



ENVIRONMENTAL SITE CHARACTERIZATION

Chapel Hill Police Department Property

828 Martin Luther King Jr. Boulevard

Chapel Hill, Orange County, NC

Revised: March 9, 2016





ENVIRONMENTAL SITE CHARACTERIZATION

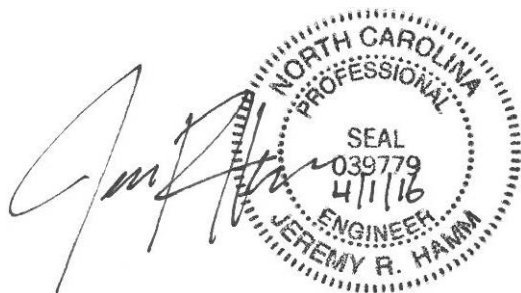
Chapel Hill Police Department Property
828 Martin Luther King Jr. Boulevard
Chapel Hill, Orange County, NC

Prepared for:

Town of Chapel Hill
Chapel Hill Town Hall
405 Martin Luther King, Jr. Blvd.
Chapel Hill, NC 27514

Submitted by:

Christopher J. Burkhardt, &
Jeremy R. Hamm P.E.
Falcon Engineering, Inc.
1210 Trinity Road, Suite 110
Raleigh, North Carolina 27607
(919) 871-0800
www.falconengineers.com
Firm: C-3193



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SECTION 1

INTRODUCTION

Falcon Engineering, Inc. (Falcon) herein presents this updated Environmental Site Characterization (ESC) Report for the Town of Chapel Hill Police Department located at 828 Martin Luther King Jr. Boulevard in Chapel Hill, Orange County, North Carolina. This ESC was conducted in general accordance with the October 2015 Inactive Hazardous Sites Program's Guidelines for Assessment and Cleanup (Guidelines). In general, the purpose of this ESC is to evaluate the on-site soil and groundwater for potential impacts from previously identified coal combustion products (CCPs) located within the property boundaries. The following is a summary of assessment activities and is not intended to replace more detailed information provided throughout the report.

Falcon has previously installed and sampled on-site monitoring wells (MWs); however, due to the local recharge rates and the nature of the CCPs to increase turbidity the initial wells were either too turbid (>10NTU) or ran dry before they could be adequately purged and stabilized. New wells were installed in proximity to the former wells but to a greater depth. Monitoring wells MW1, MW3A, and MW4A were re-developed using surging in February 2016 and purged after waiting one week. The wells were sampled after chemical stability was documented; however, only MW3A was below 10NTU at the time of sampling. Both filtered and non-filtered samples were obtained from MW1 and MW4A. This sampling event was monitored by the North Carolina Department of Environment and Natural Resources (DEQ) through ongoing correspondence before and during the sampling event. A summary of groundwater analytical results is discussed below:

- Arsenic, barium, total chromium, lead, and manganese were identified within the groundwater at MW1 at concentrations above their 2L Standard (the groundwater quality standards specified in Subchapter 2L - Groundwater Classification and Standards of 15A North Carolina Administrative Code (NCAC). Beryllium, Cobalt and vanadium were detected at MW1 but do not have a 2L standard. It should be noted MW1 is located within the area of CCP fill.
- Selenium was detected at 6µg/l above its 2L Standard of 20µg/l within the groundwater at MW3A which is down gradient of MW1. Strontium was also detected at MW3A but does not have a 2L Standard.



- COCs above the 2L standard or without a 2L standard were not identified in MW4A with the exception of Strontium.
- Copper, mercury, nickel, and zinc were detected at MW1 at concentrations below the 2L standard. Barium and manganese were detected in both MW3A and MW4A below 2L standards. Lead and zinc were also detected in MW4A below the 2L standard.

The following Table depicts COCs identified above their respective standards and their concentrations.

Table 1 **COC's Identified in the Groundwater above their 2L Standard**

COC	MW1	MW1 Filtered	MW3A	MW3A Dup	MW4A	MW4A Filtered	2L STANDARD
Arsenic	67	52	BRL	BRL	BRL	BRL	10
Barium	1300	1100	89	80	26	33	700
Chromium (total)	100	86	BRL	BRL	BRL	BRL	10
Lead	36	29	BRL	BRL	7.8	8.4	15
Manganese	9600	9000	BRL	13	49	41	50
Selenium	BRL	BRL	23	26	BRL	BRL	20

COC = Chemical of Concern, **COC's in bold are above the 2L Standard**, BRL = Below Reporting limits

Falcon also sampled the soil in the area where suspected CCPs were previously observed and where proposed construction may take place. Soil Samples SS1, SS2, and SS3 were taken at the fence line north of the existing greenway. Samples SS4, SS5, SS6, and SS7 were taken within the limits of proposed construction. The Inactive Hazardous Sites Branch has two soil remediation goals: a "health-based" remediation goal for total concentrations of contaminants, and a "protection of groundwater" remediation goal for leachable concentrations of contaminants. The results of the above mentioned sampling efforts are summarized below:

- Arsenic, cobalt, and manganese were above PRSRGs in all soil samples except manganese in sample SS3.
- Vanadium, was found in all of the samples but was only slightly elevated above its PSRG in SS1, SS1 Dup, and SS2.



The following table depicts constituents identified in the soil above their respective standard and their concentration.

Table 2 COC's Identified in the Soil above their PRSRG

COC	SS1	SS1 DUP	SS2	SS3	SS4	SS5	SS6	SS7	PRSRG	GPSRG
Arsenic	6.7	8.5	24	4.5	8.5	4.8	3.1	3.1	0.68	5.80
Cobalt	25	28	20	6.8	12	9.4	7.6	6.9	4.6	0.90
Manganese	2400	3300	1700	240	910	460	410	500	360	65.00
Vanadium	88	95	81	41	54	47	45	37	78	6.00

COC = Chemical of Concern, **COC's in bold are above the PRSRG Standard**, BRL = Below Reporting limits
PRSRG = Preliminary Residential Health Based Soil Remediation Goal
GPSRG = Protection of Groundwater Preliminary Soil Remediation Goal

1.1 Site Location and Description

The property is located at 828 Martin Luther King Jr. Blvd. in Chapel Hill, Orange County, North Carolina. The site is located immediately southeast of the Martin Luther King Jr Blvd. intersection with Bolinwood Drive. The Orange County GIS Website indicates the property is 10.24 acres and corresponds to PIN 978941394. Coordinates 35°55'36.56"N/-79° 3'10.86"W correspond to the approximate center of the existing structure on the property.

The northwest corner of the property is currently developed with a two-story structure approximately 25,000 square feet in size. A few cargo containers used for storage and two parking lots (north and south of the building) are also in this area. The remainder of the property is wooded or landscaped lawn, with the exception of Bolin Creek and the Bolin Creek Pedestrian Greenway. The creek flows from the west to the east along the southern border. The greenway follows Bolin Creek along its north bank.

1.2 Current Land Use

The site is currently owned and operated by the Town of Chapel Hill. The majority of the northwest corner of the site is used as the Chapel Hill Police Department and has been since the town acquired the property in 1980. The southern boundary of the site includes Bolin Creek and the Bolin Creek Pedestrian Greenway. The greenway is a paved trail through public open space used for recreational activities such as walking, jogging, etc.



1.3 Site History and Previous Assessment

The Town of Chapel Hill previously retained Falcon to perform environmental consultation at the property. Previous consultation includes, but is not limited to; a Phase I & Limited Phase II Environmental Site Assessment (ESA), A Remedial Investigation Work Plan, and earlier phases of this Remedial Investigation/Environmental Site Characterization Report. Additional details are provided in Table No. 3 below:

Table 3 *List of Previous Assessment Reports*

Date	Project No.	Description
July 18, 2013	E13026.00	Phase I & Limited Phase II Environmental Site Assessment
March 11, 2014	E13047.00	Initial Remedial Investigation/ Environmental Site Characterization
April 14, 2014	E13047.00	Remedial Investigation Work Plan
August 18, 2015	E16002.00	Environmental Site Characterization Report (Previous Revision)

Falcon was originally retained by the Town of Chapel Hill to perform Environmental due diligence in July 2013. During the performance of the combined Phase I and Limited Phase II ESA it became apparent that fill materials were previously placed adjacent to a steep slope along the southern portion of the property. Falcon confirmed the historic use of the site as a borrow pit in the late 1950's through early 1960's then as a fill site from the mid-1960's to mid-1970's. Falcon installed two ground water monitoring wells (MW1 and MW2) and obtained two soil samples (S1 and S4). Sample S-1 was obtained using a geoprobe during the installation of MW-1 at a depth of 15 feet below existing ground surface. S-4 was obtained through Hand Auger techniques at a depth of approximately 1 foot below ground surface. Sample S1 was analyzed for diesel range organics (DRO) only. DRO was identified in S1 but was below the regulatory action limit of 10 mg/kg. Arsenic, cadmium, chromium, cobalt, copper, iron, manganese and DRO (27mg/kg) were detected in S-4 above their respective soil to groundwater Maximum Soil Contamination Concentrations (MSCCs). Groundwater Sample MW1 exhibited levels of arsenic, barium, chromium, cobalt, iron, and manganese above the 2L standard. Groundwater Sample MW2 showed levels of barium, chromium, cobalt, copper, iron, manganese, thallium, and zinc above the standard. A Summary of the 2013 Limited Phase II ESA soil and groundwater analytical results is presented in Table 8 found in Appendix A. A Sample location map is provided in A.

Falcon mobilized to the site in March of 2014 to begin Initial Remedial Investigation and determine the nature and extent of potentially contaminated soils. Falcon performed composite



soil sampling at three locations (S5, S6, & S7). Sample locations were placed in areas observed to be potentially exposed CCP along the face of the steep slope. The samples were taken by hand auger and consisted of 4.0 feet of material just below removed leaf litter. Analytical analysis of the composite soil samples confirmed the presence of barium and chromium above the NC DEQ Soil to Groundwater Maximum Soil Contamination Concentration (MSCCs). Only Barium was reported to be above the NC DEQ Residential MSCCs on a few samples. A sample location map is included in Appendix A. Table 9 Summary of 2014 Composite Soil Sampling Analytical Results above Method Detection is included in Appendix A.

Falcon also contracted Troxler Geologic to mobilize a geoprobe to the site in March 2014. Troxler Geologic utilized direct push technology to install two monitoring wells (MW3 and MW4) and to sample the soil at greater depths. Falcon established a sampling grid across the area of suspected fill to delineate the presence or absence of disposed CCPs. A visual depiction of these sampling locations can be found in Appendix A of this report. Laboratory analysis of the groundwater sampled from MW4 indicated levels of mercury, arsenic, barium, chromium, lead and selenium above 2L Groundwater Standard. Groundwater collected and analyzed from MW-3 indicated concentrations of Barium within the sample, but below the NC DENR 2L Groundwater Standard. Table 10 Summary of 2014 MW3 and MW4 Groundwater analytical Results is included in Appendix A. Laboratory analysis of the geoprobe samples indicated levels of mercury, arsenic, barium, chromium, lead and selenium above their MSCCs. Table 11 Summary of 2014 Geoprobe Soil Sample Analytical Results is included in Appendix A.

A summary of 2014 geoprobe collected soil composition data is included in Appendix A as Table 12. This table includes location ID, final probed depths and approximate depths to which CCPs may be present. It should be noted that due to the consistency of CCPs, the material being compacted can give inaccurate portrayals of the depths of these materials. Falcon used its best judgment in determining the vertical extents of the material based on ease of drilling, recoveries, and site characteristics/gradient. It should also be noted that in some locations a layering of ash followed by a debris material or fill then back into an ash layer was observed. Field logs and pictures are provided in the Appendix for a more detailed description.

Falcon also sampled the surface water upstream and downstream of the site during the initial Remedial Investigation. Surface water sampled from Bolin Creek did not exhibit results indicative of environmental contamination above established NC DENR Surface Water Standards for water supply sources or freshwater aquatic life.



In response to the Initial Remedial Investigation the Town of Chapel Hill installed a chain-link fence between the greenway and the downslope side of the steep slope where CCPs were observed. In order to prevent material from leaving the site and to protect the public from coming in contact with CCPs. The fence is gated and secured with a padlock to deter access. In addition, two rows of silt fence were installed to mitigate future CCP exposure. One silt fence was installed immediately south of the pile to prevent further run-off from the pile. The second silt fence runs the length of the chain-link fence in an effort to restrict surface material from entering Bolin Creek.

Based upon the results of the initial Remedial Investigation, DEQ requested a Remedial Work Plan to identify other potential releases of hazardous substances, characterize the chemical nature of such releases, and collect sufficient sampling data to compile a list of contaminants of concern (COCs). The work plan was submitted to and approved by DEQ in April 2015. It was determined that MW3 and MW4 should be abandoned and two new monitoring wells (MW3A and MW4A) be installed within the same general locations but to a deeper depth in an effort to obtain less turbid samples.

Falcon installed and sampled MW3A and MW4A in May and July of 2015; however, the wells remained turbid. DEQ requested redeveloping the wells in an effort to obtain less turbid samples and provided an updated list of COCs specific to this site in an email dated January 13, 2015. The updated list targets parameters that pose an environmental and/or human health risk and have a regulatory standard (with the exception of strontium and molybdenum). The current list of COCs for all media as provided by DEQ is included below. The results of previous site characterization efforts are discussed throughout this report.

Table 4 Chemicals of Concern

COCs That Pose A Risk & Have A Regulatory Standard		
Antimony	Chromium (total)	Selenium
Arsenic	Copper	Silver
Barium	Lead	Strontium
Beryllium	Manganese	Thallium
Boron	Molybdenum	Vanadium
Cadmium	Mercury	Zinc
Cobalt	Nickel	



1.4 Current Project Objective and Scope of Work

The specific purpose of this phase of the ESC Report is to:

- Document attempts to re-develop, purge, and sample the three on-site wells (MW1, MW3A, and MW4A) in general accordance with the previously developed Work Plan and the Environmental Protection Agencies' Science and Ecosystem Support Division Groundwater Sampling Procedure document dated March 6, 2013 (EPA Document).
- Sample and analyze the groundwater within the three wells and suspect soils for the above COCs. Specifically the soils to be sampled include the area where suspected CCPs were previously observed (between the cliff and the greenway) and where the proposed greenway extension will be constructed.
- Survey the locations and elevations of wells and soil sample points utilizing a licensed Professional Land Surveyor.
- Create a Water Table Elevation Contour Map based on the survey and water level data obtained in the field. Include the survey and contour map with the report.
- Submit the Updated ESC Report including documented field activities and analytical results to DEQ upon completion.



METHODS OF INVESTIGATION

2.1 Monitoring Wells; Design, Installation, and Abandonment

Permanent monitoring wells were designed, constructed, installed, and abandoned in general accordance with the applicable rules of NCAC 15A Subchapter 2C – Well Construction Standards. Well Construction and Well Abandonment records are provided in Appendix C of this report. Drill cuttings and purge water were contained to the proximity of well locations through the use of earthen berms as needed. After installing each well, at least 24-hours was allowed for the surface pad and protective casing to cure prior to developing the wells. A Survey of monitoring well and soil sample locations is included in Appendix A.

Two groundwater monitoring wells were installed during the Limited Phase II ESA, a permanent well (MW1) and a temporary well (MW2). MW1 was installed adjacent to the southwest corner of the Police Station within the area of suspected fill. MW2 was installed between the subject property and Bolin Creek. MW1 was installed By American Environmental Drilling, Inc. using geoprobe push technology. A 2" PVC casing with 10' screen was placed to a depth of 40' below existing ground surface (BGS). MW-2 was installed by Falcon using hand auger techniques. A temporary casing was placed to a depth of approximately 8' BGS. MW2 was abandoned after sampling.

Two additional groundwater monitoring wells (MW3 and MW4) were installed by Trigon Exploration using rotary drill rigs in January 2014. MW3 was placed towards the western side of property within the wooded area north of Bolin Creek Greenway Trail. MW4 was placed towards the eastern side of property also within the wooded area north of Bolin Creek Greenway Trail. The installation depth of MW3 was 11.0' BGS and the installation depth of MW4 was 9.2' BGS.

It should be noted that shallow depths and auger refusal were encountered during the installation of MW3 and MW4. Initial groundwater depths were recorded at 3.4' BGS for MW3 and 4.1' BGS for MW4. This may have been due to the natural geology and proximity to Bolin Creek. MW3 and MW4 yielded insufficient groundwater with high turbidity preventing accurate results during subsequent sampling attempts. MW3 and MW4 were properly abandoned by Trigon Exploration on January 6 and 7, 2015, respectively.

The installation of one additional well (MW-5) was attempted in January of 2014 to determine background concentrations within the groundwater up-gradient from MW1. This well was



proposed to be placed on the north end of the property in the upper parking lot. Drilling was performed at this location until continued auger refusal was achieved due to onsite geologic conditions. Drilling completed at MW-5 at a final depth of 31.5' bgs. The augers were left for 12 hours to see if groundwater was present at these depths; however the well was observed to be dry and as a result filled in.

Two new down gradient monitoring wells, MW3A and MW4A, were installed by American Environmental Drilling, Inc., with rotary drill rigs between May 12 and 15, 2015. Both wells were constructed with 2" casing. MW3A is located directly south and down gradient of the exposed fill materials just outside of the fence north of the Bolin Creek Greenway Trail. MW4A was placed farther southeast towards the eastern property boundary and just outside of the gate to the fence north of the Bolin Creek Greenway Trail. The installation depth of MW3A was 16.0' BGS and the installation depth of MW4A was 19.0' BGS. The static water level depth at time of install for MW3A was 10.0' BGS and MW4A was 4.0' BGS. MW3A was installed with a 16' screen. MW4A was installed with a 15' screen.

2.2 Monitoring Wells; Development and Purging

The process of drilling permanent wells has the potential to affect the hydraulic characteristics of the surrounding soils-fines and other small particulate matter from the drilling process can remain in the borehole. These particles can increase turbidity and block the pores of the surrounding aquifer and/or clog the screen. Well Development is used to restore or improve hydrologic characteristics including turbidity. MW1 and MW2 were installed using geoprobe push technology (not drilling) and hand auger technology respectively during preliminary due diligence assessment; therefore, development and well stabilization was not documented during their installation.

MW3 and MW4 were developed on January 29-30, 2014. Per the established guidance, 24- hours were allowed for the surface pad and protective casing to settle before developing the wells. The method of development was by over-pumping. This method entails pumping the well at a rate greater than in normal operation allowing water to carry small particles into the hole where it can be pumped out. Both wells recharged following adequate purging of at least three well volumes or the wells being purged dry. Development and well stabilization were not documented during this phase of investigation.

MW3A and MW4A were originally developed in May and July 2015 using over pumping. This method of development was determined inadequate as the wells remained turbid after multiple



well volumes were purged. In a letter dated October 23, 2015, DEQ recommended aggressive re-development of the three remaining wells.

Falcon returned to the site in February, 2016 to re-develop MW1, MW3A, and MW4A using surging. Surging flushes water into and out of the well through the screen removing fines and other sediment that might clog the screen. Falcon utilized a 1.5" diameter x 2' long solid surge block to pull loose material through the screen and into the well so it could be pumped out. Falcon inserted the surge block into the well and quickly moved the block up and down the length of the screen within the water column creating a plunger effect. After 10-15 minutes of surging Falcon utilized a variable speed submersible pump to quickly remove the agitated well water. Falcon spent approximately one day at each well alternating between surging and pumping. MW3A became very clear by the end of the day. MW4A was significantly improved but not as clear as MW3A. MW1 changed color from dark-grey to light-brown. The three wells were allowed to settle for 1 week before purging.

