GEL Engineering of NC INC

an affiliate of **The GEL Group** INC

PRELIMINARY SITE ASSESSMENT REPORT

January 31, 2019

WBS Number: 34165.1.9

TIP Number: I-2513B

County: Buncombe

Description: Four Parcels; Asheville- New Route from North of SR 3548 (Haywood Rd) to Existing US 19-23-70

Parcel Nos (PIN): 384 (9639-71-6489-00000/ 9639-71-5775-00000)
395 (9639-72-5038-00000)
396 (9639-72-4498-00000)
397 (9639-72-4712-00000)

Addresses: 466, 472, 587, and 554 Riverside Drive, Asheville, NC 28801

Submitted to:

North Carolina Department of Transportation
Geotechnical Engineering Unit
1589 Mail Service Center
Raleigh, North Carolina 27699-1589

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This document, entitled *Preliminary Site Assessment Report*, has been prepared by GEL Engineering of NC, Inc., for the four parcels identified above in accordance with the Notice to Proceed issued by the North Carolina Department of Transportation – Geotechnical Engineering Unit on September 21, 2018. It has been prepared in accordance with accepted quality control practices for the exclusive use of the North Carolina Department of Transportation and has been reviewed by the undersigned.

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GEL ENGINEERING OF NC, INC.
an Affiliate of The GEL Group, Inc.

DocuSigned by:
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NORTH CAROLINA LICENSED SEAL 1650 GEOLOGIST ANDREW D. STAHL

E. Jorgen Bergstrom
Senior Geophysicist

Andrew D. Stahl, L.G.
Senior Project Manager

2/14/2019

January 31, 2019
Date

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1.0 INTRODUCTION

This document presents the results of preliminary site assessment (PSA) geophysical and test pit investigations conducted by GEL Engineering of NC, Inc. (GEL), on four parcels in Buncombe County (Site). The North Carolina Department of Transportation (NCDOT) requested that this work be performed to locate the lateral and vertical limits of landfill material reportedly disposed across these properties. Figure 1 shows the location of the subject parcels on a USA Topo Basemap obtained through the NCDOT RoadNC Viewer Map system (accessed at https://www.arcgis.com/home/index.html).

In accordance with the NCDOT request for a technical and cost proposal dated August 14, 2018, the scope of work included a records and historical photograph review to further evaluate the lateral limits of waste along the bank of the French Broad River outside the PSA area, and the scope of the PSAs was limited to conducting geophysical surveys of the following four parcels (Site), and excavating test pits across two of the parcels (#384 and #395):

Parcel #	Owner	Property Address
384	Terri S. Eury	466 Riverside Drive, Asheville, NC 28801
395	Bernard & Katheryn Coates	472 Riverside Drive, Asheville, NC 28801
396	Duyck Construction Co., Inc	587 Riverside Drive, Asheville, NC 28801
397	Riverside Partnership, LLC	554 Riverside Drive, Asheville, NC 28801

The geophysical investigation area and test pit investigation area are shown on Figure 2 along with the design information provided in NCDOT's I-2513B CAD files (see Appendix I for the NCDOT Conventional Plan Sheet Symbol Legend). Tax parcel boundaries obtained from Buncombe County are shown on Figure 3, illustrating that two Buncombe County tax parcels comprise NCDOT Parcel #384.

2.0 RECORDS AND HISTORICAL PHOTOGRAPH REVIEW

GEL reviewed existing reports, historical aerial photographs, and Sanborn Fire Insurance Maps to evaluate the lateral limits of the waste along the bank of the French Broad River. GEL also contacted various local and state agencies to request additional information pertaining to the Site. A summary of this information is provided below.

2.1 Prior Environmental Assessment and Reports

NCDOT provided several reference documents pertaining to the Site and surrounding properties along Riverside Drive. The most pertinent document is a *Preliminary Site Assessment Report* completed by Environmental Investigations, P.A., on July 30, 1993 for a portion of the Site (Parcel #384, Terri S. Eury property). This report summarized a historical and regulatory file review and provided the results of 15 test pits excavated to characterize and evaluate the horizontal and vertical extent of the landfilled material. Below is a brief summary of those findings:

- Only anecdotal information was obtained from the regulatory file review and from contacting local and state agencies. The Asheville Regional Office Solid Waste Section confirmed that landfilling occurred on the Site prior to governing regulations, and the action predated the regional office personnel.

- A former Asheville City Clerk stated that the landfill had no name, was created to fill low spots, and extended approximately 1.25 miles from a railroad bridge south of the Site to Pearson Bridge north of the Site. The former City Clerk also stated that an incinerator was located south of the Site and incinerated material was deposited into the landfill.

- Fifteen test pits were excavated to native soil or to the vertical extent of the backhoe. The vertical extent of landfilled material was reported to be predominantly 9 to 11 feet, with a minimum of 6 feet in the northeastern area of the Site to greater than 13 feet (vertical limit of the backhoe) towards the river bank. The landfilled material was predominantly characterized as household waste, construction debris, automotive debris, and incinerated aggregate.

A *Limited Phase I Site Assessment* report dated March 24, 2006, was prepared by Environmental Investigations, Inc. and for an area referred to as “Block B”, which is north of SR 3548 (Haywood Road) to existing US 19.23.70. The purpose of the study was to locate potential environmental

impacts within the proposed NCDOT corridor. The report references the 1993 Preliminary Site Assessment on the former landfill located on Riverside Drive. The report states that the area between Riverside Drive and the French Broad River operated as an open dump/landfill from the 1940's to the late 1950's to early 1960's. No other references to landfills were included in this report.

A *Site Summary Report, Pearson Bridge Dump*, dated September 2, 2011, was prepared by Schnabel Engineering South, P.C., for seven contiguous properties located north of the project Site, immediately south of the Pearson Bridge, between Riverside Drive and the French Broad River. The report states that a landfill slope was observed on the western boundary of the project area (referred to as the Waste Disposal Area) along the French Broad River. The exposed debris on the slope included tires, metal debris, concrete, and glass. The report also references that the years of operation for the waste disposal area was from the early 1940's to the mid 1960's. The report only includes assessment of the seven properties located adjacent to the Pearson Bridge and does not discuss the properties evaluated in the current report.

2.2 Geotechnical Investigation Boring Report Bore Logs

GEL reviewed 14 logs for geotechnical borings drilled on the subject four parcels and 9 additional geotechnical borings drilled off-Site in the vicinity of the subject parcels for a geotechnical investigation conducted for NCDOT project I-2513B in November and December 2017. These logs and a location map are provided as Appendix II. The "soil and rock descriptions" on these logs are generally consistent with the findings presented in Section 5 of this report regarding the lateral extent of landfill materials. All but one of the 14 on-Site bore logs reference the presence of "artificial fill" (LB_8502_LT references only 10 inches of asphalt and ABC stone). The descriptions of the artificial fill on these logs provide minimal detail, predominantly identifying the material as fine to coarse SAND with trace gravel. Three of the boring logs reference the presence of debris without further description or specific depths. One log (LB_7972_RT) reports the presence of trace asphalt and one log (240EB_4470) reports the presence of wood fragments, both without specific depths. Most of the nearby off-Site bore logs do not indicate the presence of buried landfill material, suggesting that landfill activities may not have extended significantly east of the boundaries of the four subject parcels (see location map in Appendix II). The one exception is bore log Y36_3190 which states that the boring was terminated at 7 feet because the lead auger was damaged on metal debris. The report of artificial debris east of I-26 on bore

log 23NB_1945_RT is interpreted to be unrelated to the landfilling activities that occurred on the four subject parcels. The thicknesses of Artificial Fill presented on the on-Site bore logs range from 2.5 to 22.5 feet, and these records are generally inconsistent with the findings presented in Section 5 of this report regarding the vertical extent of landfill materials.

2.3 Historical Aerial Photograph Review

GEL obtained and reviewed historical aerial photographs from the NCDOT Historical Aerial Imagery Index[1]. These photographs are provided in Appendix III. A summary of the observations is as follows:

Year	Observations
1957	Most of the Site appears to be developed with an automobile salvage yard and covered with vehicles. The northern portion of the Site appears to be developed with a small building, but due to low photograph resolution, specific details cannot be discerned. The salvage road appears to continue south of the Site. The area north of the Site, between Riverside Drive and the French Broad River, is cleared. This clearing may indicate active landfilling or may be attributed to planned development. A floodplain is not clearly visible on the Site and north of the Site, suggesting the former landfill extends to the edge of the French Broad River.
1963	The Site seems similar to the 1957 appearance, but with two structures within the auto salvage yard now visible. The northern portion of the Site is still developed with a small structure.
1975	Only the southern and eastern portions of the Site are visible in the photograph. The southernmost portion of the Site is still developed with the auto salvage yard; however, the parcels immediately north of the salvage yard are now developed with three structures (which appear to be the present-day structures).

[1] http://www.arcgis.com/home/item.html?id=91e02b76dce4470ebd7ec240ad202a04

Based on the review of historical aerial photographs, landfilling activities ceased on the Site and adjacent properties prior to 1957. The imagery suggests that the lateral extent of the landfill likely extends to the River's edge along the four subject parcels and north of the Site.

2.4 Sanborn Fire Insurance Map Review

GEL obtained a 1951 historical Sanborn Fire Insurance Map from the NC Live website (www.nclive.org) that covers the northern portion of the Site and the northern adjacent property. This map is included in Appendix III. The southern portion of the Site and southern adjacent properties were not depicted by the Sanborn Fire Insurance Company in 1951. A landfill or landfilling activities are not depicted on the visible portions of the Site; however, a small filling station is shown in the northern portion of the Site. Details pertaining to fuel tanks associated with the filling station are not depicted. The northern adjacent property is labeled as an auto junk yard, and a small used auto part retail structure is shown. North of the used auto parts store, the Burley Tobacco Warehouse is depicted.

2.5 Local and State Agencies

GEL contacted multiple local and state agencies for environmental information pertaining to the Site and surrounding properties. As summarized below, no agencies had information pertaining to the former landfilling activities at the Site.

Buncombe County Solid Waste Department. Ms. Kristy Smith, Solid Waste Manager for the Buncombe County Solid Waste Department, stated that she had no record of any landfills along that area due to the date of operation, which preceded environmental regulations. Ms. Smith suggested GEL contact the Buncombe County Planning Department, as the State often notifies planning departments of old landfills for consideration as development and other plans are developed.

Buncombe County Planning Department. Mr. Nate Pennington, Director of Planning, stated that the Site is outside his jurisdiction, but he did recall that buried debris, much of which had previously been incinerated, was identified during trenching operations at the Site for installation of a sewer line.

North Carolina Department of Environmental Quality (NCDEQ), Asheville Regional Office. Ms. Deb Aja, Western District Supervisor of the Division of Waste Management Solid Waste Section, confirmed that the Asheville Regional Office has no record of any landfills closed prior to 1983. She was unaware of any landfill in this area, and suggested GEL contact the NCDEQ Pre-Regulatory Landfill Program to determine if any information pertaining to this landfill was on file.

NCDEQ Pre-Regulatory Landfill Program. Mr. Ryan Channell, Supervisor of the Pre-Regulatory Landfill Unit, stated that they have no information about a former landfill on the Site. The nearest Pre-Regulatory Landfill site on record is the Pearson Bridge Dump, located approximately 0.3-miles north-northwest of the Site, between Riverside Drive and the French Broad River.

Other NCDEQ Online Information Sources. The following additional online sources were inspected for reference to subject four parcels, and none depict a former landfill or other known facility at the Site. The only listed facility in proximity to the Site is the Pearson Bridge Dump. Prior assessments identify the Pearson Bridge as the northern extent of the landfilled area along the French Broad River.

- Active Permitted Landfills Map
  https://deq.nc.gov/active-permitted-landfills-map
- Pre-Regulatory Landfills Map
  https://deq.nc.gov/about/divisions/waste-management/waste-management-rules-data/waste-management-gis-maps/pre-regulatory-landfills-map
- Hazardous Waste Sites Map
  https://deq.nc.gov/about/divisions/waste-management/waste-management-rules-data/waste-management-gis-maps/tsd-map-viewer
- Inactive Hazardous Sites Map
  https://deq.nc.gov/about/divisions/waste-management/waste-management-rules-data/waste-management-gis-maps/ihs-map-viewer
- Division of Waste Management Site Locator Tool
  https://ncdenr.maps.arcgis.com/apps/webappviewer/index.html?id=7dd59be2750b40bebebfa49fc383f688

3.0 FIELD OBSERVATIONS

GEL and NCDOT staff conducted a reconnaissance visit to each of the four parcels on October 9, 2018, to (a) notify the onsite facility operators of the upcoming field activities; (b) identify the investigation areas at the four parcels; and (c) identify existing visible monitoring wells within the investigation areas, visual evidence of USTs, and other items of concern within or immediately adjacent to the investigation areas. A summary of field observations is presented below.

The topography of the Site is generally flat. A variety of surface materials were observed across the four parcels, including gravel, rock, grass, and asphalt. The current uses of each parcel were identified during the reconnaissance, as stated below. At each of the facilities, operators were notified of the upcoming field activities.

- NCDOT Parcel #384: Current tenant is The Salvage Station, a music and event venue with a restaurant. The Site is developed with several permanent and mobile structures.
- NCDOT Parcel #395: Developed with two warehouses used to store construction and other materials.
- NCDOT Parcel #396: Developed with an office/warehouse structure occupied by the Duyck Construction Company.
- NCDOT Parcel #397: Developed with a large commercial structure occupied by Fastenal, Inspire Personal Fitness, and the Asheville Hardware Center.

The Site is generally bound to the north by warehouse structures; to the south by a drainage feature and Southern States store; to the east by an active railroad line and Riverside Drive; and to the west by the French Broad River.

The locations of the preliminary test pit locations were identified in the field and were based on site conditions and the locations of planned NCDOT improvement features (e.g., bridge approaches). During the reconnaissance, no visible monitoring wells or visual evidence of USTs were observed on the Site. The only areas of visible surface debris were in the landfill slope observed on the western boundary of the project area along the French Broad River. Exposed debris observed in the landfill slope includes tires, a car chassis, and concrete. Photographs of the landfill slope and exposed debris are provided below.

Photographs of Debris Observed on Landfill Slope at the Western Project Boundary Along the French Broad River

4.0 METHODS

The geophysical surveys included the deployment of ground penetrating radar (GPR) technology and time domain electromagnetic technology (TDEM) at the four parcels. Approximate positioning for the investigations was provided using a Trimble real-time kinematic (RTK) global positioning system (GPS). These technologies were used in concert with one another to identify subsurface anomalies and, more specifically, to identify the potential presence or absence of USTs and associated appurtenances and monitoring wells within the accessible and unobstructed portions of the investigation areas. A brief description of each technology is presented in the following paragraphs followed by a discussion of the field procedures.

4.1 Geophysical Investigation – Landfill Lateral and Vertical Extent Evaluation

GEL performed a geophysical investigation across the four parcels outlined in solid black on Figure 2 to evaluate the lateral and vertical extent of the landfill. For this investigation, GEL used a CMD-4 electromagnetic ground conductivity and magnetic susceptibility instrument, a ground penetrating radar (GPR) system, and an electrical resistivity imaging and induced polarization system (ERI/IP). These instruments and technologies are further described below.

4.1.1 CMD-4 Electromagnetic Ground Conductivity and Magnetic Susceptibility

The CMD-4 instrument by GF Instruments measures variations in electrical conductivity and magnetic susceptibility of subsurface materials. The conductivity is determined by inducing a primary electromagnetic field and measuring the amplitude and phase shift of an induced secondary magnetic field. The secondary magnetic field is created by subsurface conductive materials behaving as an inductor as the primary field is passed through them.

Terrain conductivity systems such as the CMD-4 are commonly used to delineate lateral extent of landfills. There are two components of the induced electromagnetic field measured by the CMD-4 system. The first is the quadrature-phase (out-of-phase) component that measures the bulk conductivity of soil and groundwater. The conductivity readings increase or become negative when the sensors are close to metallic objects. The second is the in-phase component that measures the magnetic susceptibility and is therefore more sensitive to isolated metallic objects such as pipes, drums, underground storage tanks, and other metallic debris. Both positive and negative readings indicate subsurface metal. By observing the response of the in-phase and quadrature-phase components, it is possible to differentiate whether a change in bulk

conductivity is due to the presence of buried metallic objects or due to changes in subsurface soil conditions or pore fluid conductivity.

The presence of metal buildings, fences, and other metallic surface objects cause interference and makes data interpretation for subsurface features near these objects difficult. The CMD-4 has an effective depth of exploration of up to approximately 20 feet below ground surface. However, the ability to detect small features decreases with depth.

4.1.2 Ground Penetrating Radar

An ImpulseRadar Cross Over dual frequency digital radar control system configured with a 170-MHz and a 600MHz was used in this investigation. GPR is an electromagnetic method that detects interfaces between subsurface materials with differing dielectric constants. The GPR system consists of: an antenna, which houses a transmitter and receiver; a profiling recorder, which processes the received signal and produces a graphic display of the data; and a video display unit, which processes and transmits the GPR signal to a color video display and recording device.

The transmitter radiates repetitive short-duration electromagnetic signals into the earth from an antenna moving across the ground surface. Electromagnetic waves are reflected back to the receiver by interfaces between materials with differing dielectric constants. The intensity of the reflected signal is a function of the contrast in the dielectric constant at the interface, the conductivity of the material which the wave is traveling through, and the frequency of the signal. Subsurface features which may cause such reflections are: 1) natural geologic conditions such as changes in sediment composition, bedding and cementation horizons, voids, and water content; or 2) man introduced materials or changes to the subsurface such as soil backfill, buried debris, tanks, pipelines, and utilities. The profiling recorder receives the signal from the antenna and produces a continuous cross section of the subsurface interface reflections, referred to as “reflectors” or “reflection events.”

Depth of investigation of the GPR signal is highly site specific and is limited by signal attenuation (absorption) of the subsurface materials. Signal attenuation is dependent upon the electrical conductivity of the subsurface materials. Signal attenuation is greatest in materials with relatively high electrical conductivities such as clays and brackish groundwater, and lowest in relatively low conductivity materials such as unsaturated sand or rock. Depth of investigation is

also dependent on antenna frequency and generally increases with decreasing frequency; however, the ability to identify smaller subsurface features is diminished with decreasing frequency.

4.1.3 Electric Resistivity and Induced Polarization Imaging

For this investigation, GEL used a 64-electrode Terrameter LS2 system by ABEM. Electrical resistivity imaging surveying is an active geophysical technique that involves the introduction of a known amount of current into the ground and subsequently measuring the earth's response in order to measure variations in their respective electrical potentials. By introducing a known amount of current into the ground and subsequently measuring the voltage potential, the resistivity of a particular volume of earth is measured. It is important to note that actual ground resistivity is not measured during a resistivity survey but rather the apparent resistivity. Actual resistivities are later determined through the inversion process.

Resistivity methods typically require that a series of small current and potential electrodes be pushed into the ground in various configurations. The electrodes are connected to a transmitter/recording instrument that generates the induced current and stores the measurements for later processing and analysis. Modern resistivity systems measure eight to twelve electrode combinations simultaneously, thereby reducing measuring time compared with standard one-channel systems. The configuration of the electrodes is dependent on the objectives of the investigation (i.e., vertical soil and bedrock profiling, contaminant mapping, or fracture mapping). The most commonly employed arrays for resistivity surveying are the Wenner, Schlumberger, and Dipole-Dipole. ERI/IP has an effective depth of exploration equal to approximately one-third of the length of the transect being evaluated.

Using the Dipole-Dipole array, the potential electrodes are closely spaced and remote from the current electrodes, which are also closely spaced. Pseudodepth sections are developed by increasing the spacing between the potential electrode dipole and the current electrode dipole in steps.

Since many underground features have electrical properties that differ from their surroundings, electrical imaging can be used to detect and delineate a large array of targets. These include: clay layers, sand or gravel lenses, the top-of-rock and rock pinnacles or float blocks, saltwater intrusion, leachate plumes, NAPLs, hydrocarbons, dam seepage, mineralized zones, water-

bearing fractures, buried foundation elements, waste disposal pits or trenches, graves, mines, tunnels, caves, ice or permafrost thicknesses, and more.

For some targets, recording the IP or chargeability improves detection and discrimination. IP measures the ability of the subsurface to hold a charge like a capacitor by measuring a residual potential after interrupting the current abruptly. Common contributors to IP anomalies are clay minerals (membrane polarization) and metallic minerals (mainly sulfide minerals). IP can also be used for delineating landfills since buried metal typically has a strong IP effect. The IP effect or chargeability and is measured in milliseconds.

The combined results of various electrode spacings are plotted as a pseudodepth section or contour map of apparent resistivity and chargeability versus depth. Inversion of the pseudodepth sections is required to convert the section to actual resistivity and chargeability cross-sections. GEL uses EarthImager 2D by Advanced Geosciences Inc., and Res2DInv by GeoTomo Software which are both industry standard resistivity and IP inversion software.

4.1.4 Geophysical Survey Procedures

CMD-4 and GPR data were collected across the accessible parts of the Site with a profile separation of approximately 20 feet. Positioning for the investigation was provided using sub-foot differential GPS data which was collected simultaneously with the CMD and GPR data. The GPS data was streamed and merged with the geophysical data sets in the geophysical data collector. Some sections of the area were excluded due to buildings, obstructions or heavy vegetation. The locations of surface metal were noted to facilitate the interpretation of the geophysical data.

The out-of-phase (conductivity) and in-phase (magnetic susceptibility) components of the CMD 4 data were analyzed and gridded using Oasis Montaj by GeoSoft. The GPR data was analyzed using CrossPoint by Impulse Radar.

ERI/IP data was collected along 9 select profiles to evaluate the vertical extent of the landfill at these locations. Before commencing field work, GEL reviewed the CMD-4 and GPR data and discussed the results with NCDOT to agree on the level-of-effort for the ERI/IP data collection. The total linear footage of ERI/IP profiles was 1,670 feet. The ERI/IP profiles were focused on

alignments of the proposed bridge approaches, with adjustments as required by field conditions. Sub-foot accuracy GPS was used to position the ERI/IP profiles.

Following the completion of the data collection, the ERI/IP data was inverted to resistivity and chargeability cross sections. Noisy data points were deleted from the data set prior to the inversion process. The collected data was compared with calculated data to ensure good correlation.

4.2 Test Pit Excavation for Landfill Vertical Extent Confirmation

GEL performed test pit investigations across the two parcels (#384 and #395) outlined in dashed black on Figure 2 to evaluate the vertical extent of the landfill. GEL and A&D Environmental Services (A&D), the excavator sub-contractor, performed test pit excavations at 22 locations across the two parcels, as shown on Figure 3.

