-4.5 Red-brown sandy, clayey silt | Core 1 Rec 5.0'/5.0' |
| 1 | S-1 | 1.0-1.5 | 3.6 | | |
| 2 | S-2 | 2.0-2.5 | 4.3 | | |
| 3 | S-3 | 3.0-3.5 | 4.0 | | |
| 4 | S-4 | 4.0-4.5 | 3.4 | 4.5-5.0 Red-brown to tan silty sand | Core 2 Rec 5.0'/5.0' |
| 5 | S-5 | 5.0-5.5 | 4.3 | 5.0-7.3 Red-brown silty clay | |
| 6 | S-6 | 6.0-6.5 | 3.5 | | |
| 7 | S-7 | 7.0-7.5 | 3.1 | 7.3-10.0 Red-brown sandy, clayey silt | |
| 8 | S-8 | 8.0-8.5 | 4.2 | | |
| 9 | S-9 | 9.0-9.5 | 2.8 | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |

Sample selected for laboratory analysis



FIELD BORING LOG

BORING NO.

B342-2

PROJECT NAME: NCDOT U-2579AB PSA PROJ. NO.: CS34.366
 LOCATION: East side of USTs
 TYPE OF BORING: Direct Push DATE STARTED: 9/6/18 SHEET: 1 of 1
 DRILLING FIRM: SAEDACCO DATE FINISHED: 9/6/18 TOTAL DEPTH: 10.0 ft
 DRILLER: Brian Ewing SAMPLE METHOD: 5' Macro Core DEPTH TO GW: Dry ft
 DRILL RIG: Geoprobe 7822 DT LOGGED BY: D. Nance COMMENT: _____

| DEPTH (ft) | SAMPLE NO. | SAMPLE DEPTH (ft) | PID READING (ppm) | FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION | REMARKS |
|------------|------------|-------------------|-------------------|---|----------------------|
| | | | | 0.0-0.3 Topsoil 0.3-1.7 Red-brown silty sand | Core 1 Rec 5.0'/5.0' |
| 1 | S-1 | 1.0-1.5 | 0.4 | | |
| 2 | S-2 | 2.0-2.5 | 0.2 | 1.7-9.0 Red-brown silty, sandy clay | |
| 3 | S-3 | 3.0-3.5 | 0.2 | | |
| 4 | S-4 | 4.0-4.5 | 0.3 | | Core 2 Rec 5.0'/5.0' |
| 5 | S-5 | 5.0-5.5 | 0.3 | | |
| 6 | S-6 | 6.0-6.5 | 0.2 | | |
| 7 | S-7 | 7.0-7.5 | 0.0 | | |
| 8 | S-8 | 8.0-8.5 | 2.6 | | |
| 9 | S-9 | 9.0-9.5 | 3.9 | 9.0-10.0 Red-brown sandy, clayey silt | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |

Sample selected for laboratory analysis



FIELD BORING LOG

BORING NO.

B342-3

PROJECT NAME: NCDOT U-2579AB PSA PROJ. NO.: CS34.366
 LOCATION: South side of USTs
 TYPE OF BORING: Direct Push DATE STARTED: 9/6/18 SHEET: 1 of 1
 DRILLING FIRM: SAEDACCO DATE FINISHED: 9/6/18 TOTAL DEPTH: 10.0 ft
 DRILLER: Brian Ewing SAMPLE METHOD: 5' Macro Core DEPTH TO GW: Dry ft
 DRILL RIG: Geoprobe 7822 DT LOGGED BY: D. Nance COMMENT: _____

| DEPTH (ft) | SAMPLE NO. | SAMPLE DEPTH (ft) | PID READING (ppm) | FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION | REMARKS |
|------------|------------|-------------------|-------------------|---|---|
| | | | | 0.0-0.2 Asphalt 0.2-0.9 Gravel | Core 1 Rec 5.0'/5.0' |
| 1 | S-1 | 1.0-1.5 | 3.3 | 0.9-9.1 Red-brown sandy, silty clay | |
| 2 | S-2 | 2.0-2.5 | 3.3 | | |
| 3 | S-3 | 3.0-3.5 | 4.2 | | |
| 4 | S-4 | 4.0-4.5 | 5.0 | | Core 2 Rec 5.0'/5.0' |
| 5 | S-5 | 5.0-5.5 | 4.4 | | |
| 6 | S-6 | 6.0-6.5 | 4.7 | | |
| 7 | S-7 | 7.0-7.5 | 5.9 | | |
| 8 | S-8 | 8.0-8.5 | 4.4 | | |
| 9 | S-9 | 9.0-9.5 | 2.9 | 9.1-10.0 Orange-tan to white silty sand | |
| 10 | | | | | Sample selected for laboratory analysis |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |



FIELD BORING LOG

BORING NO.