Falcon returned after one week and began to purge the three wells and collect well stabilization data. According to the EPA Document; "With respect to the ground water chemistry, an adequate purge is achieved when the pH and specific conductance of the ground water have stabilized and the turbidity has either stabilized or is below 10 Nephelometric Turbidity Units (NTUs)" and "Stabilization occurs when, for at least three consecutive measurements, the pH remains constant within 0.1 Standard Unit and specific conductance varies no more than approximately 5 percent.

Falcon utilized a bladder pump for MW3A and MW4A but had to rely on a variable speed submersible pump set at its lowest setting for MW1 due to the shallow depth of water (6.5') within the 40' well. Prior to initiation of pumping, a properly decontaminated water level meter was used to record the water level and monitor for a slight and stable drawdown of the water column during purging. A Hatch 2100 Turbidity Meter and a WTW Multi-parameter Water Quality Meter were used to monitor turbidity, specific conductivity, temperature, and pH.

According to the EPA Document; "With respect to volume, an adequate purge is normally achieved when three to five well volumes have been removed." And "If, after three well volumes have been removed, the chemical parameters have not stabilized according to the above criteria, additional well volumes (up to five well volumes), should be removed. If the parameters have not stabilized within five volumes, it is at the discretion of the project leader whether or not to collect a sample or to continue purging.



To determine the number of gallons within three well volumes, a 2" casing volume per foot factor of 0.48 was obtained from Table 3.2.1. Well Casing Diameter Volume Factors of the EPA Document. The following equation was used: (Total depth of water) X (0.48 – conversion to 3 well volumes in gallons) = # of gallons to purge 3 well volumes. The stabilization parameters were documented in the field. Field notes are included within the Appendix. MW3A was sampled immediately after it had stabilized and was below 10NTU.

Both MW1 and MW4A stabilized but remained turbid after multiple well volumes were purged. It was decided to continue to purge both MW1 and MW3 in an attempt to reduce turbidity once the wells were otherwise chemically stable; however, neither well produced water with low turbidity. MW1's turbidity was too high to read. It is important to note that MW1 was installed using direct push technology directly into the suspected area of CCP fill. The soil surrounding MW1 is mostly CCP. This well is likely to continue to produce turbid water. MW4A's turbidity remained in the high 100's to low 200's NTU. At the direction of DEQ and in accordance with the Guidelines both filtered and non-filtered samples were obtained from MW1 and MW4A immediately after documenting adequate purging and stabilization for comparative results. Field notes are included in the appendix.

2.3 Groundwater Sampling Methods

Sampling for this event was done in general accordance with the DEQ Guidance and the EPA Document. Sampling was performed following adequate purging and after chemical parameter stabilization criteria had been reasonably met as discussed above. Care was taken to not cross-contaminate the wells, Wells were sampled from presumed cleanest (MW3A) to presumed least clean (MW1). New non-powdered vinyl gloves were donned between wells and as needed to keep them clean.

Falcon utilized a low flow bladder pump to collect samples from MW3A and MW4A. A variable speed submersible pump was used for MW1 due to the shallow depth of the water column within the 40' well. Samples were collected directly from the pump head tubing. New clean tubing was used for each well. Pumps and monitoring equipment were scrubbed in distilled water containing Luminol (a standard brand of phosphate-free laboratory detergent), and rinsed with bottled water and again with de-ionized water.

Samples were collected in appropriately labeled containers provided by the laboratory and preserved and placed on ice immediately at the time of sample collection. Chain-of-custody



documents were filled out and kept with the samples until custody was relinquished. Rinsate, trip blanks and one duplicate sample were utilized.

2.5 Soil Sampling Methods

Soil sampling for this event was also done in general accordance with the DEQ Guidance and the EPA Document. Seven soils samples (SS1-SS7) were collected. On February 3, 2016 representatives of DEQ met with a representative of The Town of Chapel Hill and Falcon onsite to discuss the Town's proposed Bolin Creek Greenway construction project and to determine if the greenway project will have any effect on this site. DEQ requested sampling the soil where both the suspected CCP was observed and the greenway is proposed to be constructed. The locations for soil samples SS1-SS3 were flagged that day along the south side of the chain link fence where suspected CCP was observed. Flagged locations were approved by DEQ in the field. Soil samples SS4-SS7 were flagged south of the existing greenway within the construction limits of the proposed extension to the existing greenway in February. These sample locations were approved by DEQ through email conversations prior to sampling.

To avoid cross contamination, new, clean, non-powdered vinyl gloves were worn while extracting each sample. Each Sample was obtained through hand auger techniques. The hand auger was scrubbed in distilled water containing Luminol, rinsed with bottled water and again with de-ionized water between each sample. As directed by DEQ the top 0-2" of organic matter was removed and excluded from the sample. Depths varied based on refusal and potential for containing CCP. The focus was on sampling the dark soil within the top 2-12". The remaining +/- 2-12" of soil was placed in a Ziploc bag and mixed for a composite sample. Samples were placed in appropriately labeled containers provided by the laboratory. The soil samples were placed in an ice-filled cooler from the time they were sampled until they were picked up and transported to the lab. Chain-of-custody documents were filled out and kept with the samples until custody was relinquished. Rinsate, trip blanks, and one duplicate sample were utilized.

2.6 Analytical Methods

Analytical methods including laboratory quality control and quality assurance (QA/QC) procedures for this ESC were performed by Prism Laboratories, Inc. (NC Certification No. 402). Prism utilized the latest USEPA method having the lowest detection limits. A copy of the full analytical report including QC data is included in Appendix D.



Samples were analyzed for 20 different metals in accordance with the DEQs sampling parameters for CCPs. DEQ recently updated the list to target parameters that pose an environmental and/or human health risk and have a regulatory standard. The updated list can be found in Section 1 Table No. 4 list of Chemicals of Concern.



SECTION 3

SITE GEOLOGY & HYDROLOGY

3.1 Geology

The NC Geological Survey indicates the study area is underlain by metamorphosed granitic rock (520-650 my) – which is described as: megacrystic, well foliated, locally contains hornblende and is fountain intrusive. The geologic age is of the Cambrian/Late Proterozoic period. The original map label is CZg.

Falcon obtained this geologic information from the North Carolina Dept. of Environment, Health, and Natural Resources, Division of Land Resources, NC Geological Survey, in cooperation with the NC Center for Geographic Information and Analysis, 1998, Geology - North Carolina (1:250,000), coverage data file geol250. The data represents the digital equivalent of the official State Geology map (1:500,000 scale), but was digitized from (1:250,000 scale) base maps.

3.2 Soils

The US Natural Resource Conservation Service's Orange County Soil Survey provides two (2) different native soil types on the study area:

- TaE – Tatum Silt Loam Complex (15 to 25 percent slopes) - well drained soil derived from red saprolite (50% of the overall study area).
- WmE – Wedowee Sandy Loam Complex (15 to 25 percent slopes) - well drained soil derived from red saprolite (50% of the overall study area).

3.3 Hydrology

A review of the Chapel Hill, NC USGS 7.5-minute 1946 topographic map, which includes the project site, indicates that the site is located on varying elevations from 375 feet above mean sea level (AMSL) in the northwest corner of the site to 284 feet AMSL in the southeast corner where the site meets Bolin Creek. The 2010 Topographic Map from Orange County GIS indicates significantly different contours from the USGS maps. This data supports the filling and leveling of the site which would explain the soil/debris layers observed within the previously taken geoprobe soil profiles.

The site is bounded on the north and west by paved streets, to the east by residential developed woodlands. Bolin Creek flows west to east along the southern boundary, beyond which is



commercial development. The general site drainage is to the south via overland flow and along roadside ditches. Stormwater from the study area drains toward Bolin Creek. Very little, if any, surface water comes onto the site from offsite.

The study area and vicinity are serviced by municipal water from Orange Water and Sewer Authority and does not currently utilize groundwater for drinking. Falcon contacted the Orange County Health Department to request information on potable water wells registered and/or known within the area. The closest drinking water or other potable water well is located approximately 460 feet from the subject property. This well is located at 3 Mt Bolus Road and is up-gradient from the subject property. Known or registered down-gradient drinking water wells within 500 feet of property line were not reported or visually observed by Falcon staff. The closest down-stream water supply system is Jordan Lake. The closest intake for Jordan Lake is approximately 12.5 miles from the study area.

Groundwater flow was determined to be to the south-southeast. A water table elevation contour map with the direction of flow is included in the appendix. Tabulated groundwater elevation data is presented below. Water level was measured from the top of the water column to the top of the outside casing which is equal to the ground elevation above mean sea level (AMSL) according to the Licensed Professional Surveyor that prepared the survey. Water level was measured using a Heron Instruments Water Level Meter (WLM). The WLM was decontaminated between well measurements. Groundwater flow direction was determined using a graphical three point problem and solving for the dip of the plane. Groundwater flow was determined to be to the south-southeast based on the below data obtained February 17, 2016.

Table 5 *Tabulated Groundwater Elevation Data*

MW	Ground Elevation Above Meal Sea Level	Water Level Below Ground Surface	Water Table Elevation
1	346.52	-33.50	313.02
3A	298.90	-1.10	297.80
4A	298.61	-1.80	296.81



INVESTIGATION RESULTS

4.1 Groundwater Investigation Results

The 2013 Limited Phase II ESA detected arsenic, cadmium, chromium, cobalt, copper, iron, manganese and DRO (27mg/kg) above their respective MSCCs in the on-site soils. Analysis of groundwater from MW1 exhibited levels of arsenic, barium, chromium, cobalt, iron, and manganese above the 2L standard. Groundwater analyzed from MW2 showed levels of barium, chromium, cobalt, copper, iron, manganese, thallium, and zinc above the standard. A Summary of the 2013 Limited Phase II ESA soil and groundwater analytical results is presented in Table 8 found in Appendix A.

Previous investigative results since installing MW3A and MW4A include sampling events in May and July of 2015. The May sampling event occurred before the wells met the chemical stabilization criteria; therefore, the May sampling results are not an accurate indication of the dissolved phase concentration levels of the constituents of concern. However, their results are included below for comparison. Most COCs were not identified during the May sampling event with the exception of the following metals: mercury, arsenic, barium, chromium, and lead. Groundwater analytical results are presented in Table 6 below.

Falcon returned to the site in July 2015 to resample the three wells. MW3A stabilized with less than 10 NTUs and was sampled. A duplicate sample was also obtained for MW3A. MW4A was also stable; however, the turbidity was at 24.7 NTU. DEQ pre-approved filtered and non-filtered samples from MW4A. MW1 was purged but did not stabilize. Turbidity remained in the mid 100 NTUs. MW1 was not sampled in July. MW1 was purged again on August 5 and 6, 2015 in another effort to obtain samples from a stable well with low turbidity. However, turbidity ranged from unreadable to the high 100 NTUs. MW1 was not sampled in August. Groundwater analytical results are presented in Table 6 below. Barium and Boron were detected at a concentration below the NC DEQ 2L Groundwater Standard (2L Standard) at MW3A. Barium was detected at a concentration below the 2L Standard at MW4A in both the filtered and unfiltered samples. Hexavalent Chromium was not detected in either down-gradient well.

Monitoring Wells MW1, MW3A, and MW4A were sampled for the revised list of COCs on February 17 (MW3A) and 18 (MW4A and MW1). MW3A was sampled immediately after it had stabilized and was below 10 NTU. Both MW1 and MW4A stabilized but remained turbid after multiple well



volumes were purged. It was decided to continue to purge both MW1 and MW3 in an attempt to reduce turbidity once the wells were otherwise chemically stable; however, neither well produced water with low turbidity. At the direction of DEQ and in accordance with the Guidelines both filtered and non-filtered samples were obtained from MW1 and MW4A immediately after documenting adequate purging and chemical stabilization for comparative results. The following is a summary of groundwater analytical results:

- Arsenic, barium, total chromium, lead, and manganese were identified within the groundwater at MW1 at concentrations above the 2L Standard. Beryllium, cobalt and vanadium were detected at MW1 but do not have a 2L standard.
- Selenium was detected at 6µg/l above its 2L Standard of 20µg/l within the groundwater at MW3A. Strontium was also detected at MW3A but does not have a 2L Standard. Strontium was below the EPA's lifetime health advisory level of 4,000 µg/l and one-day health advisory level of 25,000µg/l.
- COCs above the 2L standard or without a 2L standard were not identified in MW4A with the exception of Strontium which was below the EPAs health advisories.
- Copper, mercury, nickel, and zinc were detected at MW1 at concentrations below the 2L standard. Barium and manganese were detected in both MW3A and MW4A below 2L standards. Lead and zinc were also detected in MW4A below the 2L standard.

The results of the above mentioned sampling efforts are presented in Table 6 below. Table 6 depicts concentration levels and the applicable 2L Standard for the current COCs.



Table 6 Groundwater Analytical Results

COC	Sampling Locations and Dates												2L Standard	IMAC
	MW1 May '15	MW1 Feb '16	MW1 Filtered Feb '16	MW3A May '15	MW3A July '15	MW3A Feb '16	MW3A Dup Feb '16	MW4A May '15	MW4A July '15	MW4A Filtered July '15	MW4A Feb '16	MW4A Filtered Feb '16		
Antimony	NS	BRL	BRL	NS	NS	BRL	BRL	NS	NS	NS	BRL	BRL	N/A	1
Arsenic	110	67	52	42	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	10	N/A
Barium	150	1300	1100	770	67	89	80	54	64	64	26	33	700	N/A
Beryllium	NS	11	8.8	NS	NS	BRL	BRL	NS	NS	NS	BRL	BRL	N/A	4
Boron	BRL	BRL	BRL	BRL	520	BRL	BRL	BRL	BRL	BRL	BRL	BRL	700	N/A
Cadmium	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	2	N/A
Chromium (total)	98	100	86	460	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	10	N/A
Cobalt	NS	78	61	NS	NS	BRL	BRL	NS	NS	NS	BRL	BRL	N/A	1
Copper	NS	170	130	NS	NS	BRL	BRL	NS	NS	NS	BRL	BRL	1000	N/A
Hexavalent Chromium	BRL	NS	NS	BRL	BRL	NS	NS	BRL	BRL	BRL	NS	NS	N/A	N/A
Lead	61	36	29	89	BRL	BRL	BRL	BRL	BRL	BRL	7.8	8.4	15	N/A
Manganese	NS	9600	9000	NS	NS	BRL	13	NS	NS	NS	49	41	50	N/A
Molybdenum	NS	BRL	BRL	NS	NS	BRL	BRL	NS	NS	NS	BRL	BRL	N/A	N/A
Mercury	0.31	.26	.21	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	1	N/A
Nickel	NS	58	46	NS	NS	BRL	BRL	NS	NS	NS	BRL	BRL	100	N/A
Selenium	BRL	BRL	BRL	BRL	BRL	23	26	BRL	BRL	BRL	BRL	BRL	20	N/A
Silver	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	20	N/A
Strontium	NS	2900	2700	NS	NS	2400	2100	NS	NS	NS	110	78	N/A	N/A
Thallium	NS	BRL	BRL	NS	NS	BRL	BRL	NS	NS	NS	BRL	BRL	N/A	.2
Vanadium	NS	260	200	NS	NS	BRL	BRL	NS	NS	NS	BRL	BRL	N/A	.3
Zinc	NS	330	260	NS	NS	BRL	BRL	NS	NS	NS	34	48	1000	N/A

Units = µg/l IMAC=Interim Maximum Allowable Concentrations NS = Not Sampled BRL = Below Reporting Limit
COC's shown in **BOLD** are above the 2L standard



4.2 Soil Investigation Results

Soil investigation results from the Limited Phase II ESA in 2013 confirmed levels of arsenic, cadmium, chromium, cobalt, copper, iron, manganese and DRO in the soil. Falcon mobilized to the site in March of 2014 to perform composite soil sampling. Analytical analysis of the composite soil samples confirmed the presence of barium and chromium above the NC DEQ Soil to Groundwater MSCCs. Only Barium was reported to be above the NC DEQ Residential MSCC on a few samples.

Falcon returned to the site on February 18, 2016 to sample the soil in the area where suspected CCPs were previously observed (between the cliff and the greenway) and where the proposed greenway extension will be constructed. Falcon collected eight samples (one was a duplicate). The results of the above mentioned sampling efforts are summarized below. Table 7 depicts concentration levels and the applicable standard for all COCs.

- Arsenic, cobalt, and manganese were above PRSRGs *in all soil samples except manganese in sample SS3.*
- Vanadium, was found in all of the samples but was only slightly elevated above its PSRG in SS1, SS1 Dup, and SS2.



Table 7 Soil Analytical Results

COC	SS1	SS1 DUP	SS2	SS3	SS4	SS5	SS6	SS7	PRSRG	GPSRG
Antimony	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	6.20	0.90
Arsenic	6.7	8.5	24	4.5	8.5	4.8	3.1	3.1	0.68	5.80
Barium	210	260	830	100	380	130	82	84	3000	580.00
Beryllium	1.2	1.4	3.5	0.80	1.2	0.89	0.70	0.60	32	63.00
Boron	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	3200	45.00
Cadmium	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	14	3.00
Chromium (total)	28	31	27	13	22	17	35	14	N/A	N/A
Cobalt	25	28	20	6.8	12	9.4	7.6	6.9	4.6	0.90
Copper	47	56	57	22	29	25	23	15	620	700.00
Lead	22	29	39	14	25	27	17	13	400	270.00
Manganese	2400	3300	1700	240	910	460	410	500	360	65.00
Mercury	0.052	0.059	0.21	0.048	0.061	0.091	0.038	0.038	1.90	1.90
Molybdenum	BRL	BRL	1.7	BRL	BRL	BRL	BRL	BRL	78	n/a
Nickel	15	18	19	5.3	12	7.9	6.5	5.9	300	130.00
Selenium	BRL	BRL	2.4	BRL	BRL	BRL	BRL	BRL	78	2.10
Silver	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	78	3.40
Strontium	120	150	190	36	51	43	25	31	9400	N/A
Thallium	1.3	1.7	1.2	BRL	BRL	BRL	BRL	BRL	0.16	0.28
Vanadium	88	95	81	41	54	47	45	37	78	6.00
Zinc	100	110	110	28	51	48	43	37	4600	1200.00

Units are reported in mg/kg

PRSRG = Preliminary Residential Health Based Soil Remediation Goal

GPSRG = Protection of Groundwater Preliminary Soil Remediation Goal



SECTION 5

CONCLUSIONS

Falcon completed an ESC Report for the Town of Chapel Hill at 828 Martin Luther King Jr. Boulevard located in Chapel Hill, Orange County, North Carolina. The purpose of the investigation was to evaluate the on-site groundwater for potential impacts within the property boundaries.

Based upon our completed field activities and subsequent laboratory analysis Falcon was able to provide the following findings:

1. Elevated levels of arsenic, barium, total chromium, lead, and manganese were detected in the groundwater at MW1 above the 2L Standard.
2. Selenium was detected at 6µg/l above its 2L standard within the groundwater at MW3A.
3. COCs above the 2L standard or equivalent were not identified within the groundwater at MW4A.
4. Arsenic, cobalt, and manganese were above PRSRGs in all soil samples except manganese in sample SS3.
5. Vanadium, was found in all of the soil samples but was only slightly elevated above its PSRG in SS1, SS1 Dup, and SS2.