Under the direction of GEL, the excavator operator excavated materials at approximately one-foot intervals at each test pit location. The excavated materials were stockpiled adjacent to the test pit. Photographs were taken of the excavated material. Additionally, a photoionization detector (PID) was used to screen soils and debris at approximately one-foot intervals for the purpose of identifying potentially hazardous materials and/or working conditions. However, laboratory analysis was not included in the scope of work to confirm the presence or absence of hazardous materials. Test pit logs were generated during the investigation to record excavation depth, observed materials, PID readings, and depth to the water table (if encountered). This process continued until the excavation extended through the landfilled material to underlying native soil.

Each test pit was backfilled with the excavated materials after the vertical extent of landfill material was identified. The materials were compacted with the excavator bucket. Gravel and/or stone were added to the surface of the test pits in areas of vehicular and/or foot traffic to ensure the test pit area was flush with the land surface and for aesthetics.

5.0 RESULTS

GEL performed geophysical and test pit investigations at the Site between October 9 and November 16, 2018 to evaluate the vertical and horizontal extents of landfilled material. Additionally, the types of landfilled materials were observed, and an estimate of the volume of buried debris was calculated for the southern two parcels. The geophysical investigation results and the test pit excavation results are presented in Sections 5.1 and 5.2, respectively.

5.1 Geophysical Investigation Results

The CMD-4 conductivity and in-phase heat maps are presented on Figures 4 and 5. Most of the anomalies in the datasets can be attributed to the influence of surface metal and buildings. However, anomalies likely to be associated with subsurface metal also exist throughout the Site. The data indicate that similar conditions exist throughout the Site, i.e. the landfill extends beyond the limits of the investigation. Natural background conditions could not be measured anywhere at the Site.

The GPR data shows a heterogeneous material with a large amount of objects close to the surface throughout the area of investigation. This is interpreted as landfill material. In areas where the landfill was less than 10 feet thick (primarily in the northern parts of the Site), the 170MHz GPR data could be used to map the bottom of the landfill. GPR Examples with interpreted bottom of the landfill are shown on Figures 6 and 7. In areas with thicker landfill material, the GPR signal was not able to penetrate through the full thickness of the landfill.

Inverted ERI and IP data are shown on Figures 8 through 13. Depth to native material based on test pits was added to the profiles for comparison. In areas with limited cultural interference, the bottom of the landfill correlates well with a change from moderately resistive material (a few hundred Ohmm) to fairly conductive material (a few tens Ohmm), and from higher IP readings (more than 30 ms) to lower readings (less than 10 ms). However, both datasets were affected by cultural interference in various areas. Overall, the resistivity data appeared less affected by cultural interference than the IP data, and the resistivity data correlated better with the test pit data. GEL therefore relied more on the resistivity data for mapping depth to the bottom of the landfill, which is shown on Figures 8 through 13.

5.2 Test Pit Excavation Vertical Extent Confirmation Results

Test pits were excavated at 22 locations across the southern two parcels of the Site (parcels #384 and #395). The inferred vertical extent of landfill material was observed in each test pit. The vertical extent was indicated by a grey to yellow sandy silt, which had no visible landfill debris. This material is inferred to be native, pre-landfill, alluvium/floodplain sediment. This inference is supported by review of the 1936 and 1943 United States Geological Survey maps included in Appendix III, which show (a) a stream traversing the subject parcels roughly parallel to the French Broad River before their confluence north of the Site, and (b) no elevation change (at a 20-ft contour interval on the 1943 map) from the river's edge to the subject parcels. Depths to native sediment are shown on Figure 14 and listed in the table below along with depths to the water table, if observed, in each test pit.

Test Pit Number	**Depth to Native Material** (feet below ground surface)	**Depth to Water Table** (feet below ground surface)
TP-1	8.5	8.5
TP-2	11	10
TP-3	14.5	14.5
TP-4	14.5	14
TP-5	8	6
TP-6	13.5	11.5
TP-7	15	11
TP-8	11.5	10
TP-9	18	13
TP-10	15	Not Observed
TP-11	13	11
TP-12	9	7
TP-13	9.5	7
TP-14	10.5	7
TP-15	8.5	6.5
TP-16	6.5	Not Observed
TP-17	13.5	13
TP-18	12	11
TP-19	15	12
TP-20	13.5	Not Observed
TP-21	16	16
TP-22	15.5	15

As shown in the table above, observed landfilled material thicknesses range from 6.5 to 18 feet. The water table was encountered in 19 test pits, with depths ranging from 6 to 16 feet. Groundwater was not encountered in test pits TP-10, -16, and -20, which were terminated when native sediment was observed at 15, 6.5, and 13.5 feet, respectively. In general, the thickness of landfilled material decreased from the river to the east towards Riverside Drive.

5.2.1 Description of Landfilled Materials

Buried debris was encountered in each of the 22 test pits excavated on the southern two parcels of the Site (parcels #384 and #395). Descriptions of encountered materials are included on the test pit logs provided in Appendix IV. Test pit photographs in Appendix V provide representative views of the varieties of debris encountered in the test pits. In most cases, a layer of non-native fill was encountered at the surface of each test pit. Generally, the buried debris consisted of crushed glass (Photograph 17), bottles (Photograph 18), incinerated debris, bricks, scrap metal, and miscellaneous household waste (Photograph 23). Test Pits TP-7 through TP-10, TP-20, and TP-21 had two to three feet of red fill that appeared to be crushed red brick (Photograph 9). In talking with a current Site occupant, an offsite school had been demolished, with some of the crushed brick from that project used as fill at the Site.

Most of the buried debris was intermixed with soil; however, some test pits contained layers consisting only of buried debris, such as in TP-2, TP-6, TP-7, TP-8, and TP-12 through TP-16 (Photographs 10-12, 19, 23, and 27). Even within these test pits, only certain layers were encountered that were predominantly debris. In many test pits, the incinerated debris included glass that had melded together to form larger, dense pieces of materials (Photographs 13 and 14). Most of these pieces were only two to three inches in diameter, but in some cases, larger eight to twelve-inch pieces were excavated. A large amount of non-glass, incinerated debris was observed in test pits TP-12 through TP-16. Bed springs, wood debris, and other scrap metals pieces were the only discernable debris in these pits. Although most pits contained a mix of crushed glass, bottles, incinerated debris, bricks, and miscellaneous waste, non-typical waste was observed in several of the test pits, as follows:

- TP-2: A large quantity of various car debris was excavated, including a car axle, metal paneling, shocks, and hub caps. The pit contained numerous automobile tires (Photographs 6 and 7). Lastly, a 55-gallon drum was encountered at a depth of about 9 feet below ground

surface. The drum emitted a paint thinner or other solvent odor (Photograph 8). PID readings taken from holes along creases in the crushed drum or where the drum had rusted through were in excess of 370 parts per million (ppm). The drum was encountered above the water table, and PID measurements did not indicate the presence of volatile organic compounds in soil excavated just prior to, along with, or subsequent to extraction of the drum. As detailed in Section 5.2.3, the drum was overpacked, profiled, and properly disposed offsite.

- Test Pits 4, 17, and 20: A large amount of various car debris was encountered, including car axles, car doors, and metal paneling (Photographs 1-5).

- Test Pit 10: Large slabs of concrete were present approximately four to six feet below ground surface. A large amount of red fill was observed on the concrete slab, and it was inferred the slabs therefore may have originated from the school demolition noted above (Photograph 21). Below the concrete slabs, a black material was encountered that emitted an asphalt/diesel type odor. Low concentrations of volatile compounds measured with the PID are not likely indicative of a subsurface hazard.

As stated above, the excavated materials were screened with a PID in one-foot increments. Aside from the drum excavated from TP-2, PID readings were 5 ppm or less, and most material had readings of zero. Therefore, except for the one encountered drum, field observation did not indicate that the encountered test pit materials represent subsurface hazards; however, laboratory analyses to evaluate for the presence or absence of hazardous materials were not included in the project scope-of-work. GEL did not observe any materials excavated from the test pits that were suspected asbestos-containing materials.

The underlying native sediment was encountered in each of the 22 test pits. The native sediment was generally a grey to yellow sandy silt with no visible landfill debris (Photographs 29 and 30). Roots, branches, leaves and other decaying organic materials were encountered in the upper layer of the native sediment.

5.2.2 Landfill Material Volume Estimate

The volume of landfill material across the southern two parcels of the Site (parcels #384 and #395) was estimated using ArcGIS 10.5 3D Analyst software. Given the thickness of landfill material observed during the test pit excavations, a surface of the landfill bottom was created

using the natural neighbor interpolation method. Land surface elevations obtained for each test pit location were used to create a land elevation surface. By conducting a cut/fill calculation between these two surfaces, an estimated 220,000 cubic yards of buried debris are contained across these two parcels.

5.2.3 Drum Excavation and Disposal

A 55-gallon drum was excavated from TP-2 from a depth of approximately 9 feet below ground surface. A paint thinner or solvent odor was observed, and organic vapor concentrations exceeding 370 ppm were measured with a PID. Additionally, a slight sheen was observed on the drum. The excavator work was stopped when the drum was encountered so that the drum could be wrapped in plastic and moved from the edge of the test pit. The drum was placed on a wooden pallet and temporarily staged at a safe location at the Salvage Station facility on parcel #384. A&D overpacked the drum on November 15, 2018, and transported it to their facility for profiling and proper disposal. A copy of the Non-Hazardous Waste Manifest is provided as Appendix VI.

6.0 SUMMARY AND CONCLUSIONS

GEL conducted a PSA geophysical and test pit investigation on four parcels along Riverside Drive, in Buncombe County, North Carolina. The work was performed to evaluate the lateral and vertical extents of landfill material across the Site. Based on the Site reconnaissance, field observations, and results of the geophysical and test pit investigations, the following summary and conclusions are offered:

- The results of the geophysical investigation indicate landfill material is present across the entire Site, and the material extends outside the Site boundaries to the north, south, and east. A landfill slope was observed on the western boundary of the Site along the French Broad River. The slope extends from the top of the artificial land surface to the edge of the river. Exposed debris was observed in the landfill slope, including vehicle parts, tires, and concrete.

- The vertical extent of landfill material was defined across the Site by the results of the geophysical investigation and test pit excavations. Buried debris was encountered in each of the 22 test pits, and the thickness of the landfill material observed in the test pits ranged between 6.5 and 18 feet. Generally, the thickness of landfill material was greater near the French Broad River, thinning to the east toward Riverside Drive.

- A review of historical records and prior assessments indicate that the former landfill extends north and south of the Site between Riverside Drive and the French Broad River. One document cited that the landfill extends 1.25 miles from the railroad bridge south of the Site to the Pearson Bridge north of the Site.

- The volume of landfill material was estimated from the geophysical results and the thicknesses observed during test pit excavation. The estimated volume of buried debris across the southern two parcels of the Site (#384 and #395) is 220,000 cubic yards.

- Various types of buried debris were observed during the test pit excavations. Commonly observed materials included crushed glass, incinerated debris, bricks, scrap metal, and indeterminable household waste. Several test pits contained automobile debris, including tires, axles, and metal sidewalls; these materials were typically observed in the test pits located along the western boundary of the Site. Occasional large pieces of concrete and some rock were also encountered.

- The only observed environmental hazard was a 55-gallon drum excavated from test pit TP-2. The drum had a paint thinner or other solvent odor, as described in Section 5.2.3, and was overpacked, profiled, and properly disposed offsite. No other suspect hazardous materials were observed; however, laboratory analyses to evaluate for the presence or absence of hazardous materials were not included in the project scope-of-work. Additionally, no suspect asbestos-containing materials were observed in the excavated materials.

- No visual or geophysical evidence of monitoring wells or USTs were observed on the Site.

7.0 RECOMMENDATIONS

GEL offers the following recommendations based on the Site reconnaissance, field observations, and results of the geophysical and test pit investigations:

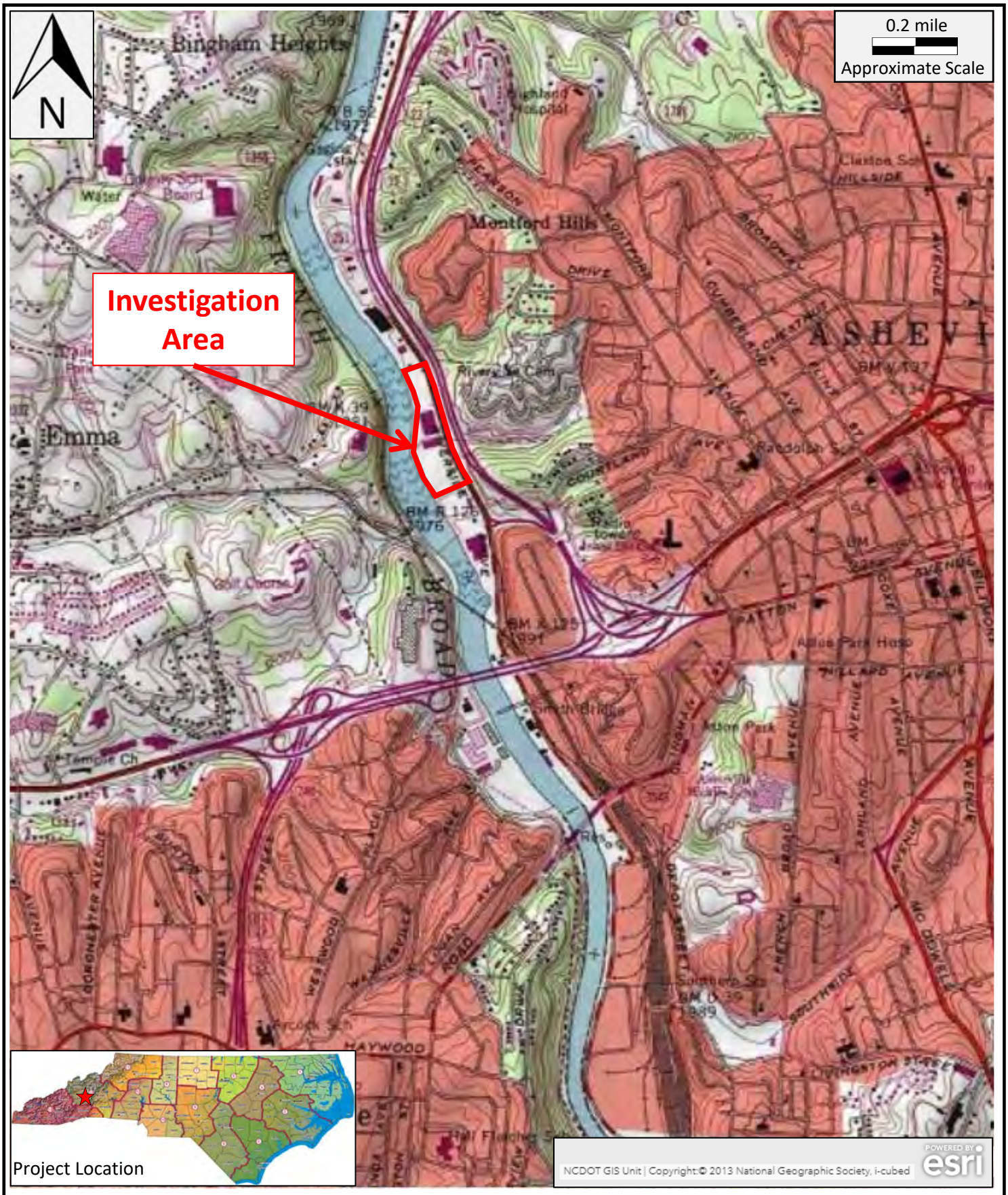
- Overall, the buried debris appears to be relatively inert. However, one drum was encountered during the test pit excavations (the drum was overpacked, profiled, and properly disposed offsite). Should the NCDEQ allow NCDOT to proceed with the planned improvement with landfill materials left in place, it is recommended that an environmental professional be present during construction to screen for potentially hazardous conditions and to assess excavated materials for proper handling.

- NCDOT should have a contractor on-call to promptly handle any suspect hazardous materials encountered during construction, including proper containment, transport, profiling, and disposal.

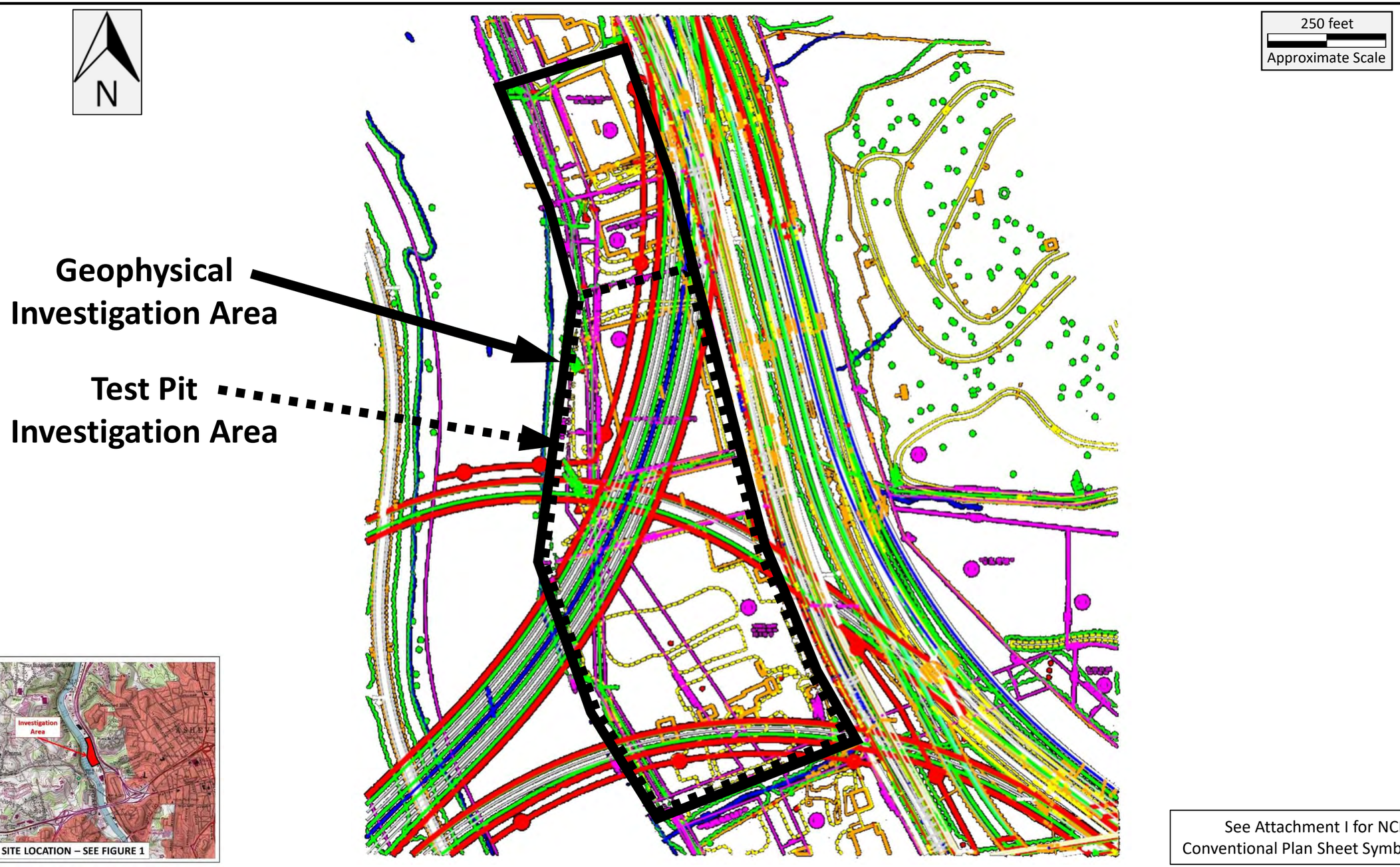
- To maintain a healthy and safe work environment and to prevent the spread of potentially hazardous materials across the Site, project-specific environmental, health, and safety protocol that describe potential hazards and emergency responses should be established and communicated to site workers.

- The results of this investigation should be communicated to the project's design-build contractor and geotechnical engineers for due consideration.

FIGURES



GEL problem solved — Engineering of NC INC an affiliate of The GEL Group INC www.gel.com 2700 Sumner Boulevard, Suite 106 Raleigh, NC 27616 P 919.544.1100 F 919.237.9177	PROJECT: ncdt05918 PRELIMINARY SITE ASSESSMENT REPORT Four Parcels; Asheville- New Route from North of SR 3548 (Haywood Rd) to Existing US 19-23-70 TIP No. I-2513B, WBS No. 34165.1.9	DATE: December 31, 2018 SITE LOCATION MAP DRAWN BY: ADS	FIGURE 1



See Attachment I for NCDOT Conventional Plan Sheet Symbol Legend

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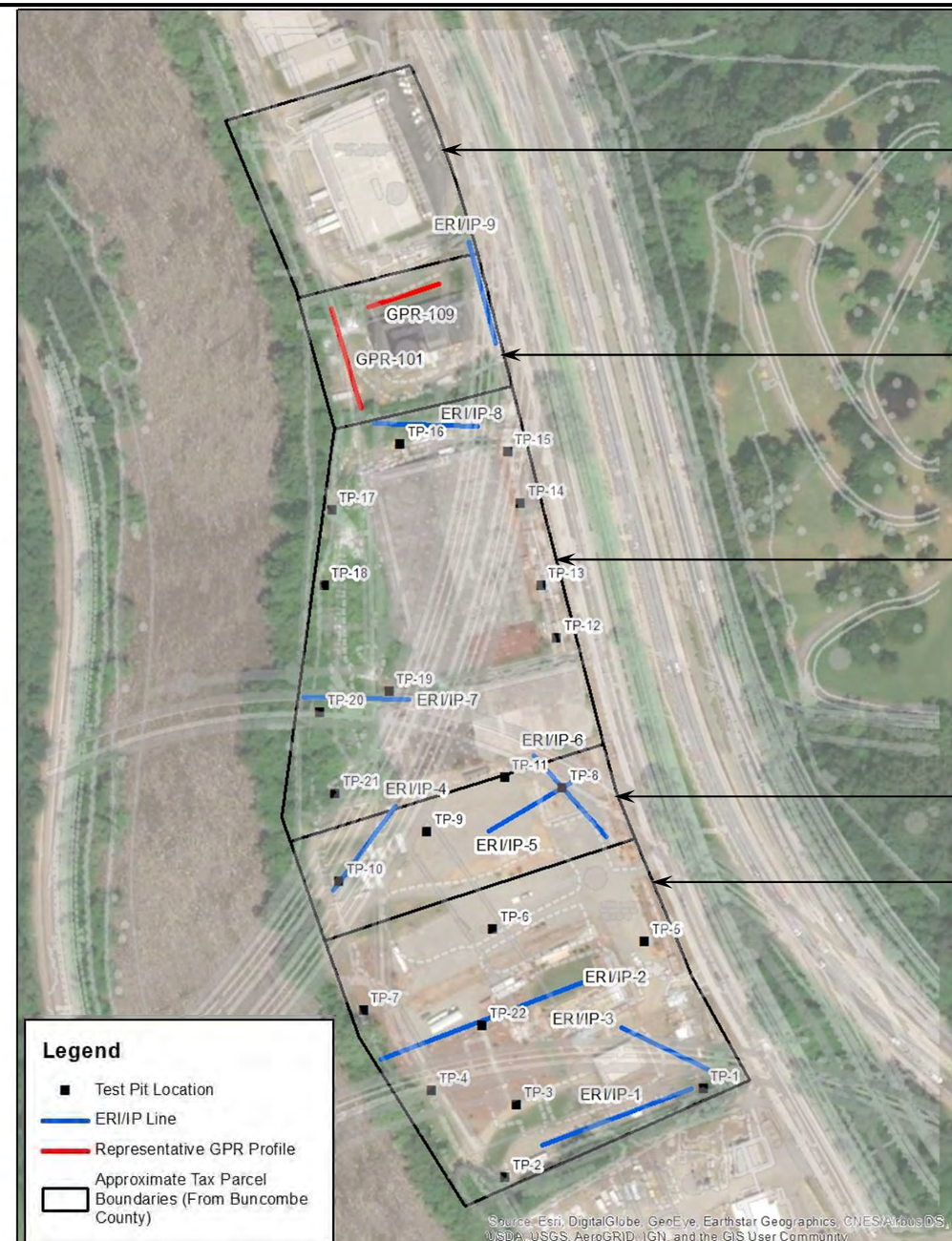
DESIGNATED INVESTIGATION AREAS

PROJECT: ncdt05918	DATE: December 31, 2018	**FIGURE 2**

N

250 feet
Approximate Scale

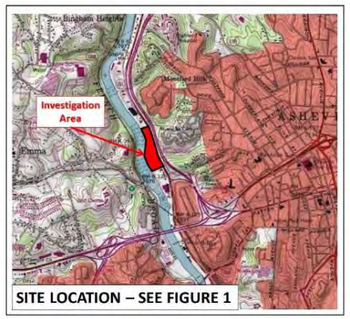


NCDOT Parcel #397
554 Riverside Drive
Owner: Riverside Partnership, LLC

NCDOT Parcel #396
587 Riverside Drive
Owner: Duyck Construction Co., Inc

NCDOT Parcel #395
472 Riverside Drive
Owners: Bernard & Katheryn Coates

NCDOT Parcel #384
(two Buncombe County tax parcels)
466 Riverside Drive
Owner: Terri S. Eury



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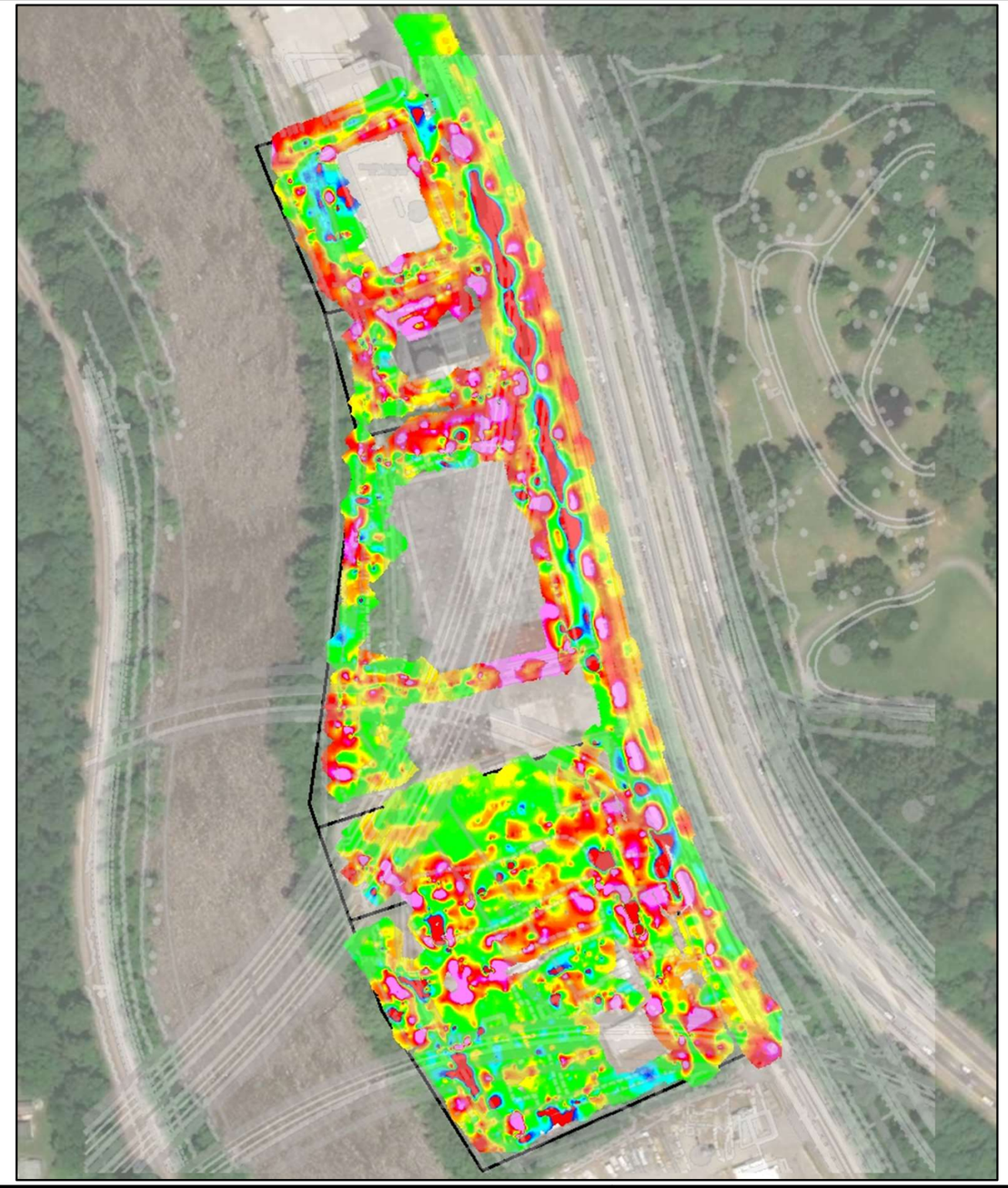
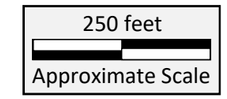
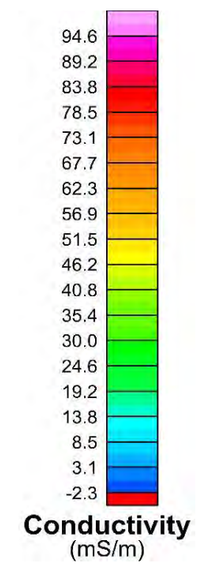
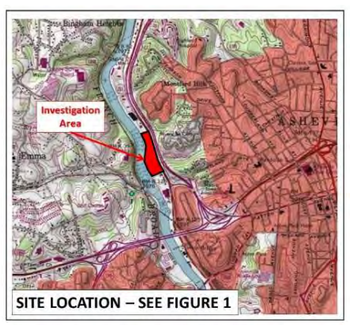
ELECTRICAL RESISTIVITY IMAGING (ERI)/INDUCED POLARIZATION (IP) LINES, REPRESENTATIVE GROUND PENETRATING RADAR (GPR) PROFILES, AND TEST PIT LOCATIONS

PROJECT: ncdt05918	DATE: December 31, 2018	**FIGURE 3**









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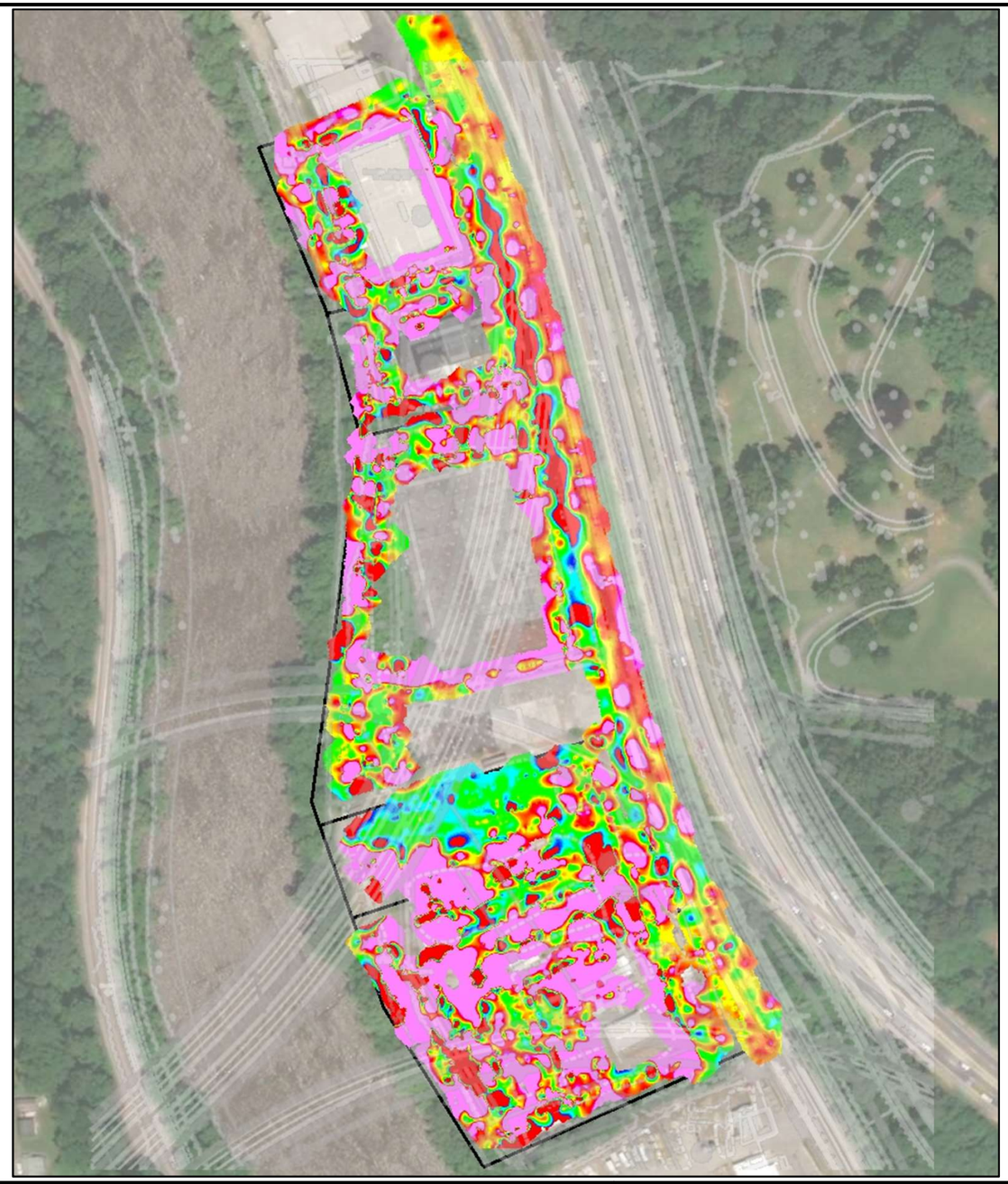
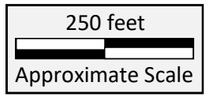
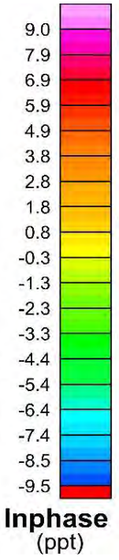
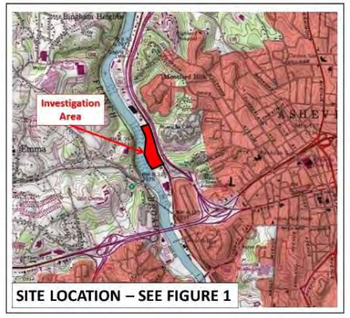
ELECTROMAGNETIC GROUND CONDUCTIVITY QUADRATURE-PHASE RESULTS

PROJECT: ncdt05918	DATE: December 31, 2018	**FIGURE 4**









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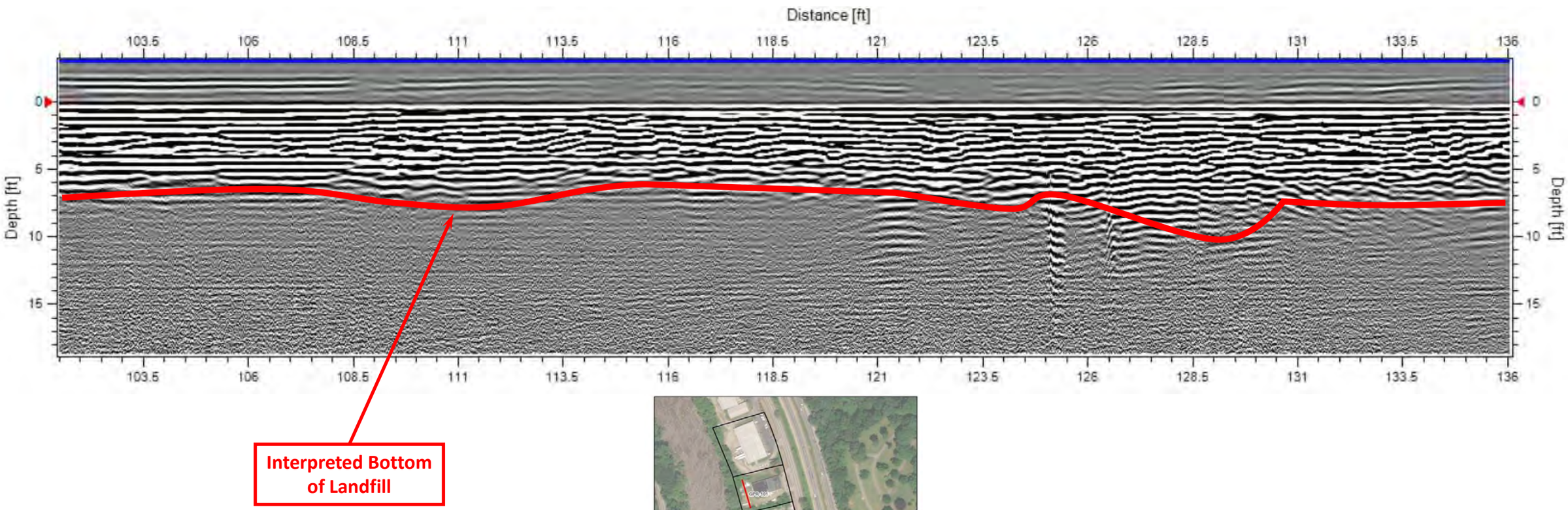
ELECTROMAGNETIC GROUND CONDUCTIVITY IN-PHASE RESULTS

PROJECT: ncdt05918	DATE: December 31, 2018	**FIGURE 5**

NORTH **GPR PROFILE 101** **SOUTH**



GPR PROFILE LOCATION – SEE FIGURE 3

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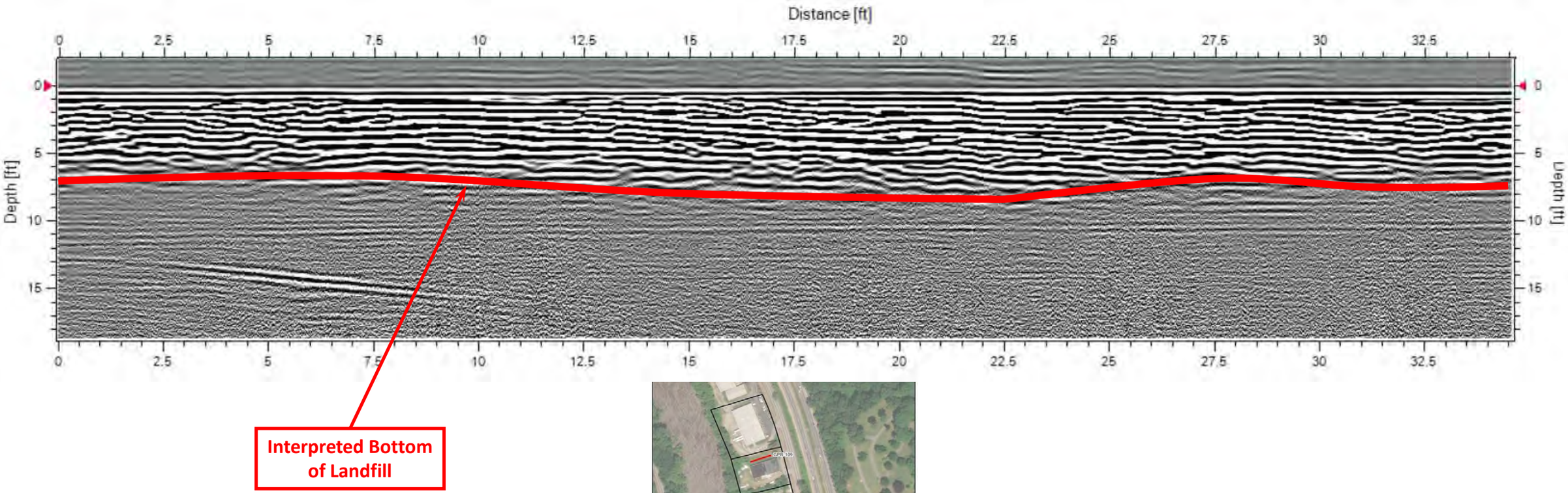
EXAMPLE NORTH-SOUTH TRENDING GROUND PENETRATING RADAR PROFILE 101

PROJECT: ncdt05918	DATE: December 31, 2018	**FIGURE 6**

WEST **GPR PROFILE 109** **EAST**



GPR PROFILE LOCATION – SEE FIGURE 3

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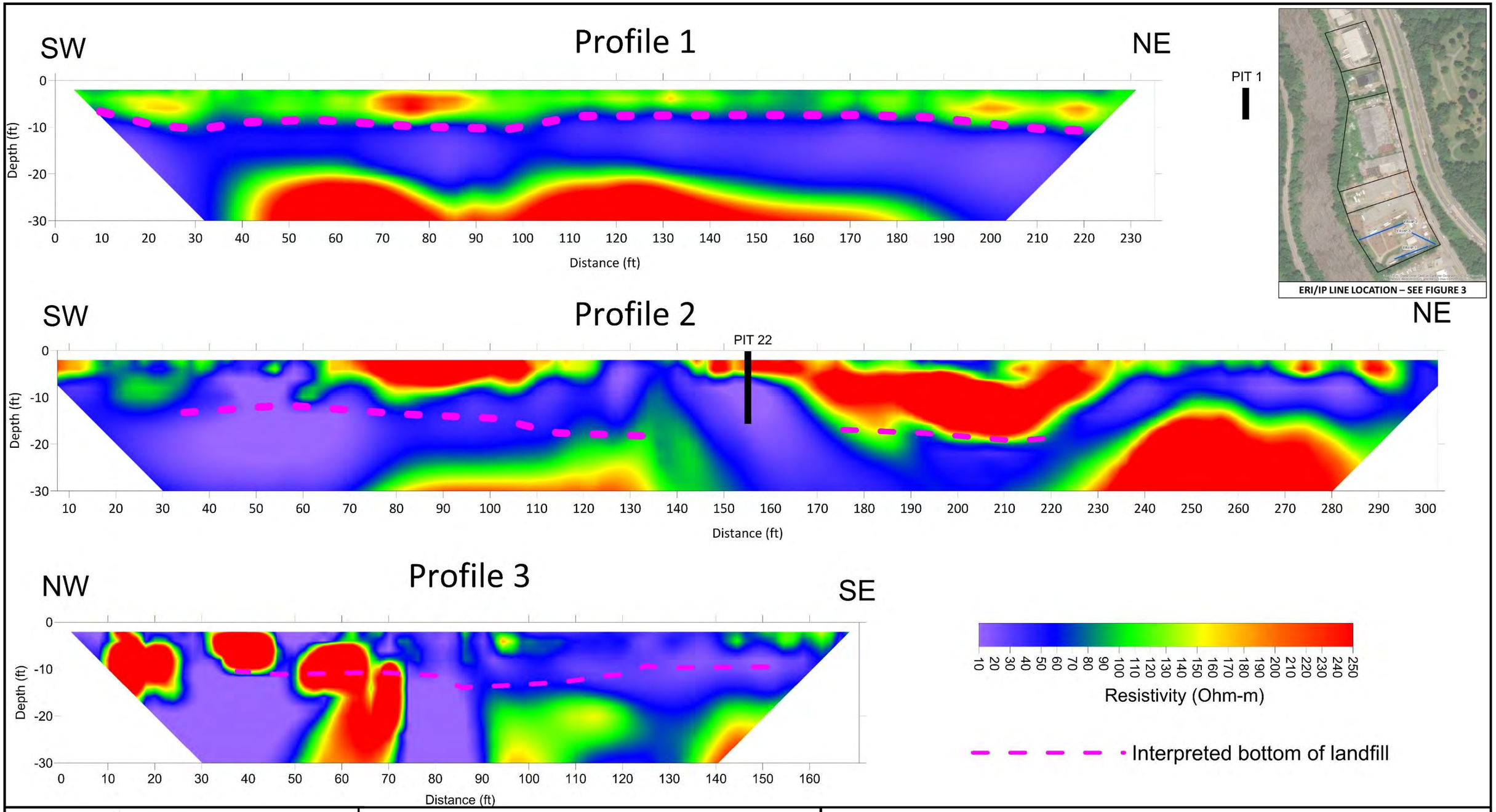
EXAMPLE WEST-EAST TRENDING GROUND PENETRATING RADAR PROFILE 109

PROJECT: ncdt05918	DATE: December 31, 2018	**FIGURE 7**



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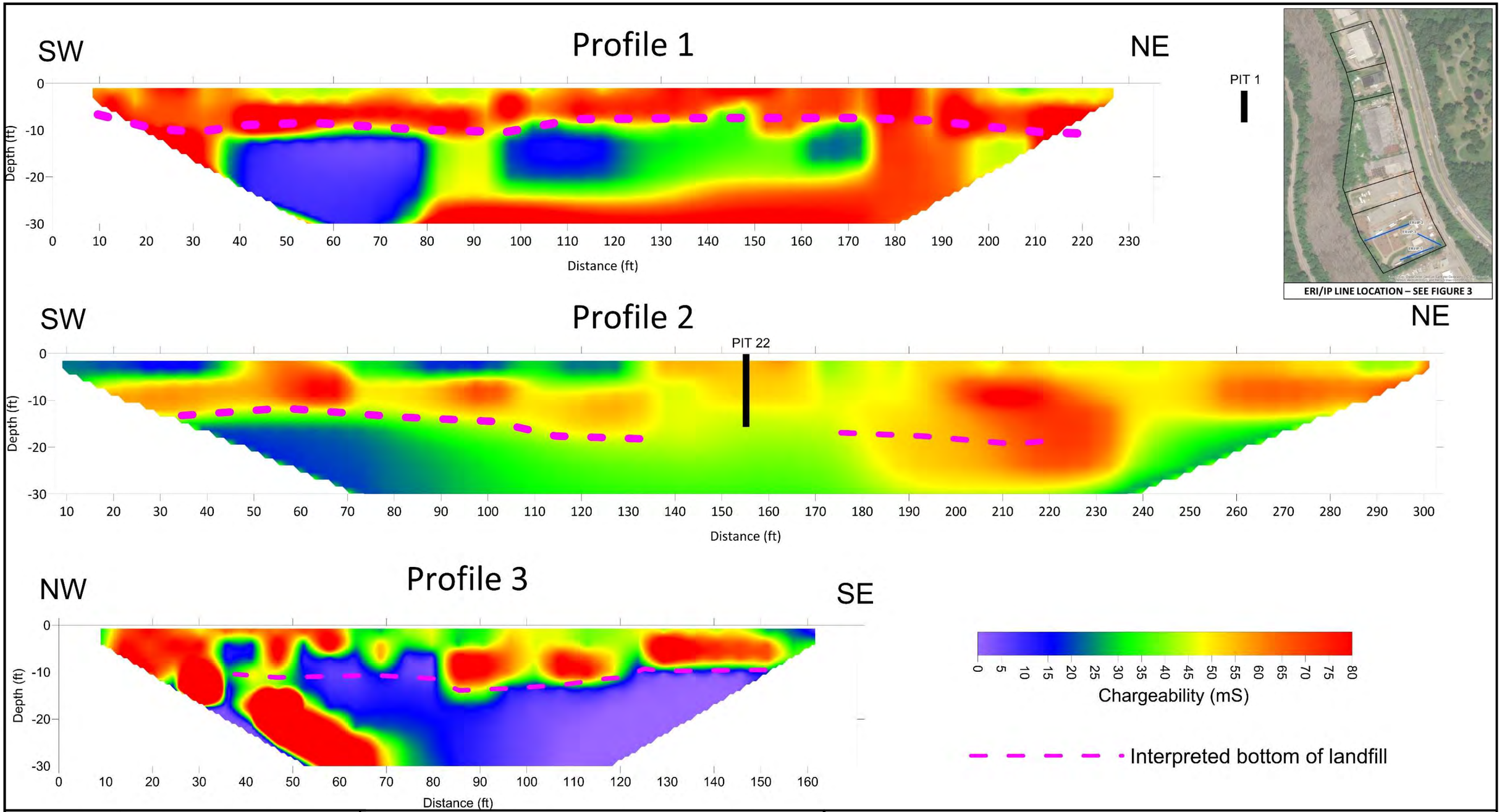
ELECTRICAL RESISTIVITY IMAGING RESULTS, PROFILES 1 THROUGH 3

PROJECT: ncdt05918 | DATE: December 31, 2018 | **FIGURE 8**



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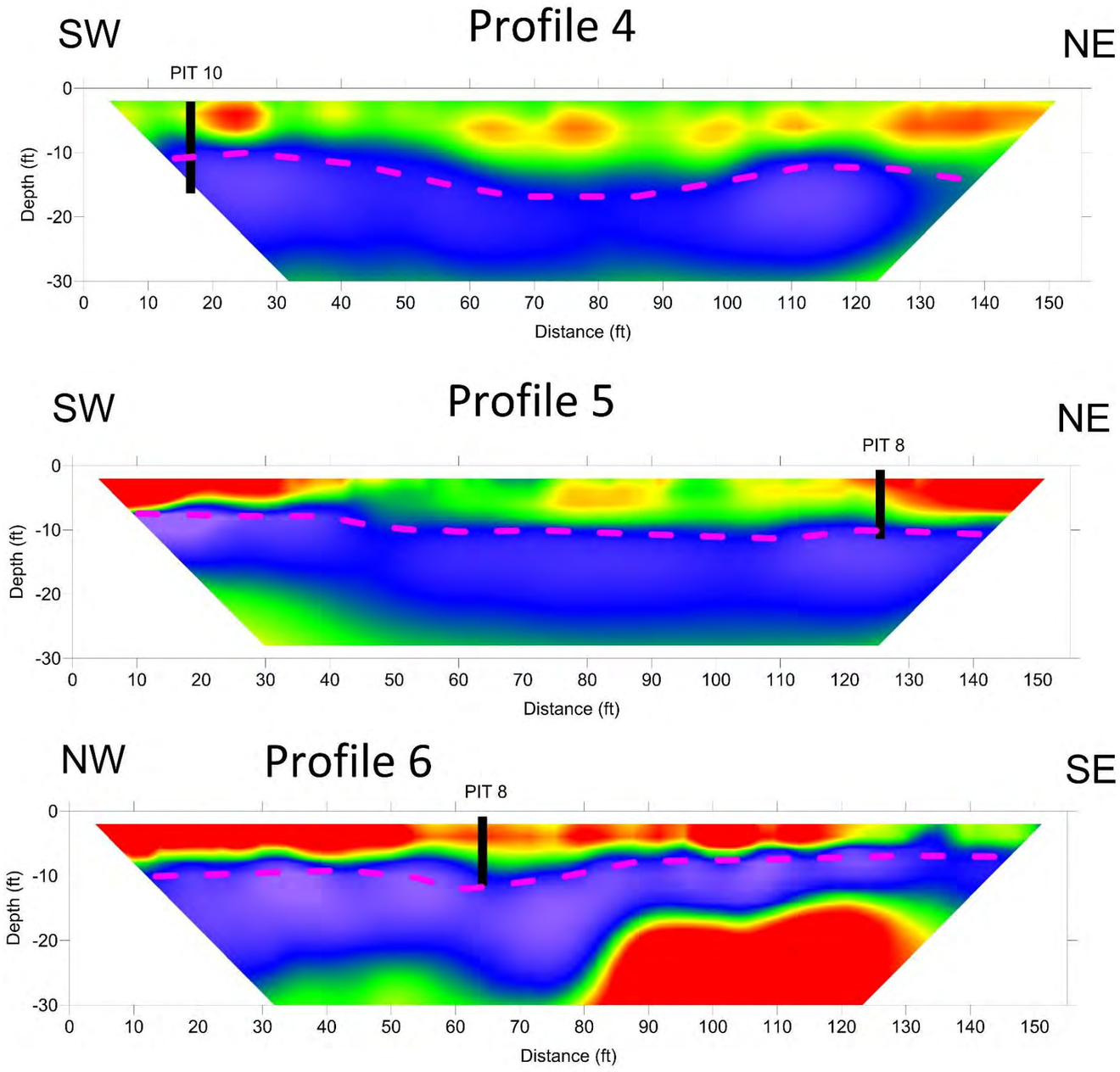
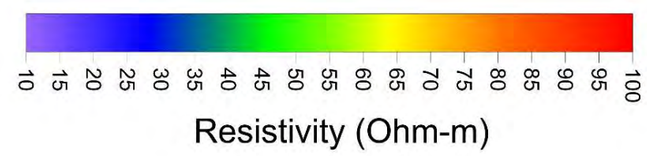
INDUCED POLARIZATION RESULTS, PROFILES 1 THROUGH 3

PROJECT: ncdt05918	DATE: December 31, 2018	**FIGURE 9**



ERI/IP LINE LOCATION – SEE FIGURE 3



Interpreted bottom of landfill

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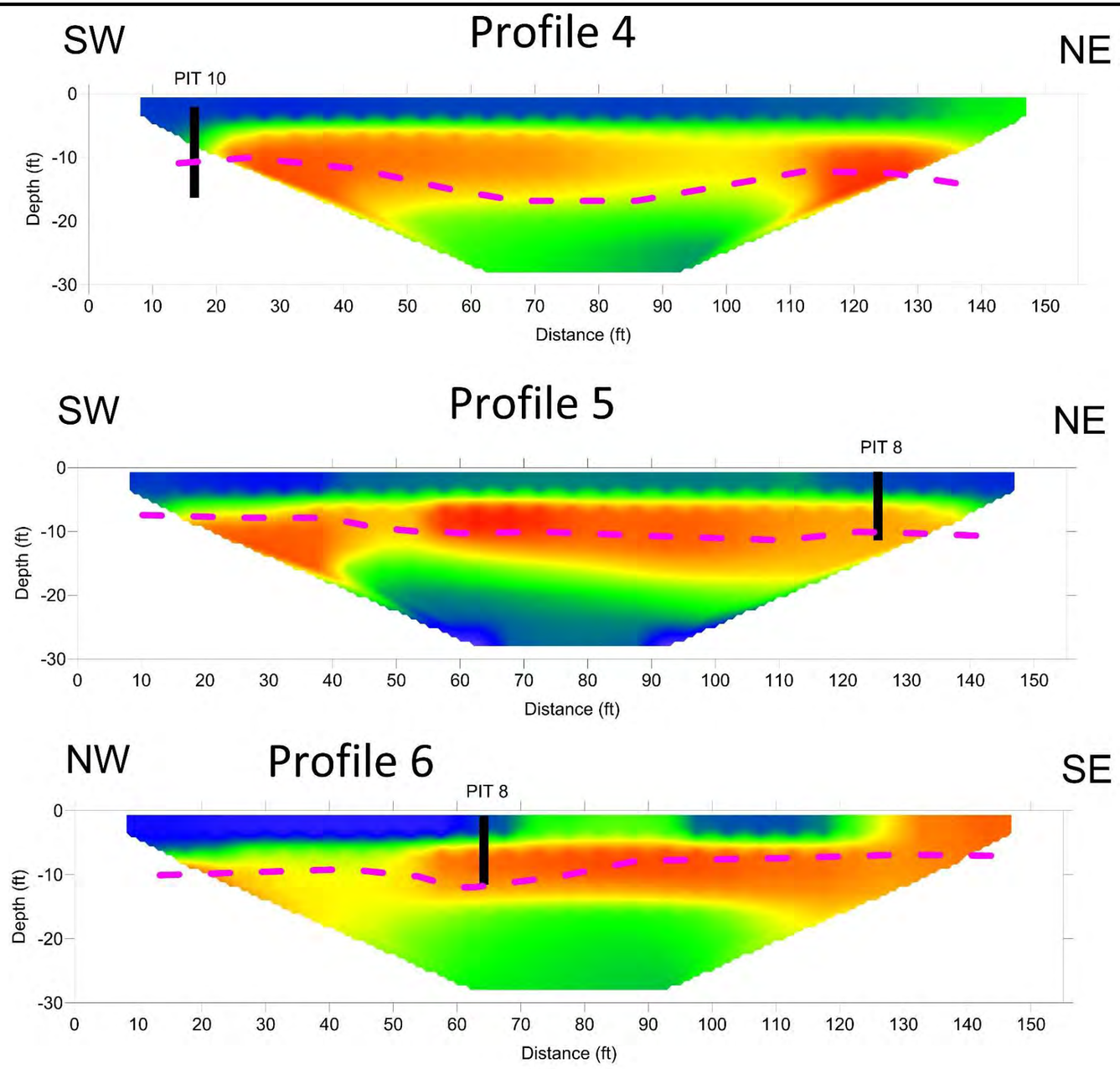
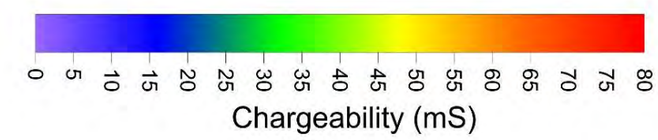
ELECTRICAL RESISTIVITY IMAGING RESULTS, PROFILES 4 THROUGH 6

PROJECT: ncdt05918	DATE: December 31, 2018	**FIGURE 10**



ERI/IP LINE LOCATION – SEE FIGURE 3



Interpreted bottom of landfill

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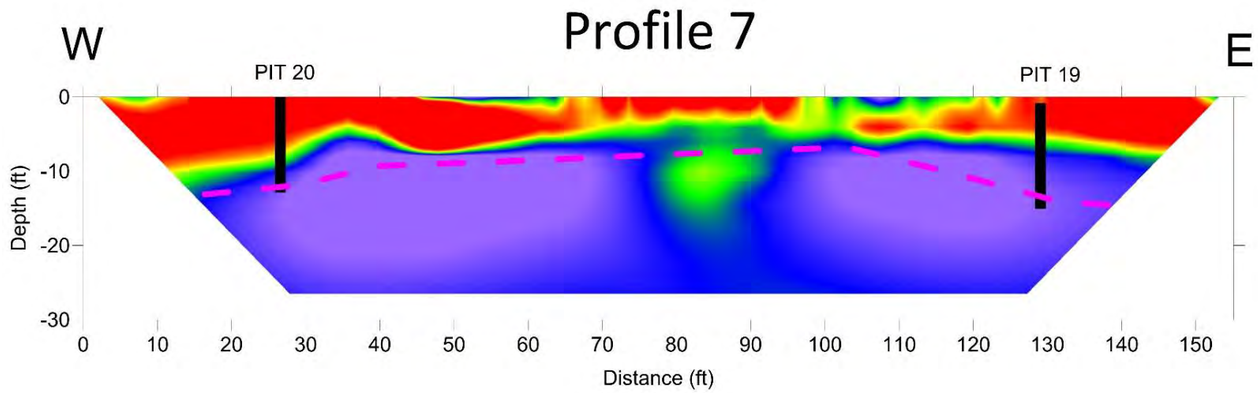
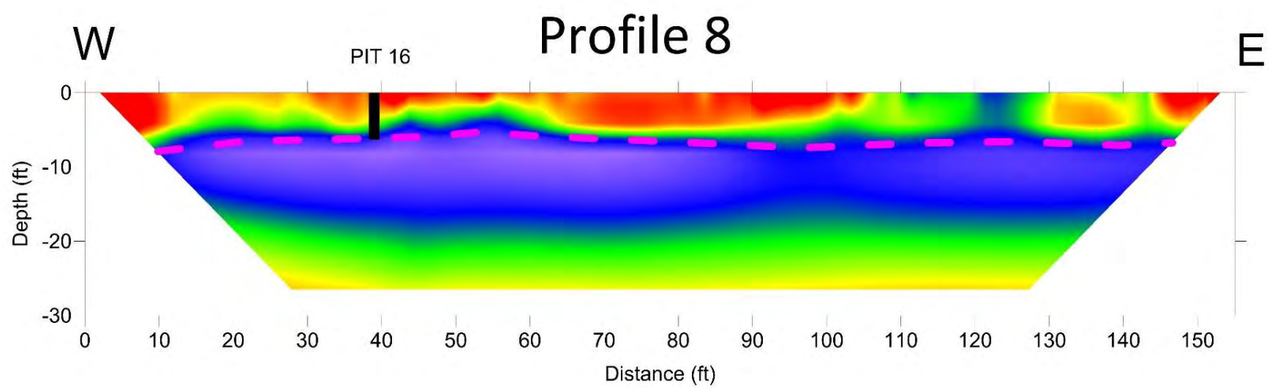
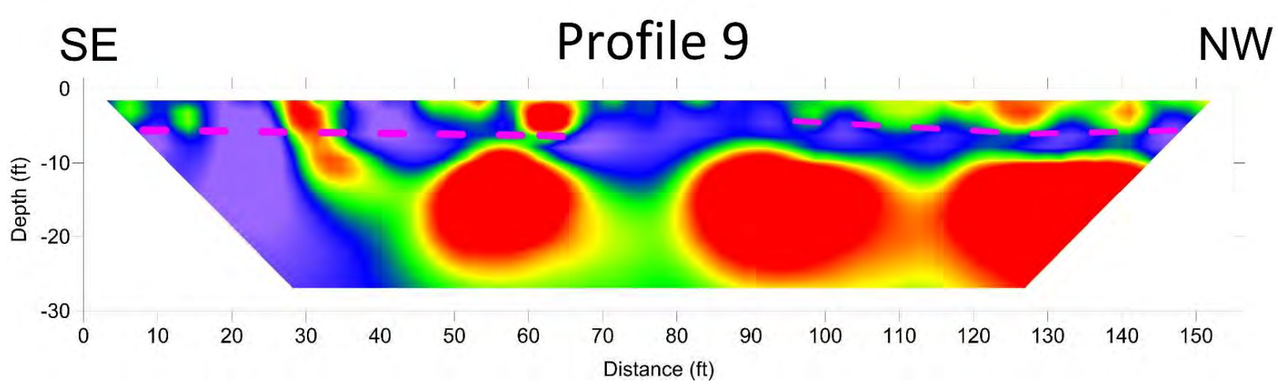
INDUCED POLARIZATION RESULTS, PROFILES 4 THROUGH 6

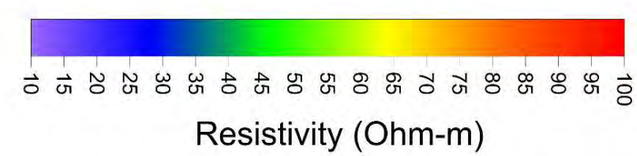
PROJECT: ncdt05918	DATE: December 31, 2018	**FIGURE 11**







ERI/IP LINE LOCATION – SEE FIGURE 3



Interpreted bottom of landfill

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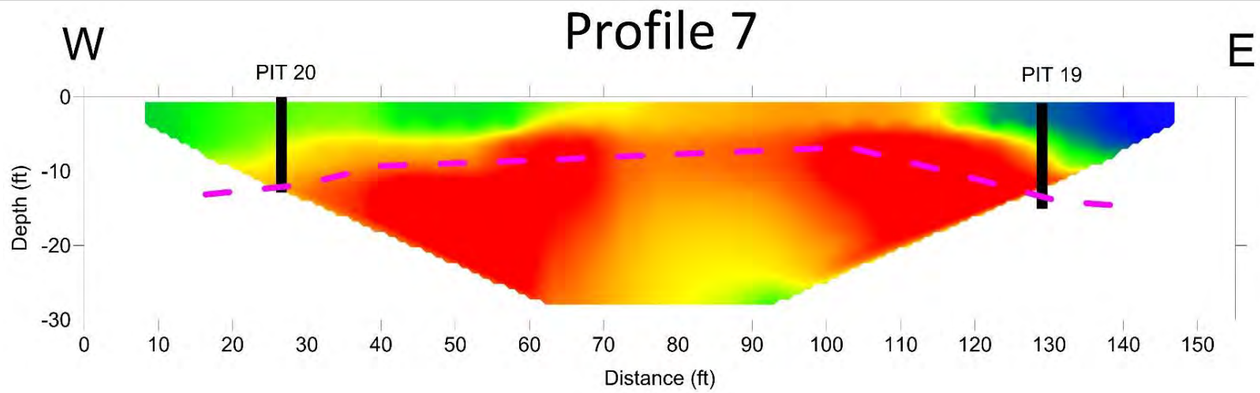
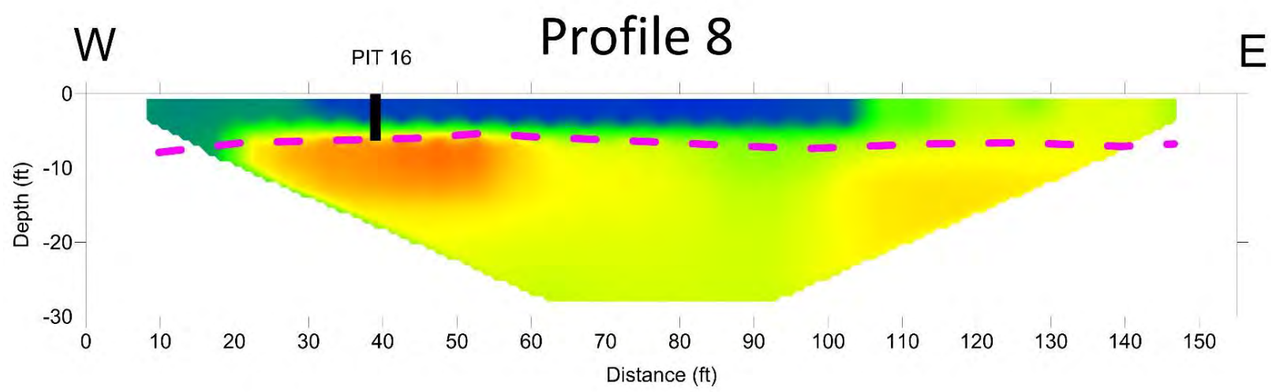
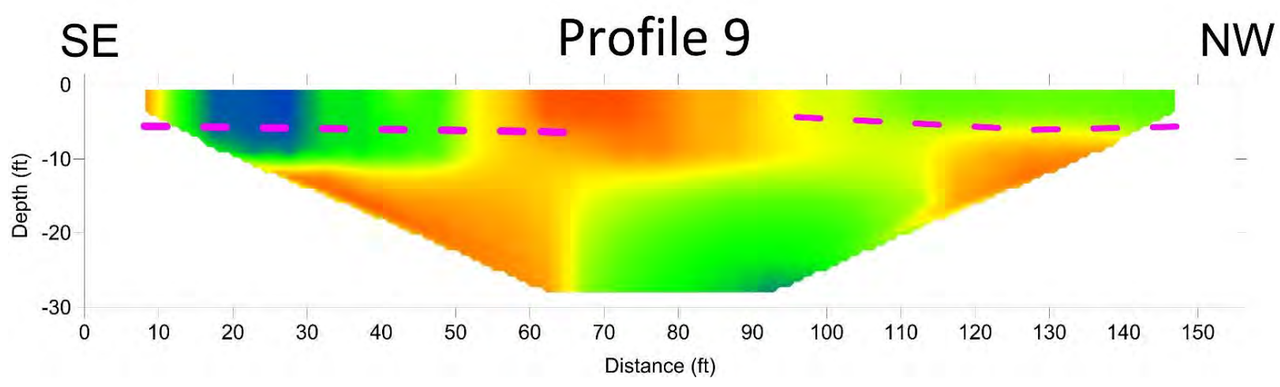
ELECTRICAL RESISTIVITY IMAGING RESULTS, PROFILES 7 THROUGH 9

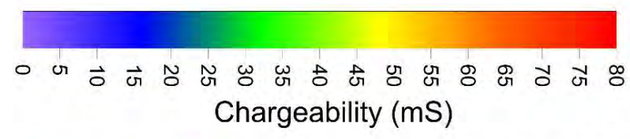
PROJECT: ncdt05918	DATE: December 31, 2018	**FIGURE 12**







ERI/IP LINE LOCATION – SEE FIGURE 3



Interpreted bottom of landfill

GEL Engineering of NC INC
problem solved
an affiliate of The GEL Group INC www.gel.com
2700 Sumner Boulevard, Suite 106
Raleigh, NC 27616
P 919.544.1100
F 919.237.9177

PRELIMINARY SITE ASSESSMENT REPORT
Four Parcels; Asheville- New Route from
North of SR 3548 (Haywood Rd) to Existing US 19-23-70
TIP No. I-2513B, WBS No. 34165.1.9

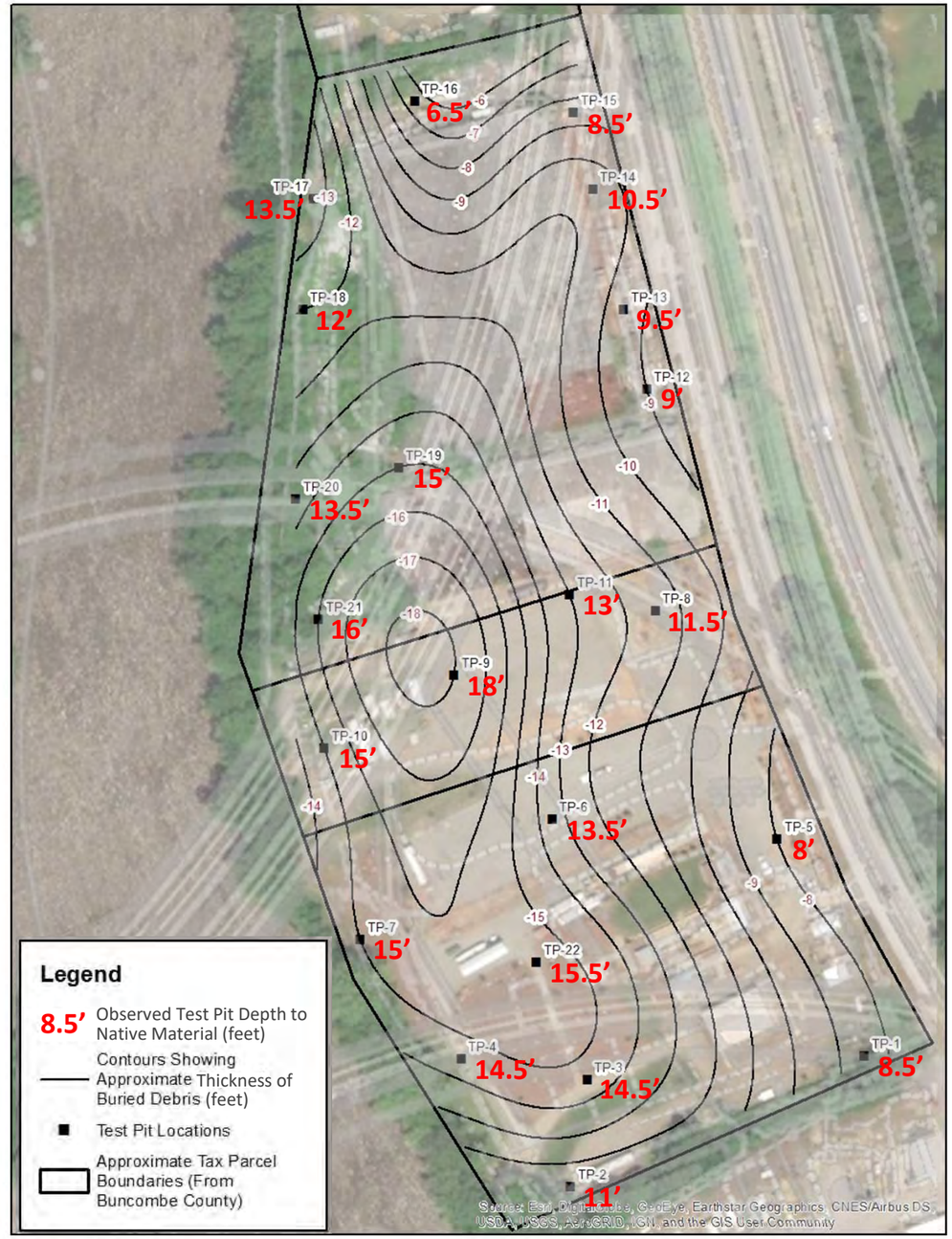
INDUCED POLARIZATION RESULTS, PROFILES 7 THROUGH 9

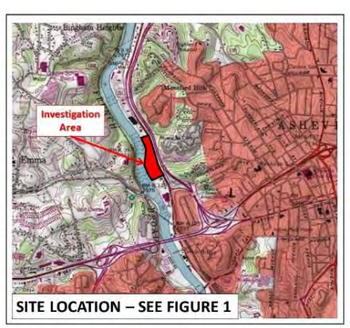
PROJECT: ncdt05918	DATE: December 31, 2018	**FIGURE 13**

N

250 feet

Approximate Scale





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PRELIMINARY SITE ASSESSMENT REPORT
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TEST PIT DEPTHS TO NATIVE MATERIAL AND LANDFILL MATERIAL THICKNESS CONTOURS

PROJECT: ncdt05918 | DATE: December 31, 2018 | **FIGURE 14**

APPENDIX I

NCDOT Conventional Plan Sheet Symbol Legend

04/06/15

PROJECT REFERENCE NO.	SHEET NO.

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 — EIP
- Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- 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 — FLOW
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — 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 — RW
- Proposed Right of Way Line with Iron Pin and Cap Marker — RW
- Proposed Right of Way Line with Concrete or Granite R/W Marker — RW
- Proposed Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- Proposed Control of Access — CA
- Existing Easement Line — E
- Proposed Temporary Construction Easement — E
- Proposed Temporary Drainage Easement — TDE
- Proposed Permanent Drainage Easement — PDE
- Proposed Permanent Drainage / Utility Easement — DUE
- Proposed Permanent Utility Easement — PUE
- Proposed Temporary Utility Easement — TUE
- Proposed Aerial Utility Easement — AUE
- Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- 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 — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- 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.

APPENDIX II

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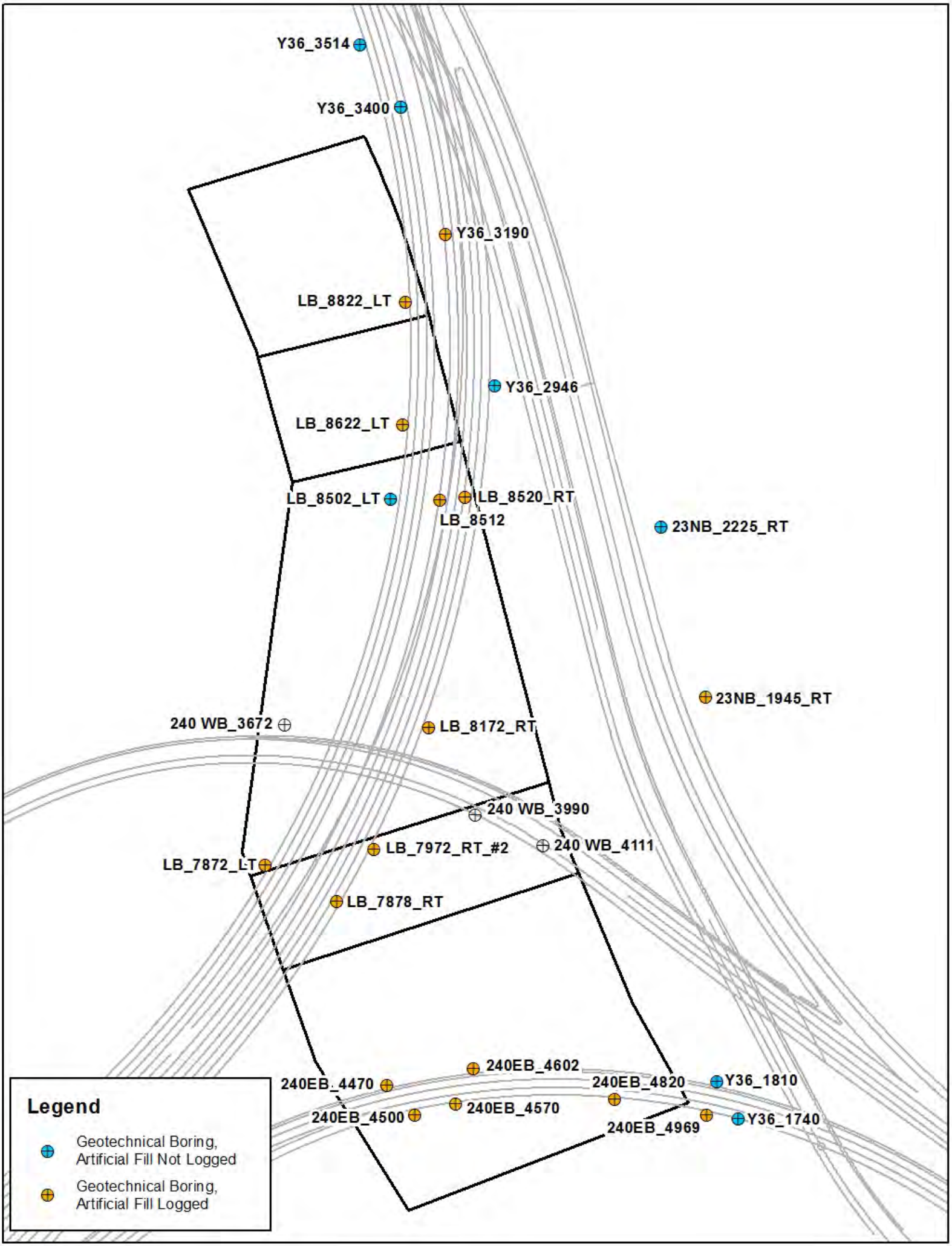
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LB_8520_RT
LB_8512
23NB_2225_RT
23NB_1945_RT
240 WB_3672
LB_8172_RT
240 WB_3990
LB_7972_RT_#2
240 WB_4111
LB_7872_LT
LB_7878_RT
240EB_4602
240EB_4470
240EB_4820
Y36_1810
240EB_4570
240EB_4500
240EB_4969
Y36_1740
Legend
Geotechnical Boring, Artificial Fill Not Logged
Geotechnical Boring, Artificial Fill Logged

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Driscoll, C.
SITE DESCRIPTION ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			**GROUND WTR (ft)**
BORING NO. LB_8622_LT	**STATION** 86+22	**OFFSET** 70 ft LT	**ALIGNMENT** -LB- / **0 HR.** 5.3
COLLAR ELEV. 1,969.3 ft	**TOTAL DEPTH** 18.3 ft	**NORTHING** 692,447	**EASTING** 937,557 / **24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, E.	**START DATE** 11/16/17	**COMP. DATE** 11/16/17	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
1970										
	1,969.3	0.0	5	3	2	5		D		1,969.3 GROUND SURFACE 0.0
1965	1,965.8	3.5	2	0	1	1		M		**ARTIFICIAL FILL** Black and Brown, Silty Fine to Coarse SAND (A-2-4) with Trace Gravel
										1,962.3 7.0
1960	1,960.8	8.5	1	2	2	4		W		Highly Plastic, Black, Clayey, Coarse to Fine SAND (A-2-7) with Trace Gravel
										1,956.8 12.5
1955	1,955.8	13.5	21	23	20	43		W		Black and Gray, Fine to Coarse SAND (A-1) with Trace Gravel
	1,951.0	18.3	60/0.0			60/0.0				1,951.0 18.3 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,951.0 ft on CRYSTALLINE ROCK (GNEISS)

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Driscoll, C.
SITE DESCRIPTION ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			**GROUND WTR (ft)**
BORING NO. LB_8822_LT	**STATION** 88+22	**OFFSET** 70 ft LT	**ALIGNMENT** -LB- / **0 HR.** Dry
COLLAR ELEV. 1,968.0 ft	**TOTAL DEPTH** 12.2 ft	**NORTHING** 692,638	**EASTING** 937,561 / **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, E.	**START DATE** 11/29/17	**COMP. DATE** 11/29/17	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1970										
	1,968.0	0.0								1,968.0 GROUND SURFACE 0.0
			1	2	3	5		M		**ARTIFICIAL FILL** Brown and Black, Silty Coarse to Fine SAND (A-2-4 & A-2-5) with Trace Gravel
1965	1,965.0	3.0	3	1	WOH	1		M		
1960	1,960.0	8.0	2	1	2	3		W		
	1,955.8	12.2	60/0.0			60/0.0				1,955.8 12.2 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,955.8 ft on CRYSTALLINE ROCK (GNEISS)

NCDOT BORE DOUBLE I2513B_GEO_DBINV_GINT.GPJ NC_DOT.GDT 2/13/18

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Driscoll, C.
SITE DESCRIPTION ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			**GROUND WTR (ft)**
BORING NO. LB_8172_RT	**STATION** 81+72	**OFFSET** 70 ft RT	**ALIGNMENT** -LB- / **0 HR.** N/A
COLLAR ELEV. 1,972.9 ft	**TOTAL DEPTH** 16.5 ft	**NORTHING** 691,979	**EASTING** 937,597 / **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, E.	**START DATE** 11/16/17	**COMP. DATE** 11/16/17	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
1975											
	1,972.9	0.0	10	7	6	13		M		1,972.9 GROUND SURFACE	0.0
1970	1,969.4	3.5	2	2	2	4		M		**ARTIFICIAL FILL** Brown, Silty Coarse to Fine SAND (A-1) with Trace Gravel	
										1,970.4 Olive Green to Brown, Silty Fine SAND (A-2-4)	2.5
1965	1,964.4	8.5	1	1	2	3		M			
1960	1,959.4	13.5	2	3	1	4		W		1,960.4 Black and Gray, Fine SAND (A-3)	12.5
	1,956.4	16.5	60/0.0			60/0.0				1,956.4 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,956.4 ft on CRYSTALLINE ROCK (GNEISS)	16.5

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Driscoll, C.
SITE DESCRIPTION ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			**GROUND WTR (ft)**
BORING NO. LB_8502_LT	**STATION** 85+02	**OFFSET** 75 ft LT	**ALIGNMENT** -LB- / **0 HR.** 8.5
COLLAR ELEV. 1,972.7 ft	**TOTAL DEPTH** 18.0 ft	**NORTHING** 692,333	**EASTING** 937,539 / **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, E.	**START DATE** 11/16/17	**COMP. DATE** 11/16/17	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
1975											
	1,971.9	0.8	2	4	4	8		M		1,972.7 GROUND SURFACE	0.0
1970	1,969.2	3.5	3	2	3	5		M		1,971.9 **ARTIFICIAL FILL** Asphalt (0.0 - 0.1 Foot) ABC Stone (0.1 - 0.8 Foot)	0.8
										Black, Silty Fine SAND (A-2-4) with Trace Gravel	
1965	1,964.2	8.5	1	0	1	1		M			
1960	1,959.2	13.5	3	4	5	9		M		1,960.2 Black and Gray, Fine SAND (A-3)	12.5
1955	1,954.7	18.0	60/0.0			60/0.0				1,954.7 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,954.7 ft on CRYSTALLINE ROCK (GNEISS)	18.0

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Driscoll, C.
SITE DESCRIPTION ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			**GROUND WTR (ft)**
BORING NO. LB_8512	**STATION** 85+12	**OFFSET** CL	**ALIGNMENT** -LB- / **0 HR.** 7.4
COLLAR ELEV. 1,971.7 ft	**TOTAL DEPTH** 18.6 ft	**NORTHING** 692,332	**EASTING** 937,615 / **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, E.	**START DATE** 11/16/17	**COMP. DATE** 11/16/17	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
1975											
										1,971.7 GROUND SURFACE	0.0
1970	1,970.9	0.8	5	3	2	5		M		**ARTIFICIAL FILL** Black, Silty Fine SAND (A-2-4) with Trace Gravel	
	1,968.2	3.5	1	1	1	2		M			
1965											
	1,963.2	8.5	1	0	1	1		Sat.		1,963.7 Black, Fine to Coarse SAND (A-1) with Trace Gravel	8.0
1960											
	1,958.2	13.5	WOH	1	1	2		Sat.		1,958.7 Highly Plastic, Black, Silty Clayey Coarse to Fine SAND (A-2-7) with Trace Gravel	13.0
1955											
	1,953.2	18.5	60/0.1			60/0.1				1,953.2 / 1,953.1 **CRYSTALLINE ROCK** Black and Gray GNEISS	18.5 / 18.6
										Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,953.1 ft in CRYSTALLINE ROCK (GNEISS)	

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Driscoll, C.
SITE DESCRIPTION ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			**GROUND WTR (ft)**
BORING NO. LB_8520_RT	**STATION** 85+20	**OFFSET** 35 ft RT	**ALIGNMENT** -LB- / **0 HR.** Dry
COLLAR ELEV. 1,969.7 ft	**TOTAL DEPTH** 14.4 ft	**NORTHING** 692,335	**EASTING** 937,651 / **24 HR.** 4.8
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, E.	**START DATE** 11/29/17	**COMP. DATE** 11/29/17	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1970										
	1,969.7	0.0	23	15	6	21		M		1,969.7 GROUND SURFACE 0.0
	1,966.2	3.5	WOH	1	2	3				1,967.2 **ARTIFICIAL FILL** Brown and Black, Silty Coarse to Fine SAND (A-2-4) 2.5
1965										Black, Silty, Coarse to Fine SAND (A-2-5) with Trace Gravel and Debris
	1,961.2	8.5	2	4	6	10		W		
1960										
	1,956.2	13.5	100/0.5			100/0.5				1,956.2 13.5
	1,955.3	14.4	60/0.0			60/0.0				1,955.3 **WEATHERED ROCK** White and Gray GNEISS 14.4
										Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,955.3 ft on CRYSTALLINE ROCK (GNEISS)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Grahl, D.
SITE DESCRIPTION ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			**GROUND WTR (ft)**
BORING NO. LB_7185_LT	**STATION** 71+85	**OFFSET** 78 ft LT	**ALIGNMENT** -LB- / **0 HR.** Dry
COLLAR ELEV. 2,048.9 ft	**TOTAL DEPTH** 66.0 ft	**NORTHING** 691,269	**EASTING** 936,900 / **24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 81% 02/20/2017		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Toothman, R.	**START DATE** 12/28/17	**COMP. DATE** 12/28/17	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
2050										
	2,048.9	0.0								2,048.9 GROUND SURFACE 0.0
			1	1	3	4		M		**RESIDUAL** Red to Reddish Yellow and Light Brown to White to Yellow, Silty Coarse to Fine SAND (A-2-4) with Trace Rock Fragments
2045	2,045.3	3.6	5	7	8	15		M		
2040	2,040.3	8.6	3	5	7	12		M		
2035	2,035.3	13.6	4	8	11	19		M		
2030	2,030.3	18.6	5	7	12	19		D		
2025	2,025.3	23.6	6	7	8	15		M		
2020	2,020.3	28.6	6	8	9	17		M		
2015	2,015.3	33.6	9	12	14	26		D		
2010	2,010.3	38.6	12	18	15	33		M		
2005	2,005.3	43.6	8	9	12	21		M		
2000	2,000.3	48.6	13	14	17	31		M		
1995	1,995.3	53.6	100/0.3			100/0.3				1,996.9 52.0 **WEATHERED ROCK** Brown and Gray GNEISS
										1,993.4 55.5 **RESIDUAL** Brown, Yellow and White, Silty Coarse to Fine SAND (A-2-4)
1990	1,990.3	58.6	14	21	28	49		M		
1985	1,985.3	63.6	11	38	62/0.1	100/0.6				1,984.6 64.3 **WEATHERED ROCK** Brown and Gray GNEISS
	1,982.9	66.0	60/0.0			60/0.0				1,982.9 66.0 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,982.9 ft on CRYSTALLINE ROCK (GNEISS)

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Driscoll, C.
SITE DESCRIPTION ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			**GROUND WTR (ft)**
BORING NO. LB_7872_LT	**STATION** 78+72	**OFFSET** 70 ft LT	**ALIGNMENT** -LB- / **0 HR.** 13.0
COLLAR ELEV. 1,970.5 ft	**TOTAL DEPTH** 21.0 ft	**NORTHING** 691,768	**EASTING** 937,343 / **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, E.	**START DATE** 11/15/17	**COMP. DATE** 11/15/17	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
1975										
1970	1,970.5	0.0								1,970.5 GROUND SURFACE 0.0
			2	1	2	3		M		**ARTIFICIAL FILL** Red and Black, Clayey SILT (A-5)
1965	1,967.0	3.5	8	6	6	12		M		1,965.5 5.0 Dark Brown, Silty Coarse to Fine SAND (A-2-4) with Trace Gravel
1960	1,962.0	8.5	3	2	3	5		M		
1955	1,957.0	13.5	3	2	4	6		M		1,953.0 17.5 Black, Fine to Coarse SAND (A-1) with Trace Gravel
1950	1,952.0	18.5	24	13	10	23		Sat.		1,949.5 21.0 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,949.5 ft on CRYSTALLINE ROCK (GNEISS)
	1,949.5	21.0	60/0.0			60/0.0				

NCDOT BORE DOUBLE I2513B_GEO_DBINV_GINT.GPJ NC_DOT.GDT 2/13/18

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Driscoll, C.
SITE DESCRIPTION ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			**GROUND WTR (ft)**
BORING NO. LB_7878_RT	**STATION** 78+78	**OFFSET** 57 ft RT	**ALIGNMENT** -LB- / **0 HR.** Dry
COLLAR ELEV. 1,975.3 ft	**TOTAL DEPTH** 20.6 ft	**NORTHING** 691,708	**EASTING** 937,456 / **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, E.	**START DATE** 11/22/17	**COMP. DATE** 11/22/17	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
1980										
1975	1,975.3	0.0	2	3	7	10		M		1,975.3 GROUND SURFACE 0.0
										ARTIFICIAL FILL Brown and Black, Silty Fine to Coarse SAND (A-2-4) with Trace Gravel
	1,971.8	3.5	7	12	11	23		M		
1970										
	1,966.8	8.5	2	2	2	4		M		
1965										
	1,961.8	13.5	1	1	2	3		W		1,962.8 12.5 **ALLUVIAL** Brown, Fine SAND (A-3)
1960										
	1,956.8	18.5	1	6	94/0.3	100/0.8				1,955.8 19.5
1955	1,954.7	20.6	60/0.0			60/0.0				1,954.7 20.6 **WEATHERED ROCK** White and Black GNEISS
										Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,954.7 ft on CRYSTALLINE ROCK (GNEISS)