B342-4

PROJECT NAME: NCDOT U-2579AB PSA PROJ. NO.: CS34.366
 LOCATION: South side of USTs
 TYPE OF BORING: Direct Push DATE STARTED: 9/6/18 SHEET: 1 of 1
 DRILLING FIRM: SAEDACCO DATE FINISHED: 9/6/18 TOTAL DEPTH: 10.0 ft
 DRILLER: Brian Ewing SAMPLE METHOD: 5' Macro Core DEPTH TO GW: Dry ft
 DRILL RIG: Geoprobe 7822 DT LOGGED BY: D. Nance COMMENT: _____

| DEPTH (ft) | SAMPLE NO. | SAMPLE DEPTH (ft) | PID READING (ppm) | FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION | REMARKS |
|------------|------------|-------------------|-------------------|---|----------------------|
| | | | | 0.0-0.2 Asphalt 0.2-0.6 Gravel | Core 1 Rec 5.0'/5.0' |
| 1 | S-1 | 1.0-1.5 | 3.9 | 0.6-6.0 Red-brown sandy, silty clay | |
| 2 | S-2 | 2.0-2.5 | 4.6 | | |
| 3 | S-3 | 3.0-3.5 | 4.8 | | |
| 4 | S-4 | 4.0-4.5 | 4.6 | | Core 2 Rec 5.0'/5.0' |
| 5 | S-5 | 5.0-5.5 | 7.0 | | |
| 6 | S-6 | 6.0-6.5 | 4.2 | 6.0-10.0 Red-brown sandy, clayey silt | |
| 7 | S-7 | 7.0-7.5 | 3.4 | | |
| 8 | S-8 | 8.0-8.5 | 4.1 | | |
| 9 | S-9 | 9.0-9.5 | 3.7 | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |

Sample selected for laboratory analysis

Sample selected for laboratory analysis



FIELD BORING LOG

BORING NO.

B342-5

PROJECT NAME: NCDOT U-2579AB PSA PROJ. NO.: CS34.366
 LOCATION: South corner of site
 TYPE OF BORING: Direct Push DATE STARTED: 9/6/18 SHEET: 1 of 1
 DRILLING FIRM: SAEDACCO DATE FINISHED: 9/6/18 TOTAL DEPTH: 10.0 ft
 DRILLER: Brian Ewing SAMPLE METHOD: 5' Macro Core DEPTH TO GW: Dry ft
 DRILL RIG: Geoprobe 7822 DT LOGGED BY: D. Nance COMMENT: _____

| DEPTH (ft) | SAMPLE NO. | SAMPLE DEPTH (ft) | PID READING (ppm) | FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION | REMARKS |
|------------|------------|-------------------|-------------------|---|----------------------|
| | | | | 0.0-0.1 Topsoil | Core 1 Rec 5.0'/5.0' |
| 1 | S-1 | 1.0-1.5 | 2.5 | 0.1-6.4 Red-brown sandy, clayey silt | |
| 2 | S-2 | 2.0-2.5 | 1.5 | | |
| 3 | S-3 | 3.0-3.5 | 1.6 | | |
| 4 | S-4 | 4.0-4.5 | 2.3 | | Core 2 Rec 5.0'/5.0' |
| 5 | S-5 | 5.0-5.5 | 1.6 | | |
| 6 | S-6 | 6.0-6.5 | 2.2 | 6.4-10.0 Orange to white-gray silty sand | |
| 7 | S-7 | 7.0-7.5 | 2.3 | | |
| 8 | S-8 | 8.0-8.5 | 2.0 | | |
| 9 | S-9 | 9.0-9.5 | 2.3 | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |

Sample selected for laboratory analysis



FIELD BORING LOG

BORING NO.