SECTION 6

RECOMMENDATIONS

Falcon recommends that this report be submitted to NC DEQ for their further review to assist them in recommending next steps. Based on the sampling results, selenium and strontium were detected down-gradient of MW1. Selenium was reported at 26µg/l, the 2L standard is 20µg/l. Strontium does not have a 2L or interim maximum allowable standard. NC DEQ will likely consider the Town of Chapel Hill Police Department a low priority site. Following NC DEQ review Falcon is available to provide additional consultation and recommended courses of action to comply with possible next steps.

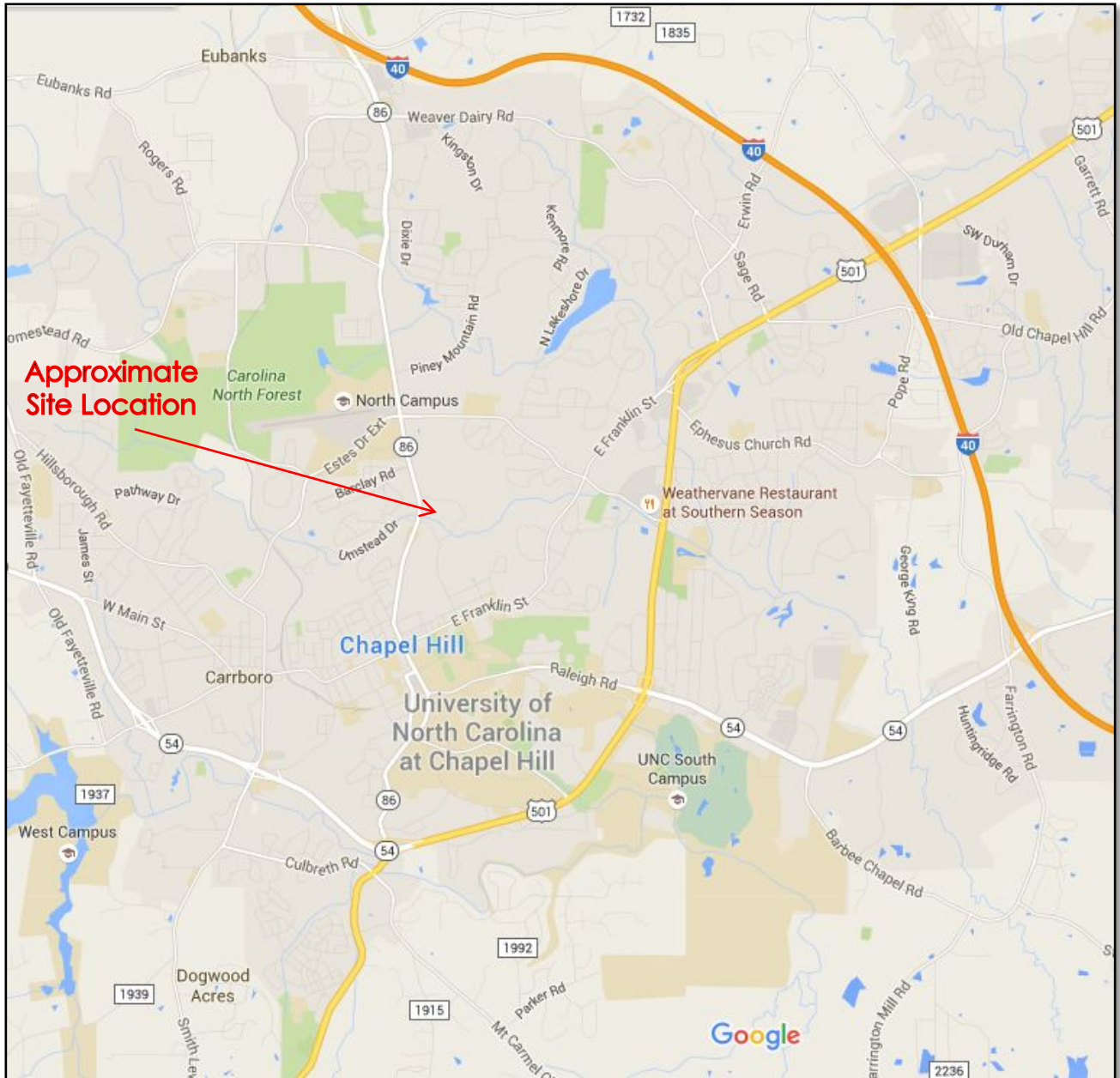


APPENDIX A

FIGURES



Town of Chapel Hill Police Department Environmental Site Characterization Vicinity Map



Project No.: E16002
Date: February 2016

Source: Google Maps
Scale: Not to Scale



Town of Chapel Hill Police Department Environmental Site Characterization 2010 Aerial Photograph



Project No.: E16002
Date: February 2016

Source: Orange County GIS
Scale: Not to Scale



Town of Chapel Hill Police Department Environmental Site Characterization 1946 USGS Topographic Map

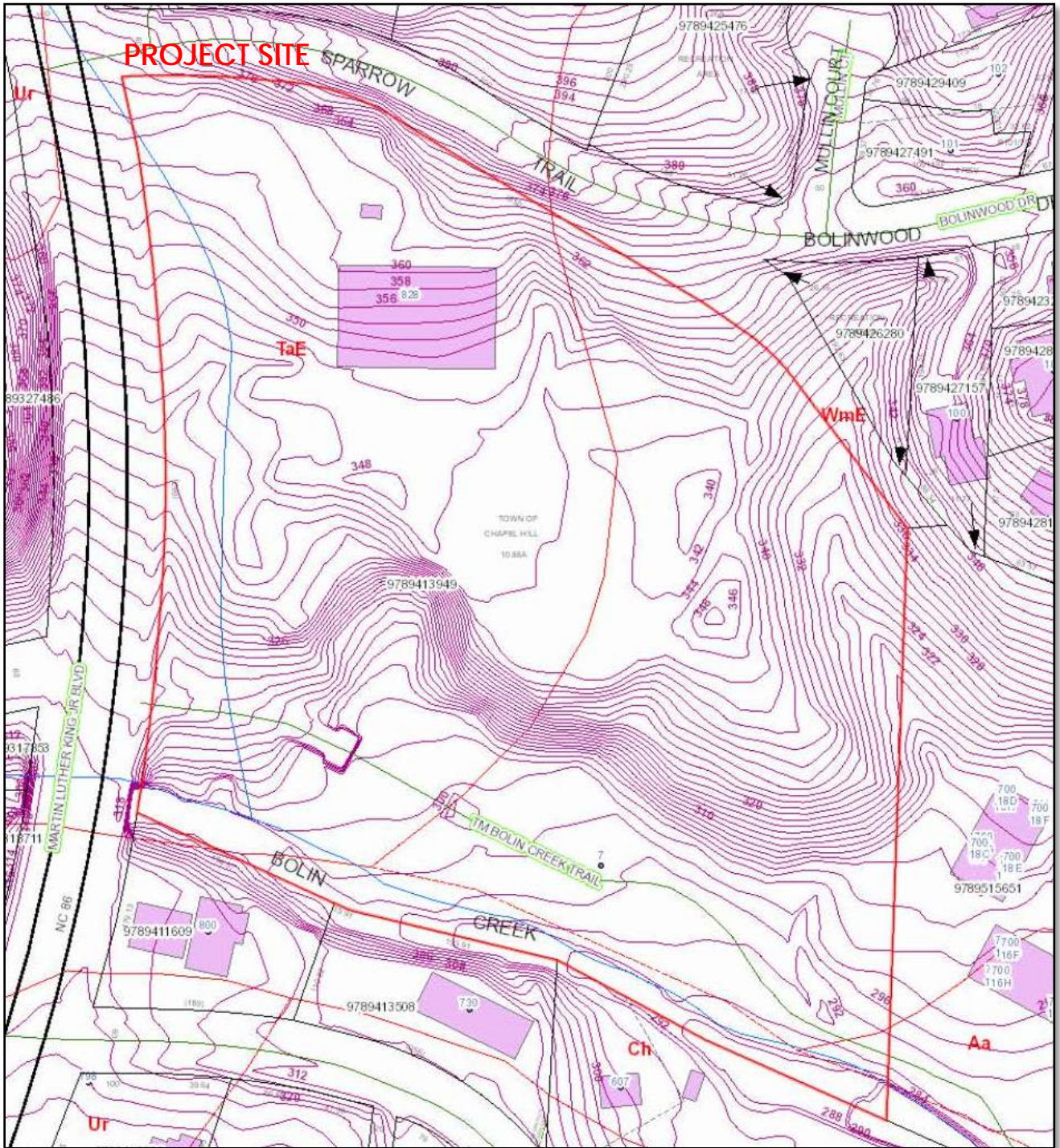


	TARGET QUAD NAME: CHAPEL HILL MAP YEAR: 1946	SITE NAME: Town of Chapel Hill ADDRESS: 828 Martin Luther King Jr Blvd Chapel Hill, NC 27514 LAT/LONG: 35.9268 / -79.0529	CLIENT: Falcon Engineering, Inc. CONTACT: Josh Dunbar INQUIRY#: 3549422.4 RESEARCH DATE: 03/20/2013
	SERIES: 7.5 SCALE: 1:24000		

Project No.: E16002
Date: February 2016

Source: Environmental Data Resources, Inc.
Scale: Not to Scale

Town of Chapel Hill Police Department Environmental Site Characterization Orange County GIS Topographic Map

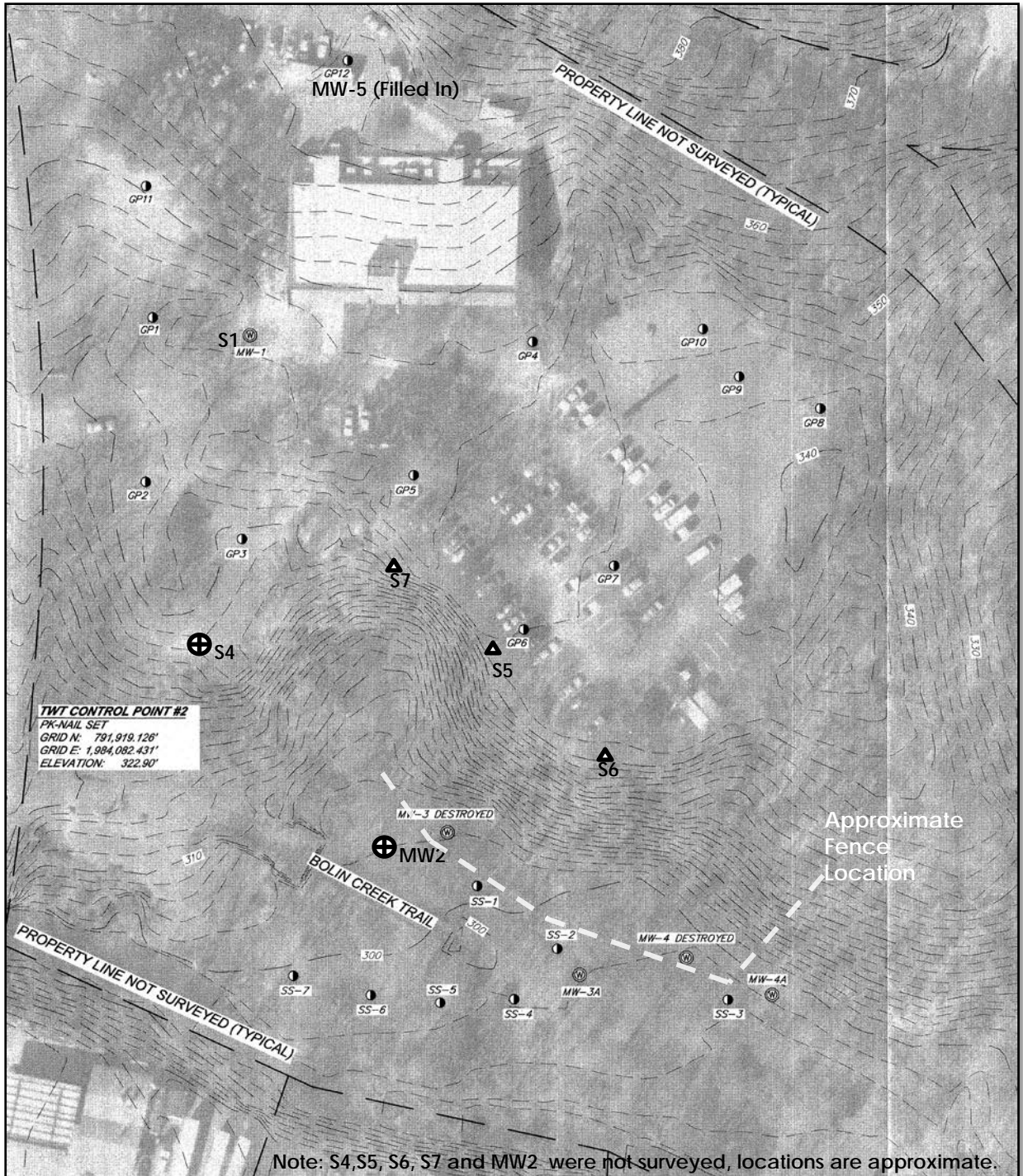


Project No.: E16002
Date: February 2016

Source: Orange County GIS
Scale: Not to Scale



Town of Chapel Hill Police Department Environmental Site Characterization Sample Location Map

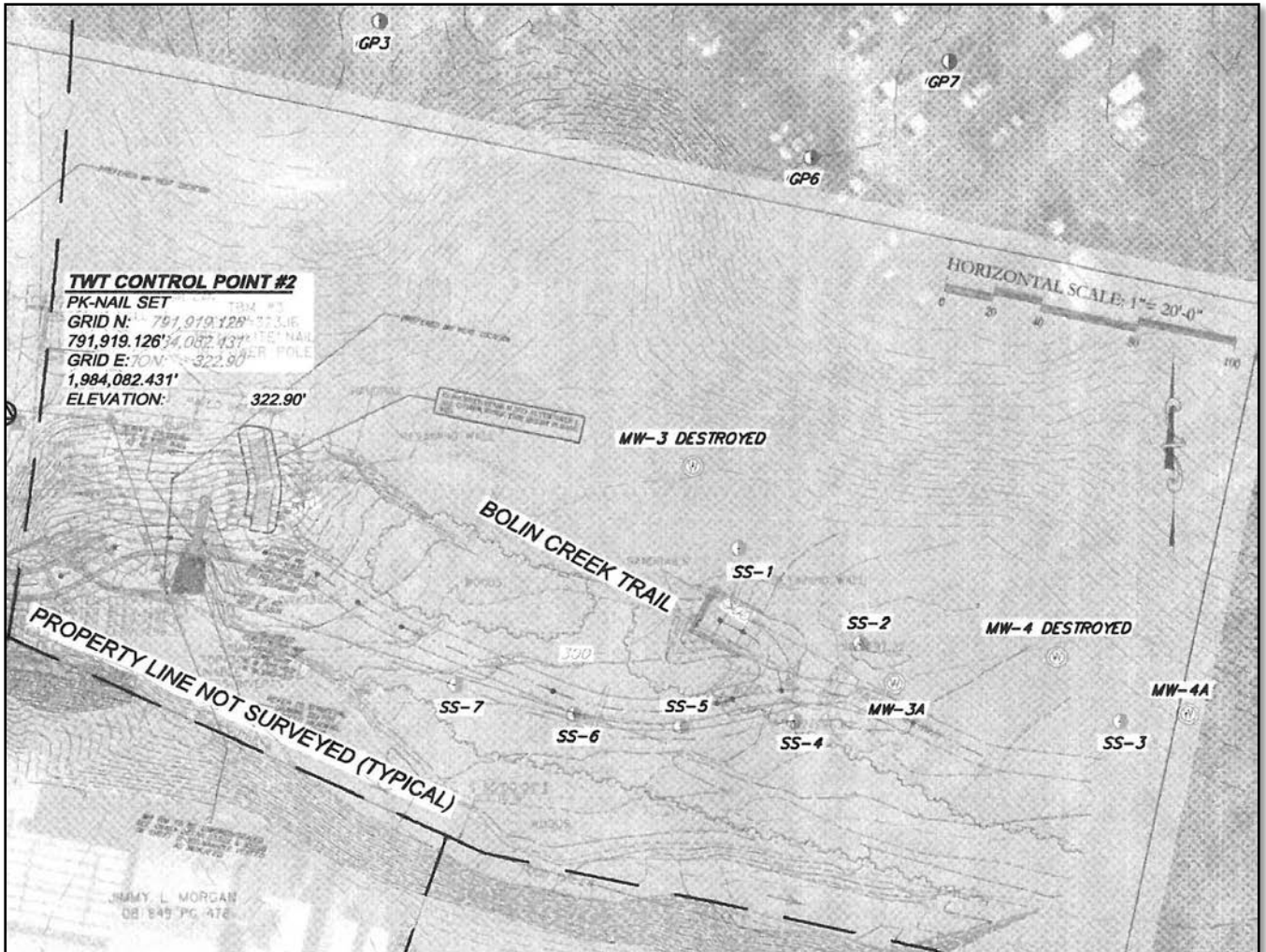


Project No.: E16002
Date: February 2016

Adapted from: TWT Survey
Scale: Not to Scale



Town of Chapel Hill Police Department Environmental Site Characterization Sample Location within Proposed Greenway Map