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Driscoll, C.
SITE DESCRIPTION ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			**GROUND WTR (ft)**
BORING NO. LB_7972_RT	**STATION** 79+72	**OFFSET** 70 ft RT	**ALIGNMENT** -LB- / **0 HR.** Dry
COLLAR ELEV. 1,974.9 ft	**TOTAL DEPTH** 19.0 ft	**NORTHING** 691,788	**EASTING** 937,514 / **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, E.	**START DATE** 11/15/17	**COMP. DATE** 11/15/17	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1975										
	1,974.9	0.0	8	3	2	5		D		1,974.9 GROUND SURFACE 0.0
										ARTIFICIAL FILL Red, Clayey SILT (A-5)
	1,971.4	3.5	3	2	3	5		D		1,971.9 3.0
1970										Dark Brown, Silty Coarse to Fine SAND with Trace Asphalt, Debris, and Gravel
	1,966.4	8.5	1	1	1	2		D		1,964.9 10.0
1965										Black and Brown, Fine to Coarse SAND with Trace Gravel
	1,961.4	13.5	WOH	1	2	3		W		
1960										
	1,956.4	18.5	WOH	1	99/0.1	60/0.0				1,955.9 19.0
	1,955.9	19.0	60/0.0			100/0.6				Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,955.9 ft on CRYSTALLINE ROCK (BIOTITE GNEISS)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Driscoll, C.
SITE DESCRIPTION ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			**GROUND WTR (ft)**
BORING NO. LB_7972_RT_#2	**STATION** 79+72	**OFFSET** 70 ft RT	**ALIGNMENT** -LB- / **0 HR.** Dry
COLLAR ELEV. 1,974.9 ft	**TOTAL DEPTH** 39.0 ft	**NORTHING** 691,788	**EASTING** 937,514 / **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, E.	**START DATE** 11/15/17	**COMP. DATE** 11/15/17	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
1975										1,974.9 GROUND SURFACE	0.0
								D		**ARTIFICIAL FILL** Red, Clayey SILT (A-5)	
										1,971.9	3.0
1970								D		Dark Brown, Silty Coarse to Fine SAND with Trace Asphalt, Debris, and Gravel	
1965								D		1,964.9	10.0
										Black and Brown, Fine to Coarse SAND with Trace Gravel	
1960								W			
1955										1,955.9	19.0
							RS-5			**CRYSTALLINE ROCK** Fresh Weathering, Very Hard to Hard, Gray, White, and Black BIOTITE GNEISS with Wide Fracture Spacing (REC - 100%; RQD - 98%; GSI - 85 to 95)	
1950											
1945											
1940										1,935.9	39.0
										Boring Terminated at Elevation 1,935.9 ft in CRYSTALLINE ROCK (BIOTITE GNEISS)	

GEOTECHNICAL BORING REPORT
CORE LOG

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Driscoll, C.
SITE DESCRIPTION ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			**GROUND WTR (ft)**
BORING NO. LB_7972_RT_#2	**STATION** 79+72	**OFFSET** 70 ft RT	**ALIGNMENT** -LB- / **0 HR.** Dry
COLLAR ELEV. 1,974.9 ft	**TOTAL DEPTH** 39.0 ft	**NORTHING** 691,788	**EASTING** 937,514 / **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, E.	**START DATE** 11/15/17	**COMP. DATE** 11/15/17	**SURFACE WATER DEPTH** N/A
CORE SIZE NQ2	**TOTAL RUN** 20.0 ft		

ELEV (ft)	RUN ELEV (ft)	DEPTH (ft)	RUN (ft)	DRILL RATE (Min/ft)	RUN REC. (ft) %	RUN RQD (ft) %	SAMP. NO.	STRATA REC. (ft) %	STRATA RQD (ft) %	LOG	DESCRIPTION AND REMARKS ELEV. (ft)	DEPTH (ft)
1955.9											Begin Coring @ 19.0 ft	
1955	1,955.9	19.0	2.0	4:45/1.0 4:45/1.0	(2.0) 100%	(1.6) 80%		(20.0) 100%	(19.6) 98%		1,955.9 **CRYSTALLINE ROCK** Fresh Weathering, Very Hard to Hard, Gray, White, and Black BIOTITE GNEISS with Wide Fracture Spacing (GSI - 85 to 95)	19.0
	1,953.9	21.0	5.0	5:00/1.0 5:00/1.0 5:15/1.0 3:45/1.0 4:30/1.0	(5.0) 100%	(5.0) 100%	RS-5					
1950	1,948.9	26.0	5.0	4:45/1.0 7:30/1.0 6:45/1.0 7:00/1.0 7:15/1.0	(5.0) 100%	(5.0) 100%						
1945	1,943.9	31.0	5.0	7:00/1.0 3:15/1.0 4:15/1.0 5:00/1.0 4:45/1.0	(5.0) 100%	(5.0) 100%						
1940	1,938.9	36.0	3.0	5:00/1.0 5:45/1.0 5:00/1.0	(3.0) 100%	(3.0) 100%						
	1,935.9	39.0									1,935.9	39.0
											Boring Terminated at Elevation 1,935.9 ft in CRYSTALLINE ROCK (BIOTITE GNEISS)	

NCDOT BORE DOUBLE I2513B_GEO_DBINV_GINT.GPJ NC_DOT.GDT 2/13/18

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Grahl, D.
SITE DESCRIPTION ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			**GROUND WTR (ft)**
BORING NO. 240EB_3782	**STATION** 37+82	**OFFSET** 23 ft LT	**ALIGNMENT** -240EB- / **0 HR.** Dry
COLLAR ELEV. 2,039.7 ft	**TOTAL DEPTH** 47.7 ft	**NORTHING** 691,074	**EASTING** 936,939 / **24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 81% 02/20/2017		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Toothman, R.	**START DATE** 12/28/17	**COMP. DATE** 12/28/17	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2040										2,039.7 GROUND SURFACE	0.0
	2,039.7	0.0	2	2	4	6		M		**RESIDUAL** Red, Sandy CLAY (A-6)	
	2,037.0	2.7	4	4	7	11		M		2,037.7 Yellowish Red and Yellow to Light Brown to White, Coarse to Fine SAND (A-2-4)	2.0
2035											
	2,032.0	7.7	5	6	7	13		M			
2030											
	2,027.0	12.7	7	10	13	23		M			
2025											
	2,022.0	17.7	16	20	22	42		D			
2020											
	2,017.0	22.7	6	10	15	25		M			
2015											
	2,012.0	27.7	6	8	11	19		M			
2010											
	2,007.0	32.7	6	8	11	19		M			
2005											
	2,002.0	37.7	6	8	13	21		M			
2000											
	1,997.0	42.7	100/0.9			100/0.9				1,997.0 **WEATHERED ROCK** Brownish Gray GNEISS	42.7
1995											
	1,992.0	47.7	60/0.0			60/0.0				1,992.0 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,992.0 ft on CRYSTALLINE ROCK (GNEISS)	47.7

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Driscoll, C.
SITE DESCRIPTION ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			**GROUND WTR (ft)**
BORING NO. 240EB_4470	**STATION** 44+70	**OFFSET** 20 ft LT	**ALIGNMENT** -240EB- / **0 HR.** 15.7
COLLAR ELEV. 1,974.3 ft	**TOTAL DEPTH** 32.5 ft	**NORTHING** 691,424	**EASTING** 937,534 / **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, E.	**START DATE** 11/27/17	**COMP. DATE** 11/27/17	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
1975										1,974.3 GROUND SURFACE	0.0
	1,974.3	0.0	2	5	10	15		M		**ARTIFICIAL FILL** Black, Orange, and Red, Silty Coarse to Fine SAND (A-2-4) with Trace of Organic Matter (Rootlets), Debris, and Gravel and Some Wood Fragments	
1970	1,970.8	3.5	1	1	2	3		M			
1965	1,965.8	8.5	2	1	1	2		M			
1960	1,960.8	13.5	2	1	1	2		M			
1955	1,955.8	18.5	16	17	11	28		M			
	1,951.8	22.5	60/0.0			60/0.0	RS-4			1,951.8 **CRYSTALLINE ROCK** Fresh to Slight Weathering, Very Hard to Hard, BIOTITE GNEISS with Wide to Moderately Close Fracture Spacing (REC - 97%; RQD - 90%; GSI - 70 to 80)	22.5
1950											
1945										1,941.8 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,941.8 ft in CRYSTALLINE ROCK (BIOTITE GNEISS)	32.5

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Driscoll, C.
SITE DESCRIPTION ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			**GROUND WTR (ft)**
BORING NO. 240EB_4500	**STATION** 45+00	**OFFSET** 31 ft RT	**ALIGNMENT** -240EB- / **0 HR.** Dry
COLLAR ELEV. 1,975.5 ft	**TOTAL DEPTH** 19.6 ft	**NORTHING** 691,381	**EASTING** 937,574 / **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, E.	**START DATE** 11/20/17	**COMP. DATE** 11/20/17	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
1980										
1975	1,975.5	0.0	3	3	3	6		M		1,975.5 GROUND SURFACE 0.0
										ARTIFICIAL FILL Red, Brown, and Black, Silty Coarse to Fine SAND (A-2-4) with Trace Gravel
	1,971.7	3.8	2	1	1	2		M		
1970										1,968.5 7.0
										Black and Brown, Silty Fine to Coarse SAND (A-1) with Trace Gravel
	1,966.7	8.8	1	0	1	1		M		
1965										1,962.5 13.0
	1,961.7	13.8	1	0	1	1		M		**ALLUVIAL** Light Brown, Silty Fine to Coarse SAND (A-2-4)
1960										
	1,956.7	18.8								1,956.2 19.3
	1,955.9	19.6	WOR 60/0.0	100/0.2		100/0.2 60/0.0				1,955.9 19.6 **WEATHERED ROCK** BIOTITE GNEISS
										Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,955.9 ft on CRYSTALLINE ROCK (BIOTITE GNEISS)

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Driscoll, C.
SITE DESCRIPTION ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			**GROUND WTR (ft)**
BORING NO. 240EB_4570	**STATION** 45+70	**OFFSET** 25 ft RT	**ALIGNMENT** -240EB- / **0 HR.** Dry
COLLAR ELEV. 1,976.8 ft	**TOTAL DEPTH** 22.7 ft	**NORTHING** 691,398	**EASTING** 937,640 / **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, E.	**START DATE** 11/20/17	**COMP. DATE** 11/20/17	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1980										
	1,976.8	0.0								1,976.8 GROUND SURFACE 0.0
1975			7	7	7	14		M		**ARTIFICIAL FILL** Red and Brown, Silty Coarse to Fine SAND (A-2-4) with Trace Gravel
	1,973.3	3.5								1,973.3 3.5
			1	1	1	2		M		Black and Brown, Fine to Coarse SAND (A-1) with Trace Gravel
1970										
	1,968.3	8.5	2	1	1	2		M		
1965										1,964.8 12.0
	1,963.3	13.5	1	5	1	6		M		Black and Brown, Silty Coarse to Fine SAND (A-2-4)
1960										
	1,958.3	18.5	1	0	1	1		M		
1955										
	1,954.1	22.7	60/0.0			60/0.0				1,954.1 22.7
										Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,954.1 ft on CRYSTALLINE ROCK (GNEISS)

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Driscoll, C.
SITE DESCRIPTION ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			**GROUND WTR (ft)**
BORING NO. 240EB_4602	**STATION** 46+02	**OFFSET** 24 ft LT	**ALIGNMENT** -240EB- / **0 HR.** Dry
COLLAR ELEV. 1,978.3 ft	**TOTAL DEPTH** 21.7 ft	**NORTHING** 691,451	**EASTING** 937,666 / **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, E.	**START DATE** 11/20/17	**COMP. DATE** 11/20/17	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION — ELEV. (ft)	DEPTH (ft)
1980											
	1,978.3	0.0								1,978.3 GROUND SURFACE	0.0
			4	6	4	10		M		**ARTIFICIAL FILL** Black and Red, Silty Coarse to Fine SAND (A-2-4) with Trace Gravel	
1975	1,974.6	3.7								1,974.3	4.0
			2	1	2	3		M		Black, Brown, and Red, Silty Coarse SAND (A-1) with Trace Gravel	
1970	1,969.6	8.7									
			1	1	1	2		M			
1965	1,964.6	13.7									
			WOR	1	0	1		W			
1960	1,959.6	18.7								1,960.8	17.5
			WOR	1	5	6		W		**ALLUVIAL** Black and Brown, Silty Fine to Coarse SAND (A-2-4) with Trace Gravel	
	1,956.6	21.7								1,956.6	21.7
			60/0.0			60/0.0				Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,956.6 ft on CRYSTALLINE ROCK (BIOTITE GNEISS)	

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Driscoll, C.
SITE DESCRIPTION ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			**GROUND WTR (ft)**
BORING NO. 240EB_4820	**STATION** 48+20	**OFFSET** 25 ft RT	**ALIGNMENT** -240EB- / **0 HR.** 9.9
COLLAR ELEV. 1,974.1 ft	**TOTAL DEPTH** 35.5 ft	**NORTHING** 691,406	**EASTING** 937,884 / **24 HR.** FIAD
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		**DRILL METHOD** Mud Rotary	**HAMMER TYPE** Automatic
DRILLER Estep, E.	**START DATE** 12/18/17	**COMP. DATE** 12/19/17	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION	
1975											
	1,974.1	0.0								1,974.1 GROUND SURFACE	0.0
			6	10	8	18		D		**ARTIFICIAL FILL** Black and Brown, Silty Coarse to Fine SAND (A-2-4) with Trace Gravel	
1970	1,970.6	3.5								1,971.6	2.5
			4	1	2	3		W		**ALLUVIAL** Black and Brown, Fine to Coarse SAND (A-1) with Trace Gravel	
1965	1,965.6	8.5									
			1	1	0	1		W			
1960	1,960.6	13.5									
			2	1	1	2					
1955	1,955.6	18.5								1,955.6	18.5
			22	78/0.3		100/0.8				**WEATHERED ROCK** Gray, Black, and White BIOTITE GNEISS	
1950	1,950.6	23.5								1,950.6	23.5
			60/0.0			60/0.0				**CRYSTALLINE ROCK** Very Slight Weathering, Hard, Gray and White BIOTITE GNEISS with Close to Moderately Close Fracture Spacing (REC - 100%; RQD - 95%; GSI - 70 to 80)	
1945											
1940										1,938.6	35.5
										Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,938.6 ft in CRYSTALLINE ROCK (GNEISS)	

NCDOT BORE DOUBLE I2513B_GEO_DBINV_GINT.GPJ NC_DOT.GDT 2/13/18

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	TIP I-2513B	COUNTY BUNCOMBE	GEOLOGIST Elliott, D. C.
SITE DESCRIPTION PROPOSED RETAINING WALL ALONG I-26 & @ END OF PEARSON DRIVE			GROUND WTR (ft)
BORING NO. LB_11525_RT	STATION 115+25	OFFSET 128 ft RT	ALIGNMENT -LB-
COLLAR ELEV. 2,031.5 ft	TOTAL DEPTH 55.9 ft	NORTHING 695,168	EASTING 937,115
DRILL RIG/HAMMER EFF./DATE AFO6744 CME - 45C 92% 07/31/2017		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Cheek, D. O.	START DATE 08/30/17	COMP. DATE 08/30/17	SURFACE WATER DEPTH N/A

GROUND WTR (ft)	
0 HR.	N/A
24 HR.	48.3

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2035											
										2,031.5 GROUND SURFACE	0.0
2030										**SAPROLITE** ORNG/BROWN/GRAY SANDY-SILT w/ MICA, w/ a TR MnO from approx. 8.7' to 10.5'	
	2,028.9	2.6	7	14	10	24					
2025	2,023.9	7.6	22	28	19	47					
2020	2,018.9	12.6	10	11	18	29					
2015	2,013.9	17.6	17	24	22	46					
2010	2,008.9	22.6	19	30	31	61				2,010.7	20.8
										SAPROLITE ORNG/BROWN/GRAY SANDY-SILT w/ MICA, w/ some WHITE CRS-GRAINED PEGAMATITE LYRS INCLUDED, & w/ TR MnO scattered	
2005	2,003.9	27.6	11	17	21	38					
2000	1,998.9	32.6	17	22	48	70					
1995	1,993.9	37.6	16	38	34	72					
1990	1,988.9	42.6	24	76/0.5		100/1.0				1,990.6	40.9
										WEATHERED ROCK DARK GRAY/DARK ORNG/BROWN w/ MICA	
1985	1,983.9	47.6	38	62/0.3		100/0.8					
1980	1,978.9	52.6	42	58/0.3		100/0.8					
	1,975.7	55.8	60/0.1			60/0.1				1,975.8	55.7
										1,975.6 **CRYSTALLINE ROCK** Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,975.6 ft ON CRYSTALLINE ROCK	55.9

WBS 34165.1.2	TIP I-2513B	COUNTY BUNCOMBE	GEOLOGIST Elliott, D. C.
SITE DESCRIPTION PROPOSED RETAINING WALL ALONG I-26, INSIDE RIVERSIDE CEMETERY			GROUND WTR (ft)
BORING NO. 23NB_1945_RT	STATION 19+45	OFFSET 57 ft RT	ALIGNMENT -23NB-
COLLAR ELEV. 1,981.5 ft	TOTAL DEPTH 27.7 ft	NORTHING 692,028	EASTING 938,025
DRILL RIG/HAMMER EFF./DATE AFO6744 CME - 45C 92% 07/31/2017		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
DRILLER Cheek, D. O.	START DATE 11/02/17	COMP. DATE 11/02/17	SURFACE WATER DEPTH N/A

GROUND WTR (ft)	
0 HR.	0.0 FIAD
24 HR.	N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1985										
										1,981.5 GROUND SURFACE 0.0
1980										**ARTIFICIAL FILL** DARK BRWN & GRAY SAND-CLAY-SILT w/ TR MICA, some RND'D PEBBLES & GRAVELS, some WOOD DEBRIS, ROOTS
	1,978.7	2.8	2	3	2	5		M		1,976.8 4.7
1975	1,973.7	7.8	4	5	4	9		M		**SAPROLITE** DARK BRWN/DRK ORNG CLAY FINE/COURSE SANDY-SILT w/ MICA
1970	1,968.7	12.8	3	4	5	9		M		
1965	1,963.7	17.8	3	5	5	10		M		
1960	1,958.7	22.8	5	6	7	13		M		
1955	1,953.8	27.7	60/0.0			60/0.0				1,954.6 26.9
										1,953.9 27.6 **WEATHERED ROCK**
										1,953.8 27.7 **CRYSTALLINE ROCK** Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,953.8 ft IN CRYSTALLINE ROCK

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Elliott, D. C.
SITE DESCRIPTION PROPOSED RETAINING WALL ALONG I-26, INSIDE RIVERSIDE CEMETERY			**GROUND WTR (ft)**
BORING NO. 23NB_2225_RT	**STATION** 22+25	**OFFSET** 61 ft RT	**ALIGNMENT** -23NB- / **0 HR.** 8.3 FIAD
COLLAR ELEV. 2,008.2 ft	**TOTAL DEPTH** 40.0 ft	**NORTHING** 692,292	**EASTING** 937,954 / **24 HR.** N/A
DRILL RIG/HAMMER EFF./DATE AFO6744 CME - 45C 92% 07/31/2017		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Cheek, D. O.	**START DATE** 10/31/17	**COMP. DATE** 10/31/17	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT (0 25 50 75 100)	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
2010										
										2,008.2 GROUND SURFACE 0.0
2005	2,005.4	2.8	3	5	3	8		M		**RESIDUAL** DARK RED SAND-CLAY-SILT w/ TR MICA w/ some ORGS/ROOTS
										2,003.3 4.9
2000	2,000.4	7.8	4	4	7	11		M		**SAPROLITE** DARK RED/DARK ORNG SAND-CLAY-SILT w/ TR MICA; some mottling
			STIFF SAP, w/ some thin WR							
1995	1,995.4	12.8	8	11	9	20		M		
1990	1,990.4	17.8	10	15	17	32		M		
										1,985.4 22.8
1985	1,985.4	22.8	9	16	19	35		M		**SAPROLITE** TAN/DARK ORNG/GRAY CLAY FINE/COURSE SANDY-SILT w/ MICA
1980	1,980.4	27.8	6	8	7	15		M		
1975	1,975.4	32.8	8	13	12	25		M		
			V. STIFF SAP w/ some WR SEAMS							
1970	1,970.4	37.8	24	29	41	70		M		
	1,968.3	39.9	60/0.1			60/0.1				1,968.6 39.6
										1,968.3 39.9 **WEATHERED ROCK**
										1,968.2 40.0 **CRYSTALLINE ROCK**
										Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,968.2 ft IN CRYSTALLINE ROCK

NCDOT BORE DOUBLE I2513B_GEO_DBINV_GINT.GPJ NC_DOT.GDT 3/14/18

GEOTECHNICAL BORING REPORT
BORE LOG

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Grahl, D.
SITE DESCRIPTION ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			**GROUND WTR (ft)**
BORING NO. 240EB_4969	**STATION** 49+69	**OFFSET** 30 ft RT	**ALIGNMENT** -240EB- / **0 HR.** Dry
COLLAR ELEV. 1,996.0 ft	**TOTAL DEPTH** 10.3 ft	**NORTHING** 689,314	**EASTING** 936,709 / **24 HR.** Dry
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 81% 02/20/2017		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Toothman, R.	**START DATE** 11/20/17	**COMP. DATE** 11/20/17	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
2000										
	1,996.0	0.0								1,996.0 GROUND SURFACE 0.0
1995			2	2	5	7, 70		M		**ARTIFICIAL FILL** Reddish Yellow, Silty Coarse to Fine SAND (A-2-4)
	1,992.2	3.8	63	35	35					1,992.2 3.8 Gray and Yellowish Brown, GRAVEL (A-1)
1990										
	1,987.2	8.8	44	56/0.4						
	1,985.7	10.3	60/0.0			100/0.9, 60/0.0				1,985.7 10.3 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,985.7 ft on CRYSTALLINE ROCK (GNEISS)

WBS 34165.1.2	**TIP** I-2513B	**COUNTY** BUNCOMBE	**GEOLOGIST** Driscoll, C.
SITE DESCRIPTION ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			**GROUND WTR (ft)**
BORING NO. 240EB_5445	**STATION** 54+45	**OFFSET** 25 ft RT	**ALIGNMENT** -240EB- / **0 HR.** 15.7
COLLAR ELEV. 1,986.1 ft	**TOTAL DEPTH** 43.6 ft	**NORTHING** 691,194	**EASTING** 938,450 / **24 HR.** 12.5
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		**DRILL METHOD** H.S. Augers	**HAMMER TYPE** Automatic
DRILLER Estep, E.	**START DATE** 12/12/12	**COMP. DATE** 12/12/12	**SURFACE WATER DEPTH** N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION (ELEV. (ft) / DEPTH (ft))
1990										
	1,986.1	0.0								1,986.1 GROUND SURFACE 0.0
1985			1	3	2	5, 16		M		**RESIDUAL** Brown, White, Black, and Dark Brown, Silty Fine SAND (A-2-4) with Trace Mica
	1,982.6	3.5	4	8	8			M		
1980										
	1,977.6	8.5	24	36	35	71		M		
1975										
	1,972.6	13.5	5	8	12	20		M		
1970										
	1,967.6	18.5	7	13	19	32		M		
1965										
	1,962.6	23.5	14	15	17	32		M		
1960										
	1,957.6	28.5	14	33	59	92		M		1,955.1 31.0 **WEATHERED ROCK** Black, Brown, and Gray BIOTITE GNEISS
1955										
	1,952.6	33.5	100/0.5			100/0.5				
1950										
	1,947.6	38.5	100/0.3			100/0.3				
1945										
	1,942.6	43.5	60/0.1			60/0.1				1,942.6 43.5 / 1,942.5 43.6 **CRYSTALLINE ROCK** Brown and Black BIOTITE GNEISS Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,942.5 ft in CRYSTALLINE ROCK (GNEISS)

NCDOT BORE DOUBLE I2513B_GEO_DBINV_GINT.GPJ NC_DOT.GDT 2/13/18

GEOTECHNICAL BORING REPORT
BORE LOG

F SM 34165.1.2	NID I-2513B	WRPENC BUNCOMBE	ULRBRUDMN Driscoll, C.
MDNL I LMWAQ NDRE ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			UARPEI F NA t)HV
SRADEU ERf Y32_4009	MNTNDRE 40+09	R. . MLN CL	TBDJEOLEN -Y32- / 4 0Af Dry
WRBBTA LBL2f 2,129.2 ft	NRNTB I L(N0 20.0 ft	ERANODEU 690,115	LTMNDEU 940,539 / YK0Af FIAD
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
I ADBBLA Estep, E.	MNTANI TNL 12/19/17	WRO(fI TNL 12/19/17	MPA. TWL F TNLA I L(N0 N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
2130										2,129.2 GROUND SURFACE	0.0
	2,128.3	0.9								2,128.3 **ARTI F TCLOSTEGOLEN** Asphalt (0.0-0.2 Foot) ABC Stone (0.2-0.9 Foot)	0.9
			3	3	5	8		M		**TBBP2DTB** Tan, Pink, and White, Fine Sandy SILT (A-4)	
2125	2,125.7	3.5	3	3	4	7		M			
2120	2,120.7	8.5	3	3	5	8		M			
										2,117.2 **ALMDPTB** Brown and Gray, Silty Fine SAND (A-2-4) with Trace Manganese	12.0
2115	2,115.7	13.5	13	18	20	38		M			
2110	2,110.7	18.5	12	12	13	25		M		2,109.2 Boring Terminated at Elevation 2,109.2 ft in RESIDUAL: Silty SAND	20.0

F SM 34165.1.2	NID I-2513B	WRPENC BUNCOMBE	ULRBRUDMN Driscoll, C.
MDNL I LMWAQ NDRE ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			UARPEI F NA t)HV
SRADEU ERf Y36_1740	MNTNDRE 17+40	R. . MLN 10 ft RT	TBDJEOLEN -Y36- / 4 0Af 4.0
WRBBTA LBL2f 1,971.2 ft	NRNTB I L(N0 13.5 ft	ERANODEU 691,373	LTMNDEU 938,077 / YK0Af FIAD
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
I ADBBLA Estep, E.	MNTANI TNL 12/12/17	WRO(fI TNL 12/12/17	MPA. TWL F TNLA I L(N0 N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1975										1,971.2 GROUND SURFACE 0.0
										1,970.7 **TANDWDTB.DBB** Asphalt (0.0-0.5 Foot) 0.5
1970	1,970.7	0.5	24	8	6	14		D		1,969.2 Gray and White, Silty Coarse SAND (A-1) with Trace Gravel 2.0
	1,967.7	3.5	1	2	2	4		M		**ALMDPTB** Orange and White, Clayey Fine SAND (A-2-6) with Trace Mica
1965										
	1,962.7	8.5	3	4	6	10		M		
1960										
	1,957.7	13.5	60/0.0			60/0.0				1,957.7 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,957.7 ft on CRYSTALLINE ROCK (BIOTITE GNEISS) 13.5

GEOTECHNICAL BORING REPORT
BORE LOG

F SM 34165.1.2	NID I-2513B	WRPENC BUNCOMBE	ULRBRUDMN Driscoll, C.
MDNL I LMWAD NDRE ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			UARPEI F NA t)HV
SRADEU ERI Y36_1810	MNTNDRE 18+10	R. . MLN 6 ft RT	TBDUEOLEN -Y36- / 4 0Af 6.0
WRBBTA LBL2f 1,971.3 ft	NRNTBI L(N0 13.1 ft	ERANODEU 691,433	LTMNDEU 938,040 / YK0Af FIAD
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
I ADBBLA Estep, E.	MNTANI TNL 12/12/17	WRO(fI TNL 12/12/17	MPA. TWL F TNLA I L(N0 N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
1975											
										1,971.3 GROUND SURFACE	0.0
1970	1,970.5	0.8	8	2	4	6		M		1,970.5 ARTI F TCLOSTEGOLEN Asphalt (0.0-0.8 Foot)	0.8
	1,967.8	3.5	2	2	2	4		M		ALMD PTB Orange, Silty Fine SAND (A-2-4) with Trace Mica	
1965											
	1,962.8	8.5	3	4	5	9		M		1,963.8 Gray, Clayey Fine SAND (A-2-6)	7.5
1960	1,958.2	13.1	60/0.0			60/0.0				1,958.2 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,958.2 ft on CRYSTALLINE ROCK (BIOTITE GNEISS)	13.1

F SM 34165.1.2	NID I-2513B	WRPENC BUNCOMBE	ULRBRUDMN Driscoll, C.
MDNL I LMWAD NDRE ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			UARPEI F NA t)HV
SRADEU ERI Y36_2946	MNTNDRE 29+46	R. . MLN 22 ft RT	TBDUEOLEN -Y36- / 4 0Af 6.0
WRBBTA LBL2f 1,968.1 ft	NRNTBI L(N0 8.5 ft	ERANODEU 692,509	LTMNDEU 937,701 / YK0Af FIAD
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
I ADBBLA Estep, E.	MNTANI TNL 12/11/17	WRO(fI TNL 12/11/17	MPA. TWL F TNLA I L(N0 N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1970										
										1,968.1 GROUND SURFACE 0.0
	1,967.3	0.8	31	23	9	32		M		TBBP2DTB 1,966.1 Gray, Silty Coarse to Fine SAND (A-2-5) 2.0
1965	1,964.6	3.5	1	1	1	2		M		Highly Plastic, Orange, Clayey, Fine SAND (A-2-6)
1960	1,959.6	8.5	60/0.0			60/0.0				1,959.6 Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,959.6 ft on CRYSTALLINE ROCK (BIOTITE GNEISS) 8.5

GEOTECHNICAL BORING REPORT
BORE LOG

F SM 34165.1.2	NID I-2513B	WRPENC BUNCOMBE	ULRBRUDMN Driscoll, C.
MDNL I LMWAQ NDRE ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			UARPEI F NA t)HV
SRADEU ERI Y36_3190	MNTNDRE 31+90	R. . MLN 7 ft RT	TBDJEOLEN -Y36- / 4 0Af N/A
WRBBTA LBL2f 1,967.6 ft	NRNTBI L(N0 7.0 ft	ERANODEU 692,741	LTMNDEU 937,623 / YK0Af FIAD
DRILL RIG/HAMMER EFF./DATE TRI8016 MOBILE B-57 97% 02/24/2017		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
I ADBBLA Estep, E.	MNTANI TNL 12/11/17	WRO(fI TNL 12/11/17	MPA. TWL F TNLA I L(N0 N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
1970											
										1,967.6 GROUND SURFACE	0.0
	1,966.8	0.8								1,966.8 TANDDWOTB. DBB Asphalt (0.0-0.8 Foot)	0.8
1965			20	20	14	34		D		TANDDWOTB. DBB Brown, Silty Fine to Coarse SAND (A-2-4) with Trace Gravel	
	1,964.1	3.5	5	18	2	20		M		1,960.6 Boring Terminated at Elevation 1,960.6 ft	7.0

Notes:
Boring terminated after damaging lead auger on metal debris.

F SM 34165.1.2	NID I-2513B	WRPENC BUNCOMBE	ULRBRUDMN Grahl, D.
MDNL I LMWAQ NDRE ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			UARPEI F NA t)HV
SRADEU ERI Y36_3400	MNTNDRE 34+00	R. . MLN 16 ft RT	TBDJEOLEN -Y36- / 4 0Af Dry
WRBBTA LBL2f 1,967.4 ft	NRNTBI L(N0 10.1 ft	ERANODEU 692,941	LTMNDEU 937,554 / YK0Af N/A
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 81% 02/20/2017		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
I ADBBLA Toothman, R.	MNTANI TNL 12/08/17	WRO(fI TNL 12/08/17	MPA. TWL F TNLA I L(N0 N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
1970											
										1,967.4 GROUND SURFACE	0.0
	1,966.4	1.0								1,966.5 TANDDWOTB. DBB Asphalt (0.0-0.9 Foot)	0.9
1965			13	7	4	11		M		1,965.4 Gray, Silty Coarse to Fine SAND (A-1) with Trace Gravel	2.0
	1,963.4	4.0	3	4	4	8		W		1,963.9 TBBP2DTB Gray, Sandy CLAY (A-6)	3.5
1960										1,959.4 Brown and Gray, Silty Coarse to Fine SAND (A-2-4)	8.0
	1,958.4	9.0									
	1,957.3	10.1	100/0.3			100/0.3 60/0.0				1,957.3 FLTNOLALI ARWG White GNEISS	10.1

Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,957.3 ft on CRYSTALLINE ROCK (GNEISS)

NCDOT BORE DOUBLE I2513B_GEO_DBINV_GINT.GPJ NC_DOT.GDT 2/13/18

GEOTECHNICAL BORING REPORT
BORE LOG

F SM 34165.1.2	NID I-2513B	WRPENC BUNCOMBE	ULRBRUDMN Grahl, D.
MDNL I LMWAD NDRE ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			UARPEI F NA t)HV
SRADEU ERI Y36_3514	MNTNDRE 35+14	R. . MLN 3 ft RT	TBDJEOLEN -Y36- / 4 0Af 3.6
WRBBTA LBL2f 1,969.0 ft	NRNTBI L(N0 21.2 ft	ERANODEU 693,038	LTMNDEU 937,491 / YK0Af N/A
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 81% 02/20/2017		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
I ADBBLA Toothman, R.	MNTANI TNL 12/07/17	WRO(fI TNL 12/07/17	MPA. TWL F TNLA I L(N0 N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION ELEV. (ft)	DEPTH (ft)
1970										1,969.0 GROUND SURFACE	0.0
	1,967.6	1.4								1,968.0 TANDDVDTB. DBB Asphalt (0.0-1.0 Foot)	1.0
			13	6	4	10				1,966.5 Red and Brown, Silty Coarse to Fine SAND (A-1) with Trace Gravel	2.5
1965	1,965.0	4.0								1,964.5 TBBP2DTB Gray and Brownish Gray, Fine Sandy CLAY (A-6)	4.5
			1	1	2	3				ALMDPTB Yellowish Brown to Gray, Coarse to Fine Sandy CLAY (A-6)	
1960	1,960.0	9.0									
			2	9	14	23					
1955	1,955.0	14.0									
			3	5	4	9					
1950	1,950.0	19.0								1,951.0 Brown and Yellowish Brown, Silty Coarse to Fine SAND (A-2-4)	18.0
			4	5	7	12				1,948.5	20.5
	1,947.8	21.2	60/0.0			60/0.0				1,947.8 F LTN0LALI ARWG GNEISS	21.2

Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,947.8 ft on CRYSTALLINE ROCK (GNEISS)

F SM 34165.1.2	NID I-2513B	WRPENC BUNCOMBE	ULRBRUDMN Grahl, D.
MDNL I LMWAD NDRE ASHEVILLE - NEW ROUTE FROM NORTH SR 3548 (HAYWOOD RD) TO EXISTING US 19-23-70			UARPEI F NA t)HV
SRADEU ERf Y36_3762	MNTNDRE 37+62	R. . MLN 11 ft RT	TBDJEOLEN -Y36- / 4 0Af 3.1
WRBBTA LBL2f 1,968.0 ft	NRNTBI L(N0 10.0 ft	ERANODEU 693,252	LTMNDEU 937,365 / YK0Af N/A
DRILL RIG/HAMMER EFF./DATE TRI0055 CME-55 81% 02/20/2017		DRILL METHOD H.S. Augers	HAMMER TYPE Automatic
I ADBBLA Toothman, R.	MNTANI TNL 12/05/17	WRO(fI TNL 12/05/17	MPA. TWL F TNLA I L(N0 N/A

ELEV (ft)	DRIVE ELEV (ft)	DEPTH (ft)	BLOW COUNT 0.5ft	0.5ft	0.5ft	BLOWS PER FOOT 0 25 50 75 100	SAMP. NO.	MOI	LOG	SOIL AND ROCK DESCRIPTION
1970										1,968.0 GROUND SURFACE 0.0
	1,967.0	1.0								1,967.2 TANDDVDTB. DBB 0.8
			6	8	8	16		M		1,966.5 Asphalt (0.0-0.8 Foot) 1.5
1965	1,964.1	3.9								1,964.5 Brown, Silty Coarse to Fine SAND (A-1) with Trace Gravel 3.5
			2	5	4	9		M		Gray, Silty Coarse to Fine SAND (A-2-4) with Little Debris and Gravel
1960										TBBP2DTB
	1,959.1	8.9								1,959.5 Gray and Light Brown, Clayey, Coarse to Fine SAND (A-2-6) 8.5
	1,958.0	10.0	23	77/0.3		100/0.8				1,958.0 10.0
			60/0.0			60/0.0				F LTN0LALI ARWG Yellowish Red and Gray GNEISS

Boring Terminated WITH STANDARD PENETRATION TEST REFUSAL at Elevation 1,958.0 ft on CRYSTALLINE ROCK (GNEISS)

APPENDIX III

Historical Sanborn Fire Insurance Map, Aerial Photographs, and Topographic Maps

ASHEVILLE, N.C.
50
PEARSON DRIVE
TACOMA CIRCLE
WESTOVER DRIVE
SYLVAN AV.
WESTOVER PL.
RIVERSIDE DRIVE
TACOMA PL.
HAWTHORNE
HAWTHORNE LA.
ROSEWOOD AV.
BOT OFFICE
BURLEY TOBACCO W.HO
AUTO JUNK YARD
FILLING STA.
French Broad River
53

1957 Aerial Photograph

1963 Aerial Photograph

1975 Aerial Photograph

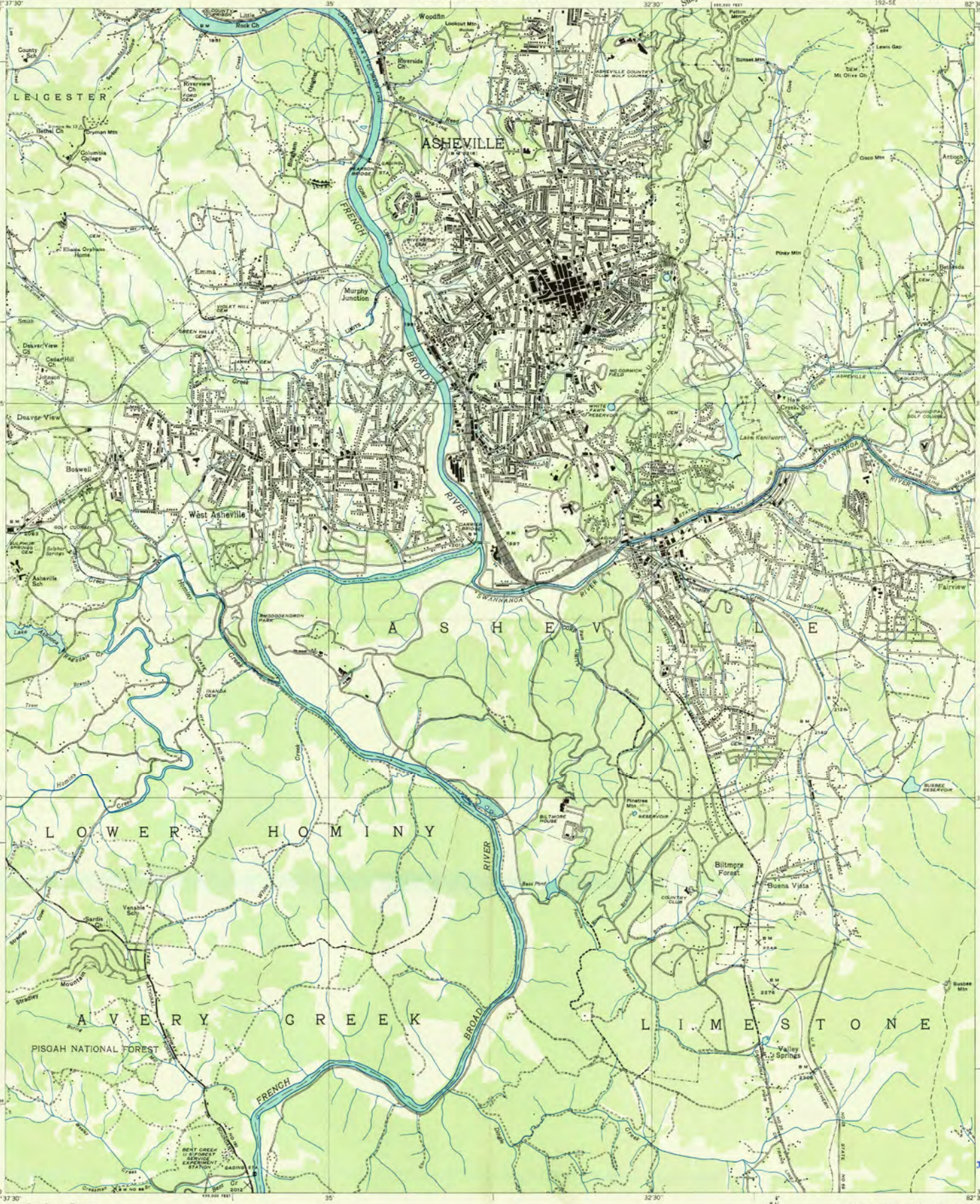
DEPARTMENT OF THE INTERIOR
U. S. GEOLOGICAL SURVEY

TENNESSEE VALLEY AUTHORITY
ARTHUR E. MORGAN, CHAIRMAN AND CHIEF ENGINEER
CARL A. BOCK, ASSISTANT CHIEF ENGINEER

Advance sheet Subject to correction

NORTH CAROLINA
(BUNCOMBE COUNTY)

7½′ ASHEVILLE QUADRANGLE



Albert Pike, Division Engineer
Compiled by U. S. Geological Survey from aerial photographs
Control by U. S. Geological Survey, U. S. Coast and Geodetic Survey and Corps of Engineers, U. S. Army
Field examination in 1936
Forest boundary by U. S. Forest Service

Scale 24,000
0 — 2 Miles
5,000 — 0 — 5,000 — 10,000 Feet

Datum is mean sea level

TRUE NORTH
MAGNETIC NORTH
APPROXIMATE MEAN DECLINATION, 1936

Polyconic projection. 1927 North American datum
10,000 foot grid based on North Carolina rectangular coordinate system

Ridge line
Trail
Probable drainage

U.S.G.S.

7½′ ASHEVILLE, N. C.
192-SE

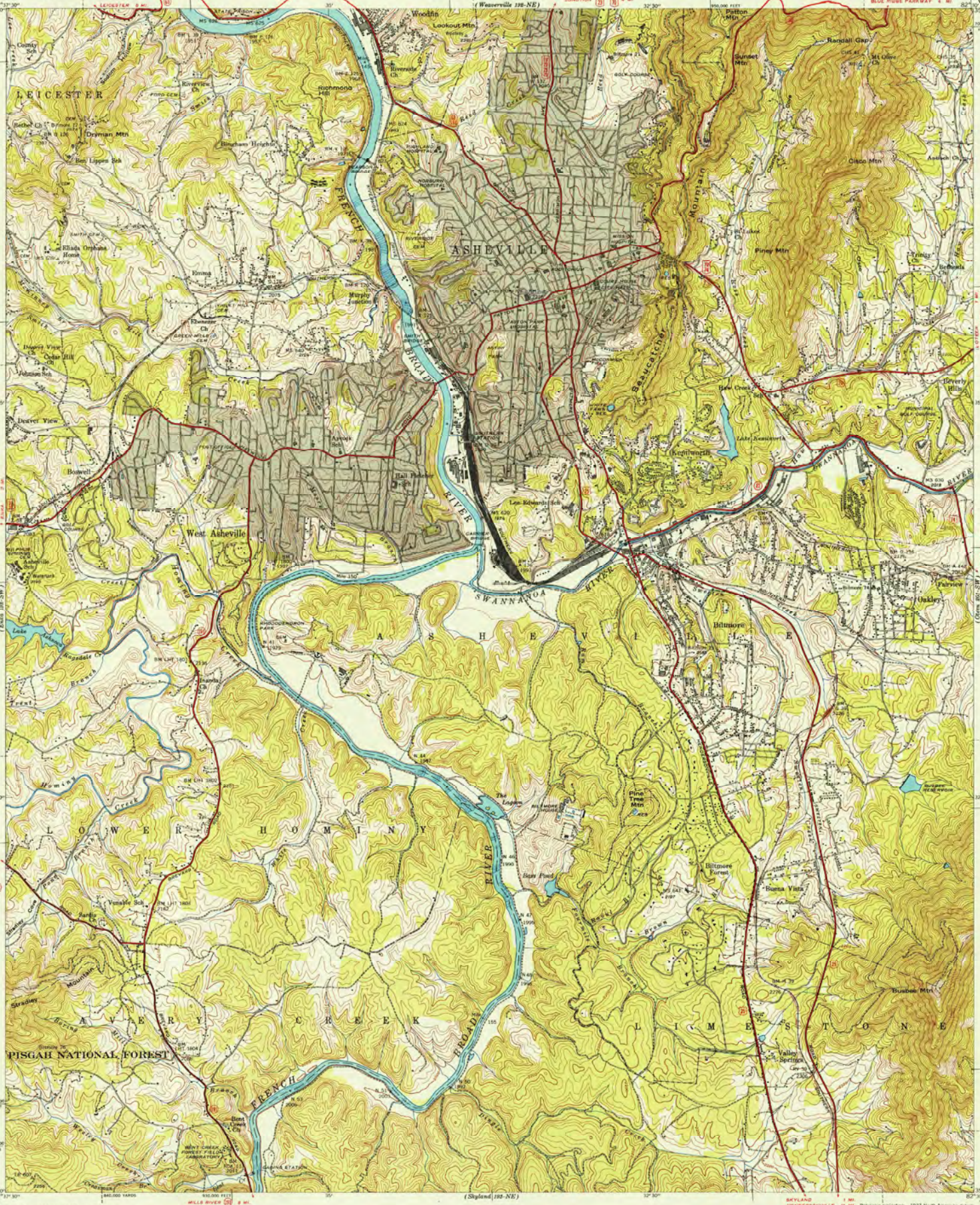
USGS FILE COPY
USGS Historical File Topographic Division

U. S. G. S.
FILE COPY
Inspection and Filing.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

UNITED STATES
TENNESSEE VALLEY AUTHORITY
MAPS AND SURVEYS DIVISION

NORTH CAROLINA
(BUNCOMBE COUNTY)
ASHEVILLE QUADRANGLE
192-SE



APPENDIX IV

Test Pit Logs

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	1
		Date:	11/13/2018
		Logged by:	Reeves
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0	Fill dirt, gravel
2	0	Glass (minimal), some metal
3	0	Bricks, glass, some metal
4	0	Metal, lots of glass, bricks, generall debris
5	0	Minimal metal, glass, general debris, some burned debris
6	0	Minimal metal, glass (mostly), rock
7	0	Metal scrapping, glass, bricks, sheet metal
8	0	Burned debris, metal, glass, bricks
9	0	Native brown/gray material and water table at 8.5'
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		

Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	2
		Date:	11/13/2018
		Logged by:	Reeves
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0.0	Glass
2	0	Tire, glass, rock, debris
3	0	Tires, glass, rock (medium size), hubcaps
4	0	Tires, glass
5	0	Tires, hubcaps, glass
6	0	Metal scraps, tires, burned trash, metal car debris, glass
7	0	Tires, metal car debris
8	0	Tires, some metal car debris
9	372	Tires, some metal car debris, axel, 55-gallon drum
10	0	Tires, metal , debris, glass
11	0	Hit native material (gray/brown) at 11'
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		

Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	3
		Date:	11/12/2018
		Logged by:	Reeves
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0.0	Bricks, metal
2	0.0	Porcelain, bricks, glass
3	0.0	Metal beam
4	0.0	Glass
5	0.0	Burned debris, glass
6	0.0	Wire, glass, crushed debris
7	0.0	Glass bottles
8	0.0	Glass, burned debris, crushed debris
9	0.0	Crushed glass and debris, some metal wire
10	0.0	Glass, some burned debris
11	0	Mostly glass
12	0	Mostly glass, some metal in side of excavation
13	0	Metal, brick, glass
14	0	Metal, glass, boulder
15	0	Water table and native material at 14.5'
16		
17		
18		
19		
20		
21		

Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	4
		Date:	11/12/2018
		Logged by:	Reeves
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0.0	Scrap metal, rock
2	0.0	Rock, brick, wood
3	0.0	Concrete debris, rock, metal wire, brick
4	0.0	Block, concrete debris (large), wheel rim, rock (large)
5	0.0	Rock, metal straps, metal car debris
6	0.0	Metal straps, large concrete blocks, car debris metal
7	0.0	Metal debris from cars, car shocks
8	0.0	car debris (metal), rock
9	0.0	car debris (metal), rock
10	0.0	Car debris, brick, metal
11	0.0	Rock, metal debris
12	0.0	Rock debris
13	0.0	Rock (large)
14	0.0	Rock (large), metal, H2O table
15	0.0	Native material (dark gray) at 15'
16		
17		
18		
19		
20		
21		

Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	5
		Date:	11/13/2018
		Logged by:	Reeves
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0.0	Asphalt layer, fill dirt
2	0.0	Fill with minimal debris
3	0.0	Minimal crushed debris
4	0.0	Burned debris (glass), bricks, porcelain
5	0.0	Burned debris (glass/metal)
6	0.0	Reddish debris w/ glass metal (H2O), burned debris
7	0.0	Burned debris (glass/metal)
8	0.0	Burned debris, crushed bottles, native material at 8'
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		

Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	6
		Date:	11/14/2018
		Logged by:	Reeves
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0	Asphalt, gravel, light brown fill with gravel
2	0	Bricks, minimal glass (mostly fill)
3	0	Mostly fill with bricks
4	0	Burned debris (slag)
5	0	Burned debris (slag), glass (minimal)
6	0	Burned debris, scrap metal (minimal)
7	0	Burned debris (minimal)
8	0	Burned debris, scrap metal (minimal), glass
9	0	Burned debris / general trash, glass
10	0	Brick/red fill, glass, burned debris
11	0	Burned debris, crushed debris
12	0	Water table @ 11.5', glass, glass and burned debris (lots of glass and bricks)
13	0	Bricks, crushed debris, some metal, rock
14	0	Native material at 13.5'
15		
16		
17		
18		
19		
20		
21		

Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	7
		Date:	11/14/2018
		Logged by:	Reeves
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0	Rock, fill, bricks
2	0	Bricks (lots), rocks, terra cotta pipe
3	0	Bricks, rock (large), red fill
4	0	Concrete, bricks
5	0	Bricks with concrete
6	0	Burned debris, glass
7	0	Burned debris, glass
8	0	Red fill with glass
9	0	Burned debris, glass (red)
10	0	Burned debris, glass (red)
11	0	Burned debris, glass at water table
12	0	Glass, burned debris (red to gray)
13	0	Glass with some burned debris (black burned debris)
14	0	Glass (mostly glass)
15	0	Glass (concrete) - black organic material at 15'
16		
17		
18		
19		
20		
21		

Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	8
		Date:	11/14/2018
		Logged by:	Reeves
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0	Red fill, bricks
2	0	Red fill with bricks and rock (medium)
3	0	Red/brown fill with bricks and rock (medium)
4	0	Brown fill with glass and small rock
5	0	Brown fill with glass and brick/burned debris
6	0	Burned debris
7	0	Black fill with glass (minimal), porcelain
8	0	Black fill with glass (minimal), porcelain
9	0	Burned debris with glass (minimal)
10	0	Glass with some metal straps; water table
11	0	Glass, small debris (glass, possible burned debris)
12	0	Native material at 11.5'
13		
14		
15		
16		
17		
18		
19		
20		
21		

Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	9
		Date:	11/13/2018
		Logged by:	Reeves
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0	Brick, general fill (minimal)
2	0	Brick, red fill (minimal)
3	0	Brick, red fill (minimal)
4	0	Burned debris, (minimal)
5	0	Burned debris, (minimal)
6	0	Burned debris, glass (minimal)
7	0	Burned debris (mostly fill)
8	0	Burned debris, bricks
9	0	Burned debris (mostly red fill)
10	0	Burned debris (mostly red fill)
11	0	Glass, burned debris
12	0	Glass, burned debris
13	0	Glass, burned debris, water table (more debris at this depth)
14	0	Burned debris, glass, wood, brick
15	0	Burned debris, glass, wood, brick (black)
16	0	Black burned debris
17	0	Black burned debris; Old fuel tank was excavated around 17' but fell from bucket before removed from test pit
18	0	Black burned debris, native sandy material at 18'
19		
20		
21		

Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	10
		Date:	11/14/2018
		Logged by:	Reeves
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0	Red fill with bricks (minimal)
2	0	Red fill
3	0	Red fill with some rock
4	0	Concrete debris (slabs)
5	0	Concrete debris (slabs)
6	0	Concrete slabs
7	0	Burned debris
8	0	Burned debris
9	2.2	Burned debris (odors similar to asphalt)
10	1.7	Burned debris (odors similar to asphalt)
11	2.4	Burned debris (odors similar to asphalt), glass
12	3.4	Burned debris (odors similar to asphalt), glass, asphalt pieces
13	4.2	Burned debris (odors similar to asphalt), small metal bucket (28.9 ppm PID reading), metal pieces
14	1.2	Burned debris (odors similar to asphalt)
15	0	Native material at 15'
16		
17		
18		
19		
20		
21		

Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	11
		Date:	11/13/2018
		Logged by:	Reeves
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0	Rock, gravel, brick
2	0	Rock, gravel, brick
3	0	Rock, gravel, brick
4	0	Glass, rock, brick
5	0	Burned debris, glass
6	0	Burned debris, glass
7	0	Burned debris, glass
8	0	Burned debris (glass)
9	0	Burned debris (glass)
10	0	Glass
11	0	Burned debris, glass, water table
12	0	Tire, glass, metal (sheet)
13	0	Metal scrap, glass; native material at 13'
14		
15		
16		
17		
18		
19		
20		
21		

Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	12
		Date:	11/15/2018
		Logged by:	Stahl
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0.5	Gravel, reddish brown soil, asphalt
2	1.6	Wood, broken glass, charred debris
3	1.6	Wood, bottles, black charred debris
4	0.1	Metal wire, bands, black charred debris
5	2.5	Metal wire, bands, black charred debris
6	1.2	at 5.5' - layer of black incinerated debris; metal, glass, paper/wood
7	0.1	same as above - maybe more metal
8	0.1	water at 7'; grayish sandy silt with clay mixed with above
9	0	Black incinerated material and gray sediment @ 8 feet
10	1.5	8.5' root mats, gray sandy silt, various landfill debris; bottles, wire, grayish sediment bed springs. Native reddish light brown silty sand at 9 feet
11		
12		
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21		

Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	13
		Date:	11/15/2018
		Logged by:	Stahl
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0	Asphalt, gravel, tan-brown sand
2	0.7	Black incinerated debris, wood, glass, tan soil
3	3.3	Same as above; more gravel and sandy soil
4	3.5	Buried metal and wood
5	0.2	Black incinerated debris, metal, wood, bottles, shoe
6	1.5	Layered plywood (possibly) and black debris as above, wood products
7	0.6	Black incinerated debris, as above
8	0.1	Water @ 6.5-7 feet, same as above, more layered wood or cardboard? (hard)
9	0.2	Same as above, bed springs, metal rods
10	0.2	Same as above
11	0.3	Same as above
12	0.1	Native yellowish tan sand and schist bedrock boulders at 9.5-10 feet
13		
14		
15		
16		
17		
18		
19		
20		
21		

Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	14
		Date:	11/15/2018
		Logged by:	Stahl
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0.1	Gravel, fill brown sand, minor debris
2	0.1	Black fill debris, incinerated, glass, misc fragments
3	0.1	Same as above, metal sheeting
4	0.2	Same as above, bottles, shoe, wood, cables
5	0.3	Same black fill debris, wire, dark brown to black sandy substance
6	0.1	Same as above; stiff grayish black clay @ 6.5 ft
7	-	Water @ 7 ft; same fill debris as above
8	0.4	Metal, bottles, wire, wood, etc.
9	0.1	Same as above
10	0.0	Same as above
11	0.0	Yellowish brown silty sand at 10.5 ft - Native material same to 11.5 ft
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Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	15
		Date:	11/15/2018
		Logged by:	Stahl
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0	Gravel fill; brick, broken glass, wood
2	1.7	Black fill dirt; wood, bottles, metal shards; bricks; bike
3	1.6	Same as above; wire, cans, plastic
4	0.9	Same as above, brick, wood
5	1.9	Same as above, more soil matrix
6	0.7	Same as above, more glass/bottles
7	0.1	Same as above, wire, metal scraps; water table at 6.5'
8		Same as above, paint can lids, some gray sandy silt (native material) at 8'
9	0.1	Gray, sandy, clayey silt at 9'
10	0	
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Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	16
		Date:	11/15/2018
		Logged by:	Stahl
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0.0	Dark brown to reddish brown gravel with sand, bottles, debris @ 1 ft
2	0.3	Black incinerated fill debris, wood, bottles, glass, wire, tire
3	1.4	Same as above, more wood, roots, fabric
4	2.7	Same as above
5	1.5	Same as above with medium brown sandy layer
6	1.2	Black incinerated debris, glass, bottles, hoses - some brown sandy mixture within
7	0.7	Gray silty sand (native material) at 6.5 ft
8	0.3	Same as above; native material confirmed
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Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	17
		Date:	11/16/2018
		Logged by:	Reeves
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0	Brown fill with glass, large rock
2	0	Brown fill with glass, scrap metal (car debris)
3	0	Car axle, brown fill
4	0	Car debris, brown fill
5	0	Car debris, brown fill
6	0	Car debris, brown fill
7	0.2	Car debris, tarp-like material, roots
8	0	Mostly fill
9	0	Mostly fill, some glass/burned debris
10	0	Fill with glass/burned debris
11	0	Fill with glass
12	0	Fill with glass
13	0	Starting to hit water, glass (glass burned), (99 car from side wall)
14	0	Glass layer, native at 13.5' (reddish to gray sand)
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Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	18
		Date:	11/16/2018
		Logged by:	Reeves
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0	Brown fill
2	0.4	Brown fill with glass
3	0	Brown fill with glass
4	0.2	Brown fill with min. sheetmetal scraps
5	0	
6	0.1	Mostly fill, min. debris
7	0	Mostly fill, min. debris, no debris
8	0	Same as above
9	0	Mostly fill, very min. glass
10	0	Mostly fill, very min. glass
11	0	Water at 11', glass layer from 10-11'
12	0	Yellow/brown sand (native material at 12'
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Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	19
		Date:	11/16/2018
		Logged by:	Reeves
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0	General fill with small rock
2	0	General fill with small rock
3	0.1	Fill with very min. debris, some scrap metal
4	0	Glass, scrap metal (min.), brick, burned debris
5	0.5	Burned debris with glass
6	0.4	Burned debris, glass, wood
7	0.7	Burned debris, glass, wood, scrap metal
8	5.0	Burned debris, glass, scrap metal (min.)
9	4.6	Same as above
10	3.1	Same as above, asphalt
11	4.5	Same as above
12	3.1	Same as above, more metal, lots of glass, hit water
13	3.4	Large metal piece, burned debris
14	0.9	Burned debris
15	0	Native @ 15' (gray sandy silt)
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Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	20
		Date:	11/16/2018
		Logged by:	Reeves
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0	Red fill with small to medium rock, roots
2	0	Red fill with small to medium rock
3	0	Red fill with small to medium rock, roots, swiltering lz brownfill
4	0	Car hood, brown fill
5	0	Large metal car debris
6	0	Car fender, car debris
7	0	Brown fill with glass, small rock, some car debris
8	0	Brown fill with glass, small
9	0	Brown fill with glass, small
10	0	Glass, burned debris, red material
11	0	Red material, roots
12	0.6	Incinerated layer to sandy
13	0	Sandy mixed with burned layer / native gray yellow sand layer @ 13.5'
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19		
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Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	21
		Date:	11/16/2018
		Logged by:	Reeves
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0	Red fill with concrete (crushed) and layer gravel pieces
2	0	Red fill with concrete (crushed)
3	0.7	Brown fill with glass, bricks, metal scrap
4	1.5	Brown fill with metal scrap, concrete, fuel smell
5	0.8	Brown fill, min. debris, some concrete, fuel smell
6	1.4	Brown fill, glass (min.), bricks, rock
7	0.9	Brown fill, rock
8	0.9	Brown fill, wood, rock
9	1.9	Incinerated debris, glass, slay, scrap metal (small)
10	2.9	Brick, glass wood
11	4.3	Brick, glass, scrap metal
12	2.1	Incinerated debris
13	0.1	Incinerated debris, wood
14	3.7	Incinerated debris, glass, roots
15	1.4	Incinerated debris, glass, rock
16	0.0	H2O table, rock, glass, native (yellow gray) @ 16'
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Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

	Test Pit Observation Log TIP Number I-2513B, WBS Number 34165.1.9 Preliminary Site Asessment, Four Parcels Buncombe County, North Carolina	Test Pit ID:	22
		Date:	11/12/2018
		Logged by:	Reeves
		Operator:	D. Hallman

Depth (ft bls)	PID (ppm)	Material Description
1	0.0	Empty conduit, glass
2	0.0	Bricks, glass
3	0.0	Metal debris, glass
4	0.0	Metal debris, glass, bricks
5	0.0	Possible incinerated trash, glass
6	0.0	Burned debris
7	0.0	Metal rod, burned debris
8	0.0	General waste, burned debris
9	0.0	Burned debris, bricks
10	0.0	Bricks
11	0.0	Burned debris, metal sheet
12	0.0	Bricks, metal debris, burned debris
13	0.0	Bricks, burned debris
14	0.0	Burned debris, bricks
15	0.0	Hit water table, misc. debris
16	0.0	Hit native gray-brown soil at 15.5'
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Note: This observation log details the various types of debris encountered during excavation. In most cases, the listed debris was intermixed with soil and was not a layer consisting only of that debris. Buried debris was observed in each test pit.

APPENDIX V

Test Pit Photographs

Photograph 1: Typical car debris encountered in the test pits, including car door and axel (Test Pit 17).

Photograph 2: Typical car debris encountered in test pits, including car door, and underpanel (Test Pit 20).

Photograph 3: Typical car debris encountered in test pits, including car shocks and rims (Test Pit 4).

Photograph 4: View of the sidewall in Pit 4, showing various metal car debris (Test Pit 4).

Photograph 5: View of the sidewall in Pit 4, showing various metal car debris (Test Pit 17).

Photograph 6: View of tires and a car axle (Test Pit 2).

Photograph 7: View of tires and metal car debris (Test Pit 2).

Photograph 8: View of the drum that was overpacked, profiled, and properly disposed offsite (Test Pit 2).

Photograph 9: Typical view of burned debris, including miscellaneous metal and wood pieces intermixed with soil (Test Pit 13)

Photograph 10: Typical view of burned debris, including glass and miscellaneous metal intermixed with soil (Test Pit 13)

Photograph 11: Typical view of burned debris, including glass, metal scrap, and miscellaneous materials intermixed with soil (Test Pit 15)

Photograph 12: Typical view of burned household debris and a tire (Test Pit 16)

Photograph 13: Typical view of small incinerated material, which appeared to be melted glass that formed small, dense pieces (Test Pit 9).

Photograph 14: Typical view of excavated layer of predominantly incinerated material mixed with glass (Test Pit 9).

Photograph 15: Stratification of Test Pit 5, displaying layer of fill on top of layers of burned debris.

Photograph 16: Stratification of Test Pit 9, displaying layer of crushed brick fill on top of layers of burned debris.

Photograph 17: Layer of predominantly crushed glass from Test Pit 8.

Photograph 18: Typical view of miscellaneous glass intermixed mostly with soil (Test Pit 1).

Photograph 19: Typical view of crushed glass intermixed with burned debris (Test Pit 7).

Photograph 20: Typical view of glass intermixed with soil and miscellaneous debris (Test Pit 6).

Photograph 21: View of concrete slabs and soil from Test Pit 10.

Photograph 22: Typical view of crushed brick fill overlaying a portion of the site (Test Pit 9).

Photograph 23: Typical view of layers within excavations with a mixture of concrete and rock, glass, and miscellaneous debris that is intermixed with minor quantities of soil (Test Pit 7).

Photograph 24: Typical view of layers within excavations that are predominantly soil intermixed with small quantities of glass, bricks, and miscellaneous debris (Test Pit 21).

Photograph 25: View of the material from Test Pit 10 that displayed an asphalt-like odor that was intermixed with glass and metal and contained low, but detectable PID readings.

Photograph 26: Typical view of excavated material that contained a majority of fill soil with minor buried debris (Test Pit 8).

Photograph 27: View of a layer of excavated material that was predominantly bricks, glass, and burned debris with minor quantities of soil (Test Pit 6).

Photograph 28: Typical view of excavated material with glass and wood debris (Test Pit 12).

Photograph 29: Typical view of native sediment encountered at the bottom of each test pit (Test Pit 1).

Photograph 30: Typical view of native sediment encountered at the bottom of each test pit (Test Pit 8).

APPENDIX VI

Drum Disposal Manifest

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
VSQG		803-957-9175	18110368-01

5. Generator's Name and Mailing Address
DOT-NC
468 Riverside Dr
Asheville, NC 28801 USA
Generator's Phone:

Generator's Site Address (if different than mailing address)

6. Transporter 1 Company Name: A&D ENVIRONMENTAL SERVICES (SC), LLC
U.S. EPA ID Number: SCD987598331

7. Transporter 2 Company Name
U.S. EPA ID Number

8. Designated Facility Name and Site Address
A&D ENVIRONMENTAL SERVICES (GA) LLC
100 WASTE RESEARCH DRIVE
MACON, GA 31206
Facility's Phone: 478-788-8899
U.S. EPA ID Number: GAR000007484

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
	1. NON REGULATED MATERIAL ~~PENDING ANALYSIS~~ Sludge	001	DM	400	P	
	2.					
	3.					
	4.					

13. Special Handling Instructions and Additional Information
Project # 1811-0368

14. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and ~~national~~ governmental regulations.

Generator's/Offeror's Printed/Typed Name: X Andrew Stahl, Agent for NCDOT
Signature: X
Month 11 Day 15 Year 18

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

16. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: Taji Caughman
Signature
Month 11 Day 15 Year 18
Transporter 2 Printed/Typed Name
Signature
Month Day Year

17. Discrepancy
17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
17b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:
17c. Signature of Alternate Facility (or Generator)
Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a
Printed/Typed Name: Marc R Ruz
Signature
Month 12 Day 10 Year 18

GENERATOR — INT'L — TRANSPORTER — DESIGNATED FACILITY