B342-6

PROJECT NAME: NCDOT U-2579AB PSA PROJ. NO.: CS34.366
 LOCATION: West side of site
 TYPE OF BORING: Direct Push DATE STARTED: 9/6/18 SHEET: 1 of 1
 DRILLING FIRM: SAEDACCO DATE FINISHED: 9/6/18 TOTAL DEPTH: 5.0 ft
 DRILLER: Brian Ewing SAMPLE METHOD: 5' Macro Core DEPTH TO GW: Dry ft
 DRILL RIG: Geoprobe 7822 DT LOGGED BY: D. Nance COMMENT: _____

| DEPTH (ft) | SAMPLE NO. | SAMPLE DEPTH (ft) | PID READING (ppm) | FIELD CLASSIFICATION AND PHYSICAL DESCRIPTION | REMARKS |
|------------|------------|-------------------|-------------------|---|---------------------|
| | | | | 0.0-0.3 Asphalt 0.3-0.7 Gravel | Core 1 Rec 4.0/5.0' |
| 1 | S-1 | 1.0-1.5 | 1.3 | 0.7-4.0 Orange-brown sandy silt | |
| 2 | S-2 | 2.0-2.5 | 2.9 | | |
| 3 | S-3 | 3.0-3.5 | 2.3 | | |
| 4 | S-4 | No Rec | | | Refusal at 5.0' |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |
| 12 | | | | | |
| 13 | | | | | |
| 14 | | | | | |
| 15 | | | | | |

Sample selected for laboratory analysis

APPENDIX B

RED LAB LABORATORY TESTING REPORT



Hydrocarbon Analysis Results

Client: ESP ASSOCIATES, INC.
Address: 7011 ALBERT PICK ROAD
 SUITE E
 GREENSBORO NC 27409

Samples taken Monday, September 10, 2018
Samples extracted Monday, September 10, 2018
Samples analysed Wednesday, September 12, 2018

Contact: DILLON NANCE

Operator NICK HENDRIX

Project: U-2579 AB

U00904

| Matrix | Sample ID | Dilution used | BTEX (C6 - C9) | GRO (C5 - C10) | DRO (C10 - C35) | TPH (C5 - C35) | Total Aromatics (C10-C35) | 16 EPA PAHs | BaP | % Ratios | | | HC Fingerprint Match |
|--------|--------------|---------------|----------------|----------------|-----------------|----------------|---------------------------|-------------|--------|----------|-----------|------|----------------------------|
| | | | | | | | | | | C5 - C10 | C10 - C18 | C18 | |
| s | B342-6 (S-3) | 25.9 | <0.65 | <0.65 | <0.65 | <0.65 | <0.13 | <0.21 | <0.026 | 0 | 100 | 0 | Residual HC |
| s | B342-5 (S-9) | 17.3 | <0.43 | <0.43 | <0.43 | <0.43 | <0.09 | <0.14 | <0.017 | 0 | 0 | 0 | PHC not detected |
| s | B342-4 (S-5) | 20.3 | <0.51 | <0.51 | 20.2 | 20.2 | 10.7 | 0.54 | <0.02 | 0 | 81.6 | 18.4 | V.Deg.PHC 77.4%,(FCM),(BO) |
| s | B342-4 (S-9) | 17.5 | <0.44 | <0.44 | <0.44 | <0.44 | <0.09 | <0.14 | <0.018 | 0 | 0 | 0 | PHC not detected |
| s | B342-3 (S-9) | 18.2 | <0.45 | <0.45 | <0.45 | <0.45 | <0.09 | <0.15 | <0.018 | 0 | 100 | 0 | PHC not detected |
| s | B342-2 (S-9) | 20.0 | <0.5 | <0.5 | <0.5 | <0.5 | <0.1 | <0.16 | <0.02 | 0 | 0 | 0 | PHC not detected |
| s | B342-1 (S-9) | 12.9 | <0.32 | <0.32 | <0.32 | <0.32 | <0.06 | <0.1 | <0.013 | 0 | 0 | 0 | (FCM) |

Initial Calibrator QC check **OK**

Final FCM QC Check **OK**

102.7 %

Concentration values in mg/kg for soil samples and mg/L for water samples. Soil values uncorrected for moisture or stone content. Fingerprints provide a tentative hydrocarbon identification.

Abbreviations :- FCM = Results calculated using Fundamental Calibration Mode : % = confidence of hydrocarbon identification : (PFM) = Poor Fingerprint Match : (T) = Turbid : (P) = Particulate detected

B = Blank Drift : (SBS)/(LBS) = Site Specific or Library Background Subtraction applied to result : (BO) = Background Organics detected : (OCR) = Outside cal range : (M) = Modified Result.

% Ratios estimated aromatic carbon number proportions : HC = Hydrocarbon : PHC = Petroleum HC : FP = Fingerprint only. **Data generated by HC-1 Analyser**

APPENDIX C
CHAIN-OF-CUSTODY FORM

Client Name: ESP Associates, Inc.
 Address: 7011 Albert Pick Rd. Ste E
Greensboro, NC 27409
 Contact: Dillon Nance
 Project Ref.: U-2579 AB
 Email: d.nance@espsociates.com
 Phone #: 336-404-3117
 Collected by: D. Nance



RAPID ENVIRONMENTAL DIAGNOSTICS
CHAIN OF CUSTODY AND ANALYTICAL
REQUEST FORM

RED Lab, LLC
 5598 Marvin K Moss Lane
 MARBIONC Bldg, Suite 2003
 Wilmington, NC 28409

Each sample will be analyzed for
 BTEX, GRO, DRO, TPH, PAH total
 aromatics and BaP

| Sample Collection Date/Time | TAT Requested | | Matrix (S/W) | Sample ID | UVF | GC BTEX | Total Wt. | Tare Wt. | Sample Wt. |
|--------------------------------|---------------|---------|-----------------|------------|-----|---------|-----------|----------|------------|
| | 24 Hour | 48 Hour | | | | | | | |
| 9/10/18 | | ✓ | S | B331-5 S-9 | ✓ | | 49.2 | 43.9 | 5.3 |
| | | | | B331-4 S-9 | | | 52.7 | 45.6 | 8.1 |
| | | | | B331-3 S-9 | | | 51.6 | 44.1 | 7.5 |
| | | | | B331-2 S-9 | | | 53.0 | 45.8 | 7.2 |
| | | | | B331-1 S-9 | | | 52.0 | 45.4 | 6.6 |
| | | | | B352-3 S-9 | | 47.4 | 52.7 | 43.7 | 3.7 |
| | | | | B352-2 S-9 | | | 52.8 | 43.7 | 9.1 |
| | | | | B352-1 S-9 | | | 51.9 | 43.8 | 8.1 |
| | | | | B342-6 S-3 | | | 49.8 | 44.4 | 5.4 |
| | | | | B342-5 S-9 | | | 52.2 | 44.1 | 8.1 |
| | | | | B342-4 S-5 | | | 51.8 | 44.4 | 6.9 |
| | | | | B342-4 S-9 | | | 52.0 | 44.0 | 8.0 |
| | | | | B342-3 S-9 | | | 52.1 | 44.4 | 7.7 |
| | | | | B342-2 S-9 | | | 50.7 | 43.7 | 7.0 |
| | | | | B342-1 S-9 | | | 50.1 | 43.9 | 6.2 |
| | | | | B54-1 S-9 | | | 51.0 | 44.1 | 6.9 |
| | | | | B54-2 S-8 | | | 51.2 | 43.5 | 7.7 |
| | | | | B54-3 S-9 | | | 51.9 | 44.0 | 7.9 |
| | | | | B54-4 S-7 | | | 49.8 | 44.3 | 5.5 |
| | | | | B54-5 S-9 | | | 51.2 | 44.3 | |

Comments: ***most samples underweight. Soil matrix representation affected - data results largely unaffected. (NH 9/12)**

RED Lab USE ONLY

| | | | |
|------------------------------------|-----------------------------------|--------------------------|--------------------------------|
| Relinquished by <u>D. Nance</u> | Date/Time <u>9/10/18 16:00</u> | Accepted by <u>NH</u> | Date/Time <u>9/12 11:00</u> |
| Relinquished by | Date/Time | Accepted by | Date/Time |