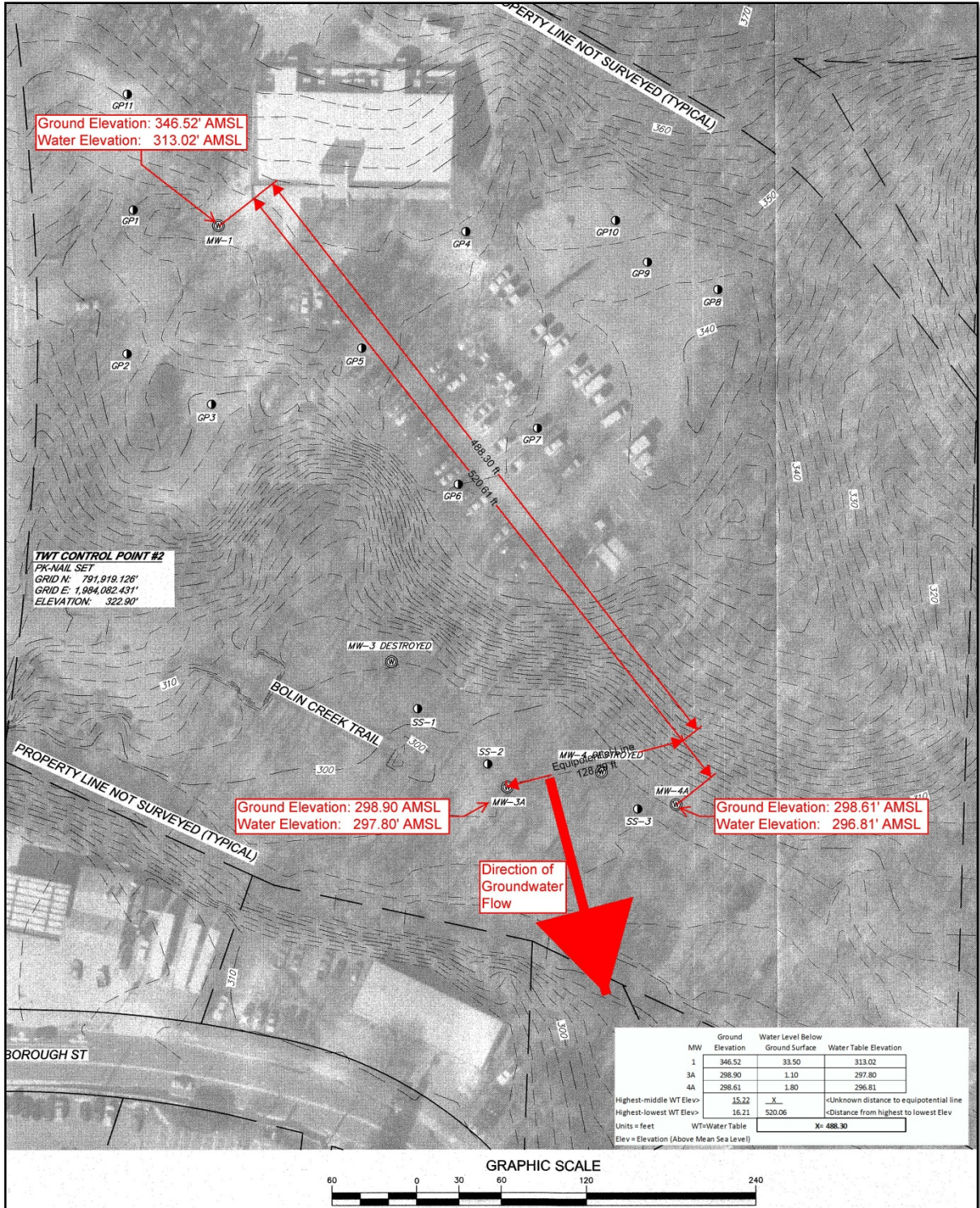


Project No.: E16002
Date: February 2016

Adapted from: Client Provided Surveys
Scale: As shown



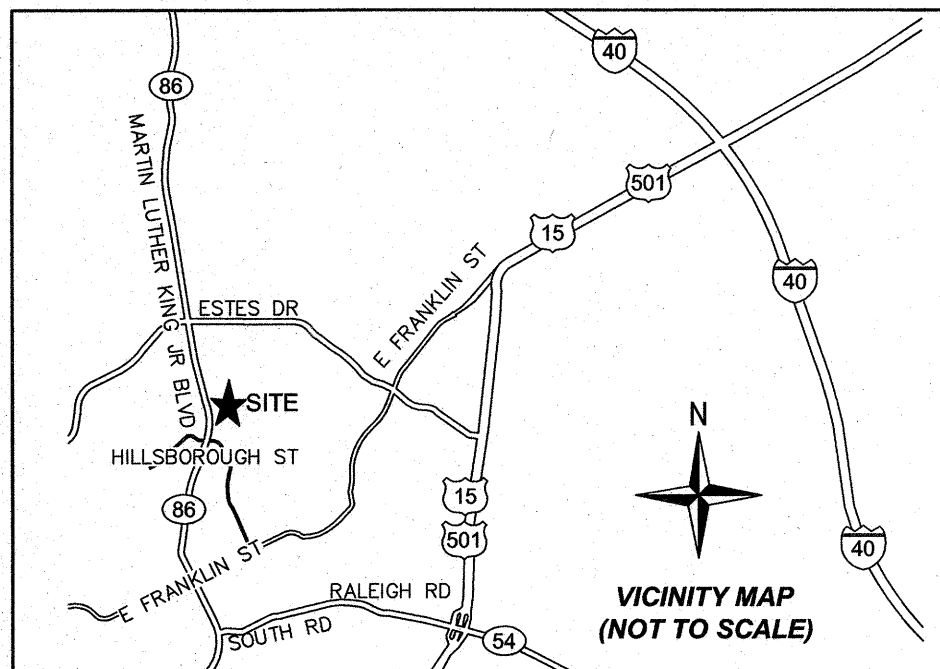
Town of Chapel Hill Police Department Environmental Site Characterization Groundwater Flow Map



Project No.: E16002
Date: February 2016

Source: Orange County GIS
Scale: As Shown





ABBREVIATIONS
 BLVD BOULEVARD
 DR DRIVE
 ELEV ELEVATION
 ST STREET

- GENERAL NOTES**
- 1) THE PURPOSE OF THIS PLAT IS TO SHOW MONITORING WELLS AND BUILDINGS IN RELATION TO THE CONTROL LINE ESTABLISHED FOR THIS SURVEY.
 - 2) ALL BEARINGS, DISTANCES, AND COORDINATES SHOWN HEREON ARE BASED UPON THE NORTH CAROLINA STATE PLANE COORDINATE SYSTEM, NAD 83 (2011), WITH NAVD88 (GEOID 12) ELEVATIONS, PER A GPS SURVEY PERFORMED BY TAYLOR WISEMAN AND TAYLOR ON FEBRUARY 25, 2014. THE N.C. STATE PLANE COORDINATE SYSTEM SHOWN FOR CONTROL POINTS HEREON WERE ESTABLISHED UTILIZING GLOBAL POSITIONS SYSTEMS (GPS) IN CONJUNCTION WITH THE NORTH CAROLINA GEODETIC SURVEYS VIRTUAL REFERENCE SYSTEM (VRS), WHICH IS BASED UPON THE CONTINUALLY OPERATING REFERENCE STATIONS (CORS).
 - 3) PROPERTIES SHOWN HEREON ARE SUBJECT TO EASEMENTS AND RESTRICTIONS OF RECORD THAT WOULD BE REVEALED BY A THOROUGH TITLE SEARCH. THIS PLAT SHOULD NOT BE RELIED UPON AS A COMPLETE RECORD OF ALL EASEMENTS THAT MAY AFFECT THESE PROPERTIES.
 - 4) THIS MAP DOES NOT REPRESENT A BOUNDARY SURVEY. PROPERTY LINES, STREAM CENTERLINES AND PLANIMETRIC INFORMATION SHOWN HEREON WERE TAKEN FROM THE ORANGE COUNTY GIS DATABASE ON MARCH 03, 2014. THE CONTOUR LINES SHOWN HEREON REPRESENT 2003 DATA AND WERE TAKEN FROM THE ORANGE COUNTY GIS DATABASE ON MAY 15, 2014. THIS INFORMATION HAS BEEN SHOWN HEREON FOR REFERENCE PURPOSES ONLY. NO TRANSLATION, ROTATION OR SCALING WAS PERFORMED ON THE GIS DATA. IT WAS INSERTED INTO OUR DRAWING FILE AS PROVIDED. NO ACCURACY OR POSITIONAL TOLERANCE IS GUARANTEED BY THIS SURVEY AS TO HOW THE SURVEYED FEATURES TRULY RELATE TO THE GIS INFORMATION SHOWN HEREON.
 - 5) ALL DISTANCES AND COORDINATES SHOWN HEREON ARE LOCALIZED, GROUND INFORMATION, UNLESS SPECIFICALLY NOTED AS "GRID".

SYMBOL LEGEND

	MONITORING WELL
	SOIL BORING
	SURVEY CONTROL POINT

FEATURE TABLE

ID	NORTHING	EASTING	TOP CASE ELEV	GROUND ELEV
MW-1	792206.53	1984238.25	346.12	346.52
MW-3	791897.55	1984360.36	304.95	301.47
MW-3A	791808.91	1984442.30	298.36	298.90
MW-4	791819.55	1984508.46	301.42	297.79
MW-4A	791796.66	1984581.34	298.41	298.61
MW-3 AND MW-4 APPEAR TO HAVE BEEN DESTROYED PRIOR TO 02/12/2016				
NOTE MW-5'S LOCATION IS AT GROUND ELEVATION MW-5 WAS DRILLED, BUT NOT SET				
GP1	792217.78	1984177.99	-	344.77
GP2	792115.52	1984173.47	-	340.93
GP3	792079.96	1984233.18	-	339.83
GP4	792202.20	1984413.72	-	347.50
GP5	792119.52	1984339.70	-	346.92
GP6	792023.33	1984407.96	-	344.65
GP7	792062.93	1984464.12	-	344.68
GP8	792160.87	1984591.83	-	340.86
GP9	792180.50	1984541.93	-	344.05
GP10	792210.13	1984519.41	-	344.92
GP11	792299.52	1984173.99	-	350.76
GP12	792377.39	1984299.37	-	362.83
SS-1	791864.28	1984378.79	-	300.09
SS-2	791825.12	1984428.38	-	298.86
SS-3	791793.49	1984534.27	-	296.79
SS-4	791793.89	1984401.55	-	298.34
SS-5	791791.77	1984355.68	-	299.59
SS-6	791796.52	1984312.60	-	299.58
SS-7	791808.49	1984264.65	-	300.39

SURVEY CONTROL / GRID TIE NOTES

DATUM DESCRIPTION	NC STATE PLANE COORDINATE SYSTEM
NAD83 (2011) [EPOCH: 2010.00]	
NAVD88 (GEOID 2012A)	
UNIT OF MEASUREMENT	U.S. SURVEY FOOT
GPS FIELD PROCEDURE	REAL TIME NETWORK (VRS)
DATE OF GPS SURVEY	2/26/2014
GPS ANTENNA	TRIMBLE R8-3 (SN: 5005414918)
PUBLISHED / FIXED CONTROL USED:	
STATION NAME	DURH
PID	DG9328
LATITUDE	35°59'46.12841"N
LONGITUDE	78°53'58.03841"W
ELLIPSOID HEIGHT	385.388
GEOID HEIGHT	-102.789
ADJUSTMENT:	
SURVEY DATA WAS POST PROCESSED WITH TRIMBLE GEOMATICS OFFICE (TGO) USING A NETWORK LEAST SQUARES ADJUSTMENT AT THE 95% CONFIDENCE LEVEL.	
CLASS OF SURVEY	CLASS A (URBAN)
POSITIONAL ACCURACY	0.05
POINT OF LOCALIZATION	TWT# 2
COMBINED FACTOR	0.999931127

I, CHAD T. HOWARD, CERTIFY THAT THIS MAP WAS DRAWN UNDER MY SUPERVISION, FROM AN ACTUAL GROUND (CONVENTIONAL) AND GPS SURVEY MADE UNDER MY SUPERVISION;
 THAT THE GPS SURVEY INFORMATION (METADATA) HAS BEEN REPORTED HEREON UNDER THE "SURVEY CONTROL / GRID TIE NOTES";
 THAT THE BOUNDARIES NOT SURVEYED ARE CLEARLY INDICATED AS SUCH AND ARE BASED UPON THE DEEDS AND PLATS REPORTED HEREON;
 THAT THE RATIO OF PRECISION OR POSITIONAL ACCURACY HAS BEEN REPORTED HEREON.

WITNESS MY ORIGINAL SIGNATURE, REGISTRATION NUMBER AND SEAL THIS 24th DAY OF FEBRUARY, IN THE YEAR OF OUR LORD 2016.

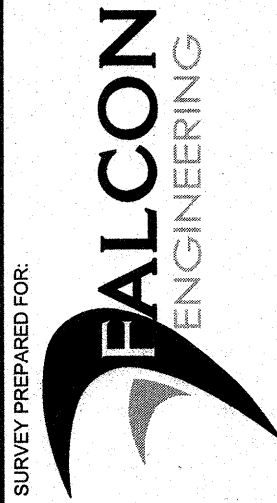
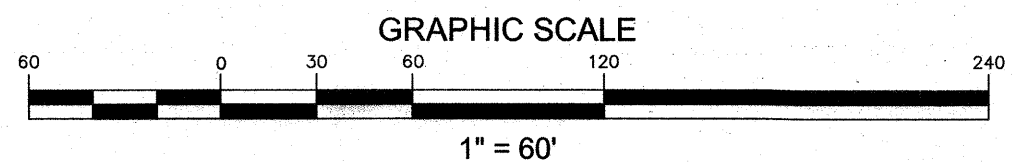
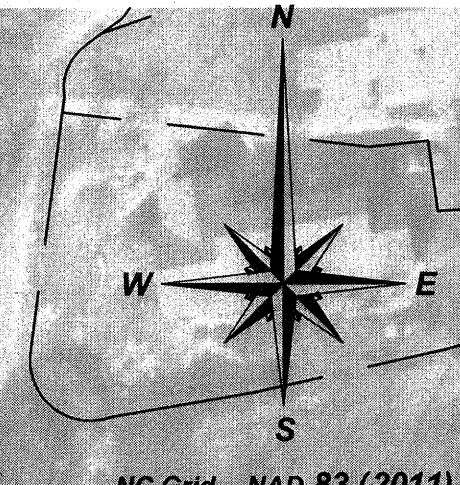
2/24/16

CHAD T. HOWARD LICENSE NO. L-4220

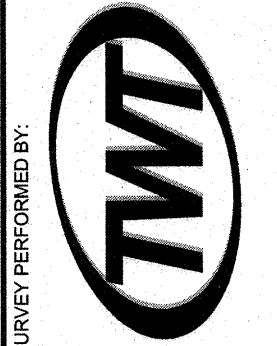


TWT CONTROL POINT #2
 PK-NAIL SET
 GRID N: 791,919.126'
 GRID E: 1,984,082.431'
 ELEVATION: 322.90'

TWT CONTROL POINT #1
 PK-NAIL SET
 N: 732,463.388'
 E: 1,984,066.579'
 ELEVATION: 363.29'



SURVEY PREPARED FOR:
TAYLOR WISEMAN & TAYLOR
 ENGINEERS | SURVEYORS | SCIENTISTS
 SUBSURFACE UTILITY ENGINEERS
 3500 REGENCY PARKWAY, SUITE 260, CARY, NC 27518
 PHONE (919) 297-0085 FAX (919) 297-0090
 NORTH CAROLINA LICENSE NUMBER: F-0362



SURVEY PERFORMED BY:
MONITORING WELL LOCATION SURVEY
 CHAPEL HILL POLICE DEPARTMENT
 828 MARTIN LUTHER KING JR BLVD
 ORANGE COUNTY, CHAPEL HILL, NC

REVISIONS:
 05-07-14 - ADDED GP1-12; REVISED CONTROL POINT #2 ELEVATION;
 ADDED GIS CONTOUR DATA;
 REMOVED REFERENCE TO MW-5
 02-12-16 - ADDED MW-3A AND MW-4A, AND SS-1-3; NOTED MW-3 AND MW-4 DESTROYED
 02-18-16 - ADDED SS-4 TO SS-7

DATE OF SURVEY: 02/26/2014
 SCALE: 1" = 60'
 DRAWN BY: J. REYNOLDS
 CHECKED BY: C. HOWARD
 PROJECT: 70616.6007.00

SHEET:
1 / 1



APPENDIX B
TABLES



Table 8 Summary of 2013 Limited Phase II ESA Soil and Groundwater Analytical Results

COC	SOIL (Units = mg/kg)				GROUNDWATER (Units = ug/l)			
	S-1 Results	S-4 Results	Soil to GW MSCC	GW Protection RSLs	MW-1 Results	MW-2 Results	Bolin Creek	NC 2L
Aluminum	NT	23000	-	23000	5600	16000	290	-
Antimony	NT	<4.4	-	0.27	5.4	0.61	<2.0	-
Arsenic	NT	14	-	0.0013	85	8.3	0.9	10
Barium	NT	24	290	120	1100	1100	27	700
Beryllium	NT	<0.44	-	13	1.6	5.5	<0.80	-
Cadmium	NT	1.5	-	0.52	0.17	0.93	<1.0	2
Calcium	NT	9900	-	-	110000	260000	16000	-
Chromium	NT	22	5.4*	0.00059*	15	8.4	<2.0	10
Cobalt	NT	30	-	0.21	15	23	0.37	-
Copper	NT	65	-	22	25	1200	2.6	1000
Iron	NT	59000	-	2700	6500	13000	860	-
Lead	NT	20	270	140	5.8	27	0.5	15
Magnesium	NT	9000	-	-	25000	47000	5300	-
Manganese	NT	1500	-	210	7600	1200	100	50
Mercury	NT	0.011	-	0.033	ND	0.18	<0.10	1
Nickel	NT	43	-	110	12	70	1.2	100
Potassium	NT	680	-	-	7600	42,000	2300	-
Selenium	NT	<8.8	-	0.4	2.5	18	<10	20
Silver	NT	<0.88	0.25	0.6	ND	0.27	<1.0	20
Sodium	NT	150	-	-	34000	52000	7800	-
Thallium	NT	<4.4	-	0.011	1	0.48	<0.40	-
Vanadium	NT	21	-	78	38	71	<10	-
Zinc	NT	120	-	290	52	2200	45	1000
GRO	ND	ND	10		NT	NT	NT	
DRO	8.0	27	10		NT	NT	NT	
Volatiles	NT	ND			ND	NT	NT	
Semi-Volatiles	NT	ND			ND	NT	NT	

COC = Constituents of Concern

S1 = Sample 1

NT = Not Tested

ND = Not Detected

MSCC = Maximum Soil Contamination Concentration

NC2L = NC DENR GW Standard (15A NCAC 02L .0202)

Table 9 Summary of 2014 Composite Soil Sampling Analytical Results above Method Detection

COC	Units	Sampling Locations			Maximum Soil Contaminant Concentrations (MSCC)	
		S-5	S-6	S-7	Soil to GW	Residential
Hexavalent Chromium	mg/kg	1.3	2.7	1.4	5.4	47
Mercury	mg/kg	0.3	0.42	0.44	NA	NA
Arsenic	mg/kg	37	43	44	NA	NA
Barium	mg/kg	2,800	3,200	2,500	290	3100
Chromium	mg/kg	21	22	29	5.4	47
Lead	mg/kg	10	12	11	270	400
Selenium	mg/kg	3.2	6.1	4.5	NA	NA
4-Isopropyltoluene	mg/kg	0.051	ND	0.024	0.12	100
Acetone	mg/kg	0.14	0.17	0.11	24	14,000
Methyl Ethyl Ketone (2-Butanone)	mg/kg	BRL	0.0086	BRL	16	9385
Toxaphene	mg/kg	BRL	BRL	0.17	NA	NA

COC = Constituents of Concern
 BRL = Below Reporting Limit

Table 10 Summary of 2014 MW3 and MW4 Groundwater Analytical Results

COC	Units	Sampling Locations		NC DENR GW Standard (15A NCAC 02L .0202)
		MW-4	MW-3	
Mercury	ug/l	1.4	BRL	1
Arsenic	ug/l	140	BRL	10
Barium	ug/l	6500	160	700
Cadmium	ug/l	1.7	BRL	2
Chromium	ug/l	930	BRL	10
Lead	ug/l	250	BRL	15
Selenium	ug/l	99	BRL	20

COC = Constituent of Concern

BRL = Below Reporting Limit

ug/l = micrograms per liter

Table 11 Summary of 2014 Geoprobe Soil Sample Analytical Results

COC	GP1	GP2	GP3	GP4	GP5	GP6	GP7	GP8	GP11	GP12	MSCC 1	MSCC 2
Arsenic	3.5	41	48	59	72	65	55	54	16	52	NA	NA
Barium	86	1100	1200	2900	2800	850	1700	4100	450	2000	290	3100
Chromium (total)	8.8	19	23	20	19	19	19	20	16	19	5.4	47
Copper	26	11	39	11	9.5	27	11	9.2	23	14	270	400
Lead	BRL	4	BRL	5.8	2.6	4.1	4.3	4.5	BRL	2.1	NA	NA
Mercury	0.083	0.24	0.42	0.51	0.33	11	0.26	0.29	0.35	0.28	NA	NA
Selenium	BRL	BRL	0.53	BRL	BRL	BRL	BRL	BRL	BRL	BRL	5.4	47

COC = Constituent of Concern

BRL = Below Reporting Limit

Units = mg/kg = milligrams per kilograms

MSCC 1 = Soil To Groundwater Maximum Soil Contamination Concentration

MSCC 2 = Residential Maximum Soil Contamination Concentration Level

GP 9&10 were not sampled, no ash was observed at sample depth



Table 12 Summary of 2014 Geoprobe Collected Soil Composition Data

Geoprobe Location ID	Final Boring Depth (ft bgs)	Depths Ash Present (ft bgs)	Soil Sampling Depth (ft bgs)	Notes
GP-1	14	9 - 12	8 - 12	Refusal at 14 ft bgs into weathered rock
GP-2	35	5 - 30	26 - 28	Refusal at 35 ft bgs
GP-3	17	10 - 16	10 - 12	Refusal at 17 ft bgs due to possible landfill debris
GP-4	20	3 - 16	10 - 12	Into native soils at 17 ft bgs
GP-5-A	8	4 - 8	No Samples	Refusal from wood debris at 8 ft bgs
GP-5	12	4 - 8	Sampled 4 - 6	Refusal at 12 ft bgs
GP-6	26	11 - 23	9 - 11	Into native soils at 24 ft bgs
GP-7	20	3 - 14	10 - 12	Into native soils at 16 ft bgs
GP-8	17	5 - 15	11 - 15	Into native soils at 16 ft bgs
GP-9	8	-	No Samples	Into native soils at 4 ft bgs / No ash observed
GP-10	8	-	No Samples	Into native soils at 1 ft bgs / No ash observed
GP-11	9	3 - 9	4 - 6	Refusal at 9 ft bgs
GP-12	12	2 - 10	2 - 4	Into native soils at 11 ft bgs

ft bgs = feet below ground surface



APPENDIX C
PHOTOGRAPHS



Town of Chapel Hill Police Department Environmental Site Characterization Site Photographs



Photograph No. 1: General View of MW1 and the Police Station.



Photograph No. 2: General view of the steep slope facing northwest toward MW1.
Note the chain-link and silt fences.

Town of Chapel Hill Police Department Environmental Site Characterization Site Photographs



Photograph No. 3: General view of MW3A.



Photograph No. 4: General view of MW4A

Town of Chapel Hill Police Department Environmental Site Characterization Site Photographs



Photograph No. 5: General view of SS1.



Photograph No. 6: General view of SS7 facing east.



APPENDIX D
LABORATORY DATA





Full-Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert No. 37735
VA Certification No. 460211
DoD ELAP: L-A-B Accredited Certificate No. L2307
ISO/IEC 17025: L-A-B Accredited Certificate No. L2307

Case Narrative

03/01/2016

Falcon Engineering
Chris Burkhardt
1210 Trinity Road #110
Raleigh, NC 27607

Project: TOCH Pd
Project No.: TOCH Pd
Lab Submittal Date: 02/19/2016
Prism Work Order: 6020362

This data package contains the analytical results for the project identified above and includes a Case Narrative, Sample Results and Chain of Custody. Unless otherwise noted, all samples were received in acceptable condition and processed according to the referenced methods.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative.

Please call if you have any questions relating to this analytical report.

Respectfully,

PRISM LABORATORIES, INC.

Angela D. Overcash
VP Laboratory Services

Reviewed By Angela D. Overcash
VP Laboratory Services

Data Qualifiers Key Reference:

- BH MB greater than one half of the RL, but the sample concentrations are greater than 10x the MB.
- BRL Below Reporting Limit
- MDL Method Detection Limit
- RPD Relative Percent Difference
- * Results reported to the reporting limit. All other results are reported to the MDL with values between MDL and reporting limit indicated with a J.

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449 Springbrook Road - P.O. Box 240543 - Charlotte, NC 28224-0543
Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409

Client Sample ID	Lab Sample ID	Matrix	Date Sampled	Date Received
MW3A	6020362-01	Water	02/17/16	02/19/16
MW3A Dup	6020362-02	Water	02/17/16	02/19/16
MW4A	6020362-03	Water	02/18/16	02/19/16
MW4A Filter	6020362-04	Water	02/18/16	02/19/16
MW1	6020362-05	Water	02/18/16	02/19/16
MW1 Filter	6020362-06	Water	02/18/16	02/19/16
SS1	6020362-07	Solid	02/18/16	02/19/16
SS1 Dup	6020362-08	Solid	02/18/16	02/19/16
SS2	6020362-09	Solid	02/18/16	02/19/16
SS3	6020362-10	Solid	02/18/16	02/19/16
SS4	6020362-11	Solid	02/18/16	02/19/16
SS5	6020362-12	Solid	02/18/16	02/19/16
SS6	6020362-13	Solid	02/18/16	02/19/16
SS7	6020362-14	Solid	02/18/16	02/19/16

Samples were received in good condition at 2.9 degrees C unless otherwise noted.

Prism ID	Client ID	Parameter	Method	Result	Units
6020362-01	MW3A	Barium	*6010C	0.089	mg/L
6020362-01	MW3A	Selenium	*6010C	0.023	mg/L
6020362-01	MW3A	Strontium	*6010C	2.4	mg/L
6020362-02	MW3A Dup	Barium	*6010C	0.080	mg/L
6020362-02	MW3A Dup	Manganese	*6010C	0.013	mg/L
6020362-02	MW3A Dup	Selenium	*6010C	0.026	mg/L
6020362-02	MW3A Dup	Strontium	*6010C	2.1	mg/L
6020362-03	MW4A	Barium	*6010C	0.026	mg/L
6020362-03	MW4A	Lead	*6010C	0.0078	mg/L
6020362-03	MW4A	Manganese	*6010C	0.049	mg/L
6020362-03	MW4A	Strontium	*6010C	0.11	mg/L
6020362-03	MW4A	Zinc	*6010C	0.034	mg/L
6020362-04	MW4A Filter	Barium	*6010C	0.033	mg/L
6020362-04	MW4A Filter	Lead	*6010C	0.0084	mg/L
6020362-04	MW4A Filter	Manganese	*6010C	0.041	mg/L
6020362-04	MW4A Filter	Strontium	*6010C	0.078	mg/L
6020362-04	MW4A Filter	Zinc	*6010C	0.048	mg/L
6020362-05	MW1	Mercury	*245.1	0.00026	mg/L
6020362-05	MW1	Arsenic	*6010C	0.067	mg/L
6020362-05	MW1	Barium	*6010C	1.3	mg/L
6020362-05	MW1	Beryllium	*6010C	0.011	mg/L
6020362-05	MW1	Chromium	*6010C	0.10	mg/L
6020362-05	MW1	Cobalt	*6010C	0.078	mg/L
6020362-05	MW1	Copper	*6010C	0.17	mg/L
6020362-05	MW1	Lead	*6010C	0.036	mg/L
6020362-05	MW1	Manganese	*6010C	9.6	mg/L
6020362-05	MW1	Nickel	*6010C	0.058	mg/L
6020362-05	MW1	Strontium	*6010C	2.9	mg/L
6020362-05	MW1	Vanadium	*6010C	0.26	mg/L
6020362-05	MW1	Zinc	*6010C	0.33	mg/L
6020362-06	MW1 Filter	Mercury	*245.1	0.00021	mg/L
6020362-06	MW1 Filter	Arsenic	*6010C	0.052	mg/L
6020362-06	MW1 Filter	Barium	*6010C	1.1	mg/L
6020362-06	MW1 Filter	Beryllium	*6010C	0.0088	mg/L
6020362-06	MW1 Filter	Chromium	*6010C	0.086	mg/L
6020362-06	MW1 Filter	Cobalt	*6010C	0.061	mg/L
6020362-06	MW1 Filter	Copper	*6010C	0.13	mg/L
6020362-06	MW1 Filter	Lead	*6010C	0.029	mg/L
6020362-06	MW1 Filter	Manganese	*6010C	9.0	mg/L
6020362-06	MW1 Filter	Nickel	*6010C	0.046	mg/L
6020362-06	MW1 Filter	Strontium	*6010C	2.7	mg/L
6020362-06	MW1 Filter	Vanadium	*6010C	0.20	mg/L
6020362-06	MW1 Filter	Zinc	*6010C	0.26	mg/L
6020362-07	SS1	Mercury	*7471B	0.052	mg/kg dry

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Prism ID	Client ID	Parameter	Method	Result	Units
6020362-07	SS1	Arsenic	*6010C	6.7	mg/kg dry
6020362-07	SS1	Barium	*6010C	210	mg/kg dry
6020362-07	SS1	Beryllium	*6010C	1.2	mg/kg dry
6020362-07	SS1	Chromium	*6010C	28	mg/kg dry
6020362-07	SS1	Cobalt	*6010C	25	mg/kg dry
6020362-07	SS1	Copper	*6010C	47	mg/kg dry
6020362-07	SS1	Lead	*6010C	22	mg/kg dry
6020362-07	SS1	Manganese	*6010C	2400	BH mg/kg dry
6020362-07	SS1	Nickel	*6010C	15	mg/kg dry
6020362-07	SS1	Strontium	*6010C	120	mg/kg dry
6020362-07	SS1	Thallium	*6010C	1.3	mg/kg dry
6020362-07	SS1	Vanadium	*6010C	88	mg/kg dry
6020362-07	SS1	Zinc	*6010C	100	mg/kg dry
6020362-08	SS1 Dup	Mercury	*7471B	0.059	mg/kg dry
6020362-08	SS1 Dup	Arsenic	*6010C	8.5	mg/kg dry
6020362-08	SS1 Dup	Barium	*6010C	260	mg/kg dry
6020362-08	SS1 Dup	Beryllium	*6010C	1.4	mg/kg dry
6020362-08	SS1 Dup	Chromium	*6010C	31	mg/kg dry
6020362-08	SS1 Dup	Cobalt	*6010C	28	mg/kg dry
6020362-08	SS1 Dup	Copper	*6010C	56	mg/kg dry
6020362-08	SS1 Dup	Lead	*6010C	29	mg/kg dry
6020362-08	SS1 Dup	Manganese	*6010C	3300	BH mg/kg dry
6020362-08	SS1 Dup	Nickel	*6010C	18	mg/kg dry
6020362-08	SS1 Dup	Strontium	*6010C	150	mg/kg dry
6020362-08	SS1 Dup	Thallium	*6010C	1.7	mg/kg dry
6020362-08	SS1 Dup	Vanadium	*6010C	95	mg/kg dry
6020362-08	SS1 Dup	Zinc	*6010C	110	mg/kg dry
6020362-09	SS2	Mercury	*7471B	0.21	mg/kg dry
6020362-09	SS2	Arsenic	*6010C	24	mg/kg dry
6020362-09	SS2	Barium	*6010C	830	mg/kg dry
6020362-09	SS2	Beryllium	*6010C	3.5	mg/kg dry
6020362-09	SS2	Chromium	*6010C	27	mg/kg dry
6020362-09	SS2	Cobalt	*6010C	20	mg/kg dry
6020362-09	SS2	Copper	*6010C	57	mg/kg dry
6020362-09	SS2	Lead	*6010C	39	mg/kg dry
6020362-09	SS2	Manganese	*6010C	1700	BH mg/kg dry
6020362-09	SS2	Molybdenum	*6010C	1.7	mg/kg dry
6020362-09	SS2	Nickel	*6010C	19	mg/kg dry
6020362-09	SS2	Selenium	*6010C	2.4	mg/kg dry
6020362-09	SS2	Strontium	*6010C	190	mg/kg dry
6020362-09	SS2	Thallium	*6010C	1.2	mg/kg dry
6020362-09	SS2	Vanadium	*6010C	81	mg/kg dry
6020362-09	SS2	Zinc	*6010C	110	mg/kg dry
6020362-10	SS3	Mercury	*7471B	0.048	mg/kg dry
6020362-10	SS3	Arsenic	*6010C	4.5	mg/kg dry

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Prism ID	Client ID	Parameter	Method	Result	Units
6020362-10	SS3	Barium	*6010C	100	mg/kg dry
6020362-10	SS3	Beryllium	*6010C	0.80	mg/kg dry
6020362-10	SS3	Chromium	*6010C	13	mg/kg dry
6020362-10	SS3	Cobalt	*6010C	6.8	mg/kg dry
6020362-10	SS3	Copper	*6010C	22	mg/kg dry
6020362-10	SS3	Lead	*6010C	14	mg/kg dry
6020362-10	SS3	Manganese	*6010C	240	BH mg/kg dry
6020362-10	SS3	Nickel	*6010C	5.3	mg/kg dry
6020362-10	SS3	Strontium	*6010C	36	mg/kg dry
6020362-10	SS3	Vanadium	*6010C	41	mg/kg dry
6020362-10	SS3	Zinc	*6010C	28	mg/kg dry
6020362-11	SS4	Mercury	*7471B	0.061	mg/kg dry
6020362-11	SS4	Arsenic	*6010C	8.5	mg/kg dry
6020362-11	SS4	Barium	*6010C	380	mg/kg dry
6020362-11	SS4	Beryllium	*6010C	1.2	mg/kg dry
6020362-11	SS4	Chromium	*6010C	22	mg/kg dry
6020362-11	SS4	Cobalt	*6010C	12	mg/kg dry
6020362-11	SS4	Copper	*6010C	29	mg/kg dry
6020362-11	SS4	Lead	*6010C	25	mg/kg dry
6020362-11	SS4	Manganese	*6010C	910	BH mg/kg dry
6020362-11	SS4	Nickel	*6010C	12	mg/kg dry
6020362-11	SS4	Strontium	*6010C	51	mg/kg dry
6020362-11	SS4	Vanadium	*6010C	54	mg/kg dry
6020362-11	SS4	Zinc	*6010C	51	mg/kg dry
6020362-12	SS5	Mercury	*7471B	0.091	mg/kg dry
6020362-12	SS5	Arsenic	*6010C	4.8	mg/kg dry
6020362-12	SS5	Barium	*6010C	130	mg/kg dry
6020362-12	SS5	Beryllium	*6010C	0.89	mg/kg dry
6020362-12	SS5	Chromium	*6010C	17	mg/kg dry
6020362-12	SS5	Cobalt	*6010C	9.4	mg/kg dry
6020362-12	SS5	Copper	*6010C	25	mg/kg dry
6020362-12	SS5	Lead	*6010C	27	mg/kg dry
6020362-12	SS5	Manganese	*6010C	460	BH mg/kg dry
6020362-12	SS5	Nickel	*6010C	7.9	mg/kg dry
6020362-12	SS5	Strontium	*6010C	43	mg/kg dry
6020362-12	SS5	Vanadium	*6010C	47	mg/kg dry
6020362-12	SS5	Zinc	*6010C	48	mg/kg dry
6020362-13	SS6	Mercury	*7471B	0.038	mg/kg dry
6020362-13	SS6	Arsenic	*6010C	3.1	mg/kg dry
6020362-13	SS6	Barium	*6010C	82	mg/kg dry
6020362-13	SS6	Beryllium	*6010C	0.70	mg/kg dry
6020362-13	SS6	Chromium	*6010C	35	mg/kg dry
6020362-13	SS6	Cobalt	*6010C	7.6	mg/kg dry
6020362-13	SS6	Copper	*6010C	23	mg/kg dry
6020362-13	SS6	Lead	*6010C	17	mg/kg dry

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Prism ID	Client ID	Parameter	Method	Result		Units
6020362-13	SS6	Manganese	*6010C	410	BH	mg/kg dry
6020362-13	SS6	Nickel	*6010C	6.5		mg/kg dry
6020362-13	SS6	Strontium	*6010C	25		mg/kg dry
6020362-13	SS6	Vanadium	*6010C	45		mg/kg dry
6020362-13	SS6	Zinc	*6010C	43		mg/kg dry
6020362-14	SS7	Mercury	*7471B	0.038		mg/kg dry
6020362-14	SS7	Arsenic	*6010C	3.1		mg/kg dry
6020362-14	SS7	Barium	*6010C	84		mg/kg dry
6020362-14	SS7	Beryllium	*6010C	0.60		mg/kg dry
6020362-14	SS7	Chromium	*6010C	14		mg/kg dry
6020362-14	SS7	Cobalt	*6010C	6.9		mg/kg dry
6020362-14	SS7	Copper	*6010C	15		mg/kg dry
6020362-14	SS7	Lead	*6010C	13		mg/kg dry
6020362-14	SS7	Manganese	*6010C	500	BH	mg/kg dry
6020362-14	SS7	Nickel	*6010C	5.9		mg/kg dry
6020362-14	SS7	Strontium	*6010C	31		mg/kg dry
6020362-14	SS7	Vanadium	*6010C	37		mg/kg dry
6020362-14	SS7	Zinc	*6010C	37		mg/kg dry



Falcon Engineering
Attn: Chris Burkhardt
1210 Trinity Road #110
Raleigh, NC 27607

Project: TOCH Pd
Project No.: TOCH Pd
Sample Matrix: Water

Client Sample ID: MW3A
Prism Sample ID: 6020362-01
Prism Work Order: 6020362
Time Collected: 02/17/16 18:00
Time Submitted: 02/19/16 15:25

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Total Metals									
Mercury	BRL	mg/L	0.00020	0.000030	1	*245.1	2/23/16 12:49	JAB	P6B0412
Antimony	BRL	mg/L	0.0050	0.00090	1	*6010C	2/27/16 7:11	bgm	P6B0408
Arsenic	BRL	mg/L	0.010	0.00070	1	*6010C	2/27/16 7:11	bgm	P6B0408
Barium	0.089	mg/L	0.010	0.00070	1	*6010C	2/27/16 7:11	bgm	P6B0408
Beryllium	BRL	mg/L	0.0020	0.00010	1	*6010C	2/27/16 7:11	bgm	P6B0408
Boron	BRL	mg/L	0.50	0.0043	1	*6010C	2/27/16 7:11	bgm	P6B0408
Cadmium	BRL	mg/L	0.0010	0.00010	1	*6010C	2/27/16 7:11	bgm	P6B0408
Chromium	BRL	mg/L	0.0050	0.00060	1	*6010C	2/27/16 7:11	bgm	P6B0408
Cobalt	BRL	mg/L	0.0050	0.000080	1	*6010C	2/27/16 7:11	bgm	P6B0408
Copper	BRL	mg/L	0.010	0.0019	1	*6010C	2/27/16 7:11	bgm	P6B0408
Lead	BRL	mg/L	0.0050	0.0013	1	*6010C	2/27/16 7:11	bgm	P6B0408
Manganese	BRL	mg/L	0.010	0.0016	1	*6010C	2/29/16 16:31	bgm	P6B0408
Molybdenum	BRL	mg/L	0.010	0.00030	1	*6010C	2/27/16 7:11	bgm	P6B0408
Nickel	BRL	mg/L	0.010	0.00040	1	*6010C	2/27/16 7:11	bgm	P6B0408
Selenium	0.023	mg/L	0.020	0.0032	1	*6010C	2/27/16 7:11	bgm	P6B0408
Silver	BRL	mg/L	0.0050	0.00020	1	*6010C	2/27/16 7:11	bgm	P6B0408
Strontium	2.4	mg/L	0.010	0.00040	1	*6010C	2/27/16 7:11	bgm	P6B0408
Thallium	BRL	mg/L	0.010	0.0013	1	*6010C	2/27/16 7:11	bgm	P6B0408
Vanadium	BRL	mg/L	0.0050	0.00030	1	*6010C	2/27/16 7:11	bgm	P6B0408
Zinc	BRL	mg/L	0.030	0.0033	1	*6010C	2/29/16 16:31	bgm	P6B0408



Falcon Engineering
 Attn: Chris Burkhardt
 1210 Trinity Road #110
 Raleigh, NC 27607

Project: TOCH Pd
 Project No.: TOCH Pd
 Sample Matrix: Water

Client Sample ID: MW3A Dup
 Prism Sample ID: 6020362-02
 Prism Work Order: 6020362
 Time Collected: 02/17/16 18:00
 Time Submitted: 02/19/16 15:25

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Total Metals									
Mercury	BRL	mg/L	0.00020	0.000030	1	*245.1	2/23/16 13:00	JAB	P6B0412
Antimony	BRL	mg/L	0.0050	0.00090	1	*6010C	2/27/16 7:35	bgm	P6B0408
Arsenic	BRL	mg/L	0.010	0.00070	1	*6010C	2/27/16 7:35	bgm	P6B0408
Barium	0.080	mg/L	0.010	0.00070	1	*6010C	2/27/16 7:35	bgm	P6B0408
Beryllium	BRL	mg/L	0.0020	0.00010	1	*6010C	2/27/16 7:35	bgm	P6B0408
Boron	BRL	mg/L	0.50	0.0043	1	*6010C	2/27/16 7:35	bgm	P6B0408
Cadmium	BRL	mg/L	0.0010	0.00010	1	*6010C	2/27/16 7:35	bgm	P6B0408
Chromium	BRL	mg/L	0.0050	0.00060	1	*6010C	2/27/16 7:35	bgm	P6B0408
Cobalt	BRL	mg/L	0.0050	0.000080	1	*6010C	2/27/16 7:35	bgm	P6B0408
Copper	BRL	mg/L	0.010	0.0019	1	*6010C	2/27/16 7:35	bgm	P6B0408
Lead	BRL	mg/L	0.0050	0.0013	1	*6010C	2/27/16 7:35	bgm	P6B0408
Manganese	0.013	mg/L	0.010	0.0016	1	*6010C	2/29/16 16:56	bgm	P6B0408
Molybdenum	BRL	mg/L	0.010	0.00030	1	*6010C	2/27/16 7:35	bgm	P6B0408
Nickel	BRL	mg/L	0.010	0.00040	1	*6010C	2/27/16 7:35	bgm	P6B0408
Selenium	0.026	mg/L	0.020	0.0032	1	*6010C	2/27/16 7:35	bgm	P6B0408
Silver	BRL	mg/L	0.0050	0.00020	1	*6010C	2/27/16 7:35	bgm	P6B0408
Strontium	2.1	mg/L	0.010	0.00040	1	*6010C	2/27/16 7:35	bgm	P6B0408
Thallium	BRL	mg/L	0.010	0.0013	1	*6010C	2/27/16 7:35	bgm	P6B0408
Vanadium	BRL	mg/L	0.0050	0.00030	1	*6010C	2/27/16 7:35	bgm	P6B0408
Zinc	BRL	mg/L	0.030	0.0033	1	*6010C	2/29/16 16:56	bgm	P6B0408



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1210 Trinity Road #110
Raleigh, NC 27607

Project: TOCH Pd
Project No.: TOCH Pd
Sample Matrix: Water

Client Sample ID: MW4A
Prism Sample ID: 6020362-03
Prism Work Order: 6020362
Time Collected: 02/18/16 14:00
Time Submitted: 02/19/16 15:25

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Total Metals									
Mercury	BRL	mg/L	0.00020	0.000030	1	*245.1	2/23/16 13:04	JAB	P6B0412
Antimony	BRL	mg/L	0.0050	0.00090	1	*6010C	2/27/16 7:43	bgm	P6B0408
Arsenic	BRL	mg/L	0.010	0.00070	1	*6010C	2/27/16 7:43	bgm	P6B0408
Barium	0.026	mg/L	0.010	0.00070	1	*6010C	2/27/16 7:43	bgm	P6B0408
Beryllium	BRL	mg/L	0.0020	0.00010	1	*6010C	2/27/16 7:43	bgm	P6B0408
Boron	BRL	mg/L	0.50	0.0043	1	*6010C	2/27/16 7:43	bgm	P6B0408
Cadmium	BRL	mg/L	0.0010	0.00010	1	*6010C	2/27/16 7:43	bgm	P6B0408
Chromium	BRL	mg/L	0.0050	0.00060	1	*6010C	2/27/16 7:43	bgm	P6B0408
Cobalt	BRL	mg/L	0.0050	0.000080	1	*6010C	2/27/16 7:43	bgm	P6B0408
Copper	BRL	mg/L	0.010	0.0019	1	*6010C	2/27/16 7:43	bgm	P6B0408
Lead	0.0078	mg/L	0.0050	0.0013	1	*6010C	2/29/16 17:04	bgm	P6B0408
Manganese	0.049	mg/L	0.010	0.0016	1	*6010C	2/29/16 17:04	bgm	P6B0408
Molybdenum	BRL	mg/L	0.010	0.00030	1	*6010C	2/27/16 7:43	bgm	P6B0408
Nickel	BRL	mg/L	0.010	0.00040	1	*6010C	2/27/16 7:43	bgm	P6B0408
Selenium	BRL	mg/L	0.020	0.0032	1	*6010C	2/27/16 7:43	bgm	P6B0408
Silver	BRL	mg/L	0.0050	0.00020	1	*6010C	2/27/16 7:43	bgm	P6B0408
Strontium	0.11	mg/L	0.010	0.00040	1	*6010C	2/27/16 7:43	bgm	P6B0408
Thallium	BRL	mg/L	0.010	0.0013	1	*6010C	2/27/16 7:43	bgm	P6B0408
Vanadium	BRL	mg/L	0.0050	0.00030	1	*6010C	2/27/16 7:43	bgm	P6B0408
Zinc	0.034	mg/L	0.030	0.0033	1	*6010C	2/29/16 17:04	bgm	P6B0408



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Attn: Chris Burkhardt
1210 Trinity Road #110
Raleigh, NC 27607

Project: TOCH Pd
Project No.: TOCH Pd
Sample Matrix: Water

Client Sample ID: MW4A Filter
Prism Sample ID: 6020362-04
Prism Work Order: 6020362
Time Collected: 02/18/16 14:00
Time Submitted: 02/19/16 15:25

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Total Metals									
Mercury	BRL	mg/L	0.00020	0.000030	1	*245.1	2/23/16 13:08	JAB	P6B0412
Antimony	BRL	mg/L	0.0050	0.00090	1	*6010C	2/27/16 7:51	bgm	P6B0408
Arsenic	BRL	mg/L	0.010	0.00070	1	*6010C	2/27/16 7:51	bgm	P6B0408
Barium	0.033	mg/L	0.010	0.00070	1	*6010C	2/27/16 7:51	bgm	P6B0408
Beryllium	BRL	mg/L	0.0020	0.00010	1	*6010C	2/27/16 7:51	bgm	P6B0408
Boron	BRL	mg/L	0.50	0.0043	1	*6010C	2/27/16 7:51	bgm	P6B0408
Cadmium	BRL	mg/L	0.0010	0.00010	1	*6010C	2/27/16 7:51	bgm	P6B0408
Chromium	BRL	mg/L	0.0050	0.00060	1	*6010C	2/27/16 7:51	bgm	P6B0408
Cobalt	BRL	mg/L	0.0050	0.000080	1	*6010C	2/27/16 7:51	bgm	P6B0408
Copper	BRL	mg/L	0.010	0.0019	1	*6010C	2/27/16 7:51	bgm	P6B0408
Lead	0.0084	mg/L	0.0050	0.0013	1	*6010C	2/29/16 17:12	bgm	P6B0408
Manganese	0.041	mg/L	0.010	0.0016	1	*6010C	2/29/16 17:12	bgm	P6B0408
Molybdenum	BRL	mg/L	0.010	0.00030	1	*6010C	2/27/16 7:51	bgm	P6B0408
Nickel	BRL	mg/L	0.010	0.00040	1	*6010C	2/27/16 7:51	bgm	P6B0408
Selenium	BRL	mg/L	0.020	0.0032	1	*6010C	2/27/16 7:51	bgm	P6B0408
Silver	BRL	mg/L	0.0050	0.00020	1	*6010C	2/27/16 7:51	bgm	P6B0408
Strontium	0.078	mg/L	0.010	0.00040	1	*6010C	2/27/16 7:51	bgm	P6B0408
Thallium	BRL	mg/L	0.010	0.0013	1	*6010C	2/27/16 7:51	bgm	P6B0408
Vanadium	BRL	mg/L	0.0050	0.00030	1	*6010C	2/27/16 7:51	bgm	P6B0408
Zinc	0.048	mg/L	0.030	0.0033	1	*6010C	2/29/16 17:12	bgm	P6B0408



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Attn: Chris Burkhardt
1210 Trinity Road #110
Raleigh, NC 27607

Project: TOCH Pd
Project No.: TOCH Pd
Sample Matrix: Water

Client Sample ID: MW1
Prism Sample ID: 6020362-05
Prism Work Order: 6020362
Time Collected: 02/18/16 16:30
Time Submitted: 02/19/16 15:25

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Total Metals									
Mercury	0.00026	mg/L	0.00020	0.000030	1	*245.1	2/23/16 13:12	JAB	P6B0412
Antimony	BRL	mg/L	0.0050	0.00090	1	*6010C	2/27/16 7:59	bgm	P6B0408
Arsenic	0.067	mg/L	0.010	0.00070	1	*6010C	2/27/16 7:59	bgm	P6B0408
Barium	1.3	mg/L	0.010	0.00070	1	*6010C	2/27/16 7:59	bgm	P6B0408
Beryllium	0.011	mg/L	0.0020	0.00010	1	*6010C	2/27/16 7:59	bgm	P6B0408
Boron	BRL	mg/L	0.50	0.0043	1	*6010C	2/27/16 7:59	bgm	P6B0408
Cadmium	BRL	mg/L	0.0010	0.00010	1	*6010C	2/27/16 7:59	bgm	P6B0408
Chromium	0.10	mg/L	0.0050	0.00060	1	*6010C	2/27/16 7:59	bgm	P6B0408
Cobalt	0.078	mg/L	0.0050	0.000080	1	*6010C	2/27/16 7:59	bgm	P6B0408
Copper	0.17	mg/L	0.010	0.0019	1	*6010C	2/27/16 7:59	bgm	P6B0408
Lead	0.036	mg/L	0.0050	0.0013	1	*6010C	2/29/16 17:20	bgm	P6B0408
Manganese	9.6	mg/L	0.010	0.0016	1	*6010C	2/27/16 7:59	bgm	P6B0408
Molybdenum	BRL	mg/L	0.010	0.00030	1	*6010C	2/27/16 7:59	bgm	P6B0408
Nickel	0.058	mg/L	0.010	0.00040	1	*6010C	2/27/16 7:59	bgm	P6B0408
Selenium	BRL	mg/L	0.020	0.0032	1	*6010C	2/27/16 7:59	bgm	P6B0408
Silver	BRL	mg/L	0.0050	0.00020	1	*6010C	2/27/16 7:59	bgm	P6B0408
Strontium	2.9	mg/L	0.010	0.00040	1	*6010C	2/27/16 7:59	bgm	P6B0408
Thallium	BRL	mg/L	0.010	0.0013	1	*6010C	2/27/16 7:59	bgm	P6B0408
Vanadium	0.26	mg/L	0.0050	0.00030	1	*6010C	2/27/16 7:59	bgm	P6B0408
Zinc	0.33	mg/L	0.030	0.0033	1	*6010C	2/29/16 17:20	bgm	P6B0408



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Attn: Chris Burkhardt
1210 Trinity Road #110
Raleigh, NC 27607

Project: TOCH Pd
Project No.: TOCH Pd
Sample Matrix: Water

Client Sample ID: MW1 Filter
Prism Sample ID: 6020362-06
Prism Work Order: 6020362
Time Collected: 02/18/16 16:35
Time Submitted: 02/19/16 15:25

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Total Metals									
Mercury	0.00021	mg/L	0.00020	0.000030	1	*245.1	2/23/16 13:15	JAB	P6B0412
Antimony	BRL	mg/L	0.0050	0.00090	1	*6010C	2/27/16 8:07	bgm	P6B0408
Arsenic	0.052	mg/L	0.010	0.00070	1	*6010C	2/27/16 8:07	bgm	P6B0408
Barium	1.1	mg/L	0.010	0.00070	1	*6010C	2/27/16 8:07	bgm	P6B0408
Beryllium	0.0088	mg/L	0.0020	0.00010	1	*6010C	2/27/16 8:07	bgm	P6B0408
Boron	BRL	mg/L	0.50	0.0043	1	*6010C	2/27/16 8:07	bgm	P6B0408
Cadmium	BRL	mg/L	0.0010	0.00010	1	*6010C	2/27/16 8:07	bgm	P6B0408
Chromium	0.086	mg/L	0.0050	0.00060	1	*6010C	2/27/16 8:07	bgm	P6B0408
Cobalt	0.061	mg/L	0.0050	0.000080	1	*6010C	2/27/16 8:07	bgm	P6B0408
Copper	0.13	mg/L	0.010	0.0019	1	*6010C	2/27/16 8:07	bgm	P6B0408
Lead	0.029	mg/L	0.0050	0.0013	1	*6010C	2/29/16 17:29	bgm	P6B0408
Manganese	9.0	mg/L	0.010	0.0016	1	*6010C	2/27/16 8:07	bgm	P6B0408
Molybdenum	BRL	mg/L	0.010	0.00030	1	*6010C	2/27/16 8:07	bgm	P6B0408
Nickel	0.046	mg/L	0.010	0.00040	1	*6010C	2/27/16 8:07	bgm	P6B0408
Selenium	BRL	mg/L	0.020	0.0032	1	*6010C	2/27/16 8:07	bgm	P6B0408
Silver	BRL	mg/L	0.0050	0.00020	1	*6010C	2/27/16 8:07	bgm	P6B0408
Strontium	2.7	mg/L	0.010	0.00040	1	*6010C	2/27/16 8:07	bgm	P6B0408
Thallium	BRL	mg/L	0.010	0.0013	1	*6010C	2/27/16 8:07	bgm	P6B0408
Vanadium	0.20	mg/L	0.0050	0.00030	1	*6010C	2/27/16 8:07	bgm	P6B0408
Zinc	0.26	mg/L	0.030	0.0033	1	*6010C	2/29/16 17:29	bgm	P6B0408



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Attn: Chris Burkhardt
1210 Trinity Road #110
Raleigh, NC 27607

Project: TOCH Pd
Project No.: TOCH Pd
Sample Matrix: Solid

Client Sample ID: SS1
Prism Sample ID: 6020362-07
Prism Work Order: 6020362
Time Collected: 02/18/16 11:02
Time Submitted: 02/19/16 15:25

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
General Chemistry Parameters									
% Solids	61.1	% by Weight	0.100	0.100	1	*SM2540 G	2/23/16 14:40	JLR	P6B0415
Total Metals									
Mercury	0.052	mg/kg dry	0.033	0.0021	1	*7471B	2/25/16 9:01	JAB	P6B0440
Antimony	BRL	mg/kg dry	0.40	0.063	1	*6010C	3/1/16 3:28	bgm	P6C0005
Arsenic	6.7	mg/kg dry	0.40	0.089	1	*6010C	3/1/16 3:28	bgm	P6C0005
Barium	210	mg/kg dry	0.80	0.43	1	*6010C	3/1/16 3:28	bgm	P6C0005
Beryllium	1.2	mg/kg dry	0.40	0.013	1	*6010C	3/1/16 3:28	bgm	P6C0005
Boron	BRL	mg/kg dry	40	0.64	1	*6010C	3/1/16 3:28	bgm	P6C0005
Cadmium	BRL	mg/kg dry	0.40	0.0085	1	*6010C	3/1/16 3:28	bgm	P6C0005
Chromium	28	mg/kg dry	0.40	0.055	1	*6010C	3/1/16 3:28	bgm	P6C0005
Cobalt	25	mg/kg dry	0.40	0.013	1	*6010C	3/1/16 3:28	bgm	P6C0005
Copper	47	mg/kg dry	0.80	0.14	1	*6010C	3/1/16 3:28	bgm	P6C0005
Lead	22	mg/kg dry	0.40	0.042	1	*6010C	3/1/16 3:28	bgm	P6C0005
Manganese	2400 BH	mg/kg dry	0.40	0.074	1	*6010C	3/1/16 3:28	bgm	P6C0005
Molybdenum	BRL	mg/kg dry	0.80	0.035	1	*6010C	3/1/16 3:28	bgm	P6C0005
Nickel	15	mg/kg dry	0.80	0.075	1	*6010C	3/1/16 3:28	bgm	P6C0005
Selenium	BRL	mg/kg dry	0.80	0.058	1	*6010C	3/1/16 3:28	bgm	P6C0005
Silver	BRL	mg/kg dry	0.40	0.0066	1	*6010C	3/1/16 3:28	bgm	P6C0005
Strontium	120	mg/kg dry	0.40	0.0098	1	*6010C	3/1/16 3:28	bgm	P6C0005
Thallium	1.3	mg/kg dry	0.80	0.058	1	*6010C	3/1/16 3:28	bgm	P6C0005
Vanadium	88	mg/kg dry	0.40	0.013	1	*6010C	3/1/16 3:28	bgm	P6C0005
Zinc	100	mg/kg dry	4.0	0.049	1	*6010C	3/1/16 3:28	bgm	P6C0005



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Attn: Chris Burkhardt
1210 Trinity Road #110
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Project: TOCH Pd
Project No.: TOCH Pd
Sample Matrix: Solid

Client Sample ID: SS1 Dup
Prism Sample ID: 6020362-08
Prism Work Order: 6020362
Time Collected: 02/18/16 11:02
Time Submitted: 02/19/16 15:25

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
General Chemistry Parameters									
% Solids	57.2	% by Weight	0.100	0.100	1	*SM2540 G	2/23/16 14:40	JLR	P6B0415
Total Metals									
Mercury	0.059	mg/kg dry	0.036	0.0024	1	*7471B	2/25/16 9:23	JAB	P6B0440
Antimony	BRL	mg/kg dry	0.43	0.068	1	*6010C	3/1/16 3:37	bgm	P6C0005
Arsenic	8.5	mg/kg dry	0.43	0.097	1	*6010C	3/1/16 3:37	bgm	P6C0005
Barium	260	mg/kg dry	0.87	0.46	1	*6010C	3/1/16 3:37	bgm	P6C0005
Beryllium	1.4	mg/kg dry	0.43	0.015	1	*6010C	3/1/16 3:37	bgm	P6C0005
Boron	BRL	mg/kg dry	43	0.69	1	*6010C	3/1/16 3:37	bgm	P6C0005
Cadmium	BRL	mg/kg dry	0.43	0.0092	1	*6010C	3/1/16 3:37	bgm	P6C0005
Chromium	31	mg/kg dry	0.43	0.059	1	*6010C	3/1/16 3:37	bgm	P6C0005
Cobalt	28	mg/kg dry	0.43	0.014	1	*6010C	3/1/16 3:37	bgm	P6C0005
Copper	56	mg/kg dry	0.87	0.15	1	*6010C	3/1/16 3:37	bgm	P6C0005
Lead	29	mg/kg dry	0.43	0.046	1	*6010C	3/1/16 3:37	bgm	P6C0005
Manganese	3300 BH	mg/kg dry	0.43	0.080	1	*6010C	3/1/16 3:37	bgm	P6C0005
Molybdenum	BRL	mg/kg dry	0.87	0.038	1	*6010C	3/1/16 3:37	bgm	P6C0005
Nickel	18	mg/kg dry	0.87	0.082	1	*6010C	3/1/16 3:37	bgm	P6C0005
Selenium	BRL	mg/kg dry	0.87	0.063	1	*6010C	3/1/16 3:37	bgm	P6C0005
Silver	BRL	mg/kg dry	0.43	0.0071	1	*6010C	3/1/16 3:37	bgm	P6C0005
Strontium	150	mg/kg dry	0.43	0.011	1	*6010C	3/1/16 3:37	bgm	P6C0005
Thallium	1.7	mg/kg dry	0.87	0.063	1	*6010C	3/1/16 3:37	bgm	P6C0005
Vanadium	95	mg/kg dry	0.43	0.015	1	*6010C	3/1/16 3:37	bgm	P6C0005
Zinc	110	mg/kg dry	4.3	0.053	1	*6010C	3/1/16 3:37	bgm	P6C0005



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 Attn: Chris Burkhardt
 1210 Trinity Road #110
 Raleigh, NC 27607

Project: TOCH Pd
 Project No.: TOCH Pd
 Sample Matrix: Solid

Client Sample ID: SS2
 Prism Sample ID: 6020362-09
 Prism Work Order: 6020362
 Time Collected: 02/18/16 11:02
 Time Submitted: 02/19/16 15:25

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
General Chemistry Parameters									
% Solids	50.3	% by Weight	0.100	0.100	1	*SM2540 G	2/23/16 14:40	JLR	P6B0415
Total Metals									
Mercury	0.21	mg/kg dry	0.040	0.0026	1	*7471B	2/25/16 9:28	JAB	P6B0440
Antimony	BRL	mg/kg dry	0.50	0.079	1	*6010C	3/1/16 3:46	bgm	P6C0005
Arsenic	24	mg/kg dry	0.50	0.11	1	*6010C	3/1/16 3:46	bgm	P6C0005
Barium	830	mg/kg dry	1.0	0.54	1	*6010C	3/1/16 3:46	bgm	P6C0005
Beryllium	3.5	mg/kg dry	0.50	0.017	1	*6010C	3/1/16 3:46	bgm	P6C0005
Boron	BRL	mg/kg dry	50	0.80	1	*6010C	3/1/16 3:46	bgm	P6C0005
Cadmium	BRL	mg/kg dry	0.50	0.011	1	*6010C	3/1/16 3:46	bgm	P6C0005
Chromium	27	mg/kg dry	0.50	0.068	1	*6010C	3/1/16 3:46	bgm	P6C0005
Cobalt	20	mg/kg dry	0.50	0.016	1	*6010C	3/1/16 3:46	bgm	P6C0005
Copper	57	mg/kg dry	1.0	0.17	1	*6010C	3/1/16 3:46	bgm	P6C0005
Lead	39	mg/kg dry	0.50	0.053	1	*6010C	3/1/16 3:46	bgm	P6C0005
Manganese	1700 BH	mg/kg dry	0.50	0.092	1	*6010C	3/1/16 3:46	bgm	P6C0005
Molybdenum	1.7	mg/kg dry	1.0	0.044	1	*6010C	3/1/16 3:46	bgm	P6C0005
Nickel	19	mg/kg dry	1.0	0.094	1	*6010C	3/1/16 3:46	bgm	P6C0005
Selenium	2.4	mg/kg dry	1.0	0.073	1	*6010C	3/1/16 3:46	bgm	P6C0005
Silver	BRL	mg/kg dry	0.50	0.0082	1	*6010C	3/1/16 3:46	bgm	P6C0005
Strontium	190	mg/kg dry	0.50	0.012	1	*6010C	3/1/16 3:46	bgm	P6C0005
Thallium	1.2	mg/kg dry	1.0	0.073	1	*6010C	3/1/16 3:46	bgm	P6C0005
Vanadium	81	mg/kg dry	0.50	0.017	1	*6010C	3/1/16 3:46	bgm	P6C0005
Zinc	110	mg/kg dry	5.0	0.061	1	*6010C	3/1/16 3:46	bgm	P6C0005



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 Attn: Chris Burkhardt
 1210 Trinity Road #110
 Raleigh, NC 27607

Project: TOCH Pd
 Project No.: TOCH Pd
 Sample Matrix: Solid

Client Sample ID: SS3
 Prism Sample ID: 6020362-10
 Prism Work Order: 6020362
 Time Collected: 02/18/16 11:02
 Time Submitted: 02/19/16 15:25

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
General Chemistry Parameters									
% Solids	75.8	% by Weight	0.100	0.100	1	*SM2540 G	2/23/16 14:40	JLR	P6B0415
Total Metals									
Mercury	0.048	mg/kg dry	0.027	0.0017	1	*7471B	2/25/16 9:32	JAB	P6B0440
Antimony	BRL	mg/kg dry	0.32	0.051	1	*6010C	3/1/16 3:55	bgm	P6C0005
Arsenic	4.5	mg/kg dry	0.32	0.072	1	*6010C	3/1/16 3:55	bgm	P6C0005
Barium	100	mg/kg dry	0.65	0.35	1	*6010C	3/1/16 3:55	bgm	P6C0005
Beryllium	0.80	mg/kg dry	0.32	0.011	1	*6010C	3/1/16 3:55	bgm	P6C0005
Boron	BRL	mg/kg dry	32	0.51	1	*6010C	3/1/16 3:55	bgm	P6C0005
Cadmium	BRL	mg/kg dry	0.32	0.0069	1	*6010C	3/1/16 3:55	bgm	P6C0005
Chromium	13	mg/kg dry	0.32	0.044	1	*6010C	3/1/16 3:55	bgm	P6C0005
Cobalt	6.8	mg/kg dry	0.32	0.010	1	*6010C	3/1/16 3:55	bgm	P6C0005
Copper	22	mg/kg dry	0.65	0.11	1	*6010C	3/1/16 3:55	bgm	P6C0005
Lead	14	mg/kg dry	0.32	0.034	1	*6010C	3/1/16 3:55	bgm	P6C0005
Manganese	240 BH	mg/kg dry	0.32	0.059	1	*6010C	3/1/16 3:55	bgm	P6C0005
Molybdenum	BRL	mg/kg dry	0.65	0.028	1	*6010C	3/1/16 3:55	bgm	P6C0005
Nickel	5.3	mg/kg dry	0.65	0.061	1	*6010C	3/1/16 3:55	bgm	P6C0005
Selenium	BRL	mg/kg dry	0.65	0.047	1	*6010C	3/1/16 3:55	bgm	P6C0005
Silver	BRL	mg/kg dry	0.32	0.0053	1	*6010C	3/1/16 3:55	bgm	P6C0005
Strontium	36	mg/kg dry	0.32	0.0079	1	*6010C	3/1/16 3:55	bgm	P6C0005
Thallium	BRL	mg/kg dry	0.65	0.047	1	*6010C	3/1/16 3:55	bgm	P6C0005
Vanadium	41	mg/kg dry	0.32	0.011	1	*6010C	3/1/16 3:55	bgm	P6C0005
Zinc	28	mg/kg dry	3.2	0.039	1	*6010C	3/1/16 3:55	bgm	P6C0005



Falcon Engineering
 Attn: Chris Burkhardt
 1210 Trinity Road #110
 Raleigh, NC 27607

Project: TOCH Pd
 Project No.: TOCH Pd
 Sample Matrix: Solid

Client Sample ID: SS4
 Prism Sample ID: 6020362-11
 Prism Work Order: 6020362
 Time Collected: 02/18/16 11:02
 Time Submitted: 02/19/16 15:25

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
General Chemistry Parameters									
% Solids	79.2	% by Weight	0.100	0.100	1	*SM2540 G	2/23/16 14:40	JLR	P6B0415
Total Metals									
Mercury	0.061	mg/kg dry	0.026	0.0017	1	*7471B	2/25/16 9:37	JAB	P6B0440
Antimony	BRL	mg/kg dry	0.32	0.050	1	*6010C	3/1/16 4:03	bgm	P6C0005
Arsenic	8.5	mg/kg dry	0.32	0.071	1	*6010C	3/1/16 4:03	bgm	P6C0005
Barium	380	mg/kg dry	0.64	0.34	1	*6010C	3/1/16 4:03	bgm	P6C0005
Beryllium	1.2	mg/kg dry	0.32	0.011	1	*6010C	3/1/16 4:03	bgm	P6C0005
Boron	BRL	mg/kg dry	32	0.51	1	*6010C	3/1/16 4:03	bgm	P6C0005
Cadmium	BRL	mg/kg dry	0.32	0.0068	1	*6010C	3/1/16 4:03	bgm	P6C0005
Chromium	22	mg/kg dry	0.32	0.043	1	*6010C	3/1/16 4:03	bgm	P6C0005
Cobalt	12	mg/kg dry	0.32	0.0099	1	*6010C	3/1/16 4:03	bgm	P6C0005
Copper	29	mg/kg dry	0.64	0.11	1	*6010C	3/1/16 4:03	bgm	P6C0005
Lead	25	mg/kg dry	0.32	0.034	1	*6010C	3/1/16 4:03	bgm	P6C0005
Manganese	910 BH	mg/kg dry	0.32	0.058	1	*6010C	3/1/16 4:03	bgm	P6C0005
Molybdenum	BRL	mg/kg dry	0.64	0.028	1	*6010C	3/1/16 4:03	bgm	P6C0005
Nickel	12	mg/kg dry	0.64	0.060	1	*6010C	3/1/16 4:03	bgm	P6C0005
Selenium	BRL	mg/kg dry	0.64	0.046	1	*6010C	3/1/16 4:03	bgm	P6C0005
Silver	BRL	mg/kg dry	0.32	0.0052	1	*6010C	3/1/16 4:03	bgm	P6C0005
Strontium	51	mg/kg dry	0.32	0.0078	1	*6010C	3/1/16 4:03	bgm	P6C0005
Thallium	BRL	mg/kg dry	0.64	0.046	1	*6010C	3/1/16 4:03	bgm	P6C0005
Vanadium	54	mg/kg dry	0.32	0.011	1	*6010C	3/1/16 4:03	bgm	P6C0005
Zinc	51	mg/kg dry	3.2	0.039	1	*6010C	3/1/16 4:03	bgm	P6C0005



Falcon Engineering
 Attn: Chris Burkhardt
 1210 Trinity Road #110
 Raleigh, NC 27607

Project: TOCH Pd
 Project No.: TOCH Pd
 Sample Matrix: Solid

Client Sample ID: SS5
 Prism Sample ID: 6020362-12
 Prism Work Order: 6020362
 Time Collected: 02/18/16 11:02
 Time Submitted: 02/19/16 15:25

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
General Chemistry Parameters									
% Solids	77.1	% by Weight	0.100	0.100	1	*SM2540 G	2/23/16 14:40	JLR	P6B0415
Total Metals									
Mercury	0.091	mg/kg dry	0.024	0.0016	1	*7471B	2/25/16 9:41	JAB	P6B0440
Antimony	BRL	mg/kg dry	0.33	0.051	1	*6010C	3/1/16 4:12	bgm	P6C0005
Arsenic	4.8	mg/kg dry	0.33	0.072	1	*6010C	3/1/16 4:12	bgm	P6C0005
Barium	130	mg/kg dry	0.65	0.35	1	*6010C	3/1/16 4:12	bgm	P6C0005
Beryllium	0.89	mg/kg dry	0.33	0.011	1	*6010C	3/1/16 4:12	bgm	P6C0005
Boron	BRL	mg/kg dry	33	0.52	1	*6010C	3/1/16 4:12	bgm	P6C0005
Cadmium	BRL	mg/kg dry	0.33	0.0069	1	*6010C	3/1/16 4:12	bgm	P6C0005
Chromium	17	mg/kg dry	0.33	0.044	1	*6010C	3/1/16 4:12	bgm	P6C0005
Cobalt	9.4	mg/kg dry	0.33	0.010	1	*6010C	3/1/16 4:12	bgm	P6C0005
Copper	25	mg/kg dry	0.65	0.11	1	*6010C	3/1/16 4:12	bgm	P6C0005
Lead	27	mg/kg dry	0.33	0.034	1	*6010C	3/1/16 4:12	bgm	P6C0005
Manganese	460 BH	mg/kg dry	0.33	0.060	1	*6010C	3/1/16 4:12	bgm	P6C0005
Molybdenum	BRL	mg/kg dry	0.65	0.028	1	*6010C	3/1/16 4:12	bgm	P6C0005
Nickel	7.9	mg/kg dry	0.65	0.061	1	*6010C	3/1/16 4:12	bgm	P6C0005
Selenium	BRL	mg/kg dry	0.65	0.047	1	*6010C	3/1/16 4:12	bgm	P6C0005
Silver	BRL	mg/kg dry	0.33	0.0053	1	*6010C	3/1/16 4:12	bgm	P6C0005
Strontium	43	mg/kg dry	0.33	0.0080	1	*6010C	3/1/16 4:12	bgm	P6C0005
Thallium	BRL	mg/kg dry	0.65	0.047	1	*6010C	3/1/16 4:12	bgm	P6C0005
Vanadium	47	mg/kg dry	0.33	0.011	1	*6010C	3/1/16 4:12	bgm	P6C0005
Zinc	48	mg/kg dry	3.3	0.040	1	*6010C	3/1/16 4:12	bgm	P6C0005



Falcon Engineering
Attn: Chris Burkhardt
1210 Trinity Road #110
Raleigh, NC 27607

Project: TOCH Pd
Project No.: TOCH Pd
Sample Matrix: Solid

Client Sample ID: SS6
Prism Sample ID: 6020362-13
Prism Work Order: 6020362
Time Collected: 02/18/16 11:02
Time Submitted: 02/19/16 15:25

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
General Chemistry Parameters									
% Solids	86.6	% by Weight	0.100	0.100	1	*SM2540 G	2/23/16 14:40	JLR	P6B0415
Total Metals									
Mercury	0.038	mg/kg dry	0.025	0.0016	1	*7471B	2/25/16 9:46	JAB	P6B0440
Antimony	BRL	mg/kg dry	0.28	0.044	1	*6010C	3/1/16 4:21	bgm	P6C0005
Arsenic	3.1	mg/kg dry	0.28	0.062	1	*6010C	3/1/16 4:21	bgm	P6C0005
Barium	82	mg/kg dry	0.56	0.30	1	*6010C	3/1/16 4:21	bgm	P6C0005
Beryllium	0.70	mg/kg dry	0.28	0.0095	1	*6010C	3/1/16 4:21	bgm	P6C0005
Boron	BRL	mg/kg dry	28	0.45	1	*6010C	3/1/16 4:21	bgm	P6C0005
Cadmium	BRL	mg/kg dry	0.28	0.0060	1	*6010C	3/1/16 4:21	bgm	P6C0005
Chromium	35	mg/kg dry	0.28	0.038	1	*6010C	3/1/16 4:21	bgm	P6C0005
Cobalt	7.6	mg/kg dry	0.28	0.0088	1	*6010C	3/1/16 4:21	bgm	P6C0005
Copper	23	mg/kg dry	0.56	0.098	1	*6010C	3/1/16 4:21	bgm	P6C0005
Lead	17	mg/kg dry	0.28	0.030	1	*6010C	3/1/16 4:21	bgm	P6C0005
Manganese	410 BH	mg/kg dry	0.28	0.052	1	*6010C	3/1/16 4:21	bgm	P6C0005
Molybdenum	BRL	mg/kg dry	0.56	0.024	1	*6010C	3/1/16 4:21	bgm	P6C0005
Nickel	6.5	mg/kg dry	0.56	0.053	1	*6010C	3/1/16 4:21	bgm	P6C0005
Selenium	BRL	mg/kg dry	0.56	0.041	1	*6010C	3/1/16 4:21	bgm	P6C0005
Silver	BRL	mg/kg dry	0.28	0.0046	1	*6010C	3/1/16 4:21	bgm	P6C0005
Strontium	25	mg/kg dry	0.28	0.0069	1	*6010C	3/1/16 4:21	bgm	P6C0005
Thallium	BRL	mg/kg dry	0.56	0.041	1	*6010C	3/1/16 4:21	bgm	P6C0005
Vanadium	45	mg/kg dry	0.28	0.0095	1	*6010C	3/1/16 4:21	bgm	P6C0005
Zinc	43	mg/kg dry	2.8	0.034	1	*6010C	3/1/16 4:21	bgm	P6C0005



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Attn: Chris Burkhardt
1210 Trinity Road #110
Raleigh, NC 27607

Project: TOCH Pd
Project No.: TOCH Pd
Sample Matrix: Solid

Client Sample ID: SS7
Prism Sample ID: 6020362-14
Prism Work Order: 6020362
Time Collected: 02/18/16 11:02
Time Submitted: 02/19/16 15:25

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
General Chemistry Parameters									
% Solids	88.6	% by Weight	0.100	0.100	1	*SM2540 G	2/23/16 14:40	JLR	P6B0415
Total Metals									
Mercury	0.038	mg/kg dry	0.021	0.0014	1	*7471B	2/25/16 9:51	JAB	P6B0440
Antimony	BRL	mg/kg dry	0.28	0.044	1	*6010C	3/1/16 4:30	bgm	P6C0005
Arsenic	3.1	mg/kg dry	0.28	0.062	1	*6010C	3/1/16 4:30	bgm	P6C0005
Barium	84	mg/kg dry	0.56	0.30	1	*6010C	3/1/16 4:30	bgm	P6C0005
Beryllium	0.60	mg/kg dry	0.28	0.0094	1	*6010C	3/1/16 4:30	bgm	P6C0005
Boron	BRL	mg/kg dry	28	0.45	1	*6010C	3/1/16 4:30	bgm	P6C0005
Cadmium	BRL	mg/kg dry	0.28	0.0060	1	*6010C	3/1/16 4:30	bgm	P6C0005
Chromium	14	mg/kg dry	0.28	0.038	1	*6010C	3/1/16 4:30	bgm	P6C0005
Cobalt	6.9	mg/kg dry	0.28	0.0088	1	*6010C	3/1/16 4:30	bgm	P6C0005
Copper	15	mg/kg dry	0.56	0.098	1	*6010C	3/1/16 4:30	bgm	P6C0005
Lead	13	mg/kg dry	0.28	0.030	1	*6010C	3/1/16 4:30	bgm	P6C0005
Manganese	500 BH	mg/kg dry	0.28	0.051	1	*6010C	3/1/16 4:30	bgm	P6C0005
Molybdenum	BRL	mg/kg dry	0.56	0.024	1	*6010C	3/1/16 4:30	bgm	P6C0005
Nickel	5.9	mg/kg dry	0.56	0.053	1	*6010C	3/1/16 4:30	bgm	P6C0005
Selenium	BRL	mg/kg dry	0.56	0.041	1	*6010C	3/1/16 4:30	bgm	P6C0005
Silver	BRL	mg/kg dry	0.28	0.0046	1	*6010C	3/1/16 4:30	bgm	P6C0005
Strontium	31	mg/kg dry	0.28	0.0068	1	*6010C	3/1/16 4:30	bgm	P6C0005
Thallium	BRL	mg/kg dry	0.56	0.041	1	*6010C	3/1/16 4:30	bgm	P6C0005
Vanadium	37	mg/kg dry	0.28	0.0094	1	*6010C	3/1/16 4:30	bgm	P6C0005
Zinc	37	mg/kg dry	2.8	0.034	1	*6010C	3/1/16 4:30	bgm	P6C0005



Falcon Engineering
Attn: Chris Burkhardt
1210 Trinity Road #110
Raleigh, NC 27607

Project: TOCH Pd
Project No: TOCH Pd

Prism Work Order: 6020362
Time Submitted: 2/19/2016 3:25:00PM

Total Metals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P6B0408 - 3010A

Blank (P6B0408-BLK1)

Prepared: 02/23/16 Analyzed: 02/27/16

Antimony	BRL	0.0050	mg/L							
Arsenic	BRL	0.010	mg/L							
Barium	BRL	0.010	mg/L							
Beryllium	BRL	0.0020	mg/L							
Boron	BRL	0.50	mg/L							
Cadmium	BRL	0.0010	mg/L							
Chromium	BRL	0.0050	mg/L							
Cobalt	BRL	0.0050	mg/L							
Copper	BRL	0.010	mg/L							
Lead	BRL	0.0050	mg/L							
Manganese	BRL	0.010	mg/L							
Molybdenum	BRL	0.010	mg/L							
Nickel	BRL	0.010	mg/L							
Selenium	BRL	0.020	mg/L							
Silver	BRL	0.0050	mg/L							
Strontium	BRL	0.010	mg/L							
Thallium	BRL	0.010	mg/L							
Vanadium	BRL	0.0050	mg/L							
Zinc	BRL	0.030	mg/L							

LCS (P6B0408-BS1)

Prepared: 02/23/16 Analyzed: 02/27/16

Antimony	0.259	0.0050	mg/L	0.2500		104	80-120			
Arsenic	0.266	0.010	mg/L	0.2500		106	80-120			
Barium	0.267	0.010	mg/L	0.2500		107	80-120			
Beryllium	0.266	0.0020	mg/L	0.2500		107	80-120			
Boron	5.28	0.50	mg/L	5.000		106	80-120			
Cadmium	0.277	0.0010	mg/L	0.2500		111	80-120			
Chromium	0.272	0.0050	mg/L	0.2500		109	80-120			
Cobalt	0.266	0.0050	mg/L	0.2500		107	80-120			
Copper	0.268	0.010	mg/L	0.2500		107	80-120			
Lead	0.276	0.0050	mg/L	0.2500		110	80-120			
Manganese	0.267	0.010	mg/L	0.2500		107	80-120			
Molybdenum	0.268	0.010	mg/L	0.2500		107	80-120			
Nickel	0.269	0.010	mg/L	0.2500		107	80-120			
Selenium	0.272	0.020	mg/L	0.2500		109	80-120			
Silver	0.107	0.0050	mg/L	0.1000		107	80-120			
Strontium	0.244	0.010	mg/L	0.2500		97	80-120			
Thallium	0.268	0.010	mg/L	0.2500		107	80-120			
Vanadium	0.274	0.0050	mg/L	0.2500		109	80-120			
Zinc	0.262	0.030	mg/L	0.2500		105	80-120			

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Attn: Chris Burkhardt
1210 Trinity Road #110
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Project: TOCH Pd
Project No: TOCH Pd

Prism Work Order: 6020362
Time Submitted: 2/19/2016 3:25:00PM

Total Metals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P6B0408 - 3010A

Matrix Spike (P6B0408-MS1)	Source: 6020362-01			Prepared: 02/23/16		Analyzed: 02/27/16				
Antimony	0.261	0.0050	mg/L	0.2500	0.00107	104	75-125			
Arsenic	0.270	0.010	mg/L	0.2500	BRL	108	75-125			
Barium	0.347	0.010	mg/L	0.2500	0.0893	103	75-125			
Beryllium	0.262	0.0020	mg/L	0.2500	0.000319	105	75-125			
Boron	5.86	0.50	mg/L	5.000	0.462	108	75-125			
Cadmium	0.263	0.0010	mg/L	0.2500	BRL	105	75-125			
Chromium	0.260	0.0050	mg/L	0.2500	0.00186	103	75-125			
Cobalt	0.249	0.0050	mg/L	0.2500	BRL	99	75-125			
Copper	0.267	0.010	mg/L	0.2500	0.00653	104	75-125			
Lead	0.262	0.0050	mg/L	0.2500	0.00150	104	75-125			
Manganese	0.261	0.010	mg/L	0.2500	0.00903	101	75-125			
Molybdenum	0.264	0.010	mg/L	0.2500	BRL	106	75-125			
Nickel	0.249	0.010	mg/L	0.2500	0.000819	99	75-125			
Selenium	0.293	0.020	mg/L	0.2500	0.0231	108	75-125			
Silver	0.102	0.0050	mg/L	0.1000	BRL	102	75-125			
Strontium	2.64	0.010	mg/L	0.2500	2.41	92	75-125			
Thallium	0.260	0.010	mg/L	0.2500	0.00326	103	75-125			
Vanadium	0.269	0.0050	mg/L	0.2500	0.00106	107	75-125			
Zinc	0.251	0.030	mg/L	0.2500	0.00552	98	75-125			

Matrix Spike Dup (P6B0408-MSD1)	Source: 6020362-01			Prepared: 02/23/16		Analyzed: 02/27/16				
Antimony	0.265	0.0050	mg/L	0.2500	0.00107	105	75-125	1	20	
Arsenic	0.272	0.010	mg/L	0.2500	BRL	109	75-125	0.9	20	
Barium	0.348	0.010	mg/L	0.2500	0.0893	103	75-125	0.4	20	
Beryllium	0.264	0.0020	mg/L	0.2500	0.000319	105	75-125	0.6	20	
Boron	5.90	0.50	mg/L	5.000	0.462	109	75-125	0.7	20	
Cadmium	0.264	0.0010	mg/L	0.2500	BRL	106	75-125	0.6	20	
Chromium	0.262	0.0050	mg/L	0.2500	0.00186	104	75-125	0.7	20	
Cobalt	0.251	0.0050	mg/L	0.2500	BRL	100	75-125	0.9	20	
Copper	0.269	0.010	mg/L	0.2500	0.00653	105	75-125	0.5	20	
Lead	0.266	0.0050	mg/L	0.2500	0.00150	106	75-125	1	20	
Manganese	0.266	0.010	mg/L	0.2500	0.00903	103	75-125	2	20	
Molybdenum	0.267	0.010	mg/L	0.2500	BRL	107	75-125	1	20	
Nickel	0.251	0.010	mg/L	0.2500	0.000819	100	75-125	1	20	
Selenium	0.297	0.020	mg/L	0.2500	0.0231	109	75-125	1	20	
Silver	0.103	0.0050	mg/L	0.1000	BRL	103	75-125	0.4	20	
Strontium	2.66	0.010	mg/L	0.2500	2.41	99	75-125	0.7	20	
Thallium	0.265	0.010	mg/L	0.2500	0.00326	105	75-125	2	20	
Vanadium	0.270	0.0050	mg/L	0.2500	0.00106	108	75-125	0.6	20	
Zinc	0.252	0.030	mg/L	0.2500	0.00552	99	75-125	0.6	20	

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Falcon Engineering
Attn: Chris Burkhardt
1210 Trinity Road #110
Raleigh, NC 27607

Project: TOCH Pd
Project No: TOCH Pd

Prism Work Order: 6020362
Time Submitted: 2/19/2016 3:25:00PM

Total Metals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
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Batch P6B0412 - 245.1

Blank (P6B0412-BLK1)				Prepared & Analyzed: 02/23/16						
Mercury	BRL	0.00020	mg/L							
LCS (P6B0412-BS1)				Prepared & Analyzed: 02/23/16						
Mercury	0.00922	0.00020	mg/L	0.009375		98	85-115			
Matrix Spike (P6B0412-MS1)				Source: 6020362-01		Prepared & Analyzed: 02/23/16				
Mercury	0.00967	0.00020	mg/L	0.009375	BRL	103	70-130			
Matrix Spike Dup (P6B0412-MSD1)				Source: 6020362-01		Prepared & Analyzed: 02/23/16				
Mercury	0.00946	0.00020	mg/L	0.009375	BRL	101	70-130	2	20	

Batch P6B0440 - 7471B

Blank (P6B0440-BLK1)				Prepared: 02/24/16 Analyzed: 02/25/16						
Mercury	BRL	0.020	mg/kg wet							
LCS (P6B0440-BS1)				Prepared: 02/24/16 Analyzed: 02/25/16						
Mercury	0.459	0.020	mg/kg wet	0.4167		110	80-120			
Matrix Spike (P6B0440-MS1)				Source: 6020362-07		Prepared: 02/24/16 Analyzed: 02/25/16				
Mercury	0.708	0.031	mg/kg dry	0.6499	0.0516	101	80-120			
Matrix Spike Dup (P6B0440-MSD1)				Source: 6020362-07		Prepared: 02/24/16 Analyzed: 02/25/16				
Mercury	0.754	0.033	mg/kg dry	0.6940	0.0516	101	80-120	6	20	

Batch P6C0005 - 3050B

Blank (P6C0005-BLK1)				Prepared: 02/23/16 Analyzed: 03/01/16						
Antimony	BRL	0.25	mg/kg wet							
Arsenic	BRL	0.25	mg/kg wet							
Barium	BRL	0.50	mg/kg wet							
Beryllium	BRL	0.25	mg/kg wet							
Boron	BRL	25	mg/kg wet							
Cadmium	BRL	0.25	mg/kg wet							
Chromium	BRL	0.25	mg/kg wet							
Cobalt	BRL	0.25	mg/kg wet							
Copper	BRL	0.50	mg/kg wet							
Lead	BRL	0.25	mg/kg wet							
Manganese	BRL	0.25	mg/kg wet							BH
Molybdenum	BRL	0.50	mg/kg wet							
Nickel	BRL	0.50	mg/kg wet							
Selenium	BRL	0.50	mg/kg wet							
Silver	BRL	0.25	mg/kg wet							
Strontium	BRL	0.25	mg/kg wet							
Thallium	BRL	0.50	mg/kg wet							
Vanadium	BRL	0.25	mg/kg wet							
Zinc	BRL	2.5	mg/kg wet							

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Falcon Engineering
Attn: Chris Burkhardt
1210 Trinity Road #110
Raleigh, NC 27607

Project: TOCH Pd
Project No: TOCH Pd

Prism Work Order: 6020362
Time Submitted: 2/19/2016 3:25:00PM

Total Metals - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch P6C0005 - 3050B										
LCS (P6C0005-BS1)										
				Prepared: 02/23/16 Analyzed: 03/01/16						
Antimony	22.9	0.25	mg/kg wet	25.00		92	80-120			
Arsenic	23.4	0.25	mg/kg wet	25.00		94	80-120			
Barium	24.5	0.50	mg/kg wet	25.00		98	80-120			
Beryllium	24.5	0.25	mg/kg wet	25.00		98	80-120			
Boron	470	25	mg/kg wet	500.0		94	80-120			
Cadmium	24.6	0.25	mg/kg wet	25.00		98	80-120			
Chromium	24.5	0.25	mg/kg wet	25.00		98	80-120			
Cobalt	24.1	0.25	mg/kg wet	25.00		96	80-120			
Copper	24.7	0.50	mg/kg wet	25.00		99	80-120			
Lead	24.1	0.25	mg/kg wet	25.00		97	80-120			
Manganese	24.4	0.25	mg/kg wet	25.00		98	80-120			
Molybdenum	24.5	0.50	mg/kg wet	25.00		98	80-120			
Nickel	24.0	0.50	mg/kg wet	25.00		96	80-120			
Selenium	23.2	0.50	mg/kg wet	25.00		93	80-120			
Silver	9.45	0.25	mg/kg wet	10.00		94	80-120			
Strontium	23.5	0.25	mg/kg wet	25.00		94	80-120			
Thallium	23.4	0.50	mg/kg wet	25.00		93	80-120			
Vanadium	25.1	0.25	mg/kg wet	25.00		100	80-120			
Zinc	24.8	2.5	mg/kg wet	25.00		99	80-120			



Falcon Engineering
Attn: Chris Burkhardt
1210 Trinity Road #110
Raleigh, NC 27607

Project: TOCH Pd
Project No: TOCH Pd

Prism Work Order: 6020362
Time Submitted: 2/19/2016 3:25:00PM

General Chemistry Parameters - Quality Control

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
---------	--------	-----------------	-------	-------------	---------------	------	-------------	-----	-----------	-------

Batch P6B0415 - Solids, Dry Weight

Blank (P6B0415-BLK1)

Prepared & Analyzed: 02/23/16

% Solids	100	0.100	% by Weight							
----------	-----	-------	-------------	--	--	--	--	--	--	--

Sample Extraction Data

Prep Method: Solids, Dry Weight

Lab Number	Batch	Initial	Final	Date/Time
6020362-07	P6B0415	30 g	30 g	02/23/16 14:40
6020362-08	P6B0415	30 g	30 g	02/23/16 14:40
6020362-09	P6B0415	30 g	30 g	02/23/16 14:40
6020362-10	P6B0415	30 g	30 g	02/23/16 14:40
6020362-11	P6B0415	30 g	30 g	02/23/16 14:40
6020362-12	P6B0415	30 g	30 g	02/23/16 14:40
6020362-13	P6B0415	30 g	30 g	02/23/16 14:40
6020362-14	P6B0415	30 g	30 g	02/23/16 14:40

Prep Method: 245.1

Lab Number	Batch	Initial	Final	Date/Time
6020362-01	P6B0412	20 mL	30 mL	02/23/16 9:10
6020362-02	P6B0412	20 mL	30 mL	02/23/16 9:10
6020362-03	P6B0412	20 mL	30 mL	02/23/16 9:10
6020362-04	P6B0412	20 mL	30 mL	02/23/16 9:10
6020362-05	P6B0412	20 mL	30 mL	02/23/16 9:10
6020362-06	P6B0412	20 mL	30 mL	02/23/16 9:10

Prep Method: 3010A

Lab Number	Batch	Initial	Final	Date/Time
6020362-01	P6B0408	50 mL	50 mL	02/23/16 7:55
6020362-01	P6B0408	50 mL	50 mL	02/23/16 7:55
6020362-02	P6B0408	50 mL	50 mL	02/23/16 7:55
6020362-02	P6B0408	50 mL	50 mL	02/23/16 7:55
6020362-03	P6B0408	50 mL	50 mL	02/23/16 7:55
6020362-03	P6B0408	50 mL	50 mL	02/23/16 7:55
6020362-04	P6B0408	50 mL	50 mL	02/23/16 7:55
6020362-04	P6B0408	50 mL	50 mL	02/23/16 7:55
6020362-05	P6B0408	50 mL	50 mL	02/23/16 7:55
6020362-05	P6B0408	50 mL	50 mL	02/23/16 7:55
6020362-06	P6B0408	50 mL	50 mL	02/23/16 7:55
6020362-06	P6B0408	50 mL	50 mL	02/23/16 7:55

Prep Method: 3050B

Lab Number	Batch	Initial	Final	Date/Time
6020362-07	P6C0005	2.04 g	50 mL	02/23/16 8:35
6020362-08	P6C0005	2.01 g	50 mL	02/23/16 8:35
6020362-09	P6C0005	1.98 g	50 mL	02/23/16 8:35
6020362-10	P6C0005	2.04 g	50 mL	02/23/16 8:35
6020362-11	P6C0005	1.98 g	50 mL	02/23/16 8:35
6020362-12	P6C0005	1.99 g	50 mL	02/23/16 8:35
6020362-13	P6C0005	2.05 g	50 mL	02/23/16 8:35
6020362-14	P6C0005	2.01 g	50 mL	02/23/16 8:35

Prep Method: 7471B

Lab Number	Batch	Initial	Final	Date/Time
6020362-07	P6B0440	0.6 g	50 mL	02/24/16 9:26
6020362-08	P6B0440	0.58 g	50 mL	02/24/16 9:26
6020362-09	P6B0440	0.6 g	50 mL	02/24/16 9:26
6020362-10	P6B0440	0.59 g	50 mL	02/24/16 9:26
6020362-11	P6B0440	0.59 g	50 mL	02/24/16 9:26
6020362-12	P6B0440	0.64 g	50 mL	02/24/16 9:26
6020362-13	P6B0440	0.55 g	50 mL	02/24/16 9:26

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Sample Extraction Data

Prep Method: 7471B

Lab Number	Batch	Initial	Final	Date/Time
6020362-14	P6B0440	0.63 g	50 mL	02/24/16 9:26

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449 Springbrook Road - P.O. Box 240543 - Charlotte, NC 28224-0543
Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409



Full-Service Analytical & Environmental Solutions

449 Springbrook Road • Charlotte, NC 28217
Phone 704/529-6364 • Fax: 704/525-0409

Client Company Name: FALCON

Report To/Contact Name: CHRISTOPHER BURKHARDT
Reporting Address: 1210 TRINITY RD
RAJ NC 27609

Phone: 919 230064 Fax (Yes) (No)?
Email Address: cburkhardt@falconengineers.com
EDD Type: PDF Excel Other
Site Location Name: TOUCH RD / COAL ASH 1
Site Location Physical Address: MIK Blvd C.R.L.

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING:

Project Name: TOUCH RD
Short Hold Analysis: (Yes) (No) (NO) **UST Project: (Yes) (NO) (NO)**
*Please ATTACH any project specific reporting (QC LEVEL I II III IV) provisions and/or QC Requirements
Invoice To: Same
Address:

Purchase Order No./Billing Reference
Requested Due Date 1 Day 2 Days 3 Days 4 Days 5 Days
"Working Days" 6-9 Days Standard 10 days Pre-Approved
Samples received after 14:00 will be processed next business day.
Turnaround time is based on business days, excluding weekends and holidays.
(SEE REVERSE FOR TERMS & CONDITIONS REGARDING SERVICES RENDERED BY PRISM LABORATORIES, INC. TO CLIENT)

TO BE FILLED IN BY CLIENT/SAMPLING PERSONNEL
Certification: NELAC DoD FL NC
SC OTHER N/A
Water Chlorinated: YES NO
Sample Iced Upon Collection: YES NO

LAB USE ONLY
Samples INTACT upon arrival? YES NO N/A
Received ON WET ICE?
PROPER PRESERVATIVES indicated?
Received WITHIN HOLDING TIMES?
CUSTODY SEALS INTACT?
VOLATILES rec'd W/OUT HEADSPACE?
PROPER CONTAINERS used?
TEMP: Therm ID: DET-0 Observed: 4/18/16 2.9 °C

CLIENT DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER			PRESERVA-TIVES	ANALYSIS REQUESTED	REMARKS	PRISM LAB ID NO.
				*TYPE SEE BELOW	NO.	SIZE				
MW3A & DOP	2/17/16	1800	H ₂ O	P			WATER	Metals FITNESS Metals	2 samples (Dup) * per IAS, 90% PARALLEL	0102
MW4A	2/18/16	1400							PLEASE FILTER	03
MW4A FINE		1400							PLEASE FILTER	04
MW1		1630							PLEASE FILTER	05
MW1		1635							PLEASE FILