Results of Post-Data Gap Assessment

828 Martin Luther King Jr. Blvd. Property
Chapel Hill, North Carolina

H&H Job No. TCH-009
December 1, 2020

NORTH CAROLINA LICENSED SEAL 2257 GEOLOGIST JUSTIN C. BALLARD

12/1/20

Hart & Hickman CELEBRATING 25 YEARS OF SMARTER ENVIRONMENTAL SOLUTIONS

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS

#C-1269 Engineering
#C-245 Geology

2923 South Tryon Street, Suite 100
Charlotte, NC 28203
704.586.0007 main

3921 Sunset Ridge Rd , Suite 301
Raleigh, NC 27607
919.847.4241 main

www.harthickman.com

Results of Post-Data Gap Assessment
828 Martin Luther King Jr. Blvd. Property
Chapel Hill, North Carolina
H&H Job No. TCH-009

Table of Contents

1.0 Introduction 1
2.0 Scope of Work 3
2.1 Drainage Pathway Soil and Soil/CCP Sampling Activities 3
2.2 Monitoring Well Installation 4
2.3 Monitoring Well Sampling 7
2.4 Laboratory Analyses 8
2.5 Quality Assurance/Quality Control (QA/QC) 8
3.0 Results Summary 10
3.1 Drainage Pathway Soil/CCP Analytical Data 10
3.2 Fill Materials Assessment 12
3.3 Groundwater Elevation Data 13
3.4 Groundwater Analytical Data 15
3.5 QA/QC Sample Summary 17
4.0 Conclusions 18

List of Tables

Table 1 Summary of Soil Analytical Data

Table 2 Monitoring Well Construction Details and Groundwater Elevation Data

Table 3 Summary of Groundwater Analytical Data

Table 4 Summary of Groundwater Geochemical Parameters

List of Figures

Figure 1 Site Location Map

Figure 2 Sample Location Map

Figure 3 Cross-Section Transect Map

Figure 4 Cross-Section A-A'

Figure 5 Conceptual Diagram of Relationship Between Perched Groundwater and Unconfined Aquifer

Figure 6 Unconfined Aquifer Potentiometric Map

List of Appendices

Appendix A Boring Logs, Well Construction Records, and Well Abandonment Records

Appendix B Roto-Sonic Drilling Core Photographs

Appendix C IDW Disposal Manifest

Appendix D Low Flow Groundwater Sampling Records

Appendix E Laboratory Analytical Reports

Results of Post-Data Gap Assessment
828 Martin Luther King Jr. Blvd. Property
Chapel Hill, North Carolina
H&H Job No. TCH-009

1.0 Introduction

Hart & Hickman, PC (H&H) has prepared this report to document the methods and results of post-data gap environmental assessment conducted at the property located at 828 Martin Luther King Jr. Blvd. in Chapel Hill (Site or subject Site). The Site is comprised of one land parcel that is approximately 10.24 acres in size and contains a two-story approximately 35,000 sq. ft building located in the north-central portion of the Site that is currently used for police department operations. The Site topography consists of an elevated area where the police building and associated parking lots are located which slopes along an embankment to the south to a lower area along Bolin Creek where the Bolin Creek Trail is located. Site topography is indicated in Figure 1.

Previous assessment activities indicate that the Site was initially used as a borrow pit from the late 1950s to early 1960s, and then was used as a fill Site from the mid-1960s to the mid-1970s. It was reported that the fill initially consisted of construction debris, and then coal combustion products (CCPs) were placed above the construction debris for structural fill. Previous environmental assessment activities were conducted from 2013 to 2017 which culminated in the completion of a Phase II Remedial Investigation (RI) Report for the Site dated August 14, 2017. Additional background information and the results of previous assessment activities are provided in the Phase II RI Report.

In 2019, the Town of Chapel Hill (Town) contracted Duncklee & Dunham (D&D) and Dr. Ken Rudo of Rudo Toxicological Consultants (Rudo) to complete a Human Health and Ecological Risk Assessment for the subject Site. Prior to performing the Human Health and Ecological Risk Assessment, D&D and Rudo identified certain data gaps and requested that additional assessment be completed to support the risk assessment activities. H&H performed the assessment activities in April 2019 which included collection and analysis of groundwater

samples from the existing monitoring well network, and collection and analysis of indoor air, soil, CCP, sediment, and surface water samples. Results from the April 2019 assessment activities are documented in a Results of Data Gap Sampling Report dated May 23, 2019. The results of Phase II RI and data gap sampling activities are also summarized in the attached summary tables.

Following completion of data gap sampling activities, the Town requested that H&H perform the following additional assessment (referred to herein as post-data gap assessment):

- Collect samples in drainage pathways along the lower portion of Site to evaluate near surface (0-2 inch) concentrations of metals in soil/CCPs. Previous samples from these areas had been collected starting at a depth of 2 inches.

- Expand the existing monitoring well network to further evaluate the location of CCPs in relation to the water table.

H&H performed these activities in August and September 2019 and February 2020. A brief description of the methods and results of the post-data gap assessment activities are provided below.

It should be noted that Interim Remedial Measures (IRMs) are currently being implemented at the Site which will include excavation and off-Site disposal of erosional CCPs in Areas G, H, and I (Figure 2). As such, some sample locations from drainage pathways which are documented in this report have or are in the process of being excavated.

2.0 Scope of Work

H&H performed post-data gap assessment activities on August 27, 2019, from September 23 through 26, 2019, and from February 6 through 13, 2020. The assessment activities were conducted in general accordance with the North Carolina Department of Environmental Quality's (DEQ's) Inactive Hazardous Sites Branch (IHSB) *Guidelines for Assessment and Cleanup* (Guidelines) and most recent versions of the U.S. Environmental Protection Agency (EPA) Region IV Science and Ecosystem Support Division (SESD) *Field Branches Quality System and Technical Procedures*.

Prior to conducting the assessment activities, H&H contacted North Carolina 811 One-Call, the public utility locator service, to mark subsurface utilities at the Site. In addition, H&H obtained a bedrock well permit (W20-0030) from the Orange County Health Department on February 4, 2020 prior to installation of bedrock well MW-11D.

After collection, sample locations (other than the existing surveyed monitoring wells) were estimated using a sub-meter global positioning system (GPS) unit. The locations of historical and recently collected groundwater and drainage pathway samples are provided in Figure 2.

2.1 Drainage Pathway Soil and Soil/CCP Sampling Activities

H&H conducted the sampling of drainage pathways identified in the lower portion of the Site between the embankment and Bolin Creek on August 27, 2019. Based on a request by D&D, a soil sample was also collected in the vicinity of previously advanced boring SS-3. Sampling activities included advancement of seven shallow (approximately 0-2 inches below ground surface [bgs]) soil borings in the following locations using a decontaminated stainless-steel hand trowel:

- H&H collected samples of soil/CCPs at previously sampled locations SS-3A, SED-11, SED-16, and SED-17. Previous samples from these locations were collected from these borings at approximately 2-6 inches bgs with the exception of SS-3, which

was collected from approximately 2-12 inches bgs. The borings were advanced near or within erosional CCP Areas H (SS-3A, SED-16, and SED-17) and I (SED-11).

- H&H collected samples of soil at previously sampled locations SED-12, SED-13, and SED-15. Historical samples from these locations were collected from these borings at approximately 2-6 inches bgs. These samples were collected outside of erosional CCP Areas G, H, and I.

At each location, soil and soil/CCP samples were collected for laboratory analysis from the center of the decontaminated hand trowel, homogenized in a stainless-steel bowl, and then the samples were placed into laboratory containers for analysis. Locations of soil and soil/CCP sampling locations are shown on Figure 2.

2.2 Monitoring Well Installation

On September 23 and 24, 2019 H&H contracted with SAEDACCO to install three additional permanent monitoring wells (MW-1A, MW-8, and MW-9) and one temporary monitoring well (TMW-10) via roto-sonic drilling techniques within the fill areas at the Site. Based upon field observations during the September 2019 drilling activities and water level data collected after the well installations, both which indicated the potential presence of perched groundwater zones in the fill materials, SAEDACCO returned to the Site on February 5 through 11, 2020 to install one permanent bedrock monitoring well (MW-11D) via hollow-stem auger/air rotary drilling techniques below the fill materials adjacent to well MW-9. A perched groundwater zone is a layer of groundwater that is separated from the underlying main aquifer zone by a zone which does not contain groundwater. A zone of perched groundwater is typically underlain by a layer of soil or rock which has a lower permeability than the surrounding area which limits downward percolation of groundwater.

Permanent and temporary monitoring well locations (denoted by MW and TMW nomenclature, respectively) are shown on Figure 2 and were advanced in the following locations:

- MW-1A was installed in the vicinity of existing monitoring well MW-1 in the western portion of the CCP placement area. MW-1 was installed by Falcon Engineering (Falcon) in 2013 and H&H was unable to locate a boring log for MW-1 from Falcon's reports. As such, MW-1A was installed to provide lithologic information for the MW-1 area. In addition, MW-1A was installed to evaluate discrepancies between CCP-related information provided in Falcon's reports and the driller's log for nearby historical boring GP-1. MW-1A was also installed because groundwater samples from well MW-1 have indicated elevated turbidity during some previous sampling events which resulted in concern that sample analytical results from well MW-1 may be impacted by turbidity.

- MW-8 was installed in the vicinity of historical boring GP-6 to verify the location of CCPs in the eastern portion of the CCP placement area relative to the water table and to provide additional groundwater data in the fill area.

- MW-9 was installed in the vicinity of historical borings GP-2/GP-3 to verify the location of CCPs in the western portion of the CCP placement area relative to the water table and to provide additional groundwater data in the fill area.

- TMW-10 was installed in the vicinity of historical boring GP-11 to verify the location of CCPs in the western portion of the CCP placement area relative to the water table and for the purpose of collecting one-time depth to groundwater information.

- MW-11D was installed adjacent to MW-9 to further evaluate potential perched water conditions identified in association with wells MW-9 and MW-1A, and to provide representative samples of groundwater below the fill not impacted by perched water conditions (if present).

The first five feet of each boring were advanced using a decontaminated stainless-steel hand auger. During drilling, continuous soil samples were collected from the monitoring well borings and logged for lithologic description and screened using visual and olfactory methods for obvious evidence of non-CCP attributes (i.e., staining and/or unusual odors) and for the presence

of volatile organic vapors using a calibrated photoionization detector (PID). No obvious evidence of non-CCP attributes was observed in the monitoring well borings. The boring logs are provided in Appendix A. Photographs of cores from the roto-sonic drilling are included in Appendix B.

With the exception of MW-11D, the monitoring wells are constructed of 2-inch diameter PVC with 15 ft of pre-packed well screen (to reduce turbidity) set to bracket the first encountered water zone and 2-inch diameter PVC well casing from the top of the well screen to the ground surface. Monitoring wells MW-1A, MW-8, MW-9, and TMW-10 were installed to depths of 40 ft bgs, 44.5 ft bgs, 45 ft bgs, and 40 ft bgs, respectively. To install bedrock monitoring well MW-11D, hollow-stem augers were advanced to a depth of approximately 43 ft bgs (approximate bedrock interface with partially weather rock [PWR]) followed by an air rotary hammer to approximately 45 ft bgs. A 6-inch diameter PVC outer well casing was then installed and grouted with Portland cement to the ground surface. Once the grout solidified after a period of approximately 24 hours, the drill rig advanced the air rotary hammer within the outer casing to a depth of approximately 56 ft bgs.

Filter sand packs were installed from the bottom of each well boring to approximately 2 ft above each well screen, and an approximately 2-foot hydrated bentonite seal was then installed above the filter sand pack followed by AQUAGUARD® well grout (a bentonite well seal mixture) to the ground surface. During well installation for MW-11D, grout inspections of the inner and outer casings were performed by the Orange County Health Department. All monitoring wells were completed flush with the ground surface inside flush mount manholes secured with 2 ft by 2 ft concrete pads. After collection of water levels in TMW-10, the casing was pulled from the boring and the well boring was grouted with cement grout. A summary of well construction and groundwater elevation information is provided in Table 1. Monitoring well boring logs, well construction records, and the well abandonment record for temporary monitoring well TMW-10 are provided in Appendix A.

Because of the presence of CCPs in some of the well boring soil cuttings, investigation derived waste (IDW) from the drilling activities was containerized in 55-gallon drums and stored on-Site.

Following receipt of waste characterization data, the 55-gallon drums were transported off-Site by A&D Environmental Services, Inc. to a permitted facility. A copy of the Non-Hazardous Materials Manifest is included in Appendix C. Based upon the previously collected groundwater analytical data indicating that metals concentrations do not exceed toxicity characteristic hazardous waste thresholds, decontamination and well development water were spread/discharged on the ground in accordance with DEQ IHSB Guidelines.

During drilling activities, H&H monitored dust levels using a TSI DustTrak DRX to monitor for potentially elevated dust levels that could lead to dust migration from the area of drilling. There were no dust levels significantly above background during the drilling activities.

2.3 Monitoring Well Sampling

H&H collected groundwater samples from newly installed monitoring wells MW-1A, MW-8, and MW-9 on September 26, 2019. On February 12, 2020, H&H returned to the Site to collect groundwater samples from existing monitoring well MW-9 and adjacent newly installed bedrock monitoring MW-11D. Before each sampling event, all Site monitoring wells were gauged for depth to water. After gauging, the monitoring wells which were to be sampled were purged to ensure that water samples obtained from the wells were representative of perched water in the fill or non-perched groundwater. Purging and sampling of the monitoring wells were completed using low flow/low stress method in general accordance with EPA Region 4 SESD protocol. Monitor well MW-9 was purged and sampled using a peristaltic pump with new polyethylene tubing. Due to depths to water greater than 25 ft, monitoring wells MW-1A, MW-8, and MW-11D were purged and sampled using decontaminated bladder pumps connected to new polyethylene tubing.

During purging, field measurements of pH, temperature, dissolved oxygen, oxidation reduction potential, turbidity, and conductivity were collected at 3 to 5-minute intervals. Purging was considered complete when water quality parameters stabilized (i.e., pH ± 0.1 SU, conductivity varies no more than 5%, and turbidity is less than 10 Nephelometric Turbidity Units [NTUs]). H&H was able to obtain samples with turbidity less than 10 NTUs at each monitor well. The low flow groundwater sampling records are provided in Appendix D.

2.4 Laboratory Analyses

Based upon previous analytical data, the groundwater and drainage pathway soil/CCP samples were analyzed for the Site metals of concern: arsenic, barium, beryllium, cadmium, total chromium, cobalt, copper, manganese, mercury, nickel, and selenium by EPA Methods 6020/7470/7471 and strontium by EPA Method 6010. Soil/CCP samples were also analyzed for hexavalent chromium by EPA Method 7199. In addition, groundwater samples collected from MW-9 and MW-11D during the February 2020 event were analyzed for alkalinity, sodium, calcium, magnesium, and potassium to further evaluate groundwater geochemistry to assist with distinguishing potential perched water in the fill from non-perched groundwater.

Upon collection, samples were placed directly into laboratory-supplied sample containers. After sample collection, sample containers were sealed, labeled, placed into a laboratory-supplied sample cooler, and covered with ice. The coolers were then delivered under standard chain-of-custody protocols to Pace Analytical Services, LLC (Pace).

2.5 Quality Assurance/Quality Control (QA/QC)

In addition to standard analytical method QA/QC procedures performed by the laboratory, H&H conducted the following field QA/QC activities:

- Non-dedicated equipment and tools were decontaminated prior to use at each boring or sampling location, or following exposure to soil/CCPs or groundwater.

- A duplicate groundwater sample was collected from MW-9 during the February 2020 sampling event to evaluate data reproducibility.

- Equipment blanks were collected by passing laboratory supplied deionized water through decontaminated equipment prior to use and then collecting the water for analysis of the same list of metals as the corresponding samples. A groundwater sample rinse blank was collected during the September 2019 sampling event by pouring the water through the

peristaltic pump tubing (sample labeled RB). The soil/CCP rinse blank was collected by pouring water over the decontaminated hand trowel during the August 2019 sampling event (sample labeled EB-1).

3.0 Results Summary

The results of analysis of the post-data gap samples are summarized in Tables 1 through 4 along with the historical analytical data. In the tables, the September 2019 sample dates are highlighted in orange, and the February 2020 sample dates are highlighted in blue for ease in referencing the additional data. As was submitted with the May 23, 2019 Results of Data Gap Sampling Report, the April 2019 sample dates are highlighted yellow. The non-highlighted sampling dates were conducted as part of the Phase II RI or pre-Phase II RI activities in the 2013 to 2016 timeframe. The laboratory analytical data is provided in Appendix E. Some observations concerning the data are provided in the following sections.

3.1 Drainage Pathway Soil/CCP Analytical Data

The soil/CCP analytical data are summarized in Table 1. The data in Table 1 are compared to Site-specific background sample concentrations and DEQ's Preliminary Soil Remediation Goals (PSRGs) dated July 2020. Note that the range of soil background concentrations and the 95% Upper Confidence Level (UCL) of the mean of the background data are provided in Table 1 and are based upon the results of analysis of the Phase II RI background samples collected in November 2016 and the additional background samples collected in April 2019.

The results of analysis of the drainage pathway samples collected from 0-2-inch depth interval within erosional CCP Area I (SED-11) and outside of the erosional CCP areas (SED-12, SED-13, and SED-15) generally indicated similar concentrations of metals as the samples collected previously from the same locations at the 2-6-inch and 2-12-inch depth intervals. Consistent with the previous samples, concentrations of arsenic, barium, and/or selenium were detected above the Site-specific background levels and the DEQ Residential, Industrial/Commercial, and/or Protection of Groundwater PSRGs.

Drainage pathway samples collected from the 0-2 inch depth interval in areas near or within erosional CCP Area H (SS-3A, SED-16, and SED-17) indicated at least one of the metals arsenic, barium, manganese, and/or selenium at higher concentrations in comparison to the

samples collected from the 2-6 inch (August 2019) and 2-12-inch (February 2016) intervals from the same location. Instances of this occurrence include:

- arsenic in SS-3/SS-3A (23.4 milligrams per kilogram [mg/kg] vs 4.5 mg/kg);
- barium in SS-3/SS-3A (1,080 mg/kg vs 100 mg/kg) and SED-17 (1,420 mg/kg vs 565 mg/kg);
- manganese in SED-16 (1,250 mg/kg vs 513 mg/kg); and
- selenium in SS-3/SS-3A (3.79 mg/kg vs non-detect [i.e., below laboratory detection limits]).

However, in one case the metal concentration was lower in the 0-2-inch sample as compared to the previous 2-6 inch and 2-12-inch samples. In SED-16, arsenic was detected in the 0-2-inch sample at 21 mg/kg and arsenic was detected at 28.3 mg/kg in the 2-6-inch sample.

As expected, concentrations of arsenic, barium, manganese, and/or selenium were detected above Site-specific background levels and the DEQ Residential, Industrial/Commercial, and/or Protection of Groundwater PSRGs in samples SS-3A, SED-16, and SED-17.

The presence of generally higher levels of metals in samples collected from 0-2 inches as compared to samples collected from the 2-6-inch and 2-12-inch intervals appears to be a function of thickness of the erosional CCP where the sample is taken. Because the amount of erosional CCP decreases with depth, samples collected from the 0-2-inch interval are comprised mostly of CCPs, whereas samples collected from 2-6 inch or 2-12 inches are likely to have increased soil content with depth and thus lower metals concentrations.

As previously noted, soil/CCPs associated with all of the erosional CCP areas are in the process of being removed as part of IRMs being conducted from Spring to Fall 2020. Post IRM samples will be collected to document metals concentrations in soil in the erosional CCP areas after the IRMs.

3.2 Fill Materials Assessment

During drilling of the additional monitor well borings, H&H collected continuous soil samples to perform a more detailed evaluation of the fill materials. In general, fill materials consisting of CCPs, construction-like debris (concrete, brick, wood, etc.), and soil were observed at depths up to approximately 40 ft bgs in the monitor well borings (see photographs in Appendix B). The fill materials were covered with approximately 2 to 5 ft of fill soil consisting of sand or clay. The deepest that CCPs were observed in the monitoring well borings was approximately 29 ft bgs in MW-1A.

As noted previously, one of the reasons that MW-1A was installed was to evaluate the depth of the CCPs in this area of the Site. The logs for nearby Falcon boring GP-1 indicated CCPs to a depth of 12 ft bgs, and the log for nearby Falcon boring GP-2 indicated CCPs to a depth of 30 ft. There was no Falcon boring log for well MW-1; however, a driller's log for MW-1 indicated CCPs to a depth of 40 ft which was inconsistent with Falcon's logs. As noted in previous correspondence on this issue, driller's logs are intended primarily to document construction details of the wells and that the wells were installed by a certified well driller, not to document lithologic information in detail like a geologist's or engineer's log. Based upon the data collected at MW-1A, we conclude that the CCPs in this area are limited to a depth less than 30 ft bgs and do not extend to 40 ft bgs.

Previous reports indicated that construction and demolition materials were initially placed in a borrow pit at the Site and then those materials were covered with CCPs. Previous log data also indicated zones of CCPs ranging from 3 ft thick to 25 ft, with an approximate average thickness of 8 ft. However, the detailed lithologic data collected during installation of the additional monitoring wells indicates that the fill materials consist primarily of construction and demolition debris and fill soil intermixed with thin zones of CCPs ranging from less than 1 ft to 3 ft with some thicker zones. Thicker zones of CCPs were identified in several monitoring well borings as follows:

- 19 to 29 ft bgs interval of monitoring well MW-1A; and
- 20 to 27 ft bgs interval of temporary monitoring well TMW-10.

Based upon the lithologic information obtained during the additional monitoring well borings, H&H prepared an updated north to south trending geologic cross-section. The cross-section is presented as Figure 4 and a cross-section transect location map is provided as Figure 3.

3.3 Groundwater Elevation Data

A summary of the groundwater elevation data is provided in Table 2. Groundwater elevations were generally consistent between the September 2019 and February 2020 gauging events for monitoring wells located in the upper portion of the Site (MW-1, MW-1A, background well MW-5, and MW-7 through MW-9). However, for monitoring wells located in the lower portion of the Site (MW-3A, MW-4A, and MW-6), depth to groundwater was measured approximately 2 to 6 ft higher during the September 2019 monitoring event, which is expected considering the large amount of rainfall that occurred prior to the event and its impact on groundwater levels in wells near Bolin Creek.

As noted previously, the results of this assessment indicate that there is evidence of perched groundwater in the fill material which is separated from the main underlying unconfined aquifer. When a monitoring well is installed in a perched groundwater zone, the perched groundwater will drain into the monitoring well and the water level in the well will rise to the elevation of the groundwater in the perched zone. This gives the impression that the monitoring well screened zone is fully saturated with groundwater from the unconfined aquifer, when in fact it is not. Therefore, multiple lines of evidence are typically used to identify perched groundwater zones such as 1) detailed lithologic information identifying potential zones of saturation, underlying low permeability zones, and underlying unsaturated zones, 2) significant differences in hydraulic head in wells located in close proximity to one another, and 3) differences in natural groundwater geochemistry between perched groundwater and the underlying unconfined aquifer. Uncontrolled fill areas such as the Site, in which layers with significantly different permeabilities are placed next to one another (i.e., debris with sand or a gravel zone immediately overlying a silt or clay layer) have a high potential for perched groundwater zones.

Evidence of perched groundwater in the fill materials at the Site is supported by the following observations:

- In MW-1A, a wet zone containing clay and construction debris at a depth of approximately 29 ft was identified below coal ash and overlying an unsaturated zone.

- In MW-9, a wet zone was observed in woody organic materials at approximately 31 to 33 ft bgs above an underlying unsaturated zone.

- In TMW-10, wet zones containing clayey sand and some coal ash was observed above an unsaturated zone.

- In adjacent wells MW-1 (screened from 30 to 40 ft bgs) and MW-1A (screened from 25 ft to 40 ft), the depths to groundwater in the September 2019 and February 2020 gauging events were approximately 4 to 5 ft higher in MW-1A as compared to MW-1.

- In the Piedmont region where the Site is located, wells screened in different intervals will typically have similar groundwater elevations because the unconfined aquifers (such as the overlying saprolite aquifer and the underlying bedrock aquifer) are fully interconnected. However, in adjacent wells MW-9 (screened from 30 to 45 ft in fill material) and MW-11D (screened from 46 to 56 ft bgs), the groundwater elevation in MW-9 measured in February 2020 is approximately 6 ft higher in MW-9 than in MW-11D.

- As noted in the following section, there were significant differences in groundwater geochemical parameters between adjacent wells MW-9 and MW-11D.

A conceptual diagram showing the relationship between perched groundwater and the unconfined aquifer is provided as Figure 5. As indicated in Figure 5, infiltrating rainwater which infiltrates the ground and recharges groundwater may get trapped by low permeability zones in the fill above the unconfined aquifer and form perched groundwater zones. These zones are

typically laterally discontinuous and only contain thin layers of water. Some of the perched groundwater may seep from the edges of the perched water to the underlying aquifer, although the volume of seepage is typically small, especially in comparison to the volume of water in the underlying aquifer.

Because of the apparent presence of perched water zones in the fill materials, H&H prepared an inferred groundwater potentiometric map for the February 2020 gauging event using the groundwater elevation data from wells MW-3A, MW-4A, MW-5, MW-6, MW-7, and MW-11D which are not screened in the fill materials and which are installed in the underlying unconfined aquifer. The potentiometric map is provided in Figure 6 and indicates that overall groundwater flow is to the southeast.

A comparison of the groundwater levels to zones of CCPs indicates that some zones of CCPs may contain perched groundwater or are present just above perched water. However, CCPs do not appear to be present within the main underlying unconfined aquifer.

3.4 Groundwater Analytical Data

A summary of the groundwater analytical data is provided in Table 3, and a summary of groundwater field geochemical parameters is provided in Table 4. In Table 3, groundwater analytical data are compared to background (MW-5) and the DEQ 15A NCAC 02L .0202 Groundwater Standards (2L Standards) dated April 2013 or the Interim Maximum Allowable Concentrations (IMACs).

Some brief observations concerning the data are provided below:

- The results of analysis of the sample collected from newly installed well MW-1A during the September 2019 event indicate the presence of barium (1,040 micrograms per liter [µg/L] versus 2L Standard of 700 µg/L), cobalt (1.2 µg/L versus IMAC of 1 µg/L), and manganese (1,200 µg/L versus background level of 580 µg/L). The concentrations of these metals are lower than those detected in adjacent well MW-1 in April 2019 when a

low turbidity sample was collected from MW-1 (barium: 1,730 µg/L; cobalt: 1.8 µg/L; and manganese: 2,420 µg/L). In MW-1A, arsenic was detected at the 2L Standard of 10 µg/L in February 2020 which is lower than the concentration of 28 µg/L (above the 2L Standard) detected in adjacent well MW-1 in February April 2019.

- In MW-8 and MW-9 concentrations of cobalt (up to 4 µg/L in MW-8) and manganese (up to 5,060 µg/L in MW-9) were detected above 2L Standards and background levels in the samples collected during the September 2019 event.

- In bedrock well MW-11D which is located below the fill adjacent to MW-9, metals concentrations were significantly lower than those in the fill and no compounds were detected above 2L Standards or IMACs. For example, in MW-11D, cobalt was not detected versus a concentration of up to 2.5 µg/L in MW-9. In addition, manganese was detected at 14.7 µg/L in MW-11D (below the 2L Standard of 50 µg/L and background level of 580 µg/L) in comparison to the detection of up to 5,430 µg/L in MW-9.

- A review of the geochemistry data between MW-9 and MW-11D also indicates significant differences in water geochemistry between the two wells, which further supports that MW-9 is monitoring perched groundwater in the fill as opposed to groundwater monitored by MW-11D in the unconfined aquifer which underlies the fill. Some examples of differences in geochemical parameters between the two wells are summarized below:

Parameter	**Units**	**MW-9 (Within Fill)**	**MW-11D (Below Fill)**
Calcium	µg/L	118,000	45,100
Potassium	µg/L	12,400	145,000
Sodium	µg/L	24,900	65,400
Dissolved Oxygen	mg/L	0.22	2.08
Oxidation Reduction Potential	mV	-102.3	15.9

Note that dissolved oxygen and oxidation reduction potential data are provided in the groundwater sampling records in Appendix D.

3.5 QA/QC Sample Summary

A brief summary of the QA/QC sample analyses is provided below:

- The results of analysis of the duplicate groundwater sample collected from MW-9 indicated generally good correlation with the parent sample.

- The results of analysis of the rinse blank samples indicated the presence of trace levels (less than 1 µg/l) of the metals barium and manganese in the groundwater blank sample. Given the trace levels detected of these metals in comparison to the sample concentrations detected and/or screening levels/standards, the concentrations of the metals in the rinse blanks are not expected to have a significant effect on interpretation of the data.

4.0 Conclusions

Based upon the results of the post-data gap assessment activities (as well as other Site data), H&H makes the following conclusions:

- Detailed lithologic data collected during installation of the additional monitoring wells indicates that the fill materials consist primarily of construction and demolition debris and fill soil intermixed with thin zones of CCPs ranging from less than 1 ft to 3 ft with some thicker zones up to 10 ft. Fill materials were identified to depths of approximately 40 ft, although the deepest that CCPs were observed was approximately 29 ft.

- Based upon the observations made during the additional monitoring well borings, the previous estimate of the amount of CCPs present at the Site (60,000 cubic yards), which was based upon an average thickness of 8 ft over the 4.5-acre area where CCP is present, is likely an overestimate and the actual amount is significantly lower.

- Geologic data, groundwater elevation data, and groundwater geochemical data indicate that there are perched water zones in the fill material and that groundwater samples collected from shallow wells in the fill are monitoring these perched zones. Perched groundwater is likely present in some zones of CCPs or just below zones of CCPs. Elevated concentrations of metals in groundwater samples are associated with the presence of CCPs within or near perched groundwater. Some impacted perched groundwater may eventually migrate through underlying unsaturated zones to groundwater in the main underlying unconfined aquifer; however, this migration is slow and of low volume. As such, there is limited or no groundwater impact in monitoring wells which are screened in non-fill zones in the unconfined aquifer, including well MW-11D located directly below the fill and shallow downgradient monitoring wells MW-3A and MW-4A which are located downgradient of the fill area.

Table 1 (page 1 of 2)
Summary of Soil Analytical Data
828 Martin Luther King, Jr. Blvd.
Chapel Hill, North Carolina
H&H Job No. TCH-009

Sample ID	Sample Date	Material Sampled (Soil or CCP)	Sample Depth	aluminum	antimony	arsenic	barium	beryllium	boron	cadmium	calcium	hexavalent chromium	trivalent chromium	total chromium	cobalt	copper	iron	lead	magnesium	manganese	mercury	molybdenum	nickel	potassium	selenium	silver	sodium	strontium	thallium	vanadium	zinc
S-4	4/29/2013	CCP	1 ft	23,000	ND	**14**	24	ND	NA	1.5	9,900	NA	NA	22	30	65	59,000	20	9,000	**1,500**	0.011	NA	43	680	ND	ND	150	NA	ND	21	120
S-5	1/31/2014	CCP	0-4 ft	NA	NA	**37**	**2,800**	NA	NA	ND	NA	1.3	19.7	21	NA	NA	NA	10	NA	NA	0.30	NA	NA	NA	**3.2**	ND	NA	NA	NA	NA	NA
S-6	1/31/2014	CCP	0-4 ft	NA	NA	**43**	**3,200**	NA	NA	ND	NA	2.7	19.3	22	NA	NA	NA	12	NA	NA	0.42	NA	NA	NA	**6.1**	ND	NA	NA	NA	NA	NA
S-7	1/31/2014	CCP	0-4 ft	NA	NA	**44**	**2,500**	NA	NA	ND	NA	1.4	27.6	29	NA	NA	NA	11	NA	NA	0.44	NA	NA	NA	**4.5**	ND	NA	NA	NA	NA	NA
GP-1	2/3/2014	CCP	8-12 ft	NA	NA	3.5	86	NA	NA	ND	NA	ND	8.8	8.8	NA	NA	NA	26	NA	NA	0.083	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
GP-2	2/3/2014	CCP	26-28 ft	NA	NA	**41**	**1,100**	NA	NA	ND	NA	ND	19	19	NA	NA	NA	11	NA	NA	0.24	NA	NA	NA	**4.0**	ND	NA	NA	NA	NA	NA
GP-3	2/3/2014	CCP	10-12 ft	NA	NA	**48**	**1,200**	NA	NA	ND	NA	0.53	22.47	23	NA	NA	NA	39	NA	NA	0.42	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
GP-4	2/4/2014	CCP	10-12 ft	NA	NA	**59**	**2,900**	NA	NA	ND	NA	ND	20	20	NA	NA	NA	11	NA	NA	0.51	NA	NA	NA	**5.8**	ND	NA	NA	NA	NA	NA
GP-5	2/4/2014	CCP	4-6 ft	NA	NA	**72**	**2,800**	NA	NA	ND	NA	ND	19	19	NA	NA	NA	9.5	NA	NA	0.33	NA	NA	NA	**2.6**	ND	NA	NA	NA	NA	NA
	4/3/2019	CCP	4-6 ft	NA	NA	**95.9**	**2,350**	5.46	NA	<0.956	NA	0.836 J	12.3	13.1	7.05	50.9	NA	NA	NA	34.7	**1.2**	NA	11.1	NA	**12.0**	NA	325	NA	NA	NA	NA
	4/3/2019[1]	CCP	4-6 ft	NA	NA	**95.9**	**2,630**	6.99	NA	<0.931	NA	0.712 J	16.2	16.9	10.3	62.5	NA	NA	NA	53.4	0.39	NA	17.1	NA	**13.0**	NA	NA	308	NA	NA	NA
GP-6	2/4/2014	CCP	9-11 ft	NA	NA	**65**	**850**	NA	NA	ND	NA	ND	19	19	NA	NA	NA	27	NA	NA	**11**	ND	NA	NA	**4.1**	ND	NA	NA	NA	NA	NA
	4/4/2019	CCP	9-10 ft	NA	NA	**6.73**	178	0.758	NA	0.118 J	NA	<1.11	10.0	10.0	5.18	11.0	NA	NA	NA	687	0.050	NA	6.24	NA	0.880	NA	NA	21.7	NA	NA	NA
GP-7	2/4/2014	CCP	10-12 ft	NA	NA	**55**	**1,700**	NA	NA	ND	NA	ND	19	19	NA	NA	NA	11	NA	NA	0.26	NA	NA	NA	**4.3**	ND	NA	NA	NA	NA	NA
GP-8	2/4/2014	CCP	11-15 ft	NA	NA	**54**	**4,100**	NA	NA	ND	NA	ND	20	20	NA	NA	NA	9.2	NA	NA	0.29	NA	NA	NA	**4.5**	ND	NA	NA	NA	NA	NA
GP-11	2/4/2014	CCP	4-6 ft	NA	NA	**16**	450	NA	NA	ND	NA	ND	16	16	NA	NA	NA	23	NA	NA	0.35	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
GP-12	2/4/2014	CCP	2-4 ft	NA	NA	**52**	**2,000**	NA	NA	ND	NA	ND	19	19	NA	NA	NA	14	NA	NA	0.28	NA	NA	NA	**2.1**	ND	NA	NA	NA	NA	NA
SS1	2/18/2016	Soil/CCPs	2-12 in	NA	ND	**6.7**	210	1.2	ND	ND	NA	NA	NA	28	25	47	NA	22	NA	**2,400**	0.052	ND	15	NA	ND	ND	NA	120	1.3	88	100
SS1-Dup [1]	2/18/2016	Soil/CCPs	2-12 in	NA	ND	**8.5**	260	1.4	ND	ND	NA	NA	NA	31	28	56	NA	29	NA	**3,300**	0.059	ND	18	NA	ND	ND	NA	150	1.7	95	110
SS2	2/18/2016	Soil/CCPs	2-12 in	NA	ND	**24**	**830**	3.5	ND	ND	NA	NA	NA	27	20	57	NA	39	NA	**1,700**	0.21	1.7	19	NA	**2.4**	ND	NA	190	1.2	81	110
SS-3/SS-3A	8/27/2019	Soil	0-2 in	NA	NA	**23.4**	**1,080**	2.68	NA	0.226 J	NA	<1.51	18.4	18.4	9.99	37.9	NA	NA	NA	463	0.19	NA	13.6	NA	**3.79**	NA	NA	119	NA	NA	NA
	2/18/2016	Soil	2-12 in	NA	ND	4.5	100	0.80	ND	ND	NA	NA	NA	13	6.8	22	NA	14	NA	240	0.048	ND	5.3	NA	ND	ND	NA	36	ND	41	28
SS4	2/18/2016	Soil	2-12 in	NA	ND	**8.5**	380	1.2	ND	ND	NA	NA	NA	22	12	29	NA	25	NA	910	0.061	ND	12	NA	ND	ND	NA	51	ND	54	51
SS5	2/18/2016	Soil	2-12 in	NA	ND	4.8	130	0.89	ND	ND	NA	NA	NA	17	9.4	25	NA	27	NA	460	0.091	ND	7.9	NA	ND	ND	NA	43	ND	47	48
SS6	2/18/2016	Soil	2-12 in	NA	ND	3.1	82	0.70	ND	ND	NA	NA	NA	35	7.6	23	NA	17	NA	410	0.038	ND	6.5	NA	ND	ND	NA	25	ND	45	43
SS7	2/18/2016	Soil	2-12 in	NA	ND	3.1	84	0.60	ND	ND	NA	NA	NA	14	6.9	15	NA	13	NA	500	0.038	ND	5.9	NA	ND	ND	NA	31	ND	37	37
HH-1	11/3/2016	Soil	0-1 ft	NA	<0.29	**5.9**	120	1.00	NA	<0.29	NA	0.45	20.55	21	7.9	25	NA	27	NA	350	0.052	NA	8.8	NA	0.69	NA	NA	31	<0.58	48	50
	11/3/2016[1]	Soil	0-1 ft	NA	<0.35	3.4	110	0.79	NA	<0.35	NA	0.54	19.46	20	8.4	17	NA	18	NA	360 BH	0.067	NA	12	NA	<0.71	NA	NA	30	<0.71	41	35
HH-2	11/3/2016	Soil	0-1 ft	NA	<0.29	4.9	140	0.93	NA	<0.29	NA	0.43	13.57	14	12	21	NA	30	NA	260	0.085	NA	5.9	NA	1.0	NA	NA	25	<0.58	48	43
HH-3	11/3/2016	Soil	0-1 ft	NA	<0.33	**9.8**	200	1.30	NA	<0.33	NA	0.46 J	17.54	18	7.8	31	NA	24	NA	350	0.076	NA	8.9	NA	**2.4**	NA	NA	36	<0.65	53	100
HH-4	11/3/2016	Soil	0-1 ft	NA	<0.28	2.4	72	1.00	NA	<0.28	NA	0.50	44.5	45	16	37	NA	2.3	NA	630	<0.023	NA	33	NA	<0.56	NA	NA	42	0.60	73	70
HH-5	11/3/2016	Soil	0-1 ft	NA	<0.30	2.4	73	0.75	NA	<0.30	NA	<0.14	23	23	8.4	19	NA	9.3	NA	410	<0.025	NA	14	NA	1.2	NA	NA	23	<0.60	39	51
HH-6	10/27/2016	Soil	0-1 ft	NA	NA	NA	NA	NA	NA	NA	NA	<0.33	20	20	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HH-7	10/27/2016	Soil	0-1 ft	NA	NA	NA	NA	NA	NA	NA	NA	<0.61	22	22	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HH-8	10/27/2016	Soil	0-1 ft	NA	<0.30	3.6	100	1.00	NA	<0.30	NA	<0.35	19	19	12	29	NA	18	NA	570	0.036	NA	9.0	NA	<0.60	NA	NA	28	<0.60	52	54
HH-9	4/3/2019	CCP	0-1 ft	NA	NA	3.37	131	0.398 J	NA	0.178 J	NA	<1.29	12.7	12.7	5.97	14.5	NA	NA	NA	260	0.31	NA	3.59	NA	0.722	NA	NA	33.2	NA	NA	NA
HH-10	4/3/2019	CCP	0-1 ft	NA	NA	**60.3**	**2,970**	5.14	NA	0.162 J	NA	<1.60	13.8	13.8	9.84	51.3	NA	NA	NA	73.3	0.22	NA	17.1	NA	5.04	NA	NA	269	NA	NA	NA
HH-11	4/3/2019	CCP	0-1 ft	NA	NA	**42.5**	**3,260**	5.90	NA	0.220 J	NA	0.467 J	18.7	19.2	13.4	55.3	NA	NA	NA	113	0.43	NA	23.5	NA	9.05	NA	NA	234	NA	NA	NA
MW-6	11/2/2016	Soil	0-1 ft	NA	<0.26	2.9	38	0.61	NA	<0.26	NA	0.21 J	9.79	10	9.5	23	NA	12	NA	570	0.082	NA	8.2	NA	1.0	NA	NA	22	**0.81**	**31**	**77**
MW-7	11/1/2016	Soil	0-1 ft	NA	<0.30	2.6	67	0.87	NA	<0.30	NA	0.89	9.11	10	3.9	180	NA	7.6	NA	100	0.030	NA	2.9	NA	<0.59	NA	NA	6.7	<0.59	61	46
SED-3A	4/5/2019	Soil	0-1 ft	NA	NA	3.45	33.9	0.418 J	NA	<0.582	NA	<1.16	17.4	17.4	16.5	6.97	NA	NA	NA	560	<0.0054	NA	5.82	NA	0.237 J	NA	NA	9.6	NA	NA	NA
SED-5A	4/4/2019	Soil	0-1 ft	NA	NA	1.25	13.5	0.156 J	NA	<0.571	NA	0.352 J	13.2	13.6	5.95	39.1	NA	NA	NA	243	0.0071	NA	4.38	NA	<0.571	NA	NA	10.9	NA	NA	NA
SED-8	4/5/2019	Drainage Pathway Soil	2-6 in	NA	NA	2.41	49.1	0.313 J	NA	0.122 J	NA	<1.25	12.0	12.0	7.01	14.3	NA	NA	NA	423	0.063	NA	4.66	NA	1.01	NA	NA	15.2	NA	NA	NA
SED-9	4/5/2019	Drainage Pathway Soil	2-6 in	NA	NA	1.16	33.8	0.199 J	NA	<0.660	NA	0.461 J	21.6	22.1	9.11	10.1	NA	NA	NA	431	0.013	NA	6.68	NA	<0.660	NA	NA	16.7	NA	NA	NA
SED-10	4/5/2019	Drainage Pathway Soil	2-6 in	NA	NA	1.29	24.4	0.118 J	NA	0.221 J	NA	0.418 J	12.0	12.4	4.43	10.8	NA	NA	NA	195	0.037	NA	4.03	NA	0.273 J	NA	NA	8.1	NA	NA	NA
SED-11	8/27/2019	Drainage Pathway Soil/CCPs	0-2 in	NA	NA	**6.08**	317	1.19	NA	0.235 J	NA	<1.73	13.3	13.3	7.82	21.6	NA	NA	NA	351	0.030	NA	10.8	NA	1.71	NA	NA	49.4	NA	NA	NA
	4/5/2019	Drainage Pathway Soil/CCPs	2-6 in	NA	NA	**5.98**	285	0.768	NA	<0.753	NA	<1.51	9.72	9.72 B	6.61	15.1	NA	NA	NA	288	0.14	NA	7.03	NA	2.03	NA	NA	65.0	NA	NA	NA
SED-12	8/27/2019	Drainage Pathway Soil	0-2 in	NA	NA	4.73	102	0.765 J	NA	0.214 J	NA	<1.68	27.6	27.6	6.17	23.1	NA	NA	NA	341	0.042	NA	7.69	NA	0.961	NA	NA	25.4	NA	NA	NA
	4/5/2019	Drainage Pathway Soil	2-6 in	NA	NA	3.97	122	0.499 J	NA	0.204 J	NA	<1.74	9.45	9.45 B	6.04	19.7	NA	NA	NA	319	0.077	NA	4.95	NA	1.36	NA	NA	32.8	NA	NA	NA
SED-13	8/27/2019	Drainage Pathway Soil	0-2 in	NA	NA	**12.4**	**958**	1.56	NA	0.284 J	NA	<2.03	29.4	29.4	13.9	38.9	NA	NA	NA	538	0.12	NA	19.2	NA	**3.07**	NA	NA	125	NA	NA	NA
	4/5/2019	Drainage Pathway Soil	2-6 in	NA	NA	**14.5**	**724**	1.10	NA	0.171 J	NA	<1.58	14.0	14.0	7.58	27.1	NA	NA	NA	563	0.075	NA	8.73	NA	1.69	NA	NA	70.5	NA	NA	NA
SED-14	4/5/2019	Drainage Pathway Soil	2-6 in	NA	NA	1.86	18.9	0.152 J	NA	<0.611	NA	0.506 J	17.2	17.7	5.07	8.00	NA	NA	NA	231	0.012	NA	3.19	NA	<0.611	NA	NA	17.3	NA	NA	NA
SED-15	8/27/2019	Drainage Pathway Soil	0-2 in	NA	NA	3.83	251	0.759 J	NA	0.328 J	NA	0.458 J	18.7	19.2	9.08	24.0	NA	NA	NA	549	0.035	NA	9.64	NA	**1.46**	NA	NA	58.0	NA	NA	NA
	4/5/2019	Drainage Pathway Soil	2-6 in	NA	NA	**5.33**	98.1	0.641 J	NA	<0.746	NA	<1.49	15.2	15.2	8.84	19.4	NA	NA	NA	550	0.030	NA	8.24	NA	**2.36**	NA	NA	39.5	NA	NA	NA
SED-16	8/27/2019	Drainage Pathway Soil/CCPs	0-2 in	NA	NA	**21.0**	**739**	2.96	NA	0.414 J	NA	<1.60	23.4	23.4	17.8	50.9	NA	NA	NA	**1,250**	0.11	NA	18.3	NA	**5.05**	NA	NA	133	NA	NA	NA
	4/5/2019	Drainage Pathway Soil/CCPs	2-6 in	NA	NA	**28.3**	**758**	2.86	NA	0.238 J	NA	<2.03	22.8	22.8	13.7	48.8	NA	NA	NA	513	0.22	NA	17.7	NA	**5.42**	NA	NA	165	NA	NA	NA
SED-17	8/27/2019	Drainage Pathway Soil/CCPs	0-2 in	NA	NA	**33.8**	**1,420**	4.18	NA	0.336 J	NA	<1.95	17.3	17.3	10.3	53.1	NA	NA	NA	296	0.24	NA	16.2	NA	**6.84**	NA	NA	198	NA	NA	NA
	4/5/2019	Drainage Pathway Soil/CCPs	2-6 in	NA	NA	**15.3**	565	1.98	NA	0.280 J	NA	<2.01	20.7	20.7	13.7	36.3	NA	NA	NA	452	0.14	NA	14.8	NA	**3.68**	NA	NA	179	NA	NA	NA
SED-18	4/5/2019	Drainage Pathway Soil	2-6 in	NA	NA	4.53	137	0.534 J	NA	<0.689	NA	<1.38	18.7	18.7	11.1	28.2	NA	NA	NA	464	0.051	NA	9.00	NA	1.85	NA	NA	32.6	NA	NA	NA
SED-19	4/5/2019	Drainage Pathway Soil	2-6 in	NA	NA	1.55	20.0	0.161 J	NA	<0.588	NA	0.435 J	21.7	22.1	7.98	8.38	NA	NA	NA	266	0.0073	NA	4.94	NA	0.334 J	NA	NA	15.0	NA	NA	NA
SED-20	4/5/2019	Drainage Pathway Soil	2-6 in	NA	NA	0.792	31.4	0.152 J	NA	<0.687	NA	<1.37	5.76	5.76 B	4.50	9.10	NA	NA	NA	360	0.012	NA	2.19	NA	0.263 J	NA	NA	11.5	NA	NA	NA
SED-21	4/5/2019	Drainage Pathway Soil	2-6 in	NA	NA	1.12	25.9	0.149 J	NA	<0.591	NA	<1.18	20.9	20.9	4.44	6.58	NA	NA	NA	221	0.011	NA	2.70	NA	0.286 J	NA	NA	12.8	NA	NA	NA
MW-5 (background)	11/2/2016	Soil	0-1 ft	NA	<0.30	2.1	76	0.99	NA	<0.30	NA	0.43 J	17.57	18	27	49	NA	4.0	NA	710	<0.023	NA	5.0	NA	<0.59	NA	NA	25	<0.59	190	47
	11/2/2016	Soil	6-7 ft	NA	<0.27	1.4	61	0.60	NA	<0.27	NA	0.81	38.19	39	19	18	NA	0.55	NA	940	<0.020	NA	20	NA	<0.53	NA	NA	29	2.3	67	75
BG-1 (background)	11/3/2016	Soil	0-1 ft	NA	<0.28	1.9	36	0.39	NA	<0.28	NA	0.87	17.13	18	6.3	16	NA	25	NA	310	0.033	NA	5.4	NA	1.6	NA	NA	15	<0.57	34	43
	11/3/2016	Soil	2-3 ft	NA	<0.29	2.3	45	0.48	NA	<0.29	NA	<0.12	19	19	7.3	18	NA	43	NA	440	0.280	NA	6.2	NA	1.6	NA	NA	15	<0.57	35	49
BG-2 (background)	11/3/2016	Soil	0-1 ft	NA	<0.28	1.9	45	0.50	NA	<0.28	NA	0.84	16.16	17	7.4	18	NA	32	NA	410	0.045	NA	4.9	NA	1.1	NA	NA	14	<0.56	35	44
	11/3/2016	Soil	2-3 ft	NA	<0.27	1.9	52	0.53	NA	<0.27	NA	0.70	23.3	24	7.5	20	NA	26	NA	450	0.038	NA	7.9	NA	1.7	NA	NA	19	<0.55	37	45
BG-3 (background)	11/3/2016	Soil	0-1 ft	NA	<0.30	1.7	44	0.43	NA	<0.30	NA	0.21 J	23.3	16	7.5	15	NA	25	NA	410	0.024	NA	5.1	NA	1.4	NA	NA	46	<0.60	37	40
	11/3/2016	Soil	2-3 ft	NA	<0.27	2.2	56	0.54	NA	<0.27	NA	0.88	21.12	22	7.5	18	NA	29	NA	410	0.040	NA	5.2	NA	1.2	NA	NA	19	<0.53	40	46
BG-4 (background)	11/3/2016	Soil	0-1 ft	NA	<0.29	1.7	50	0.50	NA	<0.29	NA	<0.13	19	19	9.5	16	NA	22	NA	450 BH	0.026	NA	6.0	NA	<0.59	NA	NA	16 A	<0.59	53	50
	11/3/2016	Soil	2-3 ft	NA	<0.33	2.0	53	0.52	NA	0.38	NA	0.50 J	22.5	23	11	23	NA	21	NA	460 BH	0.054	NA	8.5	NA	<0.65	NA	NA	19	<0.65	51	230
BG-6 (background)	4/3/2019	Soil	0-1 ft	NA	NA	2.05 O1	64.4	0.625	NA	0.177 J	NA	5.34	39.4	44.7	14.4	26.4	NA	NA	NA	448 J6	0.022	NA	12.8	NA	0.562 J	NA	NA	17.0	NA	NA	NA
	4/4/2019	Soil	2-3 ft	NA	NA	2.29	66.3	0.507 J	NA	0.139 J	NA	<1.19	22.9	22.9	14.7	32.3	NA	NA	NA	467	0.032	NA	7.78	NA	0.828	NA	NA	16.8	NA	NA	NA
BG-7 (background)	4/3/2019	Soil	0-1 ft	NA	NA	1.97	52.7	0.410 J	NA	0.136 J	NA	<1.16	70.2	70.2	18.9	36.4	NA	NA	NA	813	0.025	NA	12.8	NA	0.543 J	NA	NA	22.6	NA	NA	NA
	4/4/2019	Soil	2-3 ft	NA	NA	3.08	77.9	0.430 J	NA	0.108 J	NA	<1.16	27.0	27.0	16.3	32.5	NA	NA	NA	548	0.023	NA	6.20	NA	0.502 J	NA	NA	24.3	NA	NA	NA
BG-8 (background)	4/3/2019	Soil	0-1 ft	NA	NA	1.80	52.4	0.370 J	NA	0.0951 J	NA	<1.14	24.5	24.5	21.8	62.8	NA	NA	NA	759	0.0072	NA	9.04	NA	0.485 J	NA	NA	24.4	NA	NA	NA
	4/4/2019	Soil	2-3 ft	NA	NA	1.66	47.6	0.293 J	NA	0.0918 J	NA	<1.14	21.7	21.7	23.5	60.2	NA	NA	NA	732	<0.0067	NA	7.86	NA	0.306 J	NA	NA	25.1	NA	NA	NA
Site Specific Background Range					<0.27-<0.33	1.4-3.08	36-77.9	0.293 J-0.99		<0.27-0.38		<0.12-5.34	16.16-70.2	16-70.2	6.3-27	15-62.8		0.55-43		310-940	<0.0067-0.280		4.9-20		<0.59-1.7			14-46	<0.53-2.3	34-190	40-230
95% UCL of Site Specific Background Range[2]						2.1	58	0.58		0.18		2.19	28	25	15	27		30		591	0.114		10		1.2			29		84	147
North Carolina Background Range				7000 - >100,000	<1.0-8.8	1-18	50-1,000	ND-1.0	ND-100	1.0-10	100-280,000*	NS	NS	7-300	ND-50	2.0-20	100 - >100,000*	ND-50	50-50,000*	<2.0-7000*	0.03-0.52	<3-15*	ND	50-37,000*	<0.1-0.8	ND-5.0	<500-50,000*	ND-300	NS	15-300	11-59
PSRG - Protection of Groundwater				110,000	0.90	5.8	580	63	45	3.0	NS	3.8	360,000	NS	0.90	700	150	270	NS	65	1.0	7.1	130	NS	2.1	3.4	NS	1,500	0.28	350	1,200
PSRG - Residential Health-based				16,000	6.3	0.68	3,100	31	3,100	14	NS	0.31	23,000	NS	4.7	630	11,000	400	NS	380	2.3	78	310	NS	78	78	NS	9,400	0.16	78	4,700
PSRG - Industrial/Commercial Health-based				230,000	93	3.0	47,000	470	47,000	200	NS	6.5	350,000	NS	70	9,300	160,000	800	NS	2,200	9.7	1,200	4,700	NS	1,200	1,200	NS	140,000	2.3	1,200	70,000

Table 1 (page 2 of 2)
Summary of Soil Analytical Data
828 Martin Luther King, Jr. Blvd.
Chapel Hill, North Carolina
H&H Job No. TCH-009

Notes:
Yellow highlighting indicates samples collected as part of April 2019 data gap sampling
Orange highlighting indicates samples collected as part of August 2019 0-2 inch drainage pathway sampling
Soil concentrations are reported in milligrams per kilogram (mg/kg).
PSRG = North Carolina Department of Environmental Quality (DEQ) Preliminary Soil Remediation Goals (PSRGs) (July 2020); UCL = Upper Confidence Limit
95% UCL of site specific background ranges were calculated using EPA ProUCL 5.1
North Carolina Soil Background Range taken from *Elements in North American Soils, 2nd Edition* by James Dragun and Khaled Chekiri
*Not available for North Carolina. Used Eastern US Background Range
Bold denotes concentration above Protection of Groundwater PSRG and significantly above background.
Shading indicates concentration above Residential PSRG and significantly above background.
Underlining indicates concentration above Industrial/Commercial PSRG and significantly above background.
ND = Not Detected; NA = Not Analyzed; NS = Not Specified; -- = statistical test not applicable to data set
J = Detected above method detection limit but below laboratory reporting limit; therefore, result is an estimated concentration
O1 = Analyte failed the method required serial dilution test and/or subsequent post-spike criteria. These failures indicate matrix interference.
J6 = The sample matrix interfered with the ability to make any accurate determination; spike value is low.
BH = Method blank greater than one-half laboratory reporting limit, but sample concentration greater than 10x the method blank.
A = Continuing Calibration Verification standard recovery (82%) is less than the lower control limit (90%). Result has possible low bias.
[1] denotes duplicate sample taken
[2] 95% UCL of Site Specific Background Values were calculated using values from samples collected through the Phase II RI
Analytical Methods
Metals by EPA Method 6010C or 6020B
Hexavalent Chromium by EPA Method 7196 or 7199 (Phase II RI and April 2019 Data Gap Samples)
Mercury by EPA Method 7471B

Table 2 (page 1 of 1)
Monitoring Well Construction Details and Groundwater Elevation Data
828 Martin Luther King, Jr. Blvd.
Chapel Hill, North Carolina
H&H Job No. TCH-009

Well ID	Permanent or Temporary	Date Installed	Date Abandoned	Drilling Method	Well Material	Screen Slot Size (in)	Total Depth (ft bls)	Screened Interval	TOC Elevation (ft)	November 9, 2016		April 3, 2019		Sepember 26, 2019		February 12, 2020	
										Depth to Water (ft bls)	Groundwater Elevation (ft)	Depth to Water (ft bls)	Groundwater Elevation (ft)	Depth to Water (ft bls)	Groundwater Elevation (ft)	Depth to Water (ft bls)	Groundwater Elevation (ft)
MW-1	Permanent	4/29/2013	N/A	DPT	2" PVC	0.01	40	30-40	346.12	35.48	310.64	30.90	315.22	35.67	310.45	35.22	310.90
MW-1A	Permanent	9/24/2019	N/A	Sonic	2" PVC	0.01	40	25-40	345.96	--	--	--	--	31.43	314.53	30.27	315.69
MW-2	Temporary	6/20/2013	6/20/2013	HA	Unknown	Unknown	8	Unknown	--	--	--	--	--	--	--	--	--
MW-3	Permanent	1/27/2014	1/7/2015	Auger	2" PVC	0.01	11	6-11	--	--	--	--	--	--	--	--	--
MW-4	Permanent	1/27/2014	1/6/2015	Auger	2" PVC	0.01	9.2	4.2-9.2	--	--	--	--	--	--	--	--	--
MW-3A	Permanent	5/12/2015	N/A	Air Rotary	2" PVC	0.01	16	1-16	298.10	5.91	292.19	2.79	295.31	7.14	290.96	1.34	296.76
MW-4A	Permanent	5/14/2015	N/A	Air Rotary	2" PVC	0.01	19	4-19	298.00	6.72	291.28	3.20	294.80	7.83	290.17	2.22	295.78
MW-5	Permanent	11/2/2016	N/A	Air Rotary	2" PVC	0.01	27.5	17.5 - 27.5	369.33	9.27	360.06	7.03	362.30	10.24	359.09	9.67	359.66
MW-6	Permanent	11/2/2016	N/A	HSA	2" PVC	0.01	17.5	7.5 - 17.5	315.39	9.92	305.47	7.42	307.97	10.54	304.85	6.87	308.52
MW-7	Permanent	11/2/2016	N/A	Air Rotary	2" PVC	0.01	69.5	59.5 - 69.5	339.54	46.97	292.57	43.58	295.96	47.05	292.49	45.09	294.45
MW-8	Permanent	9/24/2019	N/A	Sonic	2" PVC	0.01	44.5	29.5-44.5	343.89	--	--	--	--	40.16	303.73	38.21	305.68
MW-9	Permanent	9/24/2019	N/A	Sonic	2" PVC	0.01	45.0	30-45	339.04	--	--	--	--	26.92	312.12	25.47	313.57
TMW-10	Temporary	9/24/2019	9/24/2019	Sonic	2" PVC	0.01	40.0	25-40	349.35	--	--	--	--	27.23*	322.12*	--	--
MW-11D	Permanent	2/11/2020	N/A	HSA / Air Rotary	2" PVC	0.01	56.0	46-56	339.29	--	--	--	--	--	--	31.85	307.44

Notes:
MW-1, MW-3A, MW-4A, MW-5, MW-6, and MW-7 were surveyed by CE Group on December 8, 2016
MW-1A, MW-8, MW-9, and TMW-10 were surveyed by H&H on September 26, 2019
MW-11D was surveyed by H&H on March 03, 2020
ft = feet; bls = below land surface; in = inches
DPT = Direct Push Technology; HA = Hand Auger; HSA = Hollow Stem Auger
TOC = Top of Casing; -- = Not Specified; N/A = Not Applicable
* = depth to water gauged on September 24, 2019.

Table 3 (page 1 of 1)
Summary of Groundwater Analytical Data
828 Martin Luther King, Jr. Blvd.
Chapel Hill, North Carolina
H&H Job No. TCH-009

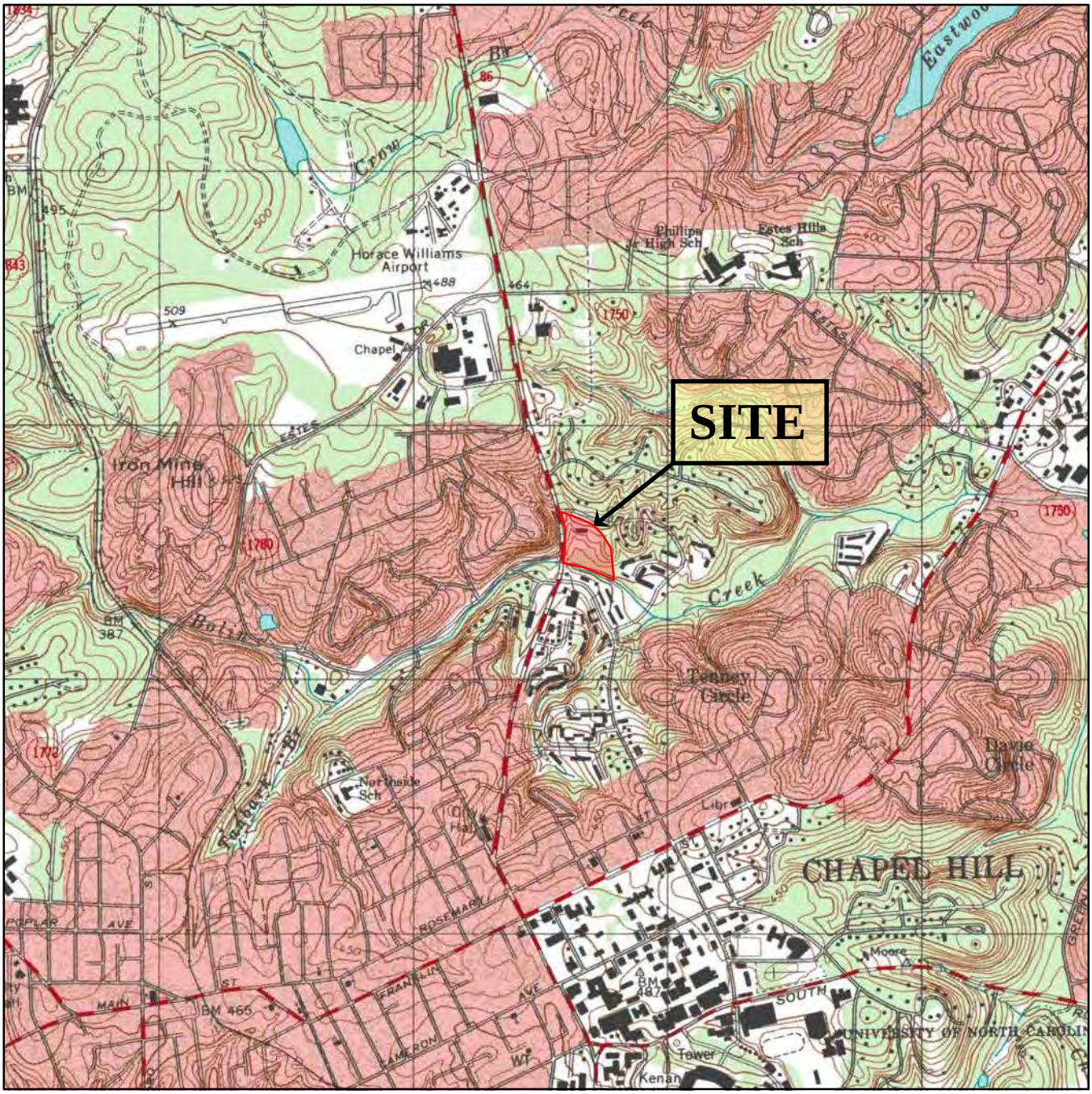
Monitoring Well ID	Sample Date	turbidity	alkalinity	aluminum	antimony*	arsenic	barium	beryllium	boron	cadmium	calcium	hexavalent chromium	trivalent chromium	Total chromium	cobalt*	copper	iron	lead	magnesium	manganese	mercury	molybdenum	nickel	potassium	selenium	silver	sodium	strontium	thallium*	vanadium*	zinc
2L Standard or IMAC		NS	NS	NS	1	10	700	4	700	2	NS	NS	NS	10	1	1,000	300	15	NS	50	1	NS	100	NS	20	20	NS	NS	0.2	0.3	1,000
MW-5 (Background)	11/9/2016	3.8	NA	NA	<0.5	<10	51	<2.0	NA	<1.0	NA	NA	NA	<5.0	0.27 J	<10	NA	<5.0	NA	**580**	<0.2	NA	<10	NA	**23**	NA	NA	190	<2.5	0.39 J	<30
	4/3/2017	8.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	<4.8	NA	<10.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MW-1	5/3/2013	NA	NA	5,600	**5.4**	**85**	**1,100**	1.6	NA	0.17	110,000	NA	NA	**15**	**15**	25	**6,500**	5.8	25,000	**7,600**	ND	NA	12	7,600	2.5	ND	34,000	NA	**1.0**	**38**	52
	2/18/2016	NS	NA	NA	ND	**67**	**1,300**	**11.0**	ND	ND	NA	NA	NA	**100**	**78**	170	NA	**36**	NA	**9,600**	0.26	ND	58	NA	ND	ND	NA	2,900	ND	**260**	330
	2/18/2016[4]	NS	NA	NA	ND	**52**	**1,100**	**8.8**	ND	ND	NA	NA	NA	**86**	**61**	130	NA	**29**	NA	**9,000**	0.21	ND	46	NA	ND	ND	NA	2,700	ND	**200**	260
	11/10/2016	475.0	NA	NA	<0.5	**19**	470	**4.1**	NA	0.15 J	NA	NA	NA	**31**	**32**	57	NA	10	NA	**8,600**	<0.2	NA	21	NA	**23**	NA	NA	2,200	<2.5	**92**	99
	11/10/2016[4]	NA	NA	NA	<0.5	<10	160	0.53 J	NA	<1.0	NA	NA	NA	<5.0	**6.0**	<10	NA	<5.0	NA	**8,000**	<0.2	NA	2.3 J	NA	<20	NA	NA	2,100	<2.5	**1.2 J**	<30
	4/3/2019	7.76	NA	NA	NA	**22.9**	**1,730**	<0.10	NA	<0.080	NA	NA	NA	<0.50	**1.8**	0.33 J	NA	NA	NA	**3,090**	<0.20	NA	0.60	NA	<0.50	NA	NA	4,710	NA	NA	NA
MW-1A	9/26/2019	6.63	NA	NA	NA	10	**1,040**	<0.50	NA	<0.40	NA	NA	NA	<2.5	**1.2**	<2.5	NA	NA	NA	**2,420**	<0.20	NA	0.82 J	NA	<2.5	NA	NA	6,360	NA	NA	NA
MW-2	6/20/2013[1]	NA	NA	16,000	0.61	8.3	**1,100**	**5.5**	NA	0.93	260,000	NA	NA	8.4	**23**	**1,200**	**13,000**	**27**	47,000	**1,200**	0.18	NA	70	42,000	18	0.27	52,000	NA	**0.48**	**71**	**2,200**
MW-3	2/5/2014	NA	NA	NA	NA	ND	160	NA	NA	ND	NA	ND	NA	ND	NA	NA	NA	ND	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
	2/5/2014[2]	NA	NA	NA	NA	ND	250	NA	NA	ND	NA	ND	NA	**24**	NA	NA	NA	ND	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
	8/15/2014[3]	1,500	NA	NA	NA	**51**	**830**	NA	NA	ND	NA	30	NA	**78**	NA	NA	NA	**30**	NA	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
	8/20/2014[4]	13.0	NA	NA	NA	ND	220	NA	NA	ND	NA	23	NA	ND	NA	NA	NA	ND	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
MW-3A	7/21/2015	5.7	NA	NA	NA	ND	67	NA	520	ND	NA	ND	NA	ND	NA	NA	NA	ND	NA	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
	2/17/2016	1.3	NA	NA	ND	ND	89	ND	ND	ND	NA	NA	NA	ND	ND	ND	NA	ND	NA	ND	ND	ND	ND	NA	**23**	ND	NA	2,400	ND	ND	ND
	2/17/2016[2]	1.3	NA	NA	ND	ND	80	ND	ND	ND	NA	NA	NA	ND	ND	ND	NA	ND	NA	23	ND	ND	ND	NA	**26**	ND	NA	2,100	ND	ND	ND
	11/9/2016	1.2	NA	NA	<0.5	<10	53	<2.0	NA	<1.0	NA	NA	NA	<5.0	<0.11	<10	NA	<5.0	NA	14	<0.2	NA	<10	NA	**50**	NA	NA	2,400	**5.4 J**	**0.94 J**	12 J
	11/9/2016[2]	1.2	NA	NA	<0.5	<10	53	<2.0	NA	<1.0	NA	NA	NA	<5.0	<0.11	<10	NA	<5.0	NA	15	<0.2	NA	<10	NA	**52**	NA	NA	2,400	**5.3 J**	**0.95 J**	<30
	4/4/2019	0.00	NA	NA	NA	0.15	68.2	<0.10	NA	<0.080	NA	NA	NA	<0.50	0.21	0.55	NA	NA	NA	5.8	<0.20	NA	0.50 J	NA	**34.2**	NA	NA	2,950	NA	NA	NA
MW-4	2/5/2014	NA	NA	NA	NA	**140**	**6,500**	NA	NA	1.7	NA	ND	NA	**930**	NA	NA	NA	**250**	NA	NA	**1.4**	NA	NA	NA	**99**	ND	NA	NA	NA	NA	NA
	8/20/2014[4,5]	<10	NA	NA	NA	ND	75	NA	NA	ND	NA	ND	NA	ND	NA	NA	NA	ND	NA	NA	NA	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
MW-4A	7/21/2015	24.7	NA	NA	NA	ND	64	NA	ND	ND	NA	ND	NA	ND	NA	NA	NA	ND	NA	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
	7/21/2015[4]	24.7	NA	NA	NA	ND	61	NA	ND	ND	NA	ND	NA	ND	NA	NA	NA	ND	NA	NA	ND	NA	NA	NA	ND	ND	NA	NA	NA	NA	NA
	2/18/2016	189.0	NA	NA	ND	ND	26	ND	ND	ND	NA	NA	NA	ND	ND	ND	NA	7.8	NA	49	ND	ND	ND	NA	ND	ND	NA	110	ND	ND	34
	2/18/2016[4]	189.0	NA	NA	ND	ND	33	ND	ND	ND	NA	NA	NA	ND	ND	ND	NA	8.4	NA	41	ND	ND	ND	NA	ND	ND	NA	78	ND	ND	48
	11/9/2016	4.8	NA	NA	<0.5	<10	36	<2.0	NA	<1.0	NA	NA	NA	1.2 J	<0.11	<10	NA	<5.0	NA	140	<0.2	NA	<10	NA	7.2 J	NA	NA	170	<2.5	<0.15	17 J
	4/4/2019	9.43	NA	NA	NA	<0.10	22.5	0.070 J	NA	<0.080	NA	NA	NA	<0.50	0.063 J	0.63	NA	NA	NA	6.0	<0.20	NA	1.5	NA	0.82	NA	NA	73	NA	NA	NA
MW-6	11/9/2016	2.5	NA	NA	<0.5	<10	340	<2.0	NA	<1.0	NA	NA	NA	**29**	<0.11	1.9 J	NA	<5.0	NA	**2,500**	<0.2	NA	22	NA	20	NA	NA	690	<2.5	**1.2 J**	<30
	4/3/2017	7.6	NA	NA	NA	NA	NA	NA	NA	NA	NA	<4.8	NA	<10.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	4/4/2019	4.48	NA	NA	NA	0.14	283	<0.10	NA	<0.080	NA	NA	NA	<0.50	0.33	<0.50	NA	NA	NA	**2,210**	<0.20	NA	0.20 J	NA	0.12 J	NA	NA	752	NA	NA	NA
	4/4/2019[2]	4.48	NA	NA	NA	0.14	279	<0.10	NA	<0.080	NA	NA	NA	<0.50	0.32	0.50 J	NA	NA	NA	**2,160**	<0.20	NA	0.19 J	NA	0.11 J	NA	NA	736	NA	NA	NA
MW-7	11/14/2016	8.9	NA	NA	<0.5	<10	10	<2.0	NA	<1.0	NA	NA	NA	1.3 J	0.17 J	1.6 J	NA	<5.0	NA	140	<0.2	NA	1.6 J	NA	<20	NA	NA	42	<2.5	**1.1 J**	26 J
	4/3/2019	8.95	NA	NA	NA	0.13	4.5	<0.10	NA	<0.080	NA	NA	NA	<0.50	<0.050	0.72	NA	NA	NA	20.5	<0.20	NA	0.43 J	NA	0.10 J	NA	NA	44.9	NA	NA	NA
MW-8	9/26/2019	7.95	NA	NA	NA	6.1	219	<0.10	NA	<0.080	NA	NA	NA	0.51	**4.0**	0.98	NA	NA	NA	**4,880**	<0.20	NA	4.1	NA	<0.50	NA	NA	750	NA	NA	NA
MW-9	9/26/2019	1.74	NA	NA	NA	0.75	394	<0.20	NA	<0.16	NA	NA	NA	<1.0	**1.5**	2.1	NA	NA	NA	**5,060**	<0.20	NA	0.41 J	NA	<1.0	NA	NA	2,160	NA	NA	NA
	2/12/2020	1.10	377,000	NA	NA	0.78J	369	<0.10	NA	<0.10	118,000	NA	NA	<1.0	**2.3**	1.0	NA	NA	26,100	**5,430**	<0.20	NA	<1.0	12,400	<1.0	NA	24,900	2,380	NA	NA	NA
	2/12/2020[2]	1.10	377,000	NA	NA	0.74J	338	<0.10	NA	<0.10	113,000	NA	NA	<1.0	**2.5**	1.1	NA	NA	25,600	**5,170**	<0.20	NA	<1.0	12,100	<1.0	NA	24,100	2,310	NA	NA	NA
MW-11D	2/13/2020	8.59	413,000	NA	NA	1.5	24.1	<0.10	NA	<0.10	45,100	NA	NA	1.7	<1.0	2.2	NA	NA	30,300	14.7	<0.20	NA	5.5	145,000	0.74J	NA	65,400	604	NA	NA	NA

Notes:
Yellow highlighting indicates samples collected as part of April 2019 data gap sampling
Orange highlighting indicates samples collected as part of August 2019 groundwater sampling
Blue highlighting indicates samples collected as part of February 2020 groundwater sampling
All results in ug/L except turbidity which is NTUs
2L Standard = North Carolina Department of Environmental Quality (DEQ) 15A NCAC 02L.0202 Groundwater Standards (April 2013).
IMAC = Interim Maximum Allowable Concentration
Bold denotes above the 2L standard or IMAC and background levels
ND = Not Detected; NA = Not Analyzed; NS = Not Specified
J = Detected above method detection limit but below laboratory reporting limit; therefore, result is an estimated concentration
U = Below method detection limit
*reported to the method detection limit instead of laboratory reporting limit
[1] Denotes sample labeled as "Well #1" in the lab report associated with the Limited Phase II ESA prepared by Falcon
[2] Denotes duplicate sample taken.
[3] Denotes sample labeled as "Well 1" in the lab report associated with the October 3, 2014 letter prepared by Falcon
[4] Denotes filtered samples
[5] An unfiltered sample was also collected from MW-4 on August 20, 2014 and the results were reported in mg/kg-wet, presumably because of the high sediment load. These data are not included in this table.
Analytical Methods:
Metals by EPA Method 6010C, 6020A, or 6020B
Hexavalent Chromium by EPA Method 7196A / SM3500
Mercury by 7470A/245.1

Table 4 (page 1 of 1)
Summary of Groundwater Geochemical Parameters
828 Martin Luther King, Jr. Blvd.
Chapel Hill, North Carolina
H&H Job No. TCH-003

Monitoring Well ID	Sample Date	DO (mg/L)	Temperature (°C)	Conductivity (µS/cm)	pH (SU)	ORP (mV)	Turbidity (NTU)
MW-5 (background)	11/9/2016	0.27	20.30	569	6.96	39.2	3.76
	4/3/2017	0.21	17.80	750	6.98	-280.4	8.19
MW-1	5/3/2013	NS	NS	NS	NS	NS	NA
	2/18/2016	NS	NS	NS	NS	NS	NS
	11/10/2016	6.87	17.13	767	6.89	79.0	475
	4/3/2019	1.35	17.90	1,269	6.03	-36.0	7.76
MW-1A	9/29/2019	0.11	20.90	1,082	6.15	-17.7	6.63
MW-2	6/20/2013	NS	NS	NS	NS	NS	NA
MW-3	2/5/2014	NS	NS	NS	NS	NS	NA
	8/15/2014	NS	NS	NS	NS	NS	1,500
	8/20/2014	NS	NS	NS	NS	NS	13
MW-3A	7/21/2015	NA	15.80	2,321	6.50	NA	5.7
	2/17/2016	NS	NS	NS	NS	NS	1.3
	11/9/2016	2.51	18.14	1,231	6.63	288.7	1.24
	4/4/2019	0.14	12.80	1,536	6.40	273.5	0.00
MW-4	2/5/2014	NS	NS	NS	NS	NS	NA
	8/20/2014	NS	NS	NS	NS	NS	<10
MW-4A	7/21/2015	NA	15.64	831	6.25	NA	24.7
	2/18/2016	NS	NS	NS	NS	NS	189
	11/9/2016	1.41	16.91	241	5.43	300.5	4.83
	4/4/2019	2.15	13.30	134	5.11	277.7	9.43
MW-6	11/9/2016	0.61	20.51	607	6.19	12.2	2.54
	4/3/2017	0.23	16.00	452	6.10	-270.0	7.64
	4/4/2019	0.10	13.80	786	6.30	-23.3	4.48
MW-7	11/14/2016	1.79	15.66	112	5.28	61.2	8.92
	4/3/2019	1.35	15.10	107	5.40	214.9	8.95
MW-8	9/26/2019	0.40	21.30	632	5.77	6.6	7.95
MW-9	9/26/2019	0.58	22.04	885	6.50	-49.1	1.74
	2/12/2020	0.22	18.4	858	6.83	-102.3	1.10
MW-11D	2/13/2020	2.08	18.9	984	9.68	15.9	8.59

Notes
Yellow highlighting indicates samples collected as part of April 2019 data gap sampling
Orange highlighting indicates samples collected as part of August 2019 groundwater sampling
Blue highlighting indicates samples collected as part of February 2020 groundwater sampling
NA = Not Analyzed; NS = Not Specified



N

APPROXIMATE

0 2000 4000

SCALE IN FEET

U.S.G.S. QUADRANGLE MAP

CHAPEL HILL, NORTH CAROLINA, 2002

QUADRANGLE
7.5 MINUTE SERIES (TOPOGRAPHIC)

TITLE

SITE LOCATION MAP

PROJECT

TOWN OF CHAPEL HILL
828 MARTIN LUTHER KING JR. BOULEVARD
CHAPEL HILL, NORTH CAROLINA

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007 (p) 704-586-0373 (f)

DATE:	8-23-17	REVISION NO:	0
JOB NO:	TCH-009	FIGURE:	1

LEGEND

- SITE PROPERTY BOUNDARY
- BOLIN CREEK
- 101 TOPOGRAPHIC CONTOUR ELEVATION (FT MSL)
- MONITORING WELL LOCATION (FALCON ENGINEERING)
- TEMPORARY MONITORING WELL LOCATION (FALCON ENGINEERING)
- SOIL BORING LOCATION (FALCON ENGINEERING)
- SURFACE WATER SAMPLE LOCATION (FALCON ENGINEERING)
- ABANDONED MONITORING WELL LOCATION
- ABANDONED TEMPORARY MONITORING WELL LOCATION (H&H)
- MONITORING WELL LOCATION (H&H)
- SOIL BORING LOCATION (H&H)
- BACKGROUND SOIL BORING LOCATION (H&H)
- SURFACE WATER/SEDIMENT SAMPLE LOCATION (H&H)
- DRAINAGE PATHWAY SOIL SAMPLE LOCATION (H&H)
- DRAINAGE PATHWAY SURFACE WATER SAMPLE LOCATION (H&H)
- COVER EVALUATION BORING LOCATION
- CCP UNDER > 2 FT COVER
- CCP UNDER < 2 FT COVER
- CCP EXPOSED AT GROUND SURFACE
- CCP DEPOSITIONAL LAYER
- STORMWATER CULVERT
- BOLIN CREEK TRAIL
- EXISTING SILT FENCE

N

APPROXIMATE
0 115 230
SCALE IN FEET

TITLE

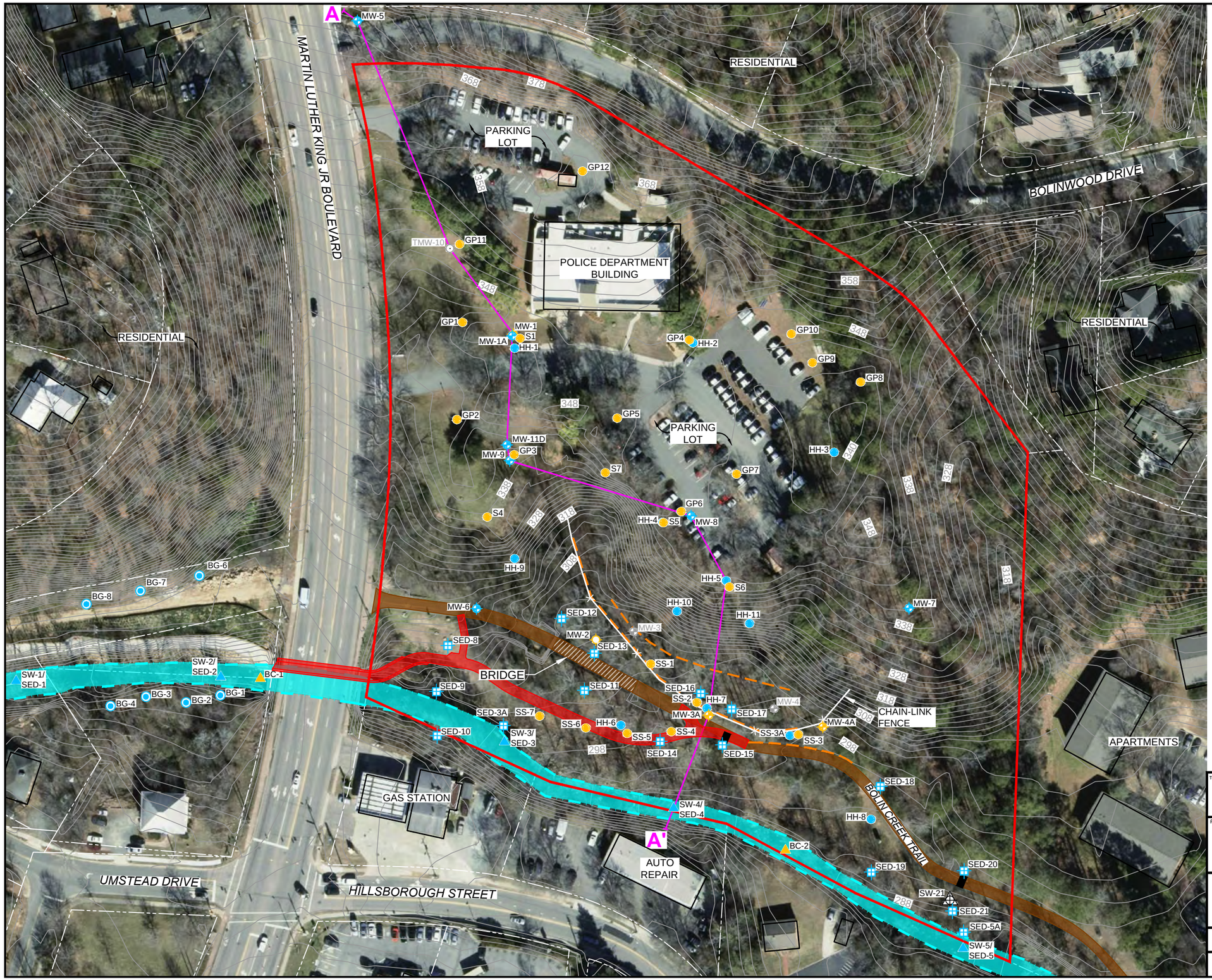
SAMPLE LOCATION MAP

PROJECT

TOWN OF CHAPEL HILL
828 MARTIN LUTHER KING JR. BOULEVARD
CHAPEL HILL, NORTH CAROLINA

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)
License # C-1269 / #C-245 Geology

DATE: 3-31-20	REVISION NO. 0
JOB NO. TCH-009	FIGURE NO. 2



NOTE:

EXISTING MONITORING WELLS & OCTOBER/ NOVEMBER 2016 SAMPLING LOCATIONS SURVEYED BY CE GROUP ON DECEMBER 8, 9, & 20, 2016.

TITLE

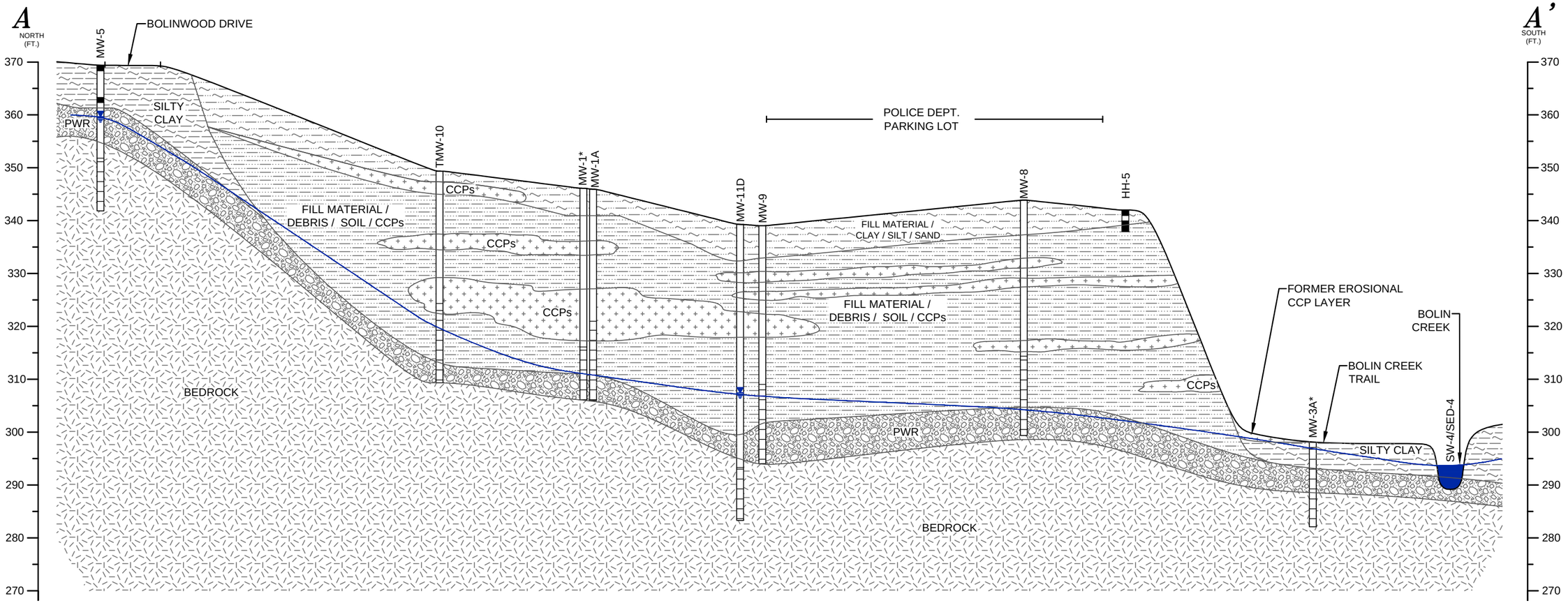
CROSS-SECTION TRANSECT LOCATION MAP

PROJECT

TOWN OF CHAPEL HILL
828 MARTIN LUTHER KING JR. BOULEVARD
CHAPEL HILL, NORTH CAROLINA

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)
License # C-1269 / #C-245 Geology

DATE: 4-22-20	REVISION NO. 0
JOB NO. TCH-009	FIGURE NO. 3



LEGEND

HH-5 — SOIL BORING DEPICTING SAMPLE INTERVAL

MW-5 — MONITORING WELL DEPICTING SCREEN INTERVAL

320 — UNCONFINED AQUIFER (FEBRUARY 2020)

- SILTY CLAY
- FILL MATERIAL / CLAY / SILT / SAND
- COAL COMBUSTION PRODUCTS (CCPs) - THICKER LAYERS
- FILL MATERIAL, DEBRIS AND SOIL WITH INTERLAYERED AND INTERMIXED CCPs
- PARTIALLY WEATHERED ROCK (PWR)
- BEDROCK

NOTES:

1. REFER TO FIGURE 3 OF THIS REPORT FOR CROSS-SECTION TRANSECT.
2. * INDICATES MONITORING WELL INSTALLED BY FALCON ENGINEERING, INC.
3. WITH THE EXCEPTION OF TMW-10 (GROUNDWATER ELEVATION MEASURED AND WELL ABANDONED ON SEPTEMBER 24, 2019), GROUNDWATER ELEVATIONS MEASURED ON FEBRUARY 12, 2020.
4. GROUNDWATER ELEVATIONS IN FILL (MW-1A, MW-9, AND TMW-10) APPEAR INDICATIVE OF PERCHED GROUNDWATER.
5. SOME CCP LAYERS CONCEPTUALLY INFERRED FOR ILLUSTRATION PURPOSES.

20 — APPROXIMATE — 0 — 80 SCALE IN FEET

VERTICAL EXAGGERATION = 4X

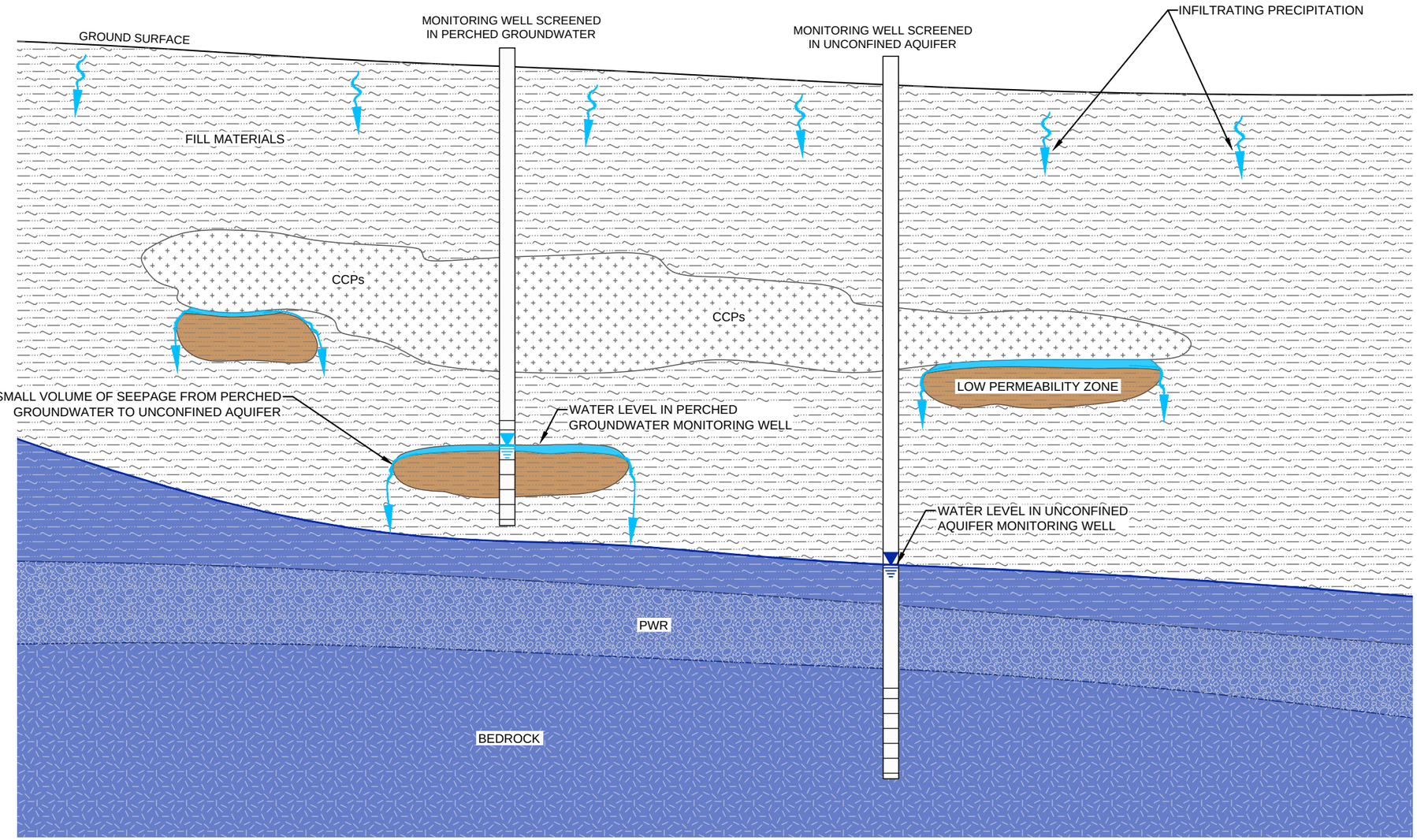
TITLE: CROSS-SECTION A-A'

PROJECT: TOWN OF CHAPEL HILL
828 MARTIN LUTHER KING JR. BOULEVARD
CHAPEL HILL, NORTH CAROLINA

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)
License # C-1269 / #C-245 Geology

DATE: 6-2-20 | REVISION NO. 0

JOB NO. TCH-009 | FIGURE NO. 4



NOT TO SCALE

LEGEND

- MONITORING WELL DEPICTING SCREEN INTERVAL
- UNCONFINED AQUIFER WATER LEVEL
- PERCHED GROUNDWATER LEVEL
- FILL MATERIALS
- COAL COMBUSTION PRODUCTS (CCPs)
- LOW PERMEABILITY ZONES (EX: CLAY)
- PERCHED GROUNDWATER
- PARTIALLY WEATHERED ROCK (PWR)
- BEDROCK
- UNCONFINED AQUIFER

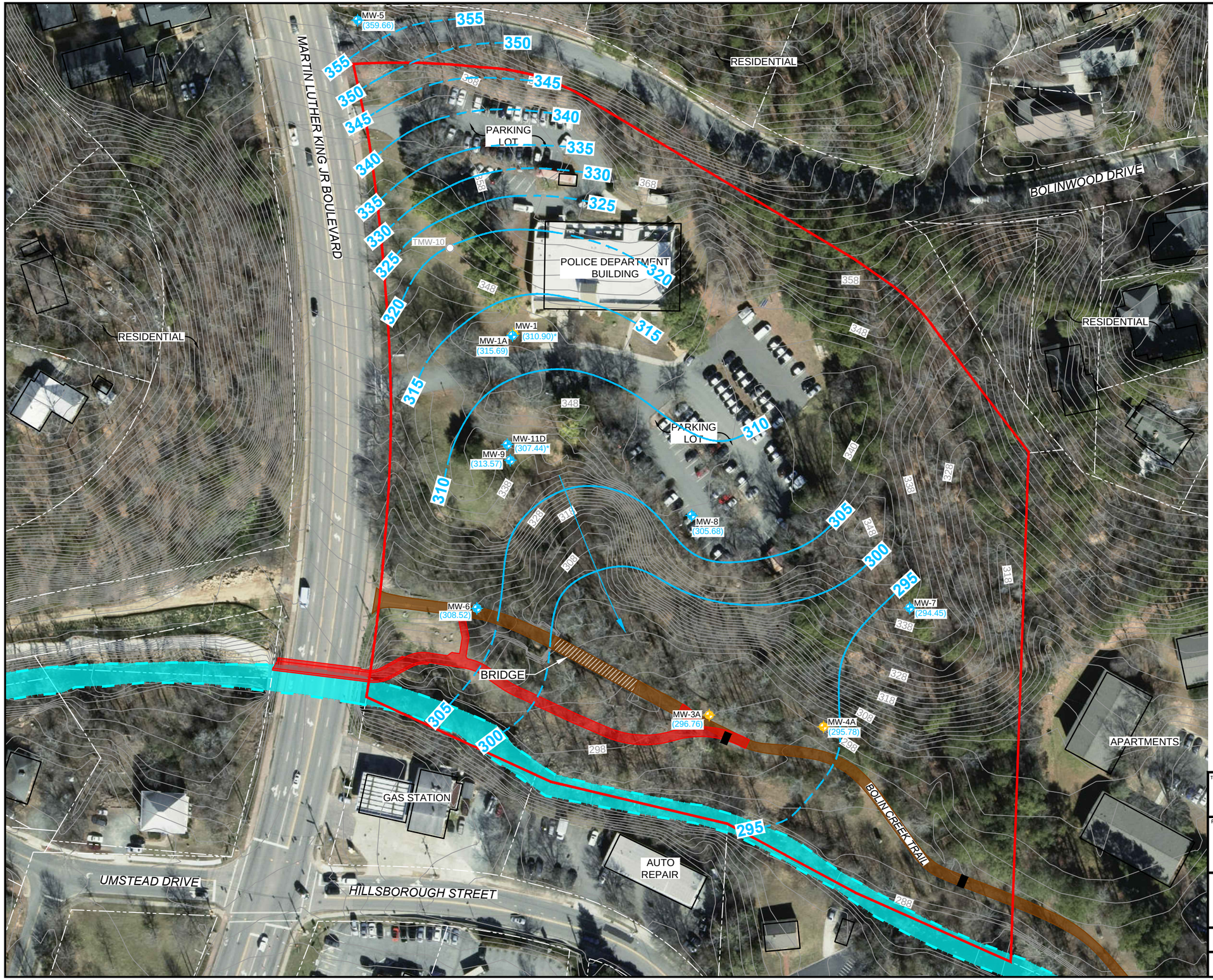
TITLE: CONCEPTUAL DIAGRAM OF RELATIONSHIP BETWEEN PERCHED GROUNDWATER AND UNCONFINED AQUIFER

PROJECT: TOWN OF CHAPEL HILL
828 MARTIN LUTHER KING JR. BOULEVARD
CHAPEL HILL, NORTH CAROLINA

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)
License # C-1269 / #C-245 Geology

DATE: 6-3-20 | REVISION NO. 0

JOB NO. TCH-009 | FIGURE NO. 5



LEGEND

- SITE PROPERTY BOUNDARY
- BOLIN CREEK
- 101 — TOPOGRAPHIC CONTOUR ELEVATION (FT MSL)
- MONITORING WELL LOCATION (FALCON ENGINEERING)
- MONITORING WELL LOCATION (H&H)
- ABANDONED TEMPORARY MONITORING WELL LOCATION (H&H)
- STORMWATER CULVERT
- BOLIN CREEK TRAIL
- 295 — GROUNDWATER ELEVATION CONTOUR (FT MSL) (DASHED WHERE INFERRED)
- APPROXIMATE GROUNDWATER FLOW DIRECTION
- (315.69) GROUNDWATER ELEVATION (FT MSL)

NOTES:

1. GROUNDWATER ELEVATIONS MEASURED ON FEBRUARY 12, 2020.
2. SHALLOW WELLS IN FILL (MW-1, MW-1A, MW-8, AND MW-9) NOT USED IN CONTOURING DUE TO LIKELY PERCHED GROUNDWATER.

N

APPROXIMATE
0 100 200
SCALE IN FEET

TITLE
UNCONFINED AQUIFER POTENTIOMETRIC MAP

PROJECT
TOWN OF CHAPEL HILL
828 MARTIN LUTHER KING JR. BOULEVARD
CHAPEL HILL, NORTH CAROLINA

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS
2923 South Tryon Street-Suite 100
Charlotte, North Carolina 28203
704-586-0007(p) 704-586-0373(f)
License # C-1269 / #C-245 Geology

DATE: 5-12-20	REVISION NO. 0
JOB NO. TCH-009	FIGURE NO. 6

Appendix A

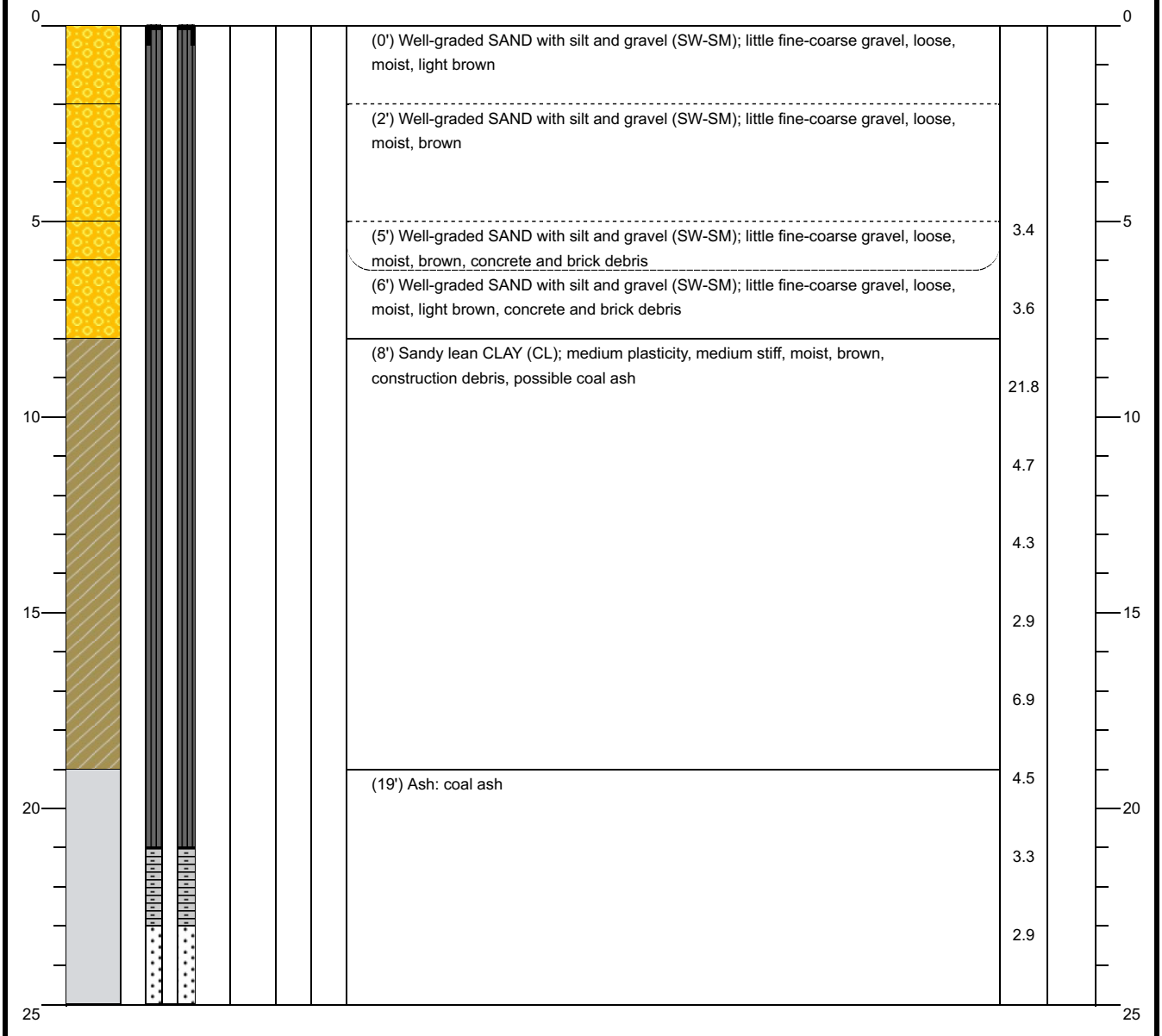
Boring Logs, Well Construction Records, and Well Abandonment Records

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS

Client:	**Town of Chapel Hill**	**WELL LOG**	
Project:	**TCH-009**	**Well No.**	**MW-1A**
Address:	**828 MLK Jr Drive, Chapel Hill, NC**	**Page:**	**1 of 2**

Drilling Start Date:	**9/24/19**	Boring Depth (ft):	**40.0**	Well Depth (ft):	**40.0**
Drilling End Date:	**9/24/19**	Boring Diameter (in):	**6.00**	Well Diameter (in):	**2.0**
Drilling Company:	**SAEDACCO**	Sampling Method(s):		Screen Slot (in):	**0.010**
Drilling Method:	**Sonic**	DTW During Drilling (ft):		Riser Material:	**Sch 40 PVC**
Drilling Equipment:	**Geoprobe 8150LS**	DTW After Drilling (ft):		Screen Material:	**PVC Prepack**
Driller:	**Will**	Top of Casing Elev. (ft):		Seal Material(s):	**Other/Bent. Chips**
Logged By:	**Patrick Stevens**	Location (X,Y):		Filter Pack:	**Sand Pack**



NOTES: Hole precleared to 5.0' on 9/24/19 by SAEDACCO using post hole dig. Dust levels monitored by TSI DustTrak DRX during drilling. Annular seal constructed with AquaGuard.

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS

Client:	**Town of Chapel Hill**		**WELL LOG**
Project:	**TCH-009**	**Well No.**	**MW-1A**
Address:	**828 MLK Jr Drive, Chapel Hill, NC**	**Page:**	**2 of 2**

Drilling Start Date:	**9/24/19**	Boring Depth (ft):	**40.0**	Well Depth (ft):	**40.0**
Drilling End Date:	**9/24/19**	Boring Diameter (in):	**6.00**	Well Diameter (in):	**2.0**
Drilling Company:	**SAEDACCO**	Sampling Method(s):		Screen Slot (in):	**0.010**
Drilling Method:	**Sonic**	DTW During Drilling (ft):		Riser Material:	**Sch 40 PVC**
Drilling Equipment:	**Geoprobe 8150LS**	DTW After Drilling (ft):		Screen Material:	**PVC Prepack**
Driller:	**Will**	Top of Casing Elev. (ft):		Seal Material(s):	**Other/Bent. Chips**
Logged By:	**Patrick Stevens**	Location (X,Y):		Filter Pack:	**Sand Pack**

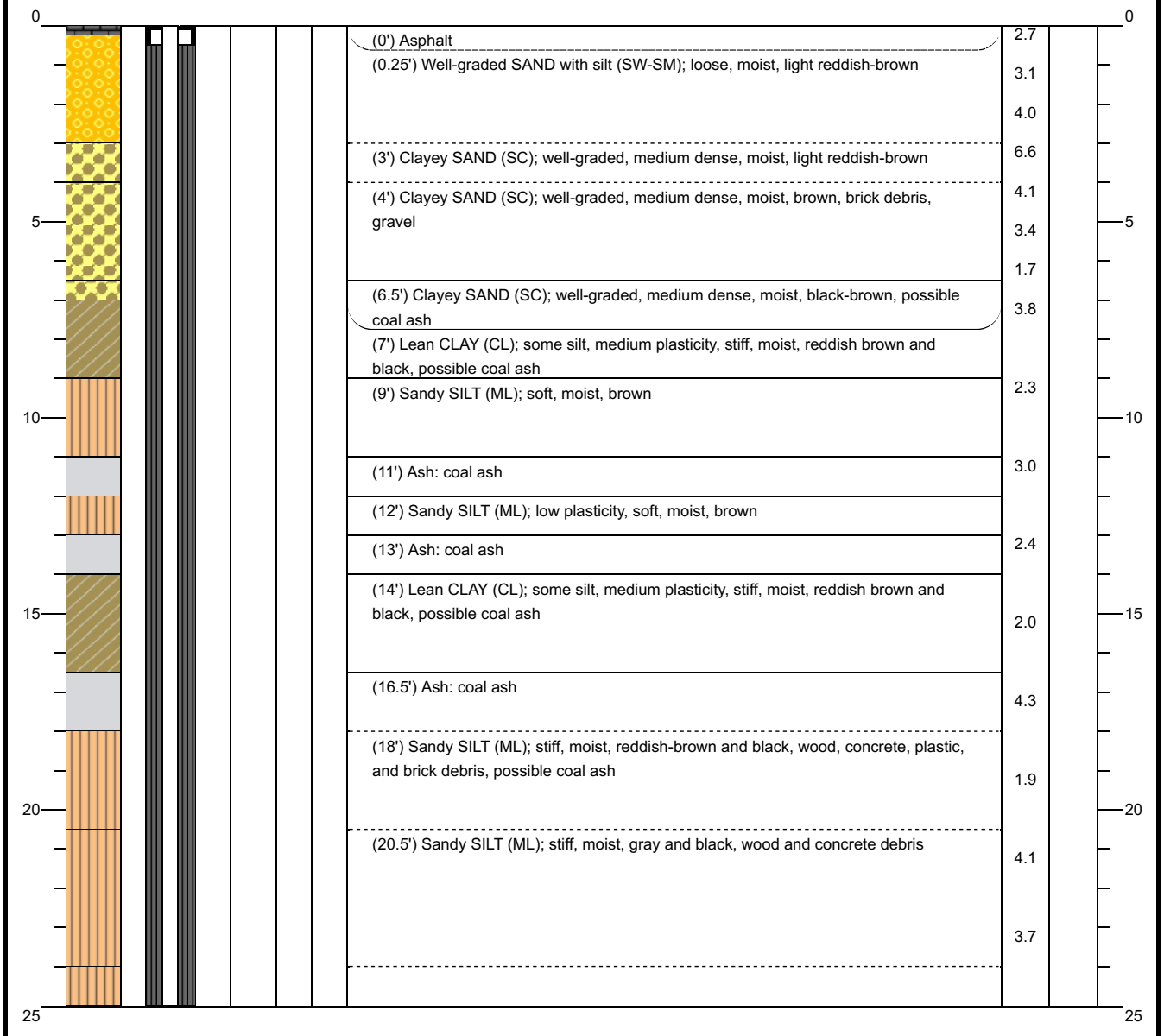
DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
25								(19') Ash: coal ash	1.6 1.3		25
30								(29') Sandy lean CLAY (CL); medium plasticity, medium stiff, wet, light brown, construction debris	2.1		30
35								(35') Sandy SILT (ML); very stiff, moist, reddish-brown, partially weathered rock			35
40								(40') Boring terminated			40
45											45
50											50

NOTES: Hole precleared to 5.0' on 9/24/19 by SAEDACCO using post hole dig. Dust levels monitored by TSI DustTrak DRX during drilling. Annular seal constructed with AquaGuard.

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS

Client:	**Town of Chapel Hill**	**WELL LOG**	
Project:	**TCH-009**	**Well No.**	**MW-8**
Address:	**828 MLK Jr Drive, Chapel Hill, NC**	**Page:**	**1 of 2**

Drilling Start Date:	**9/23/19**	Boring Depth (ft):	**45.0**	Well Depth (ft):	**44.5**
Drilling End Date:	**9/24/19**	Boring Diameter (in):	**6.00**	Well Diameter (in):	**2.0**
Drilling Company:	**SAEDACCO**	Sampling Method(s):		Screen Slot (in):	**0.010**
Drilling Method:	**Sonic**	DTW During Drilling (ft):		Riser Material:	**Sch 40 PVC**
Drilling Equipment:	**Geoprobe 8150LS**	DTW After Drilling (ft):	**40.8**	Screen Material:	**PVC Prepack**
Driller:	**Will**	Top of Casing Elev. (ft):		Seal Material(s):	**Other/Bent. Chips**
Logged By:	**Lisa Nickels**	Location (X,Y):		Filter Pack:	**Sand Pack**

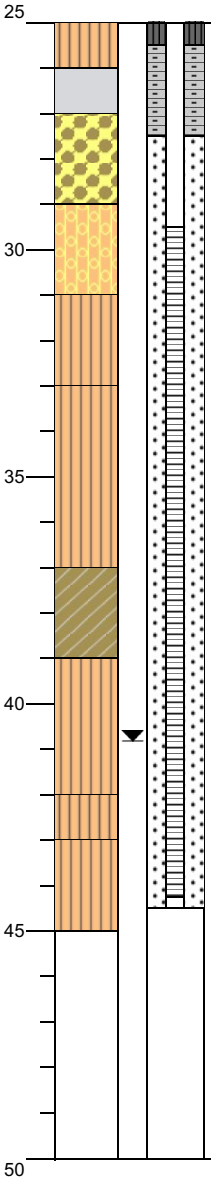


NOTES: Hole precleared to 5.0' on 9/23/19 by SAEDACCO using post hole dig. Dust levels monitored using a TSI Dusttrack DRX during drilling. Annular Seal created using AquaGaurd.

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS

Client:	**Town of Chapel Hill**	**WELL LOG**	
Project:	**TCH-009**	**Well No.**	**MW-8**
Address:	**828 MLK Jr Drive, Chapel Hill, NC**	**Page:**	**2 of 2**

Drilling Start Date:	**9/23/19**	Boring Depth (ft):	**45.0**	Well Depth (ft):	**44.5**
Drilling End Date:	**9/24/19**	Boring Diameter (in):	**6.00**	Well Diameter (in):	**2.0**
Drilling Company:	**SAEDACCO**	Sampling Method(s):		Screen Slot (in):	**0.010**
Drilling Method:	**Sonic**	DTW During Drilling (ft):		Riser Material:	**Sch 40 PVC**
Drilling Equipment:	**Geoprobe 8150LS**	DTW After Drilling (ft):	**40.8**	Screen Material:	**PVC Prepack**
Driller:	**Will**	Top of Casing Elev. (ft):		Seal Material(s):	**Other/Bent. Chips**
Logged By:	**Lisa Nickels**	Location (X,Y):		Filter Pack:	**Sand Pack**



DEPTH (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE PID (ppm)	MEASURE Lab Sample	DEPTH (ft)
25	(24') Sandy SILT (ML); medium stiff, moist, brown and black, wood, brick, and concrete, possible coal ash	6.2		25
	(25') SILT (ML); stiff, moist, black, wood and brick debris, possible coal ash			
	(26') Ash: coal ash	3.9		
	(27') Clayey SAND (SC); well-graded, medium dense, moist, reddish-brown			
30	(29') Silty SAND (SM); well-graded, loose, moist, light yellowish-brown	3.3		30
	(31') SILT (ML); soft, moist, light brown	4.7		
	(33') SILT (ML); little clay, medium stiff, moist, black, brick debris, possible coal ash	8.3		
35	(37') Sandy lean CLAY (CL); medium plasticity, very stiff, moist, dark brown	6.9		35
	(39') SILT (ML); soft, moist, light brown, partially weathered rock	2.3		
40		4.3		40
	(42') SILT (ML); medium stiff, moist, brown, partially weathered rock			
	(43') Sandy SILT (ML); medium stiff, moist, light brown, partially weathered rock	2.8		
45	(45') Boring terminated	2.2		45
50				50

NOTES: Hole precleared to 5.0' on 9/23/19 by SAEDACCO using post hole dig. Dust levels monitored using a TSI Dusttrack DRX during drilling. Annular Seal created using AquaGaurd.

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS

Client:	**Town of Chapel Hill**	**WELL LOG**	
Project:	**TCH-009**	**Well No.**	**MW-9**
Address:	**828 MLK Jr Drive, Chapel Hill, NC**	**Page:**	**1 of 2**

Drilling Start Date:	**9/23/19**	Boring Depth (ft):	**45.0**	Well Depth (ft):	**45.0**
Drilling End Date:	**9/24/19**	Boring Diameter (in):	**6.00**	Well Diameter (in):	**2.0**
Drilling Company:	**SAEDACCO**	Sampling Method(s):		Screen Slot (in):	**0.010**
Drilling Method:	**Sonic**	DTW During Drilling (ft):		Riser Material:	**Sch 40 PVC**
Drilling Equipment:	**Geoprobe 8150LS**	DTW After Drilling (ft):	**28.9**	Screen Material:	**PVC Prepack**
Driller:	**Will**	Top of Casing Elev. (ft):		Seal Material(s):	**Other/Bent. Chips**
Logged By:	**Lisa Nickels**	Location (X,Y):		Filter Pack:	**Sand Pack**

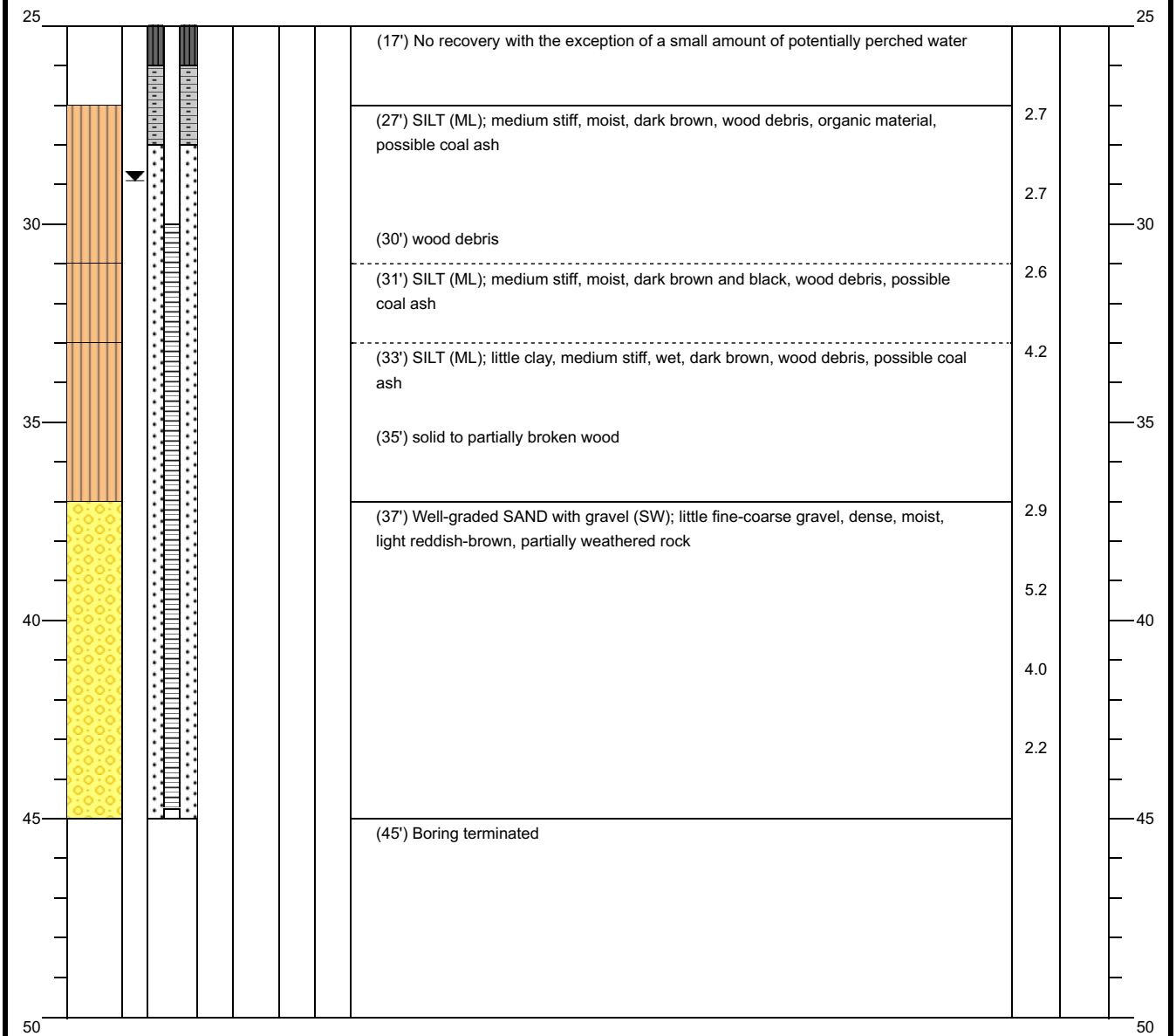
DEPTH (ft)	LITHOLOGY	WATER LEVEL	WELL COMPLETION	COLLECT: Sample Type	COLLECT: Time	COLLECT: Blow Counts	COLLECT: Recovery (ft)	SOIL/ROCK VISUAL DESCRIPTION	MEASURE: PID (ppm)	MEASURE: Lab Sample	DEPTH (ft)
0								(0') Sandy SILT (ML); soft, moist, reddish-brown	2.7		0
									2.2		
5								(4') Lean CLAY (CL); some silt, medium plasticity, very stiff, moist, reddish-brown	3.3		5
								(6') Lean CLAY (CL); some silt, medium plasticity, stiff, moist, reddish-brown and black, possible coal ash	2.2		
								(7') SILT (ML); little clay, soft, moist, brown and black, possible coal ash	2.4		
10								(9.5') Ash: coal ash	4.4		10
								(11') SILT (ML); little clay, stiff, moist, reddish-brown and white	4.5		
								(13') Ash: coal ash			
								(14') Sandy SILT (ML); stiff, moist, reddish-brown	2.6		
15								(15') Well-graded SAND with gravel (SW); little fine-coarse gravel, medium dense, moist, white			15
								(16') SILT (ML); soft, moist, very dark brown, wood debris, organic material			
								(17') No recovery with the exception of a small amount of potentially perched water			
20											20
25											25

NOTES: Hole precleared to 5.0' on 9/23/19 by SAEDACCO using post hole dig. Dust levels monitored using a TSI Dusttrak DRX during drilling. Annular seal created using AquaGuard.

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS

Client:	**Town of Chapel Hill**		**WELL LOG**
Project:	**TCH-009**	**Well No.**	**MW-9**
Address:	**828 MLK Jr Drive, Chapel Hill, NC**	**Page:**	**2 of 2**

Drilling Start Date:	**9/23/19**	Boring Depth (ft):	**45.0**	Well Depth (ft):	**45.0**
Drilling End Date:	**9/24/19**	Boring Diameter (in):	**6.00**	Well Diameter (in):	**2.0**
Drilling Company:	**SAEDACCO**	Sampling Method(s):		Screen Slot (in):	**0.010**
Drilling Method:	**Sonic**	DTW During Drilling (ft):		Riser Material:	**Sch 40 PVC**
Drilling Equipment:	**Geoprobe 8150LS**	DTW After Drilling (ft):	**28.9**	Screen Material:	**PVC Prepack**
Driller:	**Will**	Top of Casing Elev. (ft):		Seal Material(s):	**Other/Bent. Chips**
Logged By:	**Lisa Nickels**	Location (X,Y):		Filter Pack:	**Sand Pack**

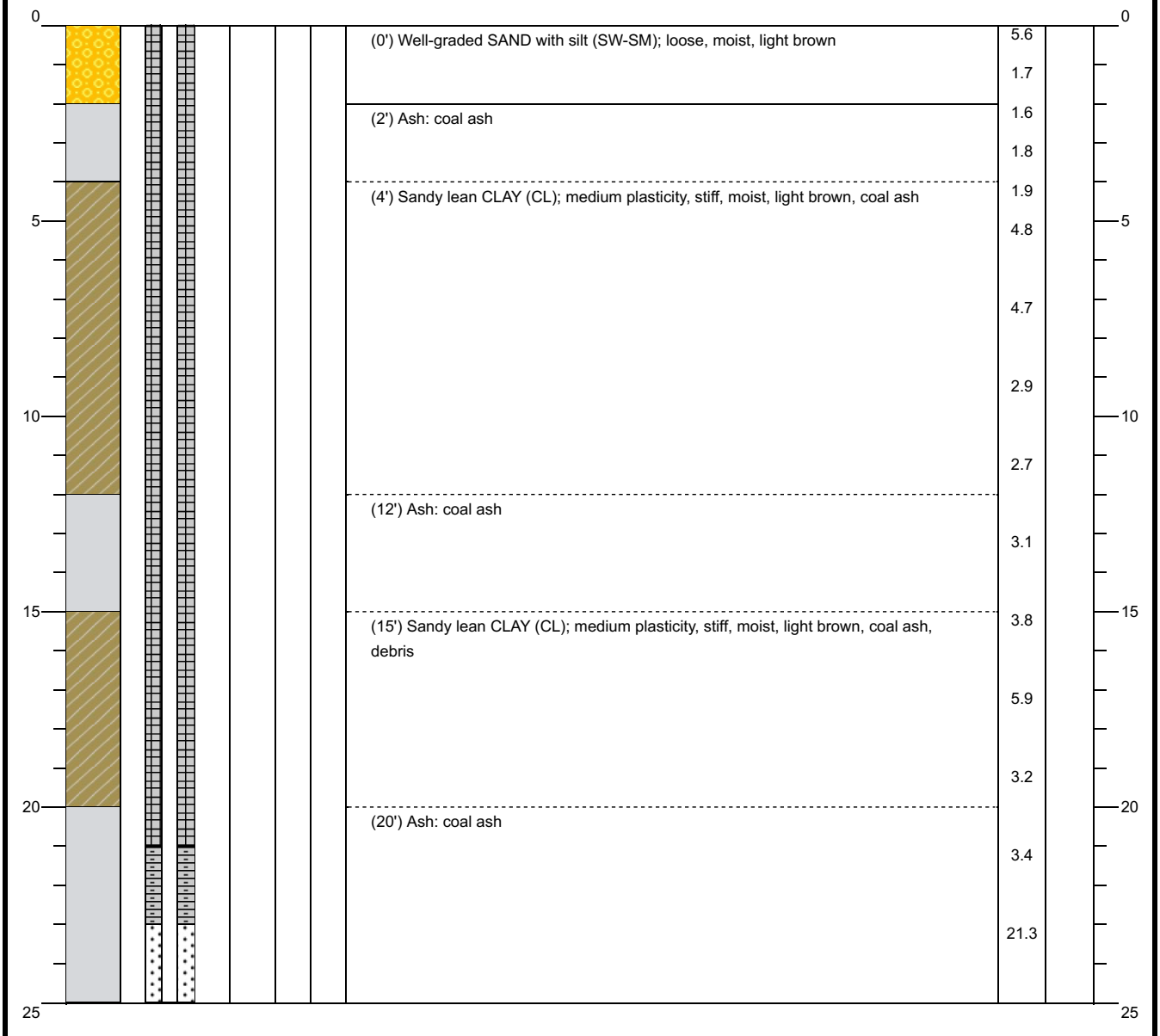


NOTES: Hole precleared to 5.0' on 9/23/19 by SAEDACCO using post hole dig. Dust levels monitored using a TSI Dusttrak DRX during drilling. Annular seal created using AquaGuard.

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS

Client:	**Town of Chapel Hill**		**WELL LOG**
Project:	**TCH-009**	**Well No.**	**TMW-10**
Address:	**828 MLK Jr Drive, Chapel Hill, NC**	**Page:**	**1 of 2**

Drilling Start Date:	**9/24/19**	Boring Depth (ft):	**40.0**	Well Depth (ft):	**40.0**
Drilling End Date:	**9/24/19**	Boring Diameter (in):	**6.00**	Well Diameter (in):	**2.0**
Drilling Company:	**SAEDACCO**	Sampling Method(s):		Screen Slot (in):	**0.010**
Drilling Method:	**Sonic**	DTW During Drilling (ft):		Riser Material:	**Sch 40 PVC**
Drilling Equipment:	**Geoprobe 8150LS**	DTW After Drilling (ft):	**27.2**	Screen Material:	**Sch 40 PVC Slotted**
Driller:	**Will**	Top of Casing Elev. (ft):		Seal Material(s):	**Bent. Pellets**
Logged By:	**Patrick Stevens**	Location (X,Y):		Filter Pack:	**Sand Pack**

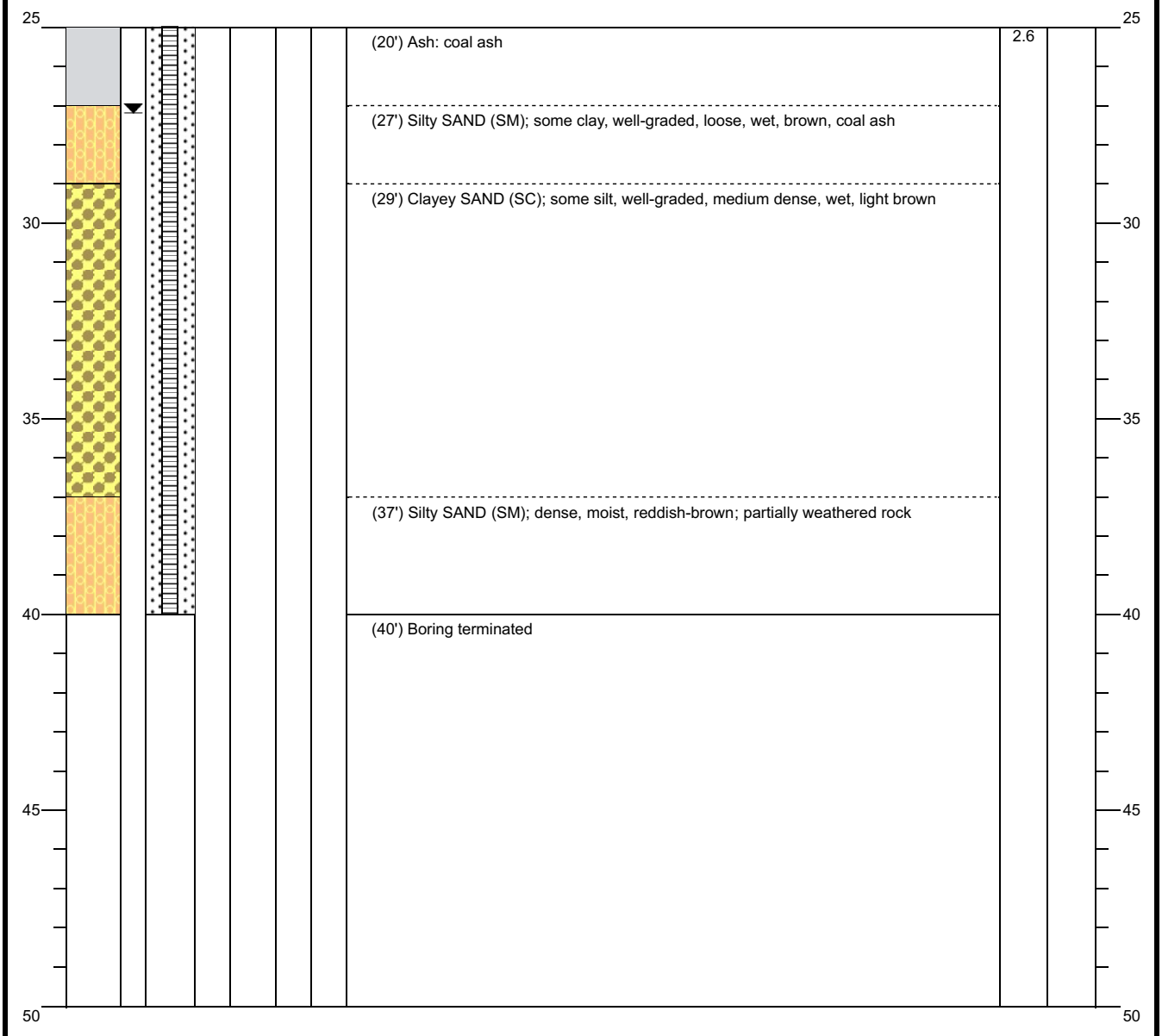


NOTES: Hole precleared to 5.0' on 9/24/19 by SAEDACCO using post hole dig. Dust levels monitored by TSI Dusttrak TRX during drilling. Temporary monitoring well abandoned on 9/24/19

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS

Client:	**Town of Chapel Hill**		**WELL LOG**
Project:	**TCH-009**	**Well No.**	**TMW-10**
Address:	**828 MLK Jr Drive, Chapel Hill, NC**	**Page:**	**2 of 2**

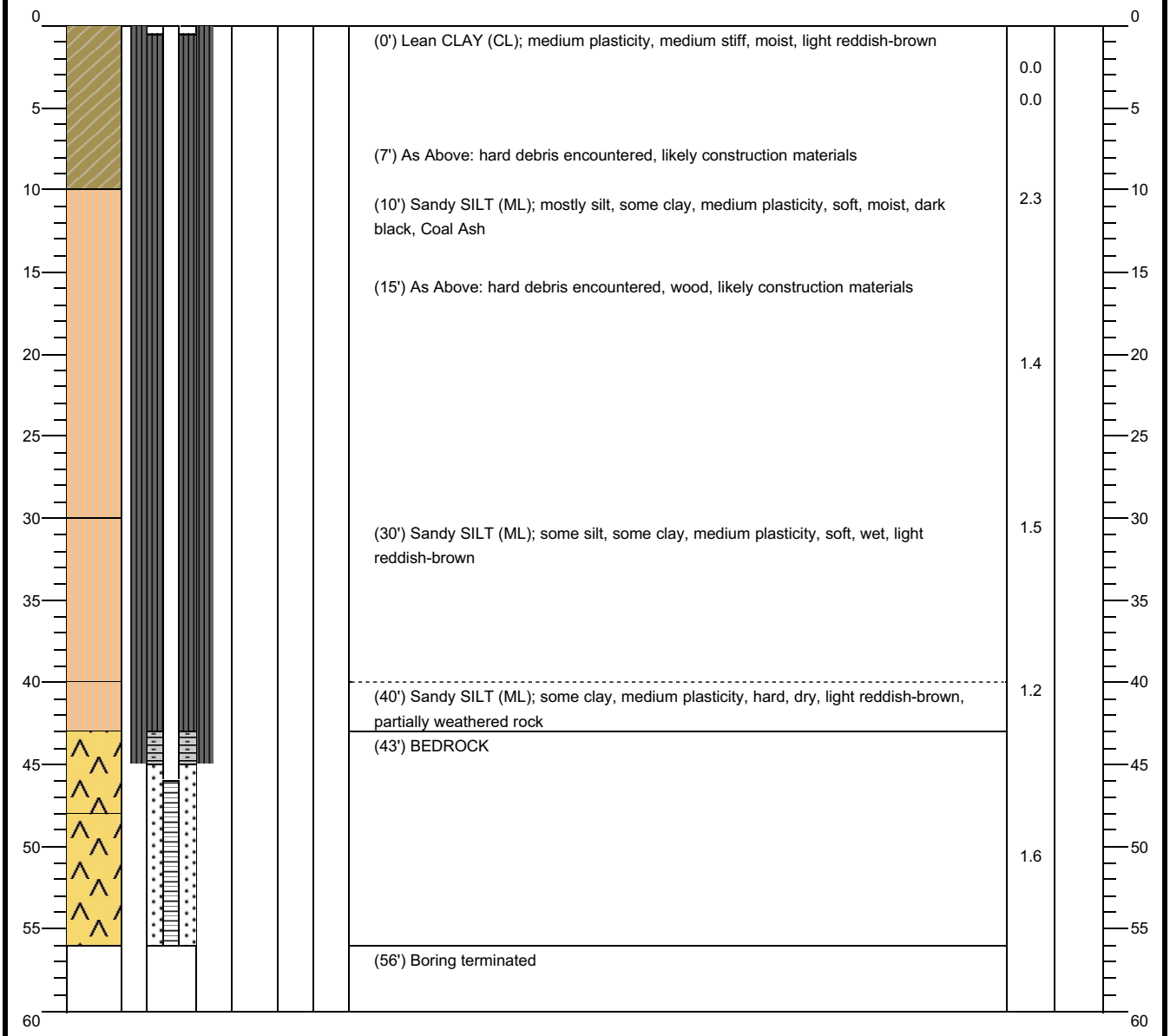
Drilling Start Date:	**9/24/19**	Boring Depth (ft):	**40.0**	Well Depth (ft):	**40.0**
Drilling End Date:	**9/24/19**	Boring Diameter (in):	**6.00**	Well Diameter (in):	**2.0**
Drilling Company:	**SAEDACCO**	Sampling Method(s):		Screen Slot (in):	**0.010**
Drilling Method:	**Sonic**	DTW During Drilling (ft):		Riser Material:	**Sch 40 PVC**
Drilling Equipment:	**Geoprobe 8150LS**	DTW After Drilling (ft):	**27.2**	Screen Material:	**Sch 40 PVC Slotted**
Driller:	**Will**	Top of Casing Elev. (ft):		Seal Material(s):	**Bent. Pellets**
Logged By:	**Patrick Stevens**	Location (X,Y):		Filter Pack:	**Sand Pack**



NOTES: Hole precleared to 5.0' on 9/24/19 by SAEDACCO using post hole dig. Dust levels monitored by TSI Dusttrak TRX during drilling. Temporary monitoring well abandoned on 9/24/19

hart hickman SMARTER ENVIRONMENTAL SOLUTIONS	**Client:** Town of Chapel Hill **Project:** TCH-009 **Address:** 828 MLK Jr Drive, Chapel Hill, NC	**WELL LOG** **Well No.** MW-11D **Page:** 1 of 1

Drilling Start Date:	**02/06/20**	Boring Depth (ft):	**56.0**	Well Depth (ft):	**56Ft**
Drilling End Date:	**02/10/20**	Boring Diameter (in):	**6.00**	Well Diameter (in):	**2in**
Drilling Company:	**SAEDACCO**	Sampling Method(s):		Screen Slot (in):	
Drilling Method:	**Air Rotary**	DTW During Drilling (ft):		Riser Material:	**Sch 40 PVC**
Drilling Equipment:	**HSA/Air Rotary Rig**	DTW After Drilling (ft):	**31.85**	Screen Material:	**PVC Prepack**
Driller:	**SAEDACCO**	Top of Casing Elev. (ft):		Seal Material(s):	**Bent.-Cement Grout/Other**
Logged By:	**Jeffrey Ollison**	Location (X,Y):		Filter Pack:	**Sand Pack**



NOTES: Hole precleared to 5.0' on 02/06/20 by SAEDACCO using post hole dig. AQUAGUARD placed above bentonite seal during well construction. Well set within 6" outer PVC casing. 6" outer cement grout casing exist 0-45'.

WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Will Keyes
Well Contractor Name

4220 A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:
☐Agricultural ☐Municipal/Public
☐Geothermal (Heating/Cooling Supply) ☐Residential Water Supply (single)
☐Industrial/Commercial ☐Residential Water Supply (shared)
☐Irrigation

Non-Water Supply Well:
☒Monitoring ☐Recovery

Injection Well:
☐Aquifer Recharge ☐Groundwater Remediation
☐Aquifer Storage and Recovery ☐Salinity Barrier
☐Aquifer Test ☐Stormwater Drainage
☐Experimental Technology ☐Subsidence Control
☐Geothermal (Closed Loop) ☐Tracer
☐Geothermal (Heating/Cooling Return) ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 9/24/19 **Well ID#** MW-8

5a. Well Location:

Chapel Hill Police Department
Facility/Owner Name — Facility ID# (if applicable)

828 Martin Luther King Jr. Blvd., Chapel Hill, NC , 27514
Physical Address, City, and Zip

Orange
County — Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(If well field, one lat/long is sufficient)

_____ N _____ W

6. Is (are) the well(s): ☒Permanent or ☐Temporary

7. Is this a repair to an existing well: ☐Yes or ☒No
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
*For multiple injection or non-water supply wells **ONLY** with the **same construction**, you can submit one form.*

9. Total well depth below land surface: 45 **(ft.)**
For multiple wells list all depths if different (example: 3@200' and 2@100').

10. Static water level below top of casing: 30 **(ft.)**
If water level is above casing, use "+".

11. Borehole diameter: 6.5" **(in.)**

12. Well construction method: Sonic
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0 ft.	29.5' ft.	2" in.	SCH-40	PVC

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
29.5ft.	44.5'ft.	2" in.	.010	SCH-40	PRE-PACK
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
0 ft.	25.5' ft.	Aqua Guard	Poured through casing
ft.	ft.		
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
27.5'ft.	45' ft.	Sand	2a
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	45' ft.	Land fill material
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

Bentonite seal from 27.5'-29.5'

22. Certification:

Signature of Certified Well Contractor — 9/29/2019 Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0102 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Will Keyes
Well Contractor Name

4220 A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:
☐Agricultural ☐Municipal/Public
☐Geothermal (Heating/Cooling Supply) ☐Residential Water Supply (single)
☐Industrial/Commercial ☐Residential Water Supply (shared)
☐Irrigation

Non-Water Supply Well:
☒Monitoring ☐Recovery

Injection Well:
☐Aquifer Recharge ☐Groundwater Remediation
☐Aquifer Storage and Recovery ☐Salinity Barrier
☐Aquifer Test ☐Stormwater Drainage
☐Experimental Technology ☐Subsidence Control
☐Geothermal (Closed Loop) ☐Tracer
☐Geothermal (Heating/Cooling Return) ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 9/24/19 **Well ID#** MW-9

5a. Well Location:

Chapel Hill Police Department
Facility/Owner Name _____ Facility ID# (if applicable)

828 Martin Luther King Jr. Blvd., Chapel Hill, NC , 27514
Physical Address, City, and Zip

Orange
County _____ Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(If well field, one lat/long is sufficient)

_____ N _____ W

6. Is (are) the well(s): ☒Permanent or ☐Temporary

7. Is this a repair to an existing well: ☐Yes or ☒No
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
*For multiple injection or non-water supply wells **ONLY** with the **same construction**, you can submit one form.*

9. Total well depth below land surface: 45 **(ft.)**
For multiple wells list all depths if different (example- 7@200' and 2@100').

10. Static water level below top of casing: 30 **(ft.)**
If water level is above casing, use "+"

11. Borehole diameter: 6.5" **(in.)**

12. Well construction method: Sonic
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0 ft.	30' ft.	2" in.	SCH-40	PVC

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
30' ft.	45' ft.	2" in.	.010	SCH-40	PRE-PACK
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
0 ft.	26' ft.	Aqua Guard	Poured through casing
ft.	ft.		
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
28' ft.	45' ft.	Sand	2a
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	45' ft.	Land fill material
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

Bentonite seal from 26'-28'

22. Certification:

_____ 9/29/2019
Signature of Certified Well Contractor Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Will Keyes
Well Contractor Name

4220 A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:
☐Agricultural ☐Municipal/Public
☐Geothermal (Heating/Cooling Supply) ☐Residential Water Supply (single)
☐Industrial/Commercial ☐Residential Water Supply (shared)
☐Irrigation

Non-Water Supply Well:
☒Monitoring ☐Recovery

Injection Well:
☐Aquifer Recharge ☐Groundwater Remediation
☐Aquifer Storage and Recovery ☐Salinity Barrier
☐Aquifer Test ☐Stormwater Drainage
☐Experimental Technology ☐Subsidence Control
☐Geothermal (Closed Loop) ☐Tracer
☐Geothermal (Heating/Cooling Return) ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 9/24/19 **Well ID#** MW-1A

5a. Well Location:

Chapel Hill Police Department
Facility/Owner Name — Facility ID# (if applicable)

828 Martin Luther King Jr. Blvd., Chapel Hill, NC , 27514
Physical Address, City, and Zip

Orange
County — Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

_____ N _____ W

6. Is (are) the well(s): ☒Permanent or ☐Temporary

7. Is this a repair to an existing well: ☐Yes or ☒No
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
*For multiple injection or non-water supply wells **ONLY** with the **same construction**, you can submit one form.*

9. Total well depth below land surface: 40 (ft.)
For multiple wells list all depths if different (example: 3@200' and 2@100').

10. Static water level below top of casing: 30 (ft.)
If water level is above casing, use "+".

11. Borehole diameter: 6.5" (in.)

12. Well construction method: Sonic
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0 ft.	25' ft.	2" in.	SCH-40	PVC

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
25' ft.	40' ft.	2" in.	.010	SCH-40	PRE-PACK
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
0 ft.	21' ft.	Aqua Guard	Poured through casing
ft.	ft.		
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
23' ft.	40' ft.	Sand	2a
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	40' ft.	Land fill material
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

Bentonite seal from 21'-23'

22. Certification:

Signature of Certified Well Contractor — 9/29/2019 Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Will Keyes
Well Contractor Name

4220 A
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: _____
List all applicable well permits (i.e. County, State, Variance, Injection, etc.)

3. Well Use (check well use):

Water Supply Well:
☐Agricultural ☐Municipal/Public
☐Geothermal (Heating/Cooling Supply) ☐Residential Water Supply (single)
☐Industrial/Commercial ☐Residential Water Supply (shared)
☐Irrigation

Non-Water Supply Well:
☒Monitoring ☐Recovery

Injection Well:
☐Aquifer Recharge ☐Groundwater Remediation
☐Aquifer Storage and Recovery ☐Salinity Barrier
☐Aquifer Test ☐Stormwater Drainage
☐Experimental Technology ☐Subsidence Control
☐Geothermal (Closed Loop) ☐Tracer
☐Geothermal (Heating/Cooling Return) ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 9/24/19 **Well ID#** TMW-10

5a. Well Location:

Chapel Hill Police Department
Facility/Owner Name _____ Facility ID# (if applicable)

828 Martin Luther King Jr. Blvd., Chapel Hill, NC , 27514
Physical Address, City, and Zip

Orange
County _____ Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(If well field, one lat/long is sufficient)

_____ N _____ W

6. Is (are) the well(s): ☐**Permanent** or ☒**Temporary**

7. Is this a repair to an existing well: ☐**Yes** or ☒**No**
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
*For multiple injection or non-water supply wells **ONLY** with the **same construction**, you can submit one form.*

9. Total well depth below land surface: 40 **(ft.)**
For multiple wells list all depths (if different (example: 3@200' and 2@ 100').

10. Static water level below top of casing: 30 **(ft.)**
If water level is above casing, use "+"

11. Borehole diameter: 6.5" **(in.)**

12. Well construction method: Sonic
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0 ft.	25' ft.	2" in.	SCH-40	PVC

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
25' ft.	40' ft.	2" in.	.010	SCH-40	PVC
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
0 ft.	21' ft.	Aqua Guard	Poured through casing
ft.	ft.		
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
23' ft.	40' ft.	Sand	2a
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	40' ft.	Land fill material
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

Bentonite seal from 21'-23'

22. Certification:

_____ 9/29/2019
Signature of Certified Well Contractor Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

WELL ABANDONMENT RECORD

This form can be used for single or multiple wells

For Internal Use ONLY

1. Well Contractor Information:

Will Keyes

Well Contractor Name (or well owner personally abandoning well on his/her property)

4220 A

NC Well Contractor Certification Number

SAEDACCO Inc

Company Name

2. Well Construction Permit #: _____

List all applicable well permits (i.e. County, State, Variance, Injection, etc.) if known.

3. Well use (check well use):

Water Supply Well:	
☐Agricultural	☐Municipal/Public
☐Geothermal (Heating/Cooling Supply)	☐Residential Water Supply (single)
☐Industrial/Commercial	☐Residential Water Supply (shared)
☐Irrigation	
Non-Water Supply Well:	
☒Monitoring	☐Recovery
Injection Well:	
☐Aquifer Recharge	☐Groundwater Remediation
☐Aquifer Storage and Recovery	☐Salinity Barrier
☐Aquifer Test	☐Stormwater Drainage
☐Experimental Technology	☐Subsidence Control
☐Geothermal (Closed Loop)	☐Tracer
☐Geothermal (Heating/Cooling Return)	☐Other (explain under 7g)

4. Date well(s) abandoned: 9/24/19

5a. Well location:

Chapel Hill Police Department

Facility/Owner Name

Facility ID# (if applicable)

828 MLK Jr. Blvd. Chapel Hill, NC 27514

Physical Address, City, and Zip

Orange

County

Parcel Identification No. (PIN)

5b. Latitude and longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

35.9268 N -79.0534 W

CONSTRUCTION DETAILS OF WELL(S) BEING ABANDONED

*Attach well construction record(s) if available. For multiple injection or non-water supply wells **ONLY** with the same construction abandonment, you can submit one form.*

6a. Well ID#: TMW-10

6b. Total well depth: 40 (ft.)

6c. Borehole diameter: 2" (in.)

6d. Water level below ground surface: 30 (ft.)

6e. Outer casing length (if known): 30 (ft.)

6f. Inner casing/tubing length (if known): _____ (ft.)

6g. Screen length (if known): 10 (ft.)

WELL ABANDONMENT DETAILS

7a. Number of wells being abandoned: 1

*For multiple injection or non-water supply wells **ONLY** with the same construction abandonment, you can submit one form.*

7b. Approximate volume of water remaining in well(s): 2 gal (gal.)

FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used: Chlorine

7d. Amount of disinfectant used: _____

7e. Sealing materials used (check all that apply):

☒ Neat Cement Grout	☐ Bentonite Chips or Pellets
☐ Sand Cement Grout	☐ Dry Clay
☐ Concrete Grout	☐ Drill Cuttings
☐ Specialty Grout	☐ Gravel
☒ Bentonite Slurry	☐ Other (explain under 7g)

7f. For each material selected above, provide amount of materials used:

Neat Cem.:47lb ,Wtr:6gal. Sand Cem.:lb ,Wtr:gal.

Bentonite.:4lb ,Wtr:gal.

7g. Provide a brief description of the abandonment procedure:

Pulled well out and poured grout from the top

8. Certification:

_____ 9/29/2019

Signature of Certified Well Contractor or Well Owner Date

By signing this form, I hereby certify that the well(s) was (were) abandoned in accordance with 15A NCAC 02C .0100 or 2C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

9. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well abandonment details. You may also attach additional pages if necessary.

SUBMITTAL INSTRUCTIONS

10a. For All Wells: Submit this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

10b. For Injection Wells: In addition to sending the form to the address in 10a above, also submit one copy of this form within 30 days of completion of well abandonment to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

10c. For Water Supply & Injection Wells: In addition to sending the form to the addresses) above, also submit one copy of this form within 30 days of completion of well abandonment to the county health department of the county where abandoned.

WELL CONSTRUCTION RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

Robert Miller
Well Contractor Name

2675
NC Well Contractor Certification Number

SAEDACCO Inc
Company Name

2. Well Construction Permit #: W20-0030
List all applicable well permits (i.e. County, State, Variance: Injection, etc.)

3. Well Use (check well use):

Water Supply Well:

☐Agricultural ☐Municipal/Public
☐Geothermal (Heating/Cooling Supply) ☐Residential Water Supply (single)
☐Industrial/Commercial ☐Residential Water Supply (shared)
☐Irrigation

Non-Water Supply Well:

☒Monitoring ☐Recovery

Injection Well:

☐Aquifer Recharge ☐Groundwater Remediation
☐Aquifer Storage and Recovery ☐Salinity Barrier
☐Aquifer Test ☐Stormwater Drainage
☐Experimental Technology ☐Subsidence Control
☐Geothermal (Closed Loop) ☐Tracer
☐Geothermal (Heating/Cooling Return) ☐Other (explain under #21 Remarks)

4. Date Well(s) Completed: 2-11-2020 **Well ID#** MW-11D

5a. Well Location:

Chapel Hill Police Department
Facility/Owner Name

Facility ID# (if applicable)

828 Martin Luther King Jr Blvd , Chapel Hill, NC, 27514
Physical Address, City, and Zip

Orange
County

Parcel Identification No. (PIN)

5b. Latitude and Longitude in degrees/minutes/seconds or decimal degrees:
(if well field, one lat/long is sufficient)

_____ N _____ W

6. Is (are) the well(s): ☒**Permanent** or ☐**Temporary**

7. Is this a repair to an existing well: ☐**Yes** or ☒**No**
If this is a repair, fill out known well construction information and explain the nature of the repair under #21 remarks section or on the back of this form.

8. Number of wells constructed: 1
*For multiple injection or non-water supply wells **ONLY** with the **same construction**, you can submit one form.*

9. Total well depth below land surface: 56' **(ft.)**
For multiple wells list all depths (if different (example- 3@200' and 2@400').

10. Static water level below top of casing: _____ **(ft.)**
If water level is above casing, use "+".

11. Borehole diameter: 6" **(in.)**

12. Well construction method: 6" Air Hammer
(i.e. auger, rotary, cable, direct push, etc.)

FOR WATER SUPPLY WELLS ONLY:

13a. Yield (gpm) _____ **Method of test:** _____

13b. Disinfection type: _____ **Amount:** _____

For Internal Use ONLY:

14. WATER ZONES

FROM	TO	DESCRIPTION
ft.	ft.	
ft.	ft.	

15. OUTER CASING (for multi-cased wells) OR LINER (if applicable)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0 ft.	45' ft.	6" in.	SCH-40	PVC

16. INNER CASING OR TUBING (geothermal closed-loop)

FROM	TO	DIAMETER	THICKNESS	MATERIAL
0 ft.	46' ft.	2" in.	SCH-40	PVC
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
46' ft.	56' ft.	2" in.	.010	SCH-40	PVC
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
0 ft.	45' ft.	Portland	TREMMIE
0 ft.	42' ft.	Aqua Guard	TREMMIE
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)

FROM	TO	MATERIAL	EMPLACEMENT METHOD
44' ft.	56' ft.	Silica Sand	20/30
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	40' ft.	Tan Sandy clay
40' ft.	45' ft.	Rock
45' ft.	56' ft.	Tan sand stone
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

Two feet bentonite seal from 42 to 44'

22. Certification:

Robert Miller 2/16/2020
Signature of Well Contractor Date

By signing this form, I hereby certify that the well(s) was (were) constructed in accordance with 15A NCAC 02C .0100 or 15A NCAC 02C .0200 Well Construction Standards and that a copy of this record has been provided to the well owner.

23. Site diagram or additional well details:
You may use the back of this page to provide additional well site details or well construction details. You may also attach additional pages if necessary.

SUBMITTAL INSTUCTIONS

24a. For All Wells: Submit this form within 30 days of completion of well construction to the following:

Division of Water Resources, Information Processing Unit,
1617 Mail Service Center, Raleigh, NC 27699-1617

24b. For Injection Wells ONLY: In addition to sending the form to the address in 24a above, also submit a copy of this form within 30 days of completion of well construction to the following:

Division of Water Resources, Underground Injection Control Program,
1636 Mail Service Center, Raleigh, NC 27699-1636

24c. For Water Supply & Injection Wells:
Also submit one copy of this form within 30 days of completion of well construction to the county health department of the county where constructed.

Appendix B

Roto-Sonic Drilling Core Photographs

Photograph 1: 5-7 ft bgs (from top to bottom of the page) in MW-1A

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

828 MARTIN LUTHER KING JR. BLVD. PROPERTY
CHAPEL HILL, NORTH CAROLINA

TCH-009

Photograph 2: 7-12 ft bgs (from top to bottom of the page) in MW-1A

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

828 MARTIN LUTHER KING JR. BLVD. PROPERTY
CHAPEL HILL, NORTH CAROLINA

Photograph 3: 12-17 ft bgs (from top to bottom of the page) in MW-1A

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

Photograph 4: 17-27 ft bgs in MW-1A

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

828 MARTIN LUTHER KING JR. BLVD. PROPERTY
CHAPEL HILL, NORTH CAROLINA

TCH-009

Photograph 5: 27-37 ft bgs (from top to bottom of the page) in MW-1A

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

828 MARTIN LUTHER KING JR. BLVD. PROPERTY
CHAPEL HILL, NORTH CAROLINA

Photograph 6: 37-40 ft bgs (from top to bottom of the page) in MW-1A

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

828 MARTIN LUTHER KING JR. BLVD. PROPERTY
CHAPEL HILL, NORTH CAROLINA

Photograph 7: 5-7 ft bgs (from top to bottom of the page) in MW-8

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

Photograph 8: 7-17 ft bgs (from top to bottom of the page) in MW-8

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

Photograph 9: 17-27 ft bgs (from top to bottom of the page) in MW-8

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

Photograph 10: 27-37 ft bgs (from top to bottom of the page) in MW-8

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

Photograph 11: 37-45 ft bgs (from top to bottom of the page) in MW-8

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

Photograph 12: 5-7 ft bgs (from top to bottom of the page) in MW-9

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

Photograph 13: 7-17 ft bgs (from top to bottom of the page) in MW-9

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

Photograph 14: 17-27 ft bgs (from top to bottom of the page) in MW-9 (no recovery)

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

Photograph 15: 27-37 ft bgs (from top to bottom of the page) in MW-9

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

828 MARTIN LUTHER KING JR. BLVD. PROPERTY
CHAPEL HILL, NORTH CAROLINA

Photograph 16: 37-45 ft bgs (from top to bottom of the page) in MW-9

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

Photograph 17: 0-5 ft bgs (from top to bottom of the page) in TMW-10

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

Photograph 18: 5-7 ft bgs (from top to bottom of the page) in TMW-10

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

Photograph 19: 7-17 ft bgs (from top to bottom of the page) in TMW-10

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

Photograph 20: 17-22 ft bgs (from top to bottom of the page) in TMW-10

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

Photograph 21: 22-27 ft bgs (from top to bottom of the page) in TMW-10

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

Photograph 22: 27-37 ft bgs (from top to bottom of the page) in TMW-10

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

Photograph 23: 37-40 ft bgs (from top to bottom of the page) in TMW-10

hart hickman
2923 S. Tryon Street, Suite 100
CHARLOTTE , NC 28203
704.586.0007(p) 704.586.0373(f)

Appendix C

IDW Disposal Manifest

A&D Environmental Services — Bill of Lading / Material Manifest

A&D Job No:	Generator ID Number	Page 1 of	Emergency Response Phone	Tracking Number
2005-0050		1	800-434-7750	36350

Generator's Name and Mailing Address: Town of Chapel Hill, 828 MLK Jr. Drive, Chapel Hill, NC 27516

Generator's Site address (if different from mailing address)

Generator's Phone: 919-969-5116

Transporter 1 ☐ 2 ☐	Company Name: A&D Environmental Services, Inc.	US EPA ID No: NCD986232221
Transporter 1 ☒ 2 ☐	Company Name: A&D Environmental Services (SC), LLC	US EPA ID No: SCD987598331
Transporter 1 ☐ 2 ☐	Company Name:	US EPA ID No:

☒ Designated Facility	☐ Designated Facility	☐ Designated Facility (Please insert facility information below)
A&D Environmental Services, Inc. 2718 Uwharrie Road Archdale, NC 27263 336-434-7750 NCD986232221	A&D Environmental Services, Inc. 3149 Lear Drive Burlington, NC 27215 336-229-0058 NCR000138628	

HM	Hazardous Materials Shipping Name and Description (if applicable)	No.	Type	QTY	Wt/Vol	Profile Number
	Non-Regulated Material (IDW-Solids)	009	DM	5400	P	2016-0059

	Petroleum Products for Recycle		No.	Type	QTY	Wt/Vol	Profile Number
X	NA1993, Diesel fuel, 3, III	EGR# 128					
X	NA 1993, Fuel oil (No. 1,2,4,5 or 6), 3, III	EGR# 128					
X	UN1203, Gasoline, 3, II	EGR# 128					
	USED OIL (Not a USDOT Hazardous Material)						
	Petroleum Contact Water (Not a USDOT Hazardous Material						

Universal Waste Lamps, Batteries, Ballasts, and Electronics for Recycle

HM	No.	Type	Est. Wt.	Count	Shipping Name and Description (if applicable)		Common Name	Discrepancy
X					RQ, UN3506, Mercury contained in manufactured articles, 8 (6.1), RQ	ERG# 172	Mercury Devices	
X					RQ, UN3432, Polychlorinated biphenyls, solid, 9, II	EGR# 171	TSCA Exempt PCB Lamp Ballasts	
X					UN2800, Batteries, wet nonspillable, 8	EGR# 154	Sealed Lead Acid Batteries	
X					UN2794, Batteries, wet, filled with acid, 8	EGR# 154	Lead Acid Batteries	
X					UN2795, Batteries, wet, filled with alkali, 8	EGR# 154	Wet NiCad Batteries	
X					UN3090, Lithium metal batteries, 9	EGR# 138	Lithium Metal Batteries	
X					UN3480, Lithium ion batteries, 9	EGR# 147	Lithium Ion Batteries	
X					Batteries, dry, sealed n.o.s.		Alkaline Batteries	
X					Batteries, dry, sealed n.o.s.		Dry NiCad Batteries	
					Universal Waste Lamps (Not DOT-Regulated per 49 CFR 173.164 (e)		Florescent lamps (4-Ft. and Under)	
					Universal Waste Lamps (Not DOT-Regulated per 49 CFR 173.164 (e)		Florescent lamps (Over 4-Ft.)	
					Universal Waste Lamps (Not DOT-Regulated per 49 CFR 173.164 (e)		Circular/U-tube lamps	
					Universal Waste Lamps (Not DOT-Regulated per 49 CFR 173.164 (e)		Compact Lamps	
					Universal Waste Lamps (Not DOT-Regulated per 49 CFR 173.164 (e)		Shielded Lamps	
					Universal Waste Lamps (Not DOT-Regulated per 49 CFR 173.164 (e)		HID/MV/UV Lamps	
					Universal Waste Lamps (Not DOT-Regulated per 49 CFR 173.164 (e)		Incandescent Lamps	
					Non-PCB Light Ballasts for Recycle (Not DOT-Regulated)		Non-PCB Light Ballasts/Capacitors	
					Electronic Equipment for Recycle (Not DOT-Regulated)		e-Waste	

Generator's Certification: This is to certify that the above-named materials are properly classified, described, packaged, marked, and labeled, and are in proper condition for transport according to the applicable regulations of the Department of Transportation. I further certify that none of the materials described above are hazardous waste as defined by EPA 40CFR Part 261 or any applicable state law, and unless specifically identified above the materials contain less than 1,000 ppm total halogens and do not contain quantifiable levels (2ppm) of PCBs as defined by EPA 40 CFR Parts 279 and 761.

Generator's/ Offeror's Printed/Typed Name	Signature	Month	Day	Year
TOWN OF CHAPEL HILL – LARRY TUCKER	Larry Tucker	5	7	20
Transporter 1 Printed/Typed Name	**Signature**	**Month**	**Day**	**Year**
MATT WRAY	Matt Wray	05	07	20
Transporter 2 Printed/Typed Name	**Signature**	**Month**	**Day**	**Year**

Discrepancy Indication / Additional Information:

Designated Facility Certification: I hereby acknowledge receipt of the materials covered by this manifest except for any discrepancy indicated above.

Printed/Typed Name	Signature	Month	Day	Year

DESIGNATED FACILITY TO GENERATOR

Appendix D

Low Flow Groundwater Sampling Records

hart hickman

SMARTER ENVIRONMENTAL SOLUTIONS

LOW-FLOW GROUNDWATER SAMPLING RECORD

Stabilization Criteria
Turb. +/- 10% (<10 NTUs)
S. Cond. +/- 5%
pH +/- 0.1 unit

Job No: TCH-009

Well ID: ~~MW-8~~ MW-1A

Well Location: Chapel Hill, NC

Date: 9/26/19

Facility Name: Chapel Hill Police Department

Top of Casing Elevation (ft msl): _____ Casing Material: PVC Volume of Water Per Well Volume: _____

Total Well Depth (ft): ~~45~~ 40 Depth to Water (ft): ~~40~~ 31.43 Well Diameter: 2"

Sampling Personnel: L. Nickels

Type of Pump: Bladder Tubing Material: Poly Pump/Tubing set at: 44 38 ft.

Weather Conditions: Sunny, 92°F NOTES: _____

GROUNDWATER SAMPLING PARAMETERS

Time	Water Level	Volume Pumped	Pumping Rate	DO (mg/l)	Temp. (°C)	S. Cond. (µS/cm)	pH (SU)	ORP (mV)	Turbidity (NTU)
1525	31.69	0 mL	150 mL/min	0.33	21.87	1242	6.49	23.4	547
1530	31.75	750		0.26	21.18	1230	6.27	17.0	572
1535	31.82	1500		0.21	21.17	1227	6.20	18.4	529
1540	31.84	2250		0.19	20.87	1216	6.15	15.7	403
1545	31.85	3000		0.16	20.73	1207	6.16	2.1	289
1550	31.89	3750		0.17	20.73	1201	6.17	-1.2	256
1555	31.87	4500		0.16	20.49	1184	6.17	-9.0	226
1600	31.96	5250		0.16	20.38	1163	6.15	-9.2	116
1605	31.92	6000		0.15	20.51	1140	6.15	-9.4	83.5
1610	31.94	6750		0.13	20.53	1133	6.15	-11.2	72.0
1615	31.89	7500		0.13	21.13	1129	6.15	-14.1	82.4
1620	31.89	8250	↓	0.12	21.22	1133	6.15	-13.8	55.6

Continued on back →

Other Sample Parameters: None

Sampled at: _____ Parameters taken with: YSI 556, Hach Turbidity Meter

Sample Delivered to: Pace by Courier at _____.

Field Filtration: ( ) Yes (X) No If yes, which sample parameters were field filtered: _____

Sample Parameter Containers (Types, Number of Containers, Preservatives): 2 250-mL plastic bottles w/ HNO_3

Time	Water Level	Volume	Pump Rate	DO	Temp	SCond	pH	ORP	Turbidity
1625	31.86	9000	150mL/min	0.12	21.50	1129	6.15	-14.0	42.3
1630	31.88	9750		6.12	21.12	1117	6.13	-13.1	30.5
1635	31.86	10500		0.12	21.00	1105	6.13	-13.4	27.1
1640	31.86	11250		0.12	20.98	1096	6.13	-14.2	21.4
1645	31.86	12000		0.12	20.93	1092	6.14	-15.9	16.4
1650	31.86	12750		0.12	20.82	1090	6.14	-16.8	13.0
1655	31.86	13500		0.11	20.85	1086	6.14	-17.8	8.66
1700	31.86	14250		0.11	20.90	1082	6.15	-17.7	6.63

hart hickman

SMARTER ENVIRONMENTAL SOLUTIONS

LOW-FLOW GROUNDWATER SAMPLING RECORD

Stabilization Criteria
Turb. +/- 10% (<10 NTUs)
S. Cond. +/- 5%
pH +/- 0.1 unit

Job No: TCH-009

Well ID: ~~MW-1A~~ MW-8

Well Location: Chapel Hill NC

Date: 9/26/19

Facility Name: Chapel Hill Police Department

Top of Casing Elevation (ft msl): _____ Casing Material: PVC Volume of Water Per Well Volume: _____

Total Well Depth (ft): 40 45 Depth to Water (ft): ~~31.43~~ 40.16 Well Diameter: 2"

Sampling Personnel: L Nickels

Type of Pump: Bladder Tubing Material: Poly Pump/Tubing set at: ~~38~~ 44 ft.

Weather Conditions: Sunny, 90°F NOTES: _____

GROUNDWATER SAMPLING PARAMETERS

Time	Water Level	Volume Pumped	Pumping Rate	DO (mg/l)	Temp. (°C)	S. Cond. (µS/cm)	pH (SU)	ORP (mV)	Turbidity (NTU)
1345	40.24	0	200 ml/min	0.54	22.46	664	6.25	39.8	323
1350	40.24	1000	↓	0.53	22.00	653	6.11	21.9	144
1355	40.23	2000	↓	0.54	21.74	647	6.02	12.8	80.8
~~1443~~ 1400	40.24	3000	↓	0.50	21.61	643	~~6~~ 5.95	9.0	54.9
1405	40.24	4000	↓	0.55	21.50	641	5.91	5.8	34.8
1410	40.24	4750	150 ml/min	0.47	21.46	638	5.87	7.4	22.7
1415	40.25	5500	↓	0.48	21.43	636	5.83	8.9	17.9
1420	40.25	6250	↓	0.44	21.42	635	5.80	13.3	13.1
1425	40.25	7000	↓	0.41	21.46	633	5.80	8.7	9.64
1430	40.25	7750	↓	0.40	21.30	632	5.77	6.6	7.95

Other Sample Parameters: None

Sampled at: ~~Pace~~ 1430 Parameters taken with: YSI 556, Hach Turbidity Meter

Sample Delivered to: Pace by Courier at _____.

Field Filtration: ( ) Yes (X) No If yes, which sample parameters were field filtered: _____

Sample Parameter Containers (Types, Number of Containers, Preservatives): 2 250-mL plastic bottles w/ HNO_3

hart hickman

SMARTER ENVIRONMENTAL SOLUTIONS

LOW-FLOW GROUNDWATER SAMPLING RECORD

Stabilization Criteria
Turb. +/- 10% (<10 NTUs)
S. Cond. +/- 5%
pH +/- 0.1 unit

Job No: TCH-009
Well ID: MW-9
Well Location: Chapel Hill NC
Date: 9/26/19

Facility Name: Chapel Hill Police Department
Top of Casing Elevation (ft msl): _____ Casing Material: PVC Volume of Water Per Well Volume: _____
Total Well Depth (ft): 45 Depth to Water (ft): 26.92 Well Diameter: 2"
Sampling Personnel: L. Nickels
Type of Pump: Peristaltic Tubing Material: 1/4" OD Poly Pump/Tubing set at: 37 ft.
Weather Conditions: Sunny, 76°F NOTES: Dup Collected

GROUNDWATER SAMPLING PARAMETERS

Time	Water Level	Volume Pumped	Pumping Rate	DO (mg/l)	Temp. (°C)	S. Cond. (µS/cm)	pH (SU)	ORP (mV)	Turbidity (NTU)
1055	27.37	0 mL	150 mL/min	1.47	22.33	905	6.83	-54.5	2.78
1100	27.38	750	~~750~~	0.60	22.57	895	6.74	-70.8	5.72
1105	27.41	1500		2.48	22.22	894	6.69	-73.6	2.30
1110	27.43	2250		1.87	22.10	889	6.62	-71.3	1.64
1115	27.45	3000		1.34	21.84	889	6.58	-68.2	1.45
1120	27.45	3750		0.76	21.95	887	6.52	-54.3	1.85
1125	27.45	4500		0.66	21.94	887	6.51	-63.7	1.75
1130	27.45	5250	↓	0.58	22.04	885	6.50	-49.1	1.74

Other Sample Parameters: None
Sampled at: 1130 Parameters taken with: YSI 556, Hach Turbidity Meter
Sample Delivered to: Pace by Courier at _____.
Field Filtration: ( ) Yes (X) No If yes, which sample parameters were field filtered: _____
Sample Parameter Containers (Types, Number of Containers, Preservatives): 2 250-mL plastic bottles w/ HNO_3 (cooled)

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS

LOW-FLOW GROUNDWATER SAMPLING RECORD

Stabilization Criteria
DO +/- 0.3 mg/l
Turb. <10 NTUs)
S. Cond. +/- 3%
ORP +/- 10 mV
pH +/- 0.1 unit
Water level: slight or stable drawdown during purging according to SESDPROC-301-R4

Job No: TCH-009
Well ID: MW-9
Well Location:
Date: 2/12/20

Facility Name: Town of Chapel Hill Police Department
Top of Casing Elevation (ft msl): _____ Casing Material: PVC Volume of Water Per Well Volume: 3.19 3.19
Total Well Depth (ft): 45.00 Depth to Water (ft): 25.47 Well Diameter: 2-inch
Sampling Personnel: J.Ollison _____, _____, _____, _____
Type of Pump: Peristaltic Tubing Material: Poly Pump/Tubing set at: 40.00 ft.
Weather Conditions: 50s Cloudy NOTES: Final turbidity collected straight form sample tubing and not flow cell, DUP collected

GROUNDWATER SAMPLING PARAMETERS

Time	Water Level	Volume Pumped	Pumping Rate	DO (mg/l)	Temp. (°C)	S. Cond. (µS/cm)	pH (SU)	ORP (mV)	Turbidity (NTU)
13:00	33.02		150 mL/min	0.31	18.2	870.0	6.76	-135.9	4.37
13:05	33.10		150 mL/min	0.24	18.1	856.0	6.77	-31.8	6.50
13:10	33.12		150 mL/min	0.26	18.3	854.0	6.77	-36.4	3.78
13:15	33.21		150 mL/min	0.25	18.3	857.0	6.81	-67.8	1.28
13:20	33.21		150 mL/min	0.22	18.4	858.0	6.83	-102.3	1.10

Other Sample Parameters: _____
Sampled at: 13:20 Parameters taken with: YSI Pro Plus, Mrico TPI turbidity meter
Sample Delivered to: Pace Analytical by H&H at _____.
Field Filtration: ○ Yes ◉ No If yes, which sample parameters were field filtered: _____
Sample Parameter Containers (Types, Number of Containers, Preservatives): 1 - 250 mL plastic bottle, unpres. , 1 - 250 mL plastic bottle, w/ HNO3

hart hickman
SMARTER ENVIRONMENTAL SOLUTIONS

LOW-FLOW GROUNDWATER SAMPLING RECORD

Stabilization Criteria
DO +/- 0.3 mg/l
Turb. <10 NTUs)
S. Cond. +/- 3%
ORP +/- 10 mV
pH +/- 0.1 unit
Water level: slight or stable drawdown during purging according to SESDPROC-301-R4

Job No: TCH-009
Well ID: MW-11D
Well Location:
Date: 2/13/20

Facility Name: Town of Chapel Hill Police Department

Top of Casing Elevation (ft msl): _____ Casing Material: PVC Volume of Water Per Well Volume: 3.78 3.78

Total Well Depth (ft): 56.00 Depth to Water (ft): 31.85 Well Diameter: 2-inch

Sampling Personnel: J.Ollison _____, _____, _____, _____

Type of Pump: Bladder Tubing Material: Poly Pump/Tubing set at: 51.00 ft.

Weather Conditions: 60s Rainy NOTES: Final turbidity collected straight form sample tubing and not flow cell

GROUNDWATER SAMPLING PARAMETERS

Time	Water Level	Volume Pumped	Pumping Rate	DO (mg/l)	Temp. (°C)	S. Cond. (µS/cm)	pH (SU)	ORP (mV)	Turbidity (NTU)
10:00	33.02		200 mL/min	2.31	19.8	847.0	7.07	106.3	20.27
10:05	33.10		200 mL/min	1.70	19.4	895.0	7.33	72.3	8.39
10:10	33.12		200 mL/min	1.72	19.0	931.0	8.58	45.9	4.46
10:15	33.21		200 mL/min	1.71	19.1	940.0	9.05	38.2	4.46
10:20	33.21		200 mL/min	1.88	19.0	997.0	9.65	19.1	2.25
10:25	33.21		200 mL/min	2.02	19.0	1,003.0	9.74	17.0	0.82
10:30	33.21		200 mL/min	2.10	19.0	980.0	9.63	16.9	0.78
10:35	33.21		200 mL/min	2.07	18.9	984.0	9.67	16.0	1.02
10:40	33.21		200 mL/min	2.08	18.9	984.0	9.68	15.9	8.59

Other Sample Parameters: _____

Sampled at: 10:40 Parameters taken with: YSI Pro Plus, Mrico TPI turbidity meter

Sample Delivered to: Pace Analytical by H&H at _____.

Field Filtration: ◯ Yes ◯ No If yes, which sample parameters were field filtered: _____

Sample Parameter Containers (Types, Number of Containers, Preservatives): 1 - 250 mL plastic bottle, unpres. , 1 - 250 mL plastic bottle, w/ HNO3

Appendix E

Laboratory Analytical Reports

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

September 09, 2019

Justin Ballard
Hart & Hickman
3921 Sunset Ridge Rd.
Suite 301
Raleigh, NC 27607

RE: Project: TCH-009
Pace Project No.: 92443252

Dear Justin Ballard:
Enclosed are the analytical results for sample(s) received by the laboratory on August 28, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
1(704)875-9092
Project Manager

Enclosures

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: TCH-009
Pace Project No.: 92443252

Pace Analytical National Certification IDs

12065 Lebanon Road, Mt. Juliet, TN 37122
Alabama Certification #: 40660
Alaska Certification 17-026
Arizona Certification #: AZ0612
Arkansas Certification #: 88-0469
California Certification #: 2932
Canada Certification #: 1461.01
Colorado Certification #: TN00003
Connecticut Certification #: PH-0197
DOD Certification: #1461.01
EPA# TN00003
Florida Certification #: E87487
Georgia DW Certification #: 923
Georgia Certification: NELAP
Idaho Certification #: TN00003
Illinois Certification #: 200008
Indiana Certification #: C-TN-01
Iowa Certification #: 364
Kansas Certification #: E-10277
Kentucky UST Certification #: 16
Kentucky Certification #: 90010
Louisiana Certification #: AI30792
Louisiana DW Certification #: LA180010
Maine Certification #: TN0002
Maryland Certification #: 324
Massachusetts Certification #: M-TN003
Michigan Certification #: 9958
Minnesota Certification #: 047-999-395
Mississippi Certification #: TN00003
Missouri Certification #: 340
Montana Certification #: CERT0086
Nebraska Certification #: NE-OS-15-05
Nevada Certification #: TN-03-2002-34
New Hampshire Certification #: 2975
New Jersey Certification #: TN002
New Mexico DW Certification
New York Certification #: 11742
North Carolina Aquatic Toxicity Certification #: 41
North Carolina Drinking Water Certification #: 21704
North Carolina Environmental Certificate #: 375
North Dakota Certification #: R-140
Ohio VAP Certification #: CL0069
Oklahoma Certification #: 9915
Oregon Certification #: TN200002
Pennsylvania Certification #: 68-02979
Rhode Island Certification #: LAO00356
South Carolina Certification #: 84004
South Dakota Certification
Tennessee DW/Chem/Micro Certification #: 2006
Texas Certification #: T 104704245-17-14
Texas Mold Certification #: LAB0152
USDA Soil Permit #: P330-15-00234
Utah Certification #: TN00003
Virginia Certification #: VT2006
Vermont Dept. of Health: ID# VT-2006
Virginia Certification #: 460132
Washington Certification #: C847
West Virginia Certification #: 233
Wisconsin Certification #: 9980939910
Wyoming UST Certification #: via A2LA 2926.01
A2LA-ISO 17025 Certification #: 1461.01
A2LA-ISO 17025 Certification #: 1461.02
AIHA-LAP/LLC EMLAP Certification #:100789

Charlotte Certification IDs

9800 Kincey Ave. Ste 100, Huntersville, NC 28078
Louisiana/NELAP Certification # LA170028
North Carolina Drinking Water Certification #: 37706
North Carolina Field Services Certification #: 5342
North Carolina Wastewater Certification #: 12
South Carolina Certification #: 99006001
Florida/NELAP Certification #: E87627
Kentucky UST Certification #: 84
Virginia/VELAP Certification #: 460221

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE SUMMARY

Project: TCH-009
Pace Project No.: 92443252

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92443252001	**SED-17**	Solid	08/27/19 11:00	08/28/19 13:09
92443252002	**SED-15**	Solid	08/27/19 11:10	08/28/19 13:09
92443252003	**SED-16**	Solid	08/27/19 11:25	08/28/19 13:09
92443252004	**SED-11**	Solid	08/27/19 11:35	08/28/19 13:09
92443252005	**SED-13**	Solid	08/27/19 11:30	08/28/19 13:09
92443252006	**SED-12**	Solid	08/27/19 11:40	08/28/19 13:09
92443252007	**SS-3A**	Solid	08/27/19 11:55	08/28/19 13:09
92443252008	**EB-1**	Water	08/27/19 12:10	08/28/19 13:09

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: TCH-009
Pace Project No.: 92443252

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92443252001	**SED-17**	EPA 6010D	SH1	1	PASI-A
		EPA 6020B	JDG	10	PAN
		EPA 7471B	SOO	1	PASI-A
		ASTM D2974-87	KDF	1	PASI-C
		SM 2540G	KBC	1	PAN
		EPA 7199	GB	1	PAN
92443252002	**SED-15**	EPA 6010D	SH1	1	PASI-A
		EPA 6020B	JDG	10	PAN
		EPA 7471B	SOO	1	PASI-A
		ASTM D2974-87	KDF	1	PASI-C
		SM 2540G	KBC	1	PAN
		EPA 7199	GB	1	PAN
92443252003	**SED-16**	EPA 6010D	SH1	1	PASI-A
		EPA 6020B	JDG	10	PAN
		EPA 7471B	SOO	1	PASI-A
		ASTM D2974-87	KDF	1	PASI-C
		SM 2540G	KBC	1	PAN
		EPA 7199	GB	1	PAN
92443252004	**SED-11**	EPA 6010D	SH1	1	PASI-A
		EPA 6020B	JDG	10	PAN
		EPA 7471B	SOO	1	PASI-A
		ASTM D2974-87	KDF	1	PASI-C
		SM 2540G	KBC	1	PAN
		EPA 7199	GB	1	PAN
92443252005	**SED-13**	EPA 6010D	SH1	1	PASI-A
		EPA 6020B	JDG	10	PAN
		EPA 7471B	SOO	1	PASI-A
		ASTM D2974-87	KDF	1	PASI-C
		SM 2540G	KBC	1	PAN
		EPA 7199	GB	1	PAN
92443252006	**SED-12**	EPA 6010D	SH1	1	PASI-A
		EPA 6020B	JDG	10	PAN
		EPA 7471B	SOO	1	PASI-A
		ASTM D2974-87	KDF	1	PASI-C
		SM 2540G	KBC	1	PAN
		EPA 7199	GB	1	PAN
92443252007	**SS-3A**	EPA 6010D	SH1	1	PASI-A

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: TCH-009
Pace Project No.: 92443252

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
		EPA 6020B	JDG	10	PAN
		EPA 7471B	SOO	1	PASI-A
		ASTM D2974-87	KDF	1	PASI-C
		SM 2540G	KBC	1	PAN
		EPA 7199	GB	1	PAN
92443252008	**EB-1**	EPA 6020B	JOR	11	PASI-A
		EPA 7470A	SOO	1	PASI-A

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: TCH-009
Pace Project No.: 92443252

Sample: SED-17 **Lab ID: 92443252001** Collected: 08/27/19 11:00 Received: 08/28/19 13:09 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B								
Strontium	**198**	mg/kg	0.60	0.30	1	09/03/19 11:46	09/04/19 02:09	7440-24-6	
Metals (ICPMS) 6020B	Analytical Method: EPA 6020B Preparation Method: 3050B								
Arsenic	**33.8**	mg/kg	0.975	0.244	5	08/30/19 06:07	08/30/19 19:20	7440-38-2	
Barium	**1420**	mg/kg	1.95	0.312	5	08/30/19 06:07	08/30/19 19:20	7440-39-3	
Beryllium	**4.18**	mg/kg	0.975	0.117	5	08/30/19 06:07	08/30/19 19:20	7440-41-7	
Cadmium	**0.336J**	mg/kg	0.975	0.156	5	08/30/19 06:07	08/30/19 19:20	7440-43-9	J
Chromium	**17.3**	mg/kg	1.95	0.526	5	08/30/19 06:07	08/30/19 19:20	7440-47-3	
Cobalt	**10.3**	mg/kg	0.975	0.253	5	08/30/19 06:07	08/30/19 19:20	7440-48-4	
Copper	**53.1**	mg/kg	1.95	0.507	5	08/30/19 06:07	08/30/19 19:20	7440-50-8	
Manganese	**296**	mg/kg	1.95	0.244	5	08/30/19 06:07	08/30/19 19:20	7439-96-5	
Nickel	**16.2**	mg/kg	0.975	0.341	5	08/30/19 06:07	08/30/19 19:20	7440-02-0	
Selenium	**6.84**	mg/kg	0.975	0.370	5	08/30/19 06:07	08/30/19 19:20	7782-49-2	
7471 Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.24**	mg/kg	0.023	0.011	5	08/30/19 15:10	09/03/19 16:08	7439-97-6	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**25.5**	%	0.10	0.10	1		08/29/19 16:58		
Total Solids 2540 G-2011	Analytical Method: SM 2540G Preparation Method: SM 2540 G								
Total Solids	**51.3**	%			1	09/04/19 19:37	09/04/19 19:45		
Wet Chemistry 7199	Analytical Method: EPA 7199 Preparation Method: 3060A								
Chromium, Hexavalent	ND	mg/kg	1.95	0.497	1	09/04/19 11:11	09/04/19 15:55	18540-29-9	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: TCH-009
Pace Project No.: 92443252

Sample: SED-15 **Lab ID: 92443252002** Collected: 08/27/19 11:10 Received: 08/28/19 13:09 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B								
Strontium	**58.0**	mg/kg	0.50	0.25	1	09/03/19 11:46	09/04/19 02:21	7440-24-6	
Metals (ICPMS) 6020B	Analytical Method: EPA 6020B Preparation Method: 3050B								
Arsenic	**3.89**	mg/kg	0.842	0.211	5	08/30/19 06:09	08/30/19 15:24	7440-38-2	
Barium	**251**	mg/kg	1.68	0.270	5	08/30/19 06:09	08/30/19 15:24	7440-39-3	
Beryllium	**0.759J**	mg/kg	0.842	0.101	5	08/30/19 06:09	08/30/19 15:24	7440-41-7	J
Cadmium	**0.328J**	mg/kg	0.842	0.135	5	08/30/19 06:09	08/30/19 15:24	7440-43-9	J
Chromium	**19.2**	mg/kg	1.68	0.455	5	08/30/19 06:09	08/30/19 15:24	7440-47-3	
Cobalt	**9.08**	mg/kg	0.842	0.219	5	08/30/19 06:09	08/30/19 15:24	7440-48-4	
Copper	**24.0**	mg/kg	1.68	0.438	5	08/30/19 06:09	08/30/19 15:24	7440-50-8	
Manganese	**549**	mg/kg	1.68	0.211	5	08/30/19 06:09	08/30/19 15:24	7439-96-5	ML
Nickel	**9.64**	mg/kg	0.842	0.295	5	08/30/19 06:09	08/30/19 15:24	7440-02-0	
Selenium	**1.46**	mg/kg	0.842	0.320	5	08/30/19 06:09	08/30/19 15:24	7782-49-2	
7471 Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.035**	mg/kg	0.0035	0.0018	1	08/30/19 15:10	09/03/19 16:11	7439-97-6	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**21.8**	%	0.10	0.10	1		08/29/19 16:58		
Total Solids 2540 G-2011	Analytical Method: SM 2540G Preparation Method: SM 2540 G								
Total Solids	**59.4**	%			1	09/04/19 19:37	09/04/19 19:45		
Wet Chemistry 7199	Analytical Method: EPA 7199 Preparation Method: 3060A								
Chromium, Hexavalent	**0.458J**	mg/kg	1.68	0.430	1	09/04/19 11:11	09/04/19 16:08	18540-29-9	J

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: TCH-009
Pace Project No.: 92443252

Sample: SED-16 **Lab ID: 92443252003** Collected: 08/27/19 11:25 Received: 08/28/19 13:09 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B								
Strontium	**133**	mg/kg	0.42	0.21	1	09/03/19 11:46	09/04/19 02:31	7440-24-6	
Metals (ICPMS) 6020B	Analytical Method: EPA 6020B Preparation Method: 3050B								
Arsenic	**21.0**	mg/kg	0.801	0.200	5	08/30/19 06:09	08/30/19 15:47	7440-38-2	
Barium	**739**	mg/kg	1.60	0.256	5	08/30/19 06:09	08/30/19 15:47	7440-39-3	
Beryllium	**2.96**	mg/kg	0.801	0.0962	5	08/30/19 06:09	08/30/19 15:47	7440-41-7	
Cadmium	**0.414J**	mg/kg	0.801	0.128	5	08/30/19 06:09	08/30/19 15:47	7440-43-9	J
Chromium	**23.4**	mg/kg	1.60	0.433	5	08/30/19 06:09	08/30/19 15:47	7440-47-3	
Cobalt	**17.8**	mg/kg	0.801	0.208	5	08/30/19 06:09	08/30/19 15:47	7440-48-4	
Copper	**50.9**	mg/kg	1.60	0.417	5	08/30/19 06:09	08/30/19 15:47	7440-50-8	
Manganese	**1250**	mg/kg	1.60	0.200	5	08/30/19 06:09	08/30/19 15:47	7439-96-5	
Nickel	**18.3**	mg/kg	0.801	0.280	5	08/30/19 06:09	08/30/19 15:47	7440-02-0	
Selenium	**5.05**	mg/kg	0.801	0.304	5	08/30/19 06:09	08/30/19 15:47	7782-49-2	
7471 Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.11**	mg/kg	0.0043	0.0022	1	08/30/19 15:10	09/03/19 16:13	7439-97-6	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**25.9**	%	0.10	0.10	1		08/29/19 16:58		
Total Solids 2540 G-2011	Analytical Method: SM 2540G Preparation Method: SM 2540 G								
Total Solids	**62.4**	%			1	09/04/19 19:37	09/04/19 19:45		
Wet Chemistry 7199	Analytical Method: EPA 7199 Preparation Method: 3060A								
Chromium, Hexavalent	ND	mg/kg	1.60	0.409	1	09/04/19 11:11	09/04/19 16:13	18540-29-9	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: TCH-009
Pace Project No.: 92443252

Sample: SED-11 **Lab ID: 92443252004** Collected: 08/27/19 11:35 Received: 08/28/19 13:09 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B								
Strontium	**49.4**	mg/kg	0.37	0.18	1	09/03/19 11:46	09/04/19 02:34	7440-24-6	
Metals (ICPMS) 6020B	Analytical Method: EPA 6020B Preparation Method: 3050B								
Arsenic	**6.08**	mg/kg	0.864	0.216	5	08/30/19 06:09	08/30/19 15:52	7440-38-2	
Barium	**317**	mg/kg	1.73	0.277	5	08/30/19 06:09	08/30/19 15:52	7440-39-3	
Beryllium	**1.19**	mg/kg	0.864	0.104	5	08/30/19 06:09	08/30/19 15:52	7440-41-7	
Cadmium	**0.235J**	mg/kg	0.864	0.138	5	08/30/19 06:09	08/30/19 15:52	7440-43-9	J
Chromium	**13.3**	mg/kg	1.73	0.467	5	08/30/19 06:09	08/30/19 15:52	7440-47-3	
Cobalt	**7.82**	mg/kg	0.864	0.225	5	08/30/19 06:09	08/30/19 15:52	7440-48-4	
Copper	**21.6**	mg/kg	1.73	0.449	5	08/30/19 06:09	08/30/19 15:52	7440-50-8	
Manganese	**351**	mg/kg	1.73	0.216	5	08/30/19 06:09	08/30/19 15:52	7439-96-5	
Nickel	**10.8**	mg/kg	0.864	0.302	5	08/30/19 06:09	08/30/19 15:52	7440-02-0	
Selenium	**1.71**	mg/kg	0.864	0.328	5	08/30/19 06:09	08/30/19 15:52	7782-49-2	
7471 Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.030**	mg/kg	0.0026	0.0013	1	08/30/19 15:10	09/03/19 16:15	7439-97-6	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**20.8**	%	0.10	0.10	1		08/29/19 16:58		
Total Solids 2540 G-2011	Analytical Method: SM 2540G Preparation Method: SM 2540 G								
Total Solids	**57.9**	%			1	09/04/19 19:37	09/04/19 19:45		
Wet Chemistry 7199	Analytical Method: EPA 7199 Preparation Method: 3060A								
Chromium, Hexavalent	ND	mg/kg	1.73	0.441	1	09/04/19 11:11	09/04/19 16:18	18540-29-9	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: TCH-009
Pace Project No.: 92443252

Sample: SED-13 **Lab ID: 92443252005** Collected: 08/27/19 11:30 Received: 08/28/19 13:09 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B								
Strontium	**125**	mg/kg	0.56	0.28	1	09/03/19 11:46	09/04/19 02:37	7440-24-6	
Metals (ICPMS) 6020B	Analytical Method: EPA 6020B Preparation Method: 3050B								
Arsenic	**12.4**	mg/kg	1.01	0.253	5	08/30/19 06:09	08/30/19 16:06	7440-38-2	
Barium	**958**	mg/kg	2.03	0.324	5	08/30/19 06:09	08/30/19 16:06	7440-39-3	
Beryllium	**1.56**	mg/kg	1.01	0.122	5	08/30/19 06:09	08/30/19 16:06	7440-41-7	
Cadmium	**0.284J**	mg/kg	1.01	0.162	5	08/30/19 06:09	08/30/19 16:06	7440-43-9	J
Chromium	**29.4**	mg/kg	2.03	0.547	5	08/30/19 06:09	08/30/19 16:06	7440-47-3	
Cobalt	**13.9**	mg/kg	1.01	0.263	5	08/30/19 06:09	08/30/19 16:06	7440-48-4	
Copper	**38.9**	mg/kg	2.03	0.527	5	08/30/19 06:09	08/30/19 16:06	7440-50-8	
Manganese	**538**	mg/kg	2.03	0.253	5	08/30/19 06:09	08/30/19 16:06	7439-96-5	
Nickel	**19.2**	mg/kg	1.01	0.355	5	08/30/19 06:09	08/30/19 16:06	7440-02-0	
Selenium	**3.07**	mg/kg	1.01	0.385	5	08/30/19 06:09	08/30/19 16:06	7782-49-2	
7471 Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.12**	mg/kg	0.011	0.0057	2	09/06/19 11:25	09/06/19 14:53	7439-97-6	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**36.4**	%	0.10	0.10	1		08/29/19 16:58		
Total Solids 2540 G-2011	Analytical Method: SM 2540G Preparation Method: SM 2540 G								
Total Solids	**49.4**	%			1	09/04/19 19:37	09/04/19 19:45		
Wet Chemistry 7199	Analytical Method: EPA 7199 Preparation Method: 3060A								
Chromium, Hexavalent	ND	mg/kg	2.03	0.517	1	09/04/19 11:11	09/04/19 16:23	18540-29-9	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: TCH-009
Pace Project No.: 92443252

Sample: SED-12 **Lab ID: 92443252006** Collected: 08/27/19 11:40 Received: 08/28/19 13:09 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B								
Strontium	**25.4**	mg/kg	0.55	0.28	1	09/03/19 11:46	09/04/19 02:40	7440-24-6	
Metals (ICPMS) 6020B	Analytical Method: EPA 6020B Preparation Method: 3050B								
Arsenic	**4.73**	mg/kg	0.842	0.210	5	08/30/19 06:09	08/30/19 16:10	7440-38-2	
Barium	**102**	mg/kg	1.68	0.269	5	08/30/19 06:09	08/30/19 16:10	7440-39-3	
Beryllium	**0.765J**	mg/kg	0.842	0.101	5	08/30/19 06:09	08/30/19 16:10	7440-41-7	J
Cadmium	**0.214J**	mg/kg	0.842	0.135	5	08/30/19 06:09	08/30/19 16:10	7440-43-9	J
Chromium	**27.6**	mg/kg	1.68	0.454	5	08/30/19 06:09	08/30/19 16:10	7440-47-3	
Cobalt	**6.17**	mg/kg	0.842	0.219	5	08/30/19 06:09	08/30/19 16:10	7440-48-4	
Copper	**23.1**	mg/kg	1.68	0.438	5	08/30/19 06:09	08/30/19 16:10	7440-50-8	
Manganese	**341**	mg/kg	1.68	0.210	5	08/30/19 06:09	08/30/19 16:10	7439-96-5	
Nickel	**7.69**	mg/kg	0.842	0.295	5	08/30/19 06:09	08/30/19 16:10	7440-02-0	
Selenium	**0.961**	mg/kg	0.842	0.320	5	08/30/19 06:09	08/30/19 16:10	7782-49-2	
7471 Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.042**	mg/kg	0.0033	0.0016	1	08/30/19 15:10	09/03/19 16:20	7439-97-6	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**28.2**	%	0.10	0.10	1		08/29/19 16:58		
Total Solids 2540 G-2011	Analytical Method: SM 2540G Preparation Method: SM 2540 G								
Total Solids	**59.4**	%			1	09/04/19 19:37	09/04/19 19:45		
Wet Chemistry 7199	Analytical Method: EPA 7199 Preparation Method: 3060A								
Chromium, Hexavalent	ND	mg/kg	1.68	0.429	1	09/04/19 11:11	09/04/19 16:28	18540-29-9	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: TCH-009
Pace Project No.: 92443252

Sample: SS-3A **Lab ID: 92443252007** Collected: 08/27/19 11:55 Received: 08/28/19 13:09 Matrix: Solid

Results reported on a "dry weight" basis and are adjusted for percent moisture, sample size and any dilutions.

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3050B								
Strontium	**119**	mg/kg	0.42	0.21	1	09/03/19 11:46	09/04/19 02:43	7440-24-6	
Metals (ICPMS) 6020B	Analytical Method: EPA 6020B Preparation Method: 3050B								
Arsenic	**23.4**	mg/kg	0.753	0.188	5	08/30/19 06:09	08/30/19 16:15	7440-38-2	
Barium	**1080**	mg/kg	1.51	0.241	5	08/30/19 06:09	08/30/19 16:15	7440-39-3	
Beryllium	**2.68**	mg/kg	0.753	0.0904	5	08/30/19 06:09	08/30/19 16:15	7440-41-7	
Cadmium	**0.226J**	mg/kg	0.753	0.121	5	08/30/19 06:09	08/30/19 16:15	7440-43-9	J
Chromium	**18.4**	mg/kg	1.51	0.407	5	08/30/19 06:09	08/30/19 16:15	7440-47-3	
Cobalt	**9.99**	mg/kg	0.753	0.196	5	08/30/19 06:09	08/30/19 16:15	7440-48-4	
Copper	**37.9**	mg/kg	1.51	0.392	5	08/30/19 06:09	08/30/19 16:15	7440-50-8	
Manganese	**463**	mg/kg	1.51	0.188	5	08/30/19 06:09	08/30/19 16:15	7439-96-5	
Nickel	**13.6**	mg/kg	0.753	0.264	5	08/30/19 06:09	08/30/19 16:15	7440-02-0	
Selenium	**3.79**	mg/kg	0.753	0.286	5	08/30/19 06:09	08/30/19 16:15	7782-49-2	
7471 Mercury	Analytical Method: EPA 7471B Preparation Method: EPA 7471B								
Mercury	**0.19**	mg/kg	0.016	0.0078	5	08/30/19 15:10	09/04/19 13:31	7439-97-6	
Percent Moisture	Analytical Method: ASTM D2974-87								
Percent Moisture	**25.4**	%	0.10	0.10	1		08/29/19 16:58		
Total Solids 2540 G-2011	Analytical Method: SM 2540G Preparation Method: SM 2540 G								
Total Solids	**66.4**	%			1	09/04/19 19:37	09/04/19 19:45		
Wet Chemistry 7199	Analytical Method: EPA 7199 Preparation Method: 3060A								
Chromium, Hexavalent	ND	mg/kg	1.51	0.384	1	09/04/19 11:11	09/04/19 16:34	18540-29-9	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: TCH-009
Pace Project No.: 92443252

Sample: EB-1 **Lab ID: 92443252008** Collected: 08/27/19 12:10 Received: 08/28/19 13:09 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	0.10	0.060	1	09/03/19 19:03	09/05/19 02:23	7440-38-2	
Barium	ND	ug/L	0.30	0.060	1	09/03/19 19:03	09/05/19 02:23	7440-39-3	
Beryllium	ND	ug/L	0.10	0.050	1	09/03/19 19:03	09/05/19 02:23	7440-41-7	
Cadmium	ND	ug/L	0.080	0.070	1	09/03/19 19:03	09/05/19 02:23	7440-43-9	
Chromium	ND	ug/L	0.50	0.42	1	09/03/19 19:03	09/05/19 02:23	7440-47-3	
Cobalt	ND	ug/L	0.10	0.050	1	09/03/19 19:03	09/05/19 02:23	7440-48-4	
Copper	ND	ug/L	0.50	0.23	1	09/03/19 19:03	09/05/19 02:23	7440-50-8	BC
Manganese	ND	ug/L	0.50	0.14	1	09/03/19 19:03	09/05/19 02:23	7439-96-5	
Nickel	ND	ug/L	0.50	0.11	1	09/03/19 19:03	09/05/19 02:23	7440-02-0	
Selenium	ND	ug/L	0.50	0.080	1	09/03/19 19:03	09/05/19 02:23	7782-49-2	
Strontium	ND	ug/L	0.50	0.060	1	09/03/19 19:03	09/05/19 02:23	7440-24-6	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury	ND	ug/L	0.20	0.10	1	09/03/19 14:35	09/04/19 16:31	7439-97-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92443252

QC Batch: 1337397
QC Batch Method: 3050B
Associated Lab Samples: 92443252001

Analysis Method: EPA 6020B
Analysis Description: Metals (ICPMS) 6020B

METHOD BLANK: R3446166-1 Matrix: Solid
Associated Lab Samples: 92443252001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	ND	0.500	0.125	08/30/19 17:03	
Barium	mg/kg	ND	1.00	0.160	08/30/19 17:03	
Beryllium	mg/kg	ND	0.500	0.0600	08/30/19 17:03	
Cadmium	mg/kg	ND	0.500	0.0800	08/30/19 17:03	
Chromium	mg/kg	ND	1.00	0.270	08/30/19 17:03	
Cobalt	mg/kg	ND	0.500	0.130	08/30/19 17:03	
Copper	mg/kg	ND	1.00	0.260	08/30/19 17:03	
Manganese	mg/kg	ND	1.00	0.125	08/30/19 17:03	
Nickel	mg/kg	ND	0.500	0.175	08/30/19 17:03	
Selenium	mg/kg	ND	0.500	0.190	08/30/19 17:03	

LABORATORY CONTROL SAMPLE & LCSD: R3446166-2 R3446166-3

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Arsenic	mg/kg	100	93.1	92.6	93.1	92.6	80.0-120	0.598	20	
Barium	mg/kg	100	95.1	95.4	95.1	95.4	80.0-120	0.295	20	
Beryllium	mg/kg	100	91.5	92.1	91.5	92.1	80.0-120	0.665	20	
Cadmium	mg/kg	100	102	103	102	103	80.0-120	0.626	20	
Chromium	mg/kg	100	98.1	97.4	98.1	97.4	80.0-120	0.723	20	
Cobalt	mg/kg	100	101	99.5	101	99.5	80.0-120	1.72	20	
Copper	mg/kg	100	92.0	90.8	92.0	90.8	80.0-120	1.34	20	
Manganese	mg/kg	100	97.0	98.2	97.0	98.2	80.0-120	1.16	20	
Nickel	mg/kg	100	101	100	101	100	80.0-120	0.752	20	
Selenium	mg/kg	100	106	107	106	107	80.0-120	1.64	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3446166-6 R3446166-7

Parameter	Units	L1133715-01 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	5.02	23.7	23.7	109	107	87.9	85.6	75.0-125	2.60	20	
Barium	mg/kg	146	23.7	23.7	270	251	105	89.0	75.0-125	7.06	20	
Cadmium	mg/kg	0.333	23.7	23.7	131	125	111	105	75.0-125	4.72	20	
Chromium	mg/kg	50.3	23.7	23.7	142	140	77.3	75.8	75.0-125	1.20	20	
Copper	mg/kg	24.7	23.7	23.7	142	136	98.9	93.5	75.0-125	4.60	20	
Selenium	mg/kg	0.887	23.7	23.7	137	128	114	107	75.0-125	6.88	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92443252

QC Batch: 1337400 Analysis Method: EPA 6020B
QC Batch Method: 3050B Analysis Description: Metals (ICPMS) 6020B
Associated Lab Samples: 92443252002, 92443252003, 92443252004, 92443252005, 92443252006, 92443252007

METHOD BLANK: R3446129-1 Matrix: Solid
Associated Lab Samples: 92443252002, 92443252003, 92443252004, 92443252005, 92443252006, 92443252007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/kg	ND	0.500	0.125	08/30/19 15:11	
Barium	mg/kg	ND	1.00	0.160	08/30/19 15:11	
Beryllium	mg/kg	ND	0.500	0.0600	08/30/19 15:11	
Cadmium	mg/kg	ND	0.500	0.0800	08/30/19 15:11	
Chromium	mg/kg	ND	1.00	0.270	08/30/19 15:11	
Cobalt	mg/kg	ND	0.500	0.130	08/30/19 15:11	
Copper	mg/kg	ND	1.00	0.260	08/30/19 15:11	
Manganese	mg/kg	ND	1.00	0.125	08/30/19 15:11	
Nickel	mg/kg	ND	0.500	0.175	08/30/19 15:11	
Selenium	mg/kg	ND	0.500	0.190	08/30/19 15:11	

LABORATORY CONTROL SAMPLE & LCSD: R3446129-2 R3446129-3

Parameter	Units	Spike Conc.	LCS Result	LCSD Result	LCS % Rec	LCSD % Rec	% Rec Limits	RPD	Max RPD	Qualifiers
Arsenic	mg/kg	100	93.1	88.7	93.1	88.7	80.0-120	4.91	20	
Barium	mg/kg	100	92.8	92.1	92.8	92.1	80.0-120	0.813	20	
Beryllium	mg/kg	100	92.4	87.6	92.4	87.6	80.0-120	5.25	20	
Cadmium	mg/kg	100	101	99.1	101	99.1	80.0-120	2.35	20	
Chromium	mg/kg	100	99.0	92.9	99.0	92.9	80.0-120	6.42	20	
Cobalt	mg/kg	100	101	95.5	101	95.5	80.0-120	5.69	20	
Copper	mg/kg	100	90.6	84.9	90.6	84.9	80.0-120	6.57	20	
Manganese	mg/kg	100	100	93.3	100	93.3	80.0-120	7.04	20	
Nickel	mg/kg	100	101	95.5	101	95.5	80.0-120	5.86	20	
Selenium	mg/kg	100	105	101	105	101	80.0-120	4.05	20	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3446129-6 R3446129-7

Parameter	Units	92443252002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/kg	3.89	33.7	33.7	158	149	91.5	86.0	75.0-125	6.11	20	
Barium	mg/kg	251	33.7	33.7	417	377	98.9	75.3	75.0-125	10.0	20	
Beryllium	mg/kg	0.759	33.7	33.7	158	151	93.5	89.1	75.0-125	4.78	20	
Cadmium	mg/kg	0.328	33.7	33.7	181	170	107	101	75.0-125	6.60	20	
Chromium	mg/kg	19.2	33.7	33.7	182	173	96.8	91.2	75.0-125	5.34	20	
Cobalt	mg/kg	9.08	33.7	33.7	181	170	102	95.3	75.0-125	6.64	20	
Copper	mg/kg	24.0	33.7	33.7	186	174	96.4	88.8	75.0-125	7.10	20	
Manganese	mg/kg	549	33.7	33.7	696	653	86.7	61.7	75.0-125	6.24	20	ML
Nickel	mg/kg	9.64	33.7	33.7	178	168	100	94.3	75.0-125	5.68	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92443252

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3446129-6 R3446129-7

Parameter	Units	92443252002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Selenium	mg/kg	1.46	33.7	33.7	189	173	111	102	75.0-125	8.54	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92443252

QC Batch: 495629 Analysis Method: EPA 7470A
QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury
Associated Lab Samples: 92443252008

METHOD BLANK: 2670079 Matrix: Water
Associated Lab Samples: 92443252008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.10	09/04/19 16:27	

LABORATORY CONTROL SAMPLE: 2670080

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.6	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2670081 2670082

Parameter	Units	92443193001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.3	2.5	90	97	75-125	7	25	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92443252

QC Batch: 495379 Analysis Method: EPA 7471B
QC Batch Method: EPA 7471B Analysis Description: 7471 Mercury
Associated Lab Samples: 92443252001, 92443252002, 92443252003, 92443252004, 92443252006, 92443252007

METHOD BLANK: 2669054 Matrix: Solid
Associated Lab Samples: 92443252001, 92443252002, 92443252003, 92443252004, 92443252006, 92443252007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.0060	0.0030	09/03/19 14:20	

LABORATORY CONTROL SAMPLE: 2669055

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.083	0.076	92	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2669056 2669057

Parameter	Units	92443374001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	ND	0.076	0.078	0.038	0.042	46	49	75-125	9	20	H3,M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92443252

QC Batch: 496370 Analysis Method: EPA 7471B
QC Batch Method: EPA 7471B Analysis Description: 7471 Mercury
Associated Lab Samples: 92443252005

METHOD BLANK: 2673342 Matrix: Solid
Associated Lab Samples: 92443252005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/kg	ND	0.0060	0.0030	09/06/19 14:37	

LABORATORY CONTROL SAMPLE: 2673343

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/kg	0.083	0.075	90	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2673344 2673345

Parameter	Units	92443382001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/kg	0.18	0.033	0.032	0.19	0.20	45	63	75-125	3	20	H3,M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92443252

QC Batch: 495641 Analysis Method: EPA 6010D
QC Batch Method: EPA 3050B Analysis Description: 6010 MET
Associated Lab Samples: 92443252001, 92443252002, 92443252003, 92443252004, 92443252005, 92443252006, 92443252007

METHOD BLANK: 2670155 Matrix: Solid
Associated Lab Samples: 92443252001, 92443252002, 92443252003, 92443252004, 92443252005, 92443252006, 92443252007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Strontium	mg/kg	ND	0.50	0.25	09/04/19 02:03	

LABORATORY CONTROL SAMPLE: 2670156

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Strontium	mg/kg	50	49.0	98	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2670157 2670158

Parameter	Units	92443252001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Strontium	mg/kg	198	58.9	58.9	261	260	108	105	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92443252

QC Batch: 495760 Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A Analysis Description: 6020 MET
Associated Lab Samples: 92443252008

METHOD BLANK: 2670881 Matrix: Water
Associated Lab Samples: 92443252008

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	ND	0.10	0.060	09/05/19 00:49	
Barium	ug/L	ND	0.30	0.060	09/05/19 00:49	
Beryllium	ug/L	ND	0.10	0.050	09/05/19 00:49	
Cadmium	ug/L	ND	0.080	0.070	09/05/19 00:49	
Chromium	ug/L	ND	0.50	0.42	09/05/19 00:49	
Cobalt	ug/L	ND	0.10	0.050	09/05/19 00:49	
Copper	ug/L	0.25J	0.50	0.23	09/05/19 00:49	BC
Manganese	ug/L	ND	0.50	0.14	09/05/19 00:49	
Nickel	ug/L	ND	0.50	0.11	09/05/19 00:49	
Selenium	ug/L	ND	0.50	0.080	09/05/19 00:49	
Strontium	ug/L	ND	0.50	0.060	09/05/19 00:49	

LABORATORY CONTROL SAMPLE: 2670882

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	10	10.4	104	80-120	
Barium	ug/L	50	53.1	106	80-120	
Beryllium	ug/L	10	9.6	96	80-120	
Cadmium	ug/L	10	10.6	106	80-120	
Chromium	ug/L	50	53.3	107	80-120	
Cobalt	ug/L	10	10.6	106	80-120	
Copper	ug/L	50	56.1	112	80-120	BC
Manganese	ug/L	50	52.1	104	80-120	
Nickel	ug/L	50	52.8	106	80-120	
Selenium	ug/L	50	49.4	99	80-120	
Strontium	ug/L	50	53.2	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2670883 2670884

Parameter	Units	92442359001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	0.099J	10	10	10.3	10.1	102	100	75-125	1	20	
Barium	ug/L	34.8	50	50	87.8	86.2	106	103	75-125	2	20	
Beryllium	ug/L	ND	10	10	9.5	9.3	94	93	75-125	2	20	
Cadmium	ug/L	ND	10	10	10.5	10.3	105	103	75-125	2	20	
Chromium	ug/L	0.48J	50	50	53.4	52.4	106	104	75-125	2	20	
Cobalt	ug/L	0.54J	10	10	11.1	10.9	105	103	75-125	2	20	
Copper	ug/L	0.62	50	50	55.5	54.5	110	108	75-125	2	20	BC

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92443252

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2670883 2670884

Parameter	Units	92442359001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Manganese	ug/L	99.1	50	50	152	151	107	103	75-125	1	20	
Nickel	ug/L	0.37J	50	50	52.3	51.8	104	103	75-125	1	20	
Selenium	ug/L	ND	50	50	47.2	46.7	94	93	75-125	1	20	
Strontium	ug/L	42.7	50	50	96.3	95.2	107	105	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92443252

QC Batch: 495215 Analysis Method: ASTM D2974-87
QC Batch Method: ASTM D2974-87 Analysis Description: Dry Weight/Percent Moisture
Associated Lab Samples: 92443252001, 92443252002, 92443252003, 92443252004, 92443252005, 92443252006, 92443252007

SAMPLE DUPLICATE: 2668484

Parameter	Units	92443252001 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	25.5	26.5	4	25	

SAMPLE DUPLICATE: 2668485

Parameter	Units	92443493004 Result	Dup Result	RPD	Max RPD	Qualifiers
Percent Moisture	%	28.3	28.0	1	25	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92443252

QC Batch: 1339889 Analysis Method: SM 2540G
QC Batch Method: SM 2540 G Analysis Description: Total Solids 2540 G-2011
Associated Lab Samples: 92443252001, 92443252002, 92443252003, 92443252004, 92443252005, 92443252006, 92443252007

METHOD BLANK: R3447496-1 Matrix: Solid
Associated Lab Samples: 92443252001, 92443252002, 92443252003, 92443252004, 92443252005, 92443252006, 92443252007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Total Solids	%	0.00100			09/04/19 19:45	

LABORATORY CONTROL SAMPLE: R3447496-2

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Total Solids	%	50.0	50.2	100	85.0-115	

SAMPLE DUPLICATE: R3447496-3

Parameter	Units	92443252003 Result	Dup Result	RPD	Max RPD	Qualifiers
Total Solids	%	62.4	68.1	8.75	10	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92443252

QC Batch: 1338392 Analysis Method: EPA 7199
QC Batch Method: 3060A Analysis Description: Wet Chemistry 7199
Associated Lab Samples: 92443252001, 92443252002, 92443252003, 92443252004, 92443252005, 92443252006, 92443252007

METHOD BLANK: R3447284-1 Matrix: Solid
Associated Lab Samples: 92443252001, 92443252002, 92443252003, 92443252004, 92443252005, 92443252006, 92443252007

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Chromium, Hexavalent	mg/kg	ND	1.00	0.255	09/04/19 15:39	

LABORATORY CONTROL SAMPLE: R3447284-2

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	10.0	9.64	96.4	80.0-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: R3447284-4 R3447284-5

Parameter	Units	L1134612-03 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Chromium, Hexavalent	mg/kg	ND	25.4	25.4	17.7	19.3	69.8	75.9	75.0-125	8.42	20	ML

MATRIX SPIKE SAMPLE: R3447284-6

Parameter	Units	L1134612-03 Result	Spike Conc.	MS Result	MS % Rec	% Rec Limits	Qualifiers
Chromium, Hexavalent	mg/kg	ND	1020	932	91.5	75.0-125	

SAMPLE DUPLICATE: R3447284-3

Parameter	Units	92443252001 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	ND	ND	0.00	20	

SAMPLE DUPLICATE: R3447284-8

Parameter	Units	L1134612-04 Result	Dup Result	RPD	Max RPD	Qualifiers
Chromium, Hexavalent	mg/kg	0.337	ND	200	20	D8

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALIFIERS

Project: TCH-009
Pace Project No.: 92443252

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PAN	Pace Analytical National
PASI-A	Pace Analytical Services - Asheville
PASI-C	Pace Analytical Services - Charlotte

ANALYTE QUALIFIERS

BC	The same analyte was detected in an associated blank at a concentration above 1/2 the reporting limit but below the laboratory reporting limit.
D8	The sample and duplicate results for this parameter are less than 5 times the reporting limit, the RPD may not be statistically valid.
H3	Sample was received or analysis requested beyond the recognized method holding time.
J	Analyte detected below the reporting limit, therefore result is an estimate. This qualifier is also used for all TICs.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.
ML	Matrix spike recovery and/or matrix spike duplicate recovery was below laboratory control limits. Result may be biased low.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: TCH-009
Pace Project No.: 92443252

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92443252001	**SED-17**	EPA 3050B	495641	EPA 6010D	495789
92443252002	**SED-15**	EPA 3050B	495641	EPA 6010D	495789
92443252003	**SED-16**	EPA 3050B	495641	EPA 6010D	495789
92443252004	**SED-11**	EPA 3050B	495641	EPA 6010D	495789
92443252005	**SED-13**	EPA 3050B	495641	EPA 6010D	495789
92443252006	**SED-12**	EPA 3050B	495641	EPA 6010D	495789
92443252007	**SS-3A**	EPA 3050B	495641	EPA 6010D	495789
92443252008	**EB-1**	EPA 3010A	495760	EPA 6020B	495803
92443252001	**SED-17**	3050B	1337397	EPA 6020B	1337397
92443252002	**SED-15**	3050B	1337400	EPA 6020B	1337400
92443252003	**SED-16**	3050B	1337400	EPA 6020B	1337400
92443252004	**SED-11**	3050B	1337400	EPA 6020B	1337400
92443252005	**SED-13**	3050B	1337400	EPA 6020B	1337400
92443252006	**SED-12**	3050B	1337400	EPA 6020B	1337400
92443252007	**SS-3A**	3050B	1337400	EPA 6020B	1337400
92443252008	**EB-1**	EPA 7470A	495629	EPA 7470A	495735
92443252001	**SED-17**	EPA 7471B	495379	EPA 7471B	495489
92443252002	**SED-15**	EPA 7471B	495379	EPA 7471B	495489
92443252003	**SED-16**	EPA 7471B	495379	EPA 7471B	495489
92443252004	**SED-11**	EPA 7471B	495379	EPA 7471B	495489
92443252005	**SED-13**	EPA 7471B	496370	EPA 7471B	496488
92443252006	**SED-12**	EPA 7471B	495379	EPA 7471B	495489
92443252007	**SS-3A**	EPA 7471B	495379	EPA 7471B	495489
92443252001	**SED-17**	ASTM D2974-87	495215		
92443252002	**SED-15**	ASTM D2974-87	495215		
92443252003	**SED-16**	ASTM D2974-87	495215		
92443252004	**SED-11**	ASTM D2974-87	495215		
92443252005	**SED-13**	ASTM D2974-87	495215		
92443252006	**SED-12**	ASTM D2974-87	495215		
92443252007	**SS-3A**	ASTM D2974-87	495215		
92443252001	**SED-17**	SM 2540 G	1339889	SM 2540G	1339889
92443252002	**SED-15**	SM 2540 G	1339889	SM 2540G	1339889
92443252003	**SED-16**	SM 2540 G	1339889	SM 2540G	1339889
92443252004	**SED-11**	SM 2540 G	1339889	SM 2540G	1339889
92443252005	**SED-13**	SM 2540 G	1339889	SM 2540G	1339889
92443252006	**SED-12**	SM 2540 G	1339889	SM 2540G	1339889
92443252007	**SS-3A**	SM 2540 G	1339889	SM 2540G	1339889
92443252001	**SED-17**	3060A	1338392	EPA 7199	1338392
92443252002	**SED-15**	3060A	1338392	EPA 7199	1338392
92443252003	**SED-16**	3060A	1338392	EPA 7199	1338392
92443252004	**SED-11**	3060A	1338392	EPA 7199	1338392
92443252005	**SED-13**	3060A	1338392	EPA 7199	1338392
92443252006	**SED-12**	3060A	1338392	EPA 7199	1338392
92443252007	**SS-3A**	3060A	1338392	EPA 7199	1338392

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: TCH-009
Pace Project No.: 92443252

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch

Pace Analytical	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: February 7, 2018 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.06	Issuing Authority: Pace Carolinas Quality Office

Laboratory receiving samples:
Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☐ Raleigh ☒ Mechanicsville ☐

Sample Condition Upon Receipt

Client Name: Hart & Hickman

Project # **WO#: 92443252**

92443252

Courier: ☐ Commercial ☑ Pace ☐ Fed Ex ☐ UPS ☐ USPS ☐ Other: ☐ Client

Custody Seal Present? ☐ Yes ☑ No Seals Intact? ☐ Yes ☐ No

Date/Initials Person Examining Contents: JWT 8/28/19

Packing Material: ☐ Bubble Wrap ☑ Bubble Bags ☐ None ☐ Other

Biological Tissue Frozen? ☐ Yes ☐ No ☑ N/A

Thermometer: ☐ IR Gun ID: 91T005 Type of Ice: ☐ Wet ☐ Blue ☐ None

Cooler Temp (°C): 2.6 Correction Factor: Add/Subtract (°C) -0.1

Cooler Temp Corrected (°C): 2.5

Temp should be above freezing to 6°C
☐ Samples out of temp criteria. Samples on ice, cooling process has begun

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

				Comments/Discrepancy:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☑ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	4.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	7.
Dissolved analysis: Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8.
Sample Labels Match COC? -Includes Date/Time/ID/Analysis Matrix: SL	☑ Yes	☐ No	☐ N/A	9.
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☐ No	☑ N/A	10.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	11.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	

COMMENTS/SAMPLE DISCREPANCY

Field Data Required? ☐ Yes ☐ No

Lot ID of split containers:

CLIENT NOTIFICATION/RESOLUTION

Person contacted: _____ Date/Time: _____

Project Manager SCURF Review: JH Date: 8/28/19

Pace Analytical	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: February 7, 2018 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.06	Issuing Authority: Pace Carolinas Quality Office

*Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.

Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC, LLHg

**Bottom half of box is to list number of bottle

Project **WO#: 92443252**

PM: KRG Due Date: 09/05/19

CLIENT: 92-Hart_Ral

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass Jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)		BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	AG0U-100 mL Amber Unpreserved vials (N/A)	VSGU-20 mL Scintillation Vials (N/A)	DG9U-40 mL Amber Unpreserved vials (N/A)
1									3																				
2									3																				
3									3																				
4									3																				
5									3																				
6									3																				
7									3																				
8																													
9					1																								
10																													
11																													
12																													

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e.

Pace Analytical

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of 1

Section A — Required Client Information:

Company:	Hart & Hickman
Address:	3921 Sunset Ridge Rd
Suite 301, Raleigh, NC 27607	
Email:	
Phone: (252)548-9191	Fax:
Requested Due Date:	Standard turn around

Section B — Required Project Information:

Report To:	Ballard, Justin JBallard@hartandhickman.com
Copy To:	Jeffrey Ollison JOllison@hartandhickman.com
Purchase Order #:	
Project Name:	TGH-009
Project #:	TGH-009

Section C — Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote:	
Pace Project Manager:	kevin.godwin@pacelabs.com,
Pace Profile #:	9481-1,2

Regulatory Agency:

State / Location: NC

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	START TIME	END DATE	END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test	Y/N	6020	6010 (Si), 7471	7199 Hexavalent Chromium	6020, 7470	Residual Chlorine (Y/N)	72443252
1	SED-17	SL	G			8-27-19	1100		3	X										X	X	X			cc1
2	SED-15						1110		1	1															cc2
3	SED-16						1125																		cc3
4	SED-11						1135																		cc4
5	SED-13						1130																		cc5
6	SED-12A				1140		~~1130~~ 1140 SA																		cc6
7	SS-3A	↓			1155		~~1146~~ 1155 SA	↓	↓	↓										↓	↓	↓			cc7
8							~~1155~~ SA																		
9	EB-1	WT	↓			↓	1210		1			X											X		cc8
10																									
11																									
12																									

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
	H&H				8/28/19	1309
	H&H	8/28/19	1338		8/28/19	1338

SAMPLE CONDITIONS

TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
2.6	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Jeffrey Ollison

SIGNATURE of SAMPLER:

DATE Signed: 8/27/19

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

October 05, 2019

Justin Ballard
Hart & Hickman
3921 Sunset Ridge Rd.
Suite 301
Raleigh, NC 27607

RE: Project: TCH-009
Pace Project No.: 92447407

Dear Justin Ballard:
Enclosed are the analytical results for sample(s) received by the laboratory on September 27, 2019. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
1(704)875-9092
Project Manager

Enclosures

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: TCH-009
Pace Project No.: 92447407

Asheville Certification IDs

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE SUMMARY

Project: TCH-009
Pace Project No.: 92447407

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92447407001	**MW-1A**	Water	09/26/19 17:00	09/27/19 14:05
92447407002	**MW-8**	Water	09/26/19 14:30	09/27/19 14:05
92447407003	**MW-9**	Water	09/26/19 11:30	09/27/19 14:05
92447407004	**DUP**	Water	09/26/19 00:00	09/27/19 14:05
92447407005	**RB**	Water	09/26/19 15:00	09/27/19 14:05
92447407006	**IDW SOIL**	Solid	09/26/19 12:05	09/27/19 14:05

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: TCH-009
Pace Project No.: 92447407

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92447407001	**MW-1A**	EPA 6010D	DS	1	PASI-A
		EPA 6020B	JOR, SER	10	PASI-A
		EPA 7470A	SOO	1	PASI-A
92447407002	**MW-8**	EPA 6010D	DS	1	PASI-A
		EPA 6020B	JOR, SER	10	PASI-A
		EPA 7470A	SOO	1	PASI-A
92447407003	**MW-9**	EPA 6010D	DS	1	PASI-A
		EPA 6020B	JOR, SER	10	PASI-A
		EPA 7470A	SOO	1	PASI-A
92447407004	**DUP**	EPA 6010D	DS	1	PASI-A
		EPA 6020B	JOR, SER	10	PASI-A
		EPA 7470A	SOO	1	PASI-A
92447407005	**RB**	EPA 6010D	DS	1	PASI-A
		EPA 6020B	SER	10	PASI-A
		EPA 7470A	SOO	1	PASI-A
92447407006	**IDW SOIL**	EPA 6010D	SH1	7	PASI-A
		EPA 7470A	SOO	1	PASI-A

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: TCH-009
Pace Project No.: 92447407

Sample: MW-1A **Lab ID: 92447407001** Collected: 09/26/19 17:00 Received: 09/27/19 14:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Strontium	**6360**	ug/L	5.0	0.90	1	09/30/19 23:53	10/02/19 18:37	7440-24-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A								
Arsenic	**10**	ug/L	0.50	0.30	5	10/01/19 00:24	10/03/19 20:21	7440-38-2	
Barium	**1040**	ug/L	1.5	0.30	5	10/01/19 00:24	10/03/19 20:21	7440-39-3	
Beryllium	ND	ug/L	0.50	0.25	5	10/01/19 00:24	10/03/19 20:21	7440-41-7	
Cadmium	ND	ug/L	0.40	0.35	5	10/01/19 00:24	10/03/19 20:21	7440-43-9	
Chromium	ND	ug/L	2.5	2.1	5	10/01/19 00:24	10/03/19 20:21	7440-47-3	
Cobalt	**1.2**	ug/L	0.50	0.25	5	10/01/19 00:24	10/03/19 20:21	7440-48-4	
Copper	ND	ug/L	2.5	1.2	5	10/01/19 00:24	10/03/19 20:21	7440-50-8	
Manganese	**2420**	ug/L	2.5	0.70	5	10/01/19 00:24	10/02/19 18:37	7439-96-5	
Nickel	**0.82J**	ug/L	2.5	0.55	5	10/01/19 00:24	10/03/19 20:21	7440-02-0	
Selenium	ND	ug/L	2.5	0.40	5	10/01/19 00:24	10/03/19 20:21	7782-49-2	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury	ND	ug/L	0.20	0.10	1	10/01/19 13:30	10/02/19 14:41	7439-97-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: TCH-009
Pace Project No.: 92447407

Sample: MW-8 **Lab ID: 92447407002** Collected: 09/26/19 14:30 Received: 09/27/19 14:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Strontium	**750**	ug/L	5.0	0.90	1	09/30/19 23:53	10/02/19 18:40	7440-24-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A								
Arsenic	**6.1**	ug/L	0.10	0.060	1	10/01/19 00:24	10/03/19 20:31	7440-38-2	
Barium	**219**	ug/L	0.30	0.060	1	10/01/19 00:24	10/03/19 20:31	7440-39-3	
Beryllium	ND	ug/L	0.10	0.050	1	10/01/19 00:24	10/03/19 20:31	7440-41-7	
Cadmium	ND	ug/L	0.080	0.070	1	10/01/19 00:24	10/03/19 20:31	7440-43-9	
Chromium	**0.51**	ug/L	0.50	0.42	1	10/01/19 00:24	10/03/19 20:31	7440-47-3	
Cobalt	**4.0**	ug/L	0.10	0.050	1	10/01/19 00:24	10/03/19 20:31	7440-48-4	
Copper	**0.98**	ug/L	0.50	0.23	1	10/01/19 00:24	10/03/19 20:31	7440-50-8	
Manganese	**4880**	ug/L	5.0	1.4	10	10/01/19 00:24	10/01/19 20:37	7439-96-5	
Nickel	**4.1**	ug/L	0.50	0.11	1	10/01/19 00:24	10/03/19 20:31	7440-02-0	
Selenium	ND	ug/L	0.50	0.080	1	10/01/19 00:24	10/03/19 20:31	7782-49-2	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury	ND	ug/L	0.20	0.10	1	10/01/19 13:30	10/02/19 14:43	7439-97-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: TCH-009
Pace Project No.: 92447407

Sample: MW-9 **Lab ID: 92447407003** Collected: 09/26/19 11:30 Received: 09/27/19 14:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Strontium	**2160**	ug/L	5.0	0.90	1	09/30/19 23:53	10/02/19 18:44	7440-24-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A								
Arsenic	**0.75**	ug/L	0.20	0.12	2	10/01/19 00:24	10/03/19 20:52	7440-38-2	
Barium	**394**	ug/L	0.60	0.12	2	10/01/19 00:24	10/03/19 20:52	7440-39-3	
Beryllium	ND	ug/L	0.20	0.10	2	10/01/19 00:24	10/03/19 20:52	7440-41-7	
Cadmium	ND	ug/L	0.16	0.14	2	10/01/19 00:24	10/03/19 20:52	7440-43-9	
Chromium	ND	ug/L	1.0	0.84	2	10/01/19 00:24	10/03/19 20:52	7440-47-3	
Cobalt	**1.5**	ug/L	0.20	0.10	2	10/01/19 00:24	10/03/19 20:52	7440-48-4	
Copper	**2.1**	ug/L	1.0	0.46	2	10/01/19 00:24	10/03/19 20:52	7440-50-8	
Manganese	**5060**	ug/L	5.0	1.4	10	10/01/19 00:24	10/01/19 20:41	7439-96-5	
Nickel	**0.41J**	ug/L	1.0	0.22	2	10/01/19 00:24	10/03/19 20:52	7440-02-0	
Selenium	ND	ug/L	1.0	0.16	2	10/01/19 00:24	10/03/19 20:52	7782-49-2	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury	ND	ug/L	0.20	0.10	1	10/01/19 13:30	10/02/19 14:45	7439-97-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: TCH-009
Pace Project No.: 92447407

Sample: DUP **Lab ID: 92447407004** Collected: 09/26/19 00:00 Received: 09/27/19 14:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Strontium	**2200**	ug/L	5.0	0.90	1	09/30/19 23:53	10/02/19 18:47	7440-24-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A								
Arsenic	**0.79**	ug/L	0.20	0.12	2	10/01/19 00:24	10/03/19 21:02	7440-38-2	
Barium	**418**	ug/L	0.60	0.12	2	10/01/19 00:24	10/03/19 21:02	7440-39-3	
Beryllium	ND	ug/L	0.20	0.10	2	10/01/19 00:24	10/03/19 21:02	7440-41-7	
Cadmium	ND	ug/L	0.16	0.14	2	10/01/19 00:24	10/03/19 21:02	7440-43-9	
Chromium	ND	ug/L	1.0	0.84	2	10/01/19 00:24	10/03/19 21:02	7440-47-3	
Cobalt	**1.6**	ug/L	0.20	0.10	2	10/01/19 00:24	10/03/19 21:02	7440-48-4	
Copper	**2.1**	ug/L	1.0	0.46	2	10/01/19 00:24	10/03/19 21:02	7440-50-8	
Manganese	**5310**	ug/L	5.0	1.4	10	10/01/19 00:24	10/01/19 20:50	7439-96-5	
Nickel	**0.42J**	ug/L	1.0	0.22	2	10/01/19 00:24	10/03/19 21:02	7440-02-0	
Selenium	ND	ug/L	1.0	0.16	2	10/01/19 00:24	10/03/19 21:02	7782-49-2	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury	ND	ug/L	0.20	0.10	1	10/01/19 13:30	10/02/19 14:48	7439-97-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: TCH-009
Pace Project No.: 92447407

Sample: RB **Lab ID: 92447407005** Collected: 09/26/19 15:00 Received: 09/27/19 14:05 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Strontium	ND	ug/L	5.0	0.90	1	09/30/19 23:53	10/02/19 18:50	7440-24-6	
6020 MET ICPMS	Analytical Method: EPA 6020B Preparation Method: EPA 3010A								
Arsenic	ND	ug/L	0.10	0.060	1	10/01/19 00:24	10/03/19 21:12	7440-38-2	
Barium	**0.18J**	ug/L	0.30	0.060	1	10/01/19 00:24	10/03/19 21:12	7440-39-3	
Beryllium	ND	ug/L	0.10	0.050	1	10/01/19 00:24	10/03/19 21:12	7440-41-7	
Cadmium	ND	ug/L	0.080	0.070	1	10/01/19 00:24	10/03/19 21:12	7440-43-9	
Chromium	ND	ug/L	0.50	0.42	1	10/01/19 00:24	10/03/19 21:12	7440-47-3	
Cobalt	ND	ug/L	0.10	0.050	1	10/01/19 00:24	10/03/19 21:12	7440-48-4	
Copper	ND	ug/L	0.50	0.23	1	10/01/19 00:24	10/03/19 21:12	7440-50-8	
Manganese	**0.21J**	ug/L	0.50	0.14	1	10/01/19 00:24	10/03/19 21:12	7439-96-5	
Nickel	ND	ug/L	0.50	0.11	1	10/01/19 00:24	10/03/19 21:12	7440-02-0	
Selenium	ND	ug/L	0.50	0.080	1	10/01/19 00:24	10/03/19 21:12	7782-49-2	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury	ND	ug/L	0.20	0.10	1	10/01/19 13:30	10/02/19 14:50	7439-97-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: TCH-009
Pace Project No.: 92447407

Sample: IDW SOIL **Lab ID: 92447407006** Collected: 09/26/19 12:05 Received: 09/27/19 14:05 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, TCLP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A Leachate Method/Date: EPA 1311; 10/03/19 12:09 Initial pH: 8.89; Final pH: 5								
Arsenic	**0.019J**	mg/L	0.050	0.0047	1	10/04/19 09:39	10/04/19 15:00	7440-38-2	B
Barium	**1.0**	mg/L	0.25	0.0010	1	10/04/19 09:39	10/04/19 15:00	7440-39-3	
Cadmium	**0.00049J**	mg/L	0.0050	0.00040	1	10/04/19 09:39	10/04/19 15:00	7440-43-9	
Chromium	**0.0015J**	mg/L	0.050	0.0010	1	10/04/19 09:39	10/04/19 15:00	7440-47-3	
Lead	**0.024J**	mg/L	0.025	0.0016	1	10/04/19 09:39	10/04/19 15:00	7439-92-1	B
Selenium	**0.0084J**	mg/L	0.10	0.0047	1	10/04/19 09:39	10/04/19 15:00	7782-49-2	B
Silver	ND	mg/L	0.025	0.0025	1	10/04/19 09:39	10/04/19 15:00	7440-22-4	
7470 Mercury, TCLP	Analytical Method: EPA 7470A Preparation Method: EPA 7470A Leachate Method/Date: EPA 1311; 10/03/19 12:09 Initial pH: 8.89; Final pH: 5								
Mercury	ND	mg/L	0.00020	0.00010	1	10/04/19 11:00	10/04/19 14:07	7439-97-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92447407

QC Batch: 501695 Analysis Method: EPA 7470A
QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury TCLP
Associated Lab Samples: 92447407006

METHOD BLANK: 2696678 Matrix: Water
Associated Lab Samples: 92447407006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/L	ND	0.00020	0.00010	10/04/19 13:57	

METHOD BLANK: 2696855 Matrix: Water
Associated Lab Samples: 92447407006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/L	ND	0.00020	0.00010	10/04/19 14:02	

LABORATORY CONTROL SAMPLE: 2697919

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.0025	0.0024	98	80-120	

LABORATORY CONTROL SAMPLE: 2697981

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.0025	0.0025	101	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2697920 2697921

Parameter	Units	92447407006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	ND	0.0025	0.0025	0.0026	0.0025	104	99	75-125	5	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92447407

QC Batch: 500911 Analysis Method: EPA 7470A
QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury
Associated Lab Samples: 92447407001, 92447407002, 92447407003, 92447407004, 92447407005

METHOD BLANK: 2694442 Matrix: Water
Associated Lab Samples: 92447407001, 92447407002, 92447407003, 92447407004, 92447407005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.10	10/02/19 13:53	

LABORATORY CONTROL SAMPLE: 2694443

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.8	111	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2694444 2694445

Parameter	Units	92447333003 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.9	2.6	117	102	75-125	13	25	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92447407

QC Batch: 501694
QC Batch Method: EPA 3010A
Associated Lab Samples: 92447407006

Analysis Method: EPA 6010D
Analysis Description: 6010 MET TCLP

METHOD BLANK: 2696678 Matrix: Water
Associated Lab Samples: 92447407006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/L	0.014J	0.050	0.0047	10/04/19 14:47	
Barium	mg/L	0.059J	0.25	0.0010	10/04/19 14:47	
Cadmium	mg/L	ND	0.0050	0.00040	10/04/19 14:47	
Chromium	mg/L	ND	0.050	0.0010	10/04/19 14:47	
Lead	mg/L	0.0045J	0.025	0.0016	10/04/19 14:47	
Selenium	mg/L	ND	0.10	0.0047	10/04/19 14:47	
Silver	mg/L	ND	0.025	0.0025	10/04/19 14:47	

METHOD BLANK: 2696855 Matrix: Water
Associated Lab Samples: 92447407006

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/L	0.014J	0.050	0.0047	10/04/19 14:53	
Barium	mg/L	0.035J	0.25	0.0010	10/04/19 14:53	
Cadmium	mg/L	ND	0.0050	0.00040	10/04/19 14:53	
Chromium	mg/L	ND	0.050	0.0010	10/04/19 14:53	
Lead	mg/L	ND	0.025	0.0016	10/04/19 14:53	
Selenium	mg/L	0.0047J	0.10	0.0047	10/04/19 14:53	
Silver	mg/L	ND	0.025	0.0025	10/04/19 14:53	

LABORATORY CONTROL SAMPLE: 2697916

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/L	2.5	2.4	96	80-120	
Barium	mg/L	2.5	2.5	100	80-120	
Cadmium	mg/L	2.5	2.4	97	80-120	
Chromium	mg/L	2.5	2.4	97	80-120	
Lead	mg/L	2.5	2.3	92	80-120	
Selenium	mg/L	2.5	2.5	100	80-120	
Silver	mg/L	1.2	1.2	98	80-120	

LABORATORY CONTROL SAMPLE: 2697962

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/L	2.5	2.4	96	80-120	
Barium	mg/L	2.5	2.5	99	80-120	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92447407

LABORATORY CONTROL SAMPLE: 2697962

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Cadmium	mg/L	2.5	2.4	96	80-120	
Chromium	mg/L	2.5	2.4	97	80-120	
Lead	mg/L	2.5	2.3	93	80-120	
Selenium	mg/L	2.5	2.5	99	80-120	
Silver	mg/L	1.2	1.2	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2697917 2697918

Parameter	Units	92447407006 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/L	0.019J	2.5	2.5	2.4	2.4	94	96	75-125	1	20	
Barium	mg/L	1.0	2.5	2.5	3.5	3.4	97	95	75-125	1	20	
Cadmium	mg/L	0.00049J	2.5	2.5	2.4	2.4	95	96	75-125	1	20	
Chromium	mg/L	0.0015J	2.5	2.5	2.4	2.4	95	96	75-125	1	20	
Lead	mg/L	0.024J	2.5	2.5	2.3	2.3	91	92	75-125	1	20	
Selenium	mg/L	0.0084J	2.5	2.5	2.5	2.5	98	99	75-125	1	20	
Silver	mg/L	ND	1.2	1.2	1.2	1.2	96	96	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92447407

QC Batch: 500816 Analysis Method: EPA 6010D
QC Batch Method: EPA 3010A Analysis Description: 6010 MET
Associated Lab Samples: 92447407001, 92447407002, 92447407003, 92447407004, 92447407005

METHOD BLANK: 2694216 Matrix: Water
Associated Lab Samples: 92447407001, 92447407002, 92447407003, 92447407004, 92447407005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Strontium	ug/L	ND	5.0	0.90	10/02/19 16:35	

LABORATORY CONTROL SAMPLE: 2694217

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Strontium	ug/L	500	486	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2694218 2694219

Parameter	Units	92446513021 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Strontium	ug/L	18.2	500	500	534	541	103	104	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92447407

QC Batch: 500817 Analysis Method: EPA 6020B
QC Batch Method: EPA 3010A Analysis Description: 6020 MET
Associated Lab Samples: 92447407001, 92447407002, 92447407003, 92447407004, 92447407005

METHOD BLANK: 2694220 Matrix: Water
Associated Lab Samples: 92447407001, 92447407002, 92447407003, 92447407004, 92447407005

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	ND	0.10	0.060	10/03/19 20:11	
Barium	ug/L	ND	0.30	0.060	10/03/19 20:11	
Beryllium	ug/L	ND	0.10	0.050	10/03/19 20:11	
Cadmium	ug/L	ND	0.080	0.070	10/03/19 20:11	
Chromium	ug/L	ND	0.50	0.42	10/03/19 20:11	
Cobalt	ug/L	ND	0.10	0.050	10/03/19 20:11	
Copper	ug/L	ND	0.50	0.23	10/03/19 20:11	
Manganese	ug/L	ND	0.50	0.14	10/03/19 20:11	
Nickel	ug/L	ND	0.50	0.11	10/03/19 20:11	
Selenium	ug/L	ND	0.50	0.080	10/03/19 20:11	

LABORATORY CONTROL SAMPLE: 2694221

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	10	10.6	106	80-120	
Barium	ug/L	50	51.9	104	80-120	
Beryllium	ug/L	10	10.1	101	80-120	
Cadmium	ug/L	10	10.6	106	80-120	
Chromium	ug/L	50	52.8	106	80-120	
Cobalt	ug/L	10	10.6	106	80-120	
Copper	ug/L	50	55.1	110	80-120	
Manganese	ug/L	50	52.2	104	80-120	
Nickel	ug/L	50	53.0	106	80-120	
Selenium	ug/L	50	53.5	107	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2694222 2694223

Parameter	Units	92447333001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	4.2	10	10	13.8	13.8	96	96	75-125	0	20	
Barium	ug/L	1.2	50	50	50.9	51.4	99	100	75-125	1	20	
Beryllium	ug/L	0.29	10	10	9.9	9.9	96	96	75-125	0	20	
Cadmium	ug/L	ND	10	10	10	9.9	100	99	75-125	0	20	
Chromium	ug/L	1.8	50	50	52.7	52.7	102	102	75-125	0	20	
Cobalt	ug/L	0.16	10	10	10.3	10.3	101	101	75-125	0	20	
Copper	ug/L	ND	50	50	55.6	53.2	111	106	75-125	4	20	
Manganese	ug/L	3.4	50	50	54.2	54.1	102	101	75-125	0	20	
Nickel	ug/L	0.91	50	50	51.0	51.0	100	100	75-125	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92447407

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2694222 2694223

Parameter	Units	92447333001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Selenium	ug/L	ND	50	50	48.0	48.3	96	97	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALIFIERS

Project: TCH-009
Pace Project No.: 92447407

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: TCH-009
Pace Project No.: 92447407

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92447407006	**IDW SOIL**	EPA 3010A	501694	EPA 6010D	501765
92447407001	**MW-1A**	EPA 3010A	500816	EPA 6010D	500836
92447407002	**MW-8**	EPA 3010A	500816	EPA 6010D	500836
92447407003	**MW-9**	EPA 3010A	500816	EPA 6010D	500836
92447407004	**DUP**	EPA 3010A	500816	EPA 6010D	500836
92447407005	**RB**	EPA 3010A	500816	EPA 6010D	500836
92447407001	**MW-1A**	EPA 3010A	500817	EPA 6020B	500835
92447407002	**MW-8**	EPA 3010A	500817	EPA 6020B	500835
92447407003	**MW-9**	EPA 3010A	500817	EPA 6020B	500835
92447407004	**DUP**	EPA 3010A	500817	EPA 6020B	500835
92447407005	**RB**	EPA 3010A	500817	EPA 6020B	500835
92447407006	**IDW SOIL**	EPA 7470A	501695	EPA 7470A	501770
92447407001	**MW-1A**	EPA 7470A	500911	EPA 7470A	500991
92447407002	**MW-8**	EPA 7470A	500911	EPA 7470A	500991
92447407003	**MW-9**	EPA 7470A	500911	EPA 7470A	500991
92447407004	**DUP**	EPA 7470A	500911	EPA 7470A	500991
92447407005	**RB**	EPA 7470A	500911	EPA 7470A	500991

Pace Analytical	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: February 7, 2018 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.06	Issuing Authority: Pace Carolinas Quality Office

Laboratory receiving samples:

Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☐ Raleigh ☑ Mechanicsville ☐

Sample Condition Upon Receipt:

Client Name: Hart & Hickman

Project

WO#: 92447407

92447407

Courier: ☐ Commercial ☑ Pace ☐ Fed Ex ☐ UPS ☐ USPS ☐ Other: ☐ Client

Custody Seal Present? ☐ Yes ☑ No Seals Intact? ☐ Yes ☐ No

Date/Initials Person Examining Contents: DDS 9/27/19

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☑ None ☐ Other

Thermometer: ☐ IR Gun ID: 9170005

Type of Ice: ☑ Wet ☐ Blue ☐ None

Biological Tissue Frozen? ☐ Yes ☐ No ☑ N/A

Cooler Temp (°C): 2.4 Correction Factor: Add/Subtract (°C) -0.1

Cooler Temp Corrected (°C): 2.3

Temp should be above freezing to 6°C

☐ Samples out of temp criteria. Samples on ice, cooling process has begun

USDA Regulated Soil (☑ N/A, water sample)

Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

				Comments/Discrepancy:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☑ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☑ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☑ No	☐ N/A	4.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☑ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☑ Yes	☐ No	☐ N/A	
Containers Intact?	☑ Yes	☐ No	☐ N/A	7.
Dissolved analysis: Samples Field Filtered?	☐ Yes	☐ No	☑ N/A	8.
Sample Labels Match COC?	☑ Yes	☐ No	☐ N/A	9.
-Includes Date/Time/ID/Analysis Matrix: WT				
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☐ No	☑ N/A	10.
Trip Blank Present?	☐ Yes	☐ No	☑ N/A	11.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☑ N/A	

COMMENTS/SAMPLE DISCREPANCY

Field Data Required? ☐ Yes ☐ No

CLIENT NOTIFICATION/RESOLUTION

Lot ID of split containers:

Person contacted: Date/Time:

Project Manager SCURF Review: JH Date: 9/27/19

Project Manager SRF Review: JH Date: 9/27/19

Pace Analytical	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: February 7, 2018 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.06	Issuing Authority: Carolinas Quality Office

*Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.

Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC, LLHg

**Bottom half of box is to list number of bottle

Project # **WO# : 92447407**

PM: KRG Due Date: 10/04/19

CLIENT: 92-Hart_Ral

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass Jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SP5T-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)		BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	AG0U-100 mL Amber Unpreserved vials (N/A)	VSGU-20 mL Scintillation vials (N/A)	DG9U-40 mL Amber Unpreserved vials (N/A)
1					2																							
2					2																							
3					2																							
4					2																							
5					2																							
6											1																	
7																												
8																												
9																												
10																												
11																												
12																												

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers.

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Pace Analytical

Page: 1 Of 1

Section A — Required Client Information:

Company:	Hart & Hickman_Raleigh
Address:	3921 Sunset Ridge Rd.
	Raleigh, NC 27607
Email:	jballard@harthickman.com
Phone:	(919)723-2507 Fax:
Requested Due Date:	

Section B — Required Project Information:

Report To:	Justin Ballard
Copy To:	
Purchase Order #:	
Project Name:	TCH-009
Project #:	

Section C — Invoice Information:

Attention:	
Company Name:	
Address:	
Pace Quote:	
Pace Project Manager:	kevin.godwin@pacelabs.com,
Pace Profile #:	9481

Regulatory Agency:

State / Location: NC

SAMPLE ID — One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique

MATRIX	CODE
Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Other	OT
Tissue	TS

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID	MATRIX CODE	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	COLLECTED START TIME	COLLECTED END DATE	COLLECTED END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	TCLP Metals	6020**/7470 Metals	6010 (Sr only)	Residual Chlorine (Y/N)	32447407
1	MW-1A	WT		9/26/19	1700				2			X								X	X		001
2	MW-8	WT		↓	1430				2			X								X	X		002
3	MW-9	WT		↓	1130				2			X								X	X		003
4	DUP	WT		↓					2			X								X	X		004
5	RB	WT		↓	1500				2			X								X	X		005
6	IDW-Soil	SL		↓	1205				1	X									X				006
7																							
8																							
9																							
10																							
11																							
12																							

ADDITIONAL COMMENTS: 020**: As, Ba, Be, Cd, Cr, Cd, Cu, Mn, Ni, Se

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	TEMP in C	Received on Ice (Y/N)	Custody Sealed Cooler (Y/N)	Samples Intact (Y/N)
[signature]	9/27/19	1405	[signature] / H&H	9/27/19	1405				
[signature] / H&H	9/27/19	1420	[signature]	9/27/19	1420	2.4	Y	N	Y

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Lisa Nickels

SIGNATURE of SAMPLER: [signature]

DATE Signed: 9/26/19

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

March 02, 2020

Justin Ballard
Hart & Hickman
3921 Sunset Ridge Rd.
Suite 301
Raleigh, NC 27607

RE: Project: TCH-009
Pace Project No.: 92465068

Dear Justin Ballard:
Enclosed are the analytical results for sample(s) received by the laboratory on February 13, 2020. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
1(704)875-9092
Project Manager

Enclosures

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: TCH-009
Pace Project No.: 92465068

Pace Analytical Services Ormond Beach

8 East Tower Circle, Ormond Beach, FL 32174
Alaska DEC- CS/UST/LUST
Alabama Certification #: 41320
Arizona Certification# AZ0819
Colorado Certification: FL NELAC Reciprocity
Connecticut Certification #: PH-0216
Delaware Certification: FL NELAC Reciprocity
Florida Certification #: E83079
Georgia Certification #: 955
Guam Certification: FL NELAC Reciprocity
Hawaii Certification: FL NELAC Reciprocity
Illinois Certification #: 200068
Indiana Certification: FL NELAC Reciprocity
Kansas Certification #: E-10383
Kentucky Certification #: 90050
Louisiana Certification #: FL NELAC Reciprocity
Louisiana Environmental Certificate #: 05007
Maryland Certification: #346
Michigan Certification #: 9911
Mississippi Certification: FL NELAC Reciprocity
Missouri Certification #: 236
Montana Certification #: Cert 0074
Nebraska Certification: NE-OS-28-14
New Hampshire Certification #: 2958
New Jersey Certification #: FL022
New York Certification #: 11608
North Carolina Environmental Certificate #: 667
North Carolina Certification #: 12710
North Dakota Certification #: R-216
Oklahoma Certification #: D9947
Pennsylvania Certification #: 68-00547
Puerto Rico Certification #: FL01264
South Carolina Certification: #96042001
Tennessee Certification #: TN02974
Texas Certification: FL NELAC Reciprocity
US Virgin Islands Certification: FL NELAC Reciprocity
Virginia Environmental Certification #: 460165
West Virginia Certification #: 9962C
Wisconsin Certification #: 399079670
Wyoming (EPA Region 8): FL NELAC Reciprocity

Pace Analytical Services Asheville

2225 Riverside Drive, Asheville, NC 28804
Florida/NELAP Certification #: E87648
Massachusetts Certification #: M-NC030
North Carolina Drinking Water Certification #: 37712
North Carolina Wastewater Certification #: 40
South Carolina Certification #: 99030001
Virginia/VELAP Certification #: 460222

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE SUMMARY

Project: TCH-009
Pace Project No.: 92465068

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92465068001	**MW-9**	Water	02/12/20 13:20	02/13/20 13:13
92465068002	**MW-11D**	Water	02/13/20 10:40	02/13/20 13:13
92465068003	**DUP**	Water	02/12/20 00:00	02/13/20 13:13
92465068004	**IDW**	Solid	02/12/20 17:10	02/13/20 13:13

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

SAMPLE ANALYTE COUNT

Project: TCH-009
Pace Project No.: 92465068

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92465068001	**MW-9**	EPA 6010D	DS, SH1	5	PASI-A
		EPA 6020	AMS, SLG	10	PASI-O
		EPA 7470A	SOO	1	PASI-A
		SM 2320B-2011	ECH	1	PASI-A
92465068002	**MW-11D**	EPA 6010D	DS, SH1	5	PASI-A
		EPA 6020	SLG	10	PASI-O
		EPA 7470A	SOO	1	PASI-A
		SM 2320B-2011	ECH	1	PASI-A
92465068003	**DUP**	EPA 6010D	DS, SH1	5	PASI-A
		EPA 6020	SLG	10	PASI-O
		EPA 7470A	SOO	1	PASI-A
		SM 2320B-2011	ECH	1	PASI-A
92465068004	**IDW**	EPA 6010D	DS	7	PASI-A
		EPA 7470A	SOO	1	PASI-A

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: TCH-009
Pace Project No.: 92465068

Sample: MW-9 **Lab ID: 92465068001** Collected: 02/12/20 13:20 Received: 02/13/20 13:13 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Calcium	**118000**	ug/L	500	121	5	02/18/20 01:27	02/19/20 09:38	7440-70-2	
Magnesium	**26100**	ug/L	100	17.1	1	02/18/20 01:27	02/18/20 18:25	7439-95-4	
Potassium	**12400**	ug/L	5000	890	1	02/18/20 01:27	02/18/20 18:25	7440-09-7	
Sodium	**24900**	ug/L	5000	174	1	02/18/20 01:27	02/18/20 18:25	7440-23-5	
Strontium	**2380**	ug/L	5.0	0.90	1	02/18/20 01:27	02/18/20 18:25	7440-24-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Arsenic	**0.78J**	ug/L	1.0	0.50	1	02/28/20 03:47	03/02/20 11:22	7440-38-2	
Barium	**369**	ug/L	1.0	0.50	1	02/28/20 03:47	02/29/20 12:20	7440-39-3	
Beryllium	ND	ug/L	0.10	0.070	1	02/28/20 03:47	03/02/20 11:22	7440-41-7	
Cadmium	ND	ug/L	0.10	0.050	1	02/28/20 03:47	03/02/20 11:22	7440-43-9	
Chromium	ND	ug/L	1.0	0.50	1	02/28/20 03:47	03/02/20 11:22	7440-47-3	
Cobalt	**2.3**	ug/L	1.0	0.50	1	02/28/20 03:47	03/02/20 11:22	7440-48-4	
Copper	**1.0**	ug/L	1.0	0.93	1	02/28/20 03:47	03/02/20 11:22	7440-50-8	
Manganese	**5430**	ug/L	20.0	13.8	20	02/28/20 03:47	03/02/20 11:19	7439-96-5	
Nickel	ND	ug/L	1.0	0.62	1	02/28/20 03:47	03/02/20 11:22	7440-02-0	
Selenium	ND	ug/L	1.0	0.50	1	02/28/20 03:47	03/02/20 11:22	7782-49-2	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury	ND	ug/L	0.20	0.10	1	02/18/20 12:04	02/19/20 19:06	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity, Total as CaCO3	**377**	mg/L	5.0	5.0	1		02/19/20 00:24		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: TCH-009
Pace Project No.: 92465068

Sample: MW-11D **Lab ID: 92465068002** Collected: 02/13/20 10:40 Received: 02/13/20 13:13 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Calcium	**45100**	ug/L	100	24.2	1	02/18/20 01:27	02/18/20 18:28	7440-70-2	
Magnesium	**30300**	ug/L	100	17.1	1	02/18/20 01:27	02/18/20 18:28	7439-95-4	
Potassium	**145000**	ug/L	25000	4450	5	02/18/20 01:27	02/19/20 09:41	7440-09-7	
Sodium	**65400**	ug/L	5000	174	1	02/18/20 01:27	02/18/20 18:28	7440-23-5	
Strontium	**604**	ug/L	5.0	0.90	1	02/18/20 01:27	02/18/20 18:28	7440-24-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Arsenic	**1.5**	ug/L	1.0	0.50	1	02/27/20 01:11	02/27/20 22:04	7440-38-2	
Barium	**24.1**	ug/L	1.0	0.50	1	02/27/20 01:11	02/27/20 22:04	7440-39-3	
Beryllium	ND	ug/L	0.10	0.070	1	02/27/20 01:11	02/27/20 22:04	7440-41-7	
Cadmium	ND	ug/L	0.10	0.050	1	02/27/20 01:11	02/27/20 22:04	7440-43-9	
Chromium	**1.7**	ug/L	1.0	0.50	1	02/27/20 01:11	02/27/20 22:04	7440-47-3	
Cobalt	ND	ug/L	1.0	0.50	1	02/27/20 01:11	02/27/20 22:04	7440-48-4	
Copper	**2.2**	ug/L	1.0	0.93	1	02/27/20 01:11	02/27/20 22:04	7440-50-8	
Manganese	**14.7**	ug/L	1.0	0.69	1	02/27/20 01:11	02/27/20 22:04	7439-96-5	
Nickel	**5.5**	ug/L	1.0	0.62	1	02/27/20 01:11	02/27/20 22:04	7440-02-0	
Selenium	**0.74J**	ug/L	1.0	0.50	1	02/27/20 01:11	02/27/20 22:04	7782-49-2	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury	ND	ug/L	0.20	0.10	1	02/18/20 12:04	02/19/20 19:09	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity, Total as CaCO3	**413**	mg/L	5.0	5.0	1		02/19/20 00:44		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: TCH-009
Pace Project No.: 92465068

Sample: DUP **Lab ID: 92465068003** Collected: 02/12/20 00:00 Received: 02/13/20 13:13 Matrix: Water

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A								
Calcium	**113000**	ug/L	500	121	5	02/18/20 01:27	02/19/20 09:44	7440-70-2	
Magnesium	**25600**	ug/L	100	17.1	1	02/18/20 01:27	02/18/20 18:31	7439-95-4	
Potassium	**12100**	ug/L	5000	890	1	02/18/20 01:27	02/18/20 18:31	7440-09-7	
Sodium	**24100**	ug/L	5000	174	1	02/18/20 01:27	02/18/20 18:31	7440-23-5	
Strontium	**2310**	ug/L	5.0	0.90	1	02/18/20 01:27	02/18/20 18:31	7440-24-6	
6020 MET ICPMS	Analytical Method: EPA 6020 Preparation Method: EPA 3010								
Arsenic	**0.74J**	ug/L	1.0	0.50	1	02/27/20 01:11	02/27/20 22:07	7440-38-2	
Barium	**338**	ug/L	1.0	0.50	1	02/27/20 01:11	02/27/20 22:07	7440-39-3	
Beryllium	ND	ug/L	0.10	0.070	1	02/27/20 01:11	02/27/20 22:07	7440-41-7	
Cadmium	ND	ug/L	0.10	0.050	1	02/27/20 01:11	02/27/20 22:07	7440-43-9	
Chromium	ND	ug/L	1.0	0.50	1	02/27/20 01:11	02/27/20 22:07	7440-47-3	
Cobalt	**2.5**	ug/L	1.0	0.50	1	02/27/20 01:11	02/27/20 22:07	7440-48-4	
Copper	**1.1**	ug/L	1.0	0.93	1	02/27/20 01:11	02/27/20 22:07	7440-50-8	
Manganese	**5170**	ug/L	20.0	13.8	20	02/27/20 01:11	02/29/20 10:22	7439-96-5	
Nickel	ND	ug/L	1.0	0.62	1	02/27/20 01:11	02/27/20 22:07	7440-02-0	
Selenium	ND	ug/L	1.0	0.50	1	02/27/20 01:11	02/27/20 22:07	7782-49-2	
7470 Mercury	Analytical Method: EPA 7470A Preparation Method: EPA 7470A								
Mercury	ND	ug/L	0.20	0.10	1	02/18/20 12:04	02/19/20 19:11	7439-97-6	
2320B Alkalinity	Analytical Method: SM 2320B-2011								
Alkalinity, Total as CaCO3	**377**	mg/L	5.0	5.0	1		02/19/20 01:34		

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

ANALYTICAL RESULTS

Project: TCH-009
Pace Project No.: 92465068

Sample: IDW **Lab ID: 92465068004** Collected: 02/12/20 17:10 Received: 02/13/20 13:13 Matrix: Solid

Results reported on a "wet-weight" basis

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
6010 MET ICP, TCLP	Analytical Method: EPA 6010D Preparation Method: EPA 3010A Leachate Method/Date: EPA 1311; 02/17/20 13:45 Initial pH: 9.55; Final pH: 5								
Arsenic	ND	mg/L	0.050	0.0047	1	02/18/20 11:05	02/18/20 19:57	7440-38-2	
Barium	**1.4**	mg/L	0.25	0.0010	1	02/18/20 11:05	02/18/20 19:57	7440-39-3	
Cadmium	**0.0029J**	mg/L	0.0050	0.00040	1	02/18/20 11:05	02/18/20 19:57	7440-43-9	B
Chromium	ND	mg/L	0.050	0.0010	1	02/18/20 11:05	02/18/20 19:57	7440-47-3	
Lead	**0.093**	mg/L	0.025	0.0016	1	02/18/20 11:05	02/18/20 19:57	7439-92-1	
Selenium	**0.023J**	mg/L	0.10	0.0047	1	02/18/20 11:05	02/18/20 19:57	7782-49-2	B
Silver	ND	mg/L	0.025	0.0025	1	02/18/20 11:05	02/18/20 19:57	7440-22-4	
7470 Mercury, TCLP	Analytical Method: EPA 7470A Preparation Method: EPA 7470A Leachate Method/Date: EPA 1311; 02/17/20 13:45 Initial pH: 9.55; Final pH: 5								
Mercury	ND	mg/L	0.00020	0.00010	1	02/18/20 13:12	02/19/20 18:19	7439-97-6	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92465068

QC Batch: 525657 Analysis Method: EPA 7470A
QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury TCLP
Associated Lab Samples: 92465068004

METHOD BLANK: 2808374 Matrix: Water
Associated Lab Samples: 92465068004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	mg/L	ND	0.00020	0.00010	02/19/20 17:58	

LABORATORY CONTROL SAMPLE: 2809605

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	mg/L	0.0025	0.0026	106	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2809606 2809607

Parameter	Units	92463037001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	mg/L	ND	0.0025	0.0025	0.0030	0.0030	120	118	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92465068

QC Batch: 525637 Analysis Method: EPA 7470A
QC Batch Method: EPA 7470A Analysis Description: 7470 Mercury
Associated Lab Samples: 92465068001, 92465068002, 92465068003

METHOD BLANK: 2809537 Matrix: Water
Associated Lab Samples: 92465068001, 92465068002, 92465068003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Mercury	ug/L	ND	0.20	0.10	02/19/20 18:31	

LABORATORY CONTROL SAMPLE: 2809538

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Mercury	ug/L	2.5	2.8	110	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2809539 2809540

Parameter	Units	92464959002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Mercury	ug/L	ND	2.5	2.5	2.7	2.8	105	110	75-125	4	25	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92465068

QC Batch: 525655 Analysis Method: EPA 6010D
QC Batch Method: EPA 3010A Analysis Description: 6010 MET TCLP
Associated Lab Samples: 92465068004

METHOD BLANK: 2808374 Matrix: Water
Associated Lab Samples: 92465068004

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	mg/L	ND	0.050	0.0047	02/18/20 19:19	
Barium	mg/L	0.034J	0.25	0.0010	02/18/20 19:19	
Cadmium	mg/L	0.0023J	0.0050	0.00040	02/18/20 19:19	
Chromium	mg/L	ND	0.050	0.0010	02/18/20 19:19	
Lead	mg/L	ND	0.025	0.0016	02/18/20 19:19	
Selenium	mg/L	0.014J	0.10	0.0047	02/18/20 19:19	
Silver	mg/L	ND	0.025	0.0025	02/18/20 19:19	

LABORATORY CONTROL SAMPLE: 2809599

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	mg/L	2.5	2.5	100	80-120	
Barium	mg/L	2.5	2.4	96	80-120	
Cadmium	mg/L	2.5	2.4	96	80-120	
Chromium	mg/L	2.5	2.5	99	80-120	
Lead	mg/L	2.5	2.3	91	80-120	
Selenium	mg/L	2.5	2.4	97	80-120	
Silver	mg/L	1.2	1.3	102	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2809600 2809601

Parameter	Units	92463037001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	mg/L	ND	2.5	2.5	2.5	2.5	100	101	75-125	2	20	
Barium	mg/L	1.7	2.5	2.5	4.2	4.2	100	99	75-125	1	20	
Cadmium	mg/L	0.034	2.5	2.5	2.5	2.5	98	98	75-125	1	20	
Chromium	mg/L	ND	2.5	2.5	2.5	2.5	100	100	75-125	0	20	
Lead	mg/L	18.1	2.5	2.5	21.3	21.1	125	118	75-125	1	20	
Selenium	mg/L	ND	2.5	2.5	2.5	2.5	99	101	75-125	2	20	
Silver	mg/L	ND	1.2	1.2	1.3	1.3	105	105	75-125	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92465068

QC Batch: 525582 Analysis Method: EPA 6010D
QC Batch Method: EPA 3010A Analysis Description: 6010 MET
Associated Lab Samples: 92465068001, 92465068002, 92465068003

METHOD BLANK: 2809414 Matrix: Water
Associated Lab Samples: 92465068001, 92465068002, 92465068003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Calcium	ug/L	ND	100	24.2	02/18/20 17:41	
Magnesium	ug/L	ND	100	17.1	02/18/20 17:41	
Potassium	ug/L	ND	5000	890	02/18/20 17:41	
Sodium	ug/L	ND	5000	174	02/18/20 17:41	
Strontium	ug/L	ND	5.0	0.90	02/18/20 17:41	

LABORATORY CONTROL SAMPLE: 2809415

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Calcium	ug/L	5000	4810	96	80-120	
Magnesium	ug/L	5000	5230	105	80-120	
Potassium	ug/L	5000	4940J	99	80-120	
Sodium	ug/L	5000	4980J	100	80-120	
Strontium	ug/L	500	484	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2809416 2809417

Parameter	Units	92464192001 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Calcium	ug/L	243	5000	5000	5110	5080	97	97	75-125	1	20	
Magnesium	ug/L	253	5000	5000	5560	5480	106	105	75-125	1	20	
Potassium	ug/L	93300	5000	5000	100000	96800	142	70	75-125	4	20	E,M1
Sodium	ug/L	195000	5000	5000	203000	196000	160	22	75-125	3	20	E,M1
Strontium	ug/L	ND	500	500	496	493	99	98	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92465068

QC Batch: 613572 Analysis Method: EPA 6020
QC Batch Method: EPA 3010 Analysis Description: 6020 MET
Associated Lab Samples: 92465068002, 92465068003

METHOD BLANK: 3333412 Matrix: Water
Associated Lab Samples: 92465068002, 92465068003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	ND	1.0	0.50	02/27/20 21:31	
Barium	ug/L	ND	1.0	0.50	02/27/20 21:31	
Beryllium	ug/L	ND	0.10	0.070	02/27/20 21:31	
Cadmium	ug/L	ND	0.10	0.050	02/27/20 21:31	
Chromium	ug/L	ND	1.0	0.50	02/27/20 21:31	
Cobalt	ug/L	ND	1.0	0.50	02/27/20 21:31	
Copper	ug/L	ND	1.0	0.93	02/27/20 21:31	
Manganese	ug/L	ND	1.0	0.69	02/27/20 21:31	
Nickel	ug/L	ND	1.0	0.62	02/27/20 21:31	
Selenium	ug/L	ND	1.0	0.50	02/27/20 21:31	

LABORATORY CONTROL SAMPLE: 3333413

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	50	48.8	98	80-120	
Barium	ug/L	50	47.0	94	80-120	
Beryllium	ug/L	5	5.2	104	80-120	
Cadmium	ug/L	5	5.3	105	80-120	
Chromium	ug/L	50	52.6	105	80-120	
Cobalt	ug/L	50	51.3	103	80-120	
Copper	ug/L	50	52.6	105	80-120	
Manganese	ug/L	50	50.2	100	80-120	
Nickel	ug/L	50	52.4	105	80-120	
Selenium	ug/L	50	50.2	100	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3333414 3333415

Parameter	Units	35533269002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	0.50U	50	50	49.3	48.8	98	97	75-125	1	20	
Barium	ug/L	5.0	50	50	51.1	50.6	92	91	75-125	1	20	
Beryllium	ug/L	0.070U	5	5	5.7	5.7	114	113	75-125	0	20	
Cadmium	ug/L	0.050U	5	5	5.1	5.1	103	102	75-125	0	20	
Chromium	ug/L	1.9	50	50	55.4	55.5	107	107	75-125	0	20	
Cobalt	ug/L	0.50U	50	50	51.0	50.4	102	101	75-125	1	20	
Copper	ug/L	3.2	50	50	56.4	54.8	106	103	75-125	3	20	
Manganese	ug/L	0.69U	50	50	52.5	51.7	105	103	75-125	2	20	
Nickel	ug/L	0.62U	50	50	52.4	51.6	104	103	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92465068

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3333414 3333415

Parameter	Units	35533269002 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Selenium	ug/L	0.50U	50	50	50.9	51.5	101	102	75-125	1	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92465068

QC Batch: 613953
QC Batch Method: EPA 3010
Analysis Method: EPA 6020
Analysis Description: 6020 MET
Associated Lab Samples: 92465068001

METHOD BLANK: 3335545
Matrix: Water
Associated Lab Samples: 92465068001

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Arsenic	ug/L	ND	1.0	0.50	03/02/20 10:58	
Barium	ug/L	ND	1.0	0.50	03/02/20 10:58	
Beryllium	ug/L	ND	0.10	0.070	03/02/20 10:58	
Cadmium	ug/L	ND	0.10	0.050	03/02/20 10:58	
Chromium	ug/L	ND	1.0	0.50	03/02/20 10:58	
Cobalt	ug/L	ND	1.0	0.50	03/02/20 10:58	
Copper	ug/L	ND	1.0	0.93	03/02/20 10:58	
Manganese	ug/L	ND	1.0	0.69	03/02/20 10:58	
Nickel	ug/L	ND	1.0	0.62	03/02/20 10:58	
Selenium	ug/L	ND	1.0	0.50	03/02/20 10:58	

LABORATORY CONTROL SAMPLE: 3335546

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Arsenic	ug/L	50	47.4	95	80-120	
Barium	ug/L	50	48.5	97	80-120	
Beryllium	ug/L	5	4.8	97	80-120	
Cadmium	ug/L	5	4.8	95	80-120	
Chromium	ug/L	50	50.4	101	80-120	
Cobalt	ug/L	50	49.3	99	80-120	
Copper	ug/L	50	47.2	94	80-120	
Manganese	ug/L	50	49.5	99	80-120	
Nickel	ug/L	50	50.8	102	80-120	
Selenium	ug/L	50	48.4	97	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3335547 3335548

Parameter	Units	35533666016 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Arsenic	ug/L	1.1	50	50	49.5	49.7	97	97	75-125	0	20	
Barium	ug/L	34.5	50	50	85.7	85.4	102	102	75-125	0	20	
Beryllium	ug/L	0.070U	5	5	6.3	6.1	124	120	75-125	3	20	
Cadmium	ug/L	0.050U	5	5	4.8	4.9	97	98	75-125	1	20	
Chromium	ug/L	5.1	50	50	54.6	54.7	99	99	75-125	0	20	
Cobalt	ug/L	0.50U	50	50	48.6	48.7	97	97	75-125	0	20	
Copper	ug/L	1.5	50	50	49.0	49.3	95	96	75-125	0	20	
Manganese	ug/L	66.0	50	50	113	114	95	96	75-125	1	20	
Nickel	ug/L	3.5	50	50	53.0	52.7	99	99	75-125	0	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92465068

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 3335547 3335548

Parameter	Units	35533666016 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Selenium	ug/L	0.50U	50	50	48.9	47.9	97	95	75-125	2	20	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: TCH-009
Pace Project No.: 92465068

QC Batch: 525622 Analysis Method: SM 2320B-2011
QC Batch Method: SM 2320B-2011 Analysis Description: 2320B Alkalinity
Associated Lab Samples: 92465068001, 92465068002, 92465068003

METHOD BLANK: 2809487 Matrix: Water
Associated Lab Samples: 92465068001, 92465068002, 92465068003

Parameter	Units	Blank Result	Reporting Limit	MDL	Analyzed	Qualifiers
Alkalinity, Total as CaCO3	mg/L	ND	5.0	5.0	02/18/20 21:11	

LABORATORY CONTROL SAMPLE: 2809488

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Alkalinity, Total as CaCO3	mg/L	50	51.3	103	80-120	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2809489 2809490

Parameter	Units	92464515021 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	18.7	50	50	68.3	68.3	99	99	80-120	0	25	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 2809491 2809492

Parameter	Units	92464515031 Result	MS Spike Conc.	MSD Spike Conc.	MS Result	MSD Result	MS % Rec	MSD % Rec	% Rec Limits	RPD	Max RPD	Qual
Alkalinity, Total as CaCO3	mg/L	ND	50	50	ND	ND	0	0	80-120		25	M1

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALIFIERS

Project: TCH-009
Pace Project No.: 92465068

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

TNTC - Too Numerous To Count

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit - The lowest concentration value that meets project requirements for quantitative data with known precision and bias for a specific analyte in a specific matrix.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-A	Pace Analytical Services - Asheville
PASI-O	Pace Analytical Services - Ormond Beach

ANALYTE QUALIFIERS

B	Analyte was detected in the associated method blank.
E	Analyte concentration exceeded the calibration range. The reported result is estimated.
M1	Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

Pace Analytical Services, LLC
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: TCH-009
Pace Project No.: 92465068

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92465068004	**IDW**	EPA 3010A	525655	EPA 6010D	525669
92465068001	**MW-9**	EPA 3010A	525582	EPA 6010D	525599
92465068002	**MW-11D**	EPA 3010A	525582	EPA 6010D	525599
92465068003	**DUP**	EPA 3010A	525582	EPA 6010D	525599
92465068001	**MW-9**	EPA 3010	613953	EPA 6020	613959
92465068002	**MW-11D**	EPA 3010	613572	EPA 6020	613576
92465068003	**DUP**	EPA 3010	613572	EPA 6020	613576
92465068004	**IDW**	EPA 7470A	525657	EPA 7470A	525730
92465068001	**MW-9**	EPA 7470A	525637	EPA 7470A	525737
92465068002	**MW-11D**	EPA 7470A	525637	EPA 7470A	525737
92465068003	**DUP**	EPA 7470A	525637	EPA 7470A	525737
92465068001	**MW-9**	SM 2320B-2011	525622		
92465068002	**MW-11D**	SM 2320B-2011	525622		
92465068003	**DUP**	SM 2320B-2011	525622		

Pace Analytical	Document Name: Sample Condition Upon Receipt(SCUR)	Document Revised: February 7, 2018 Page 1 of 2
	Document No.: F-CAR-CS-033-Rev.06	Issuing Authority: Pace Carolinas Quality Office

Laboratory receiving samples:
Asheville ☐ Eden ☐ Greenwood ☐ Huntersville ☐ Raleigh ☑ Mechanicsville ☐

Sample Condition Upon Receipt

Client Name: Hart & Hickman **Project**

WO# : 92465068

92465068

Courier: ☐ Commercial ☐ Fed Ex ☐ Pace ☐ UPS ☐ USPS ☐ Other: ☑ Client

Custody Seal Present? ☐ Yes ☐ No **Seals Intact?** ☐ Yes ☐ No

Date/Initials Person Examining Contents: WBT 2.13.20

Packing Material: ☐ Bubble Wrap ☐ Bubble Bags ☐ None ☐ Other

Biological Tissue Frozen? ☐ Yes ☐ No ☐ N/A

Thermometer: ☒ IR Gun ID: 917005 **Type of Ice:** ☒ Wet ☐ Blue ☐ None

Cooler Temp (°C): 5.6 **Correction Factor:** Add/Subtract (°C) 0.0

Cooler Temp Corrected (°C): 5.6

Temp should be above freezing to 6°C
☐ Samples out of temp criteria. Samples on ice, cooling process has begun

USDA Regulated Soil (☒ N/A, water sample)
Did samples originate in a quarantine zone within the United States: CA, NY, or SC (check maps)? ☐ Yes ☐ No

Did samples originate from a foreign source (internationally, including Hawaii and Puerto Rico)? ☐ Yes ☐ No

				Comments/Discrepancy:
Chain of Custody Present?	☑ Yes	☐ No	☐ N/A	1.
Samples Arrived within Hold Time?	☒ Yes	☐ No	☐ N/A	2.
Short Hold Time Analysis (<72 hr.)?	☐ Yes	☑ No	☐ N/A	3.
Rush Turn Around Time Requested?	☐ Yes	☒ No	☐ N/A	4.
Sufficient Volume?	☑ Yes	☐ No	☐ N/A	5.
Correct Containers Used?	☒ Yes	☐ No	☐ N/A	6.
-Pace Containers Used?	☒ Yes	☐ No	☐ N/A	
Containers Intact?	☒ Yes	☐ No	☐ N/A	7.
Dissolved analysis: Samples Field Filtered?	☐ Yes	☐ No	☒ N/A	8.
Sample Labels Match COC?	☒ Yes	☐ No	☐ N/A	9.
-Includes Date/Time/ID/Analysis Matrix: WT/SL				
Headspace in VOA Vials (>5-6mm)?	☐ Yes	☐ No	☒ N/A	10.
Trip Blank Present?	☐ Yes	☐ No	☒ N/A	11.
Trip Blank Custody Seals Present?	☐ Yes	☐ No	☒ N/A	

COMMENTS/SAMPLE DISCREPANCY

Field Data Required? ☐ Yes ☐ No

Lot ID of split containers:

CLIENT NOTIFICATION/RESOLUTION

Person contacted: _____ Date/Time: _____

Project Manager SCURF Review: _____ **Date:** _____

Project Manager SRF Review: _____ **Date:** _____

***Check mark top half of box if pH and/or dechlorination is verified and within the acceptance range for preservation samples.**

Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC, LLHg

****Bottom half of box is to list number of bottle**

Project : **WO# : 92465068**

PM: KRG Due Date: 02/20/20

CLIENT: 92-Hart_Ral

Item#	BP4U-125 mL Plastic Unpreserved (N/A) (Cl-)	BP3U-250 mL Plastic Unpreserved (N/A)	BP2U-500 mL Plastic Unpreserved (N/A)	BP1U-1 liter Plastic Unpreserved (N/A)	BP4S-125 mL Plastic H2SO4 (pH < 2) (Cl-)	BP3N-250 mL plastic HNO3 (pH < 2)	BP4Z-125 mL Plastic ZN Acetate & NaOH (>9)	BP4C-125 mL Plastic NaOH (pH > 12) (Cl-)	WGFU-Wide-mouthed Glass jar Unpreserved	AG1U-1 liter Amber Unpreserved (N/A) (Cl-)	AG1H-1 liter Amber HCl (pH < 2)	AG3U-250 mL Amber Unpreserved (N/A) (Cl-)	AG1S-1 liter Amber H2SO4 (pH < 2)	AG3S-250 mL Amber H2SO4 (pH < 2)	AG3A(DG3A)-250 mL Amber NH4Cl (N/A)(Cl-)	DG9H-40 mL VOA HCl (N/A)	VG9T-40 mL VOA Na2S2O3 (N/A)	VG9U-40 mL VOA Unp (N/A)	DG9P-40 mL VOA H3PO4 (N/A)	VOAK (6 vials per kit)-5035 kit (N/A)	V/GK (3 vials per kit)-VPH/Gas kit (N/A)	SPST-125 mL Sterile Plastic (N/A – lab)	SP2T-250 mL Sterile Plastic (N/A – lab)		BP3A-250 mL Plastic (NH2)2SO4 (9.3-9.7)	AG0U-100 mL Amber Unpreserved vials (N/A)	VSGU-20 mL Scintillation vials (N/A)	DG9U-40 mL Amber Unpreserved vials (N/A)
1		1				1																							
2		1				1																							
3		1				1																							
4												1																	
5																													
6																													
7																													
8																													
9																													
10																													
11																													
12																													

pH Adjustment Log for Preserved Samples

Sample ID	Type of Preservative	pH upon receipt	Date preservation adjusted	Time preservation adjusted	Amount of Preservative added	Lot #

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. Out of hold, incorrect preservative, out of temp, incorrect containers.

Pace Analytical
WWW.PACELABS.COM

CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page : 1 Of

Section A Required Client Information:		Section B Required Project Information:		Section C Invoice Information:	
Company:	Hart & Hickman_Raleigh	Report To:	~~Jeffrey Ollison~~ Justin Ballard	Attention:	accountspayable@hearthickman.com
Address:	3921 Sunset Ridge Rd.	Copy To:	JBallard@harthickman.com	Company Name:	Hart & Hickman
Raleigh, NC 27607				Address:	3921 Sunset Ridge Road Raleigh, NC
Email:	jollison@harthickman.com / JBallard@harthickman.com	Purchase Order #:	TCH-009	Pace Quote:	
Phone:	(919)723-2513 Fax	Project Name:	TCH-009	Pace Project Manager:	kevin.godwin@pacelabs.com,
Requested Due Date:	H&H Standard	Project #:	TCH-009	Pace Profile #:	9481

Regulatory Agency:

State / Location: NC

Requested Analysis Filtered (Y/N)

ITEM #	SAMPLE ID (One Character per box. (A-Z, 0-9 / , -) Sample Ids must be unique)	MATRIX CODE (see valid codes to left)	SAMPLE TYPE (G=GRAB C=COMP)	COLLECTED START DATE	START TIME	END DATE	END TIME	SAMPLE TEMP AT COLLECTION	# OF CONTAINERS	Preservatives: Unpreserved	H2SO4	HNO3	HCl	NaOH	Na2S2O3	Methanol	Other	Analyses Test Y/N	6010/6020/7470	Alkalinity	TCLP RCRA Metals	Barium	Arsenic	Beryllium	Cadmium	Total Chromium	Mercury	Selenium	Strontium (6010)	Residual Chlorine (Y/N)	9246508
1	MW-9	WT	G			2/12/20	1320		2	X		X							X	X		X	X	X	X	X	X	X	See listed metals for WT analysis	001
2	MW-11D	↓	↓			2/13/20	1040		↓	↓		↓							↓	↓		↓	↓	↓	↓	↓	↓	↓		002
3	DUP	↓	↓			2/12/20			↓	↓		↓							↓	↓		↓	↓	↓	↓	↓	↓	↓		003
4	IDW	SL	C			↓	1710		1	X								SC	X		X								ICLP RCRA Metals ONLY	004
5																														
6																														
7																														
8																														
9																														
10																														
11																														
12																														

MATRIX	CODE
Drinking Water	DW
Water	WT
Waste Water	WW
Product	P
Soil/Solid	SL
Oil	OL
Wipe	WP
Air	AR
Other	OT
Tissue	TS

ADDITIONAL COMMENTS	RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS
	H&H	02/13/20	1313		2/13/20	1313	5.6 Y N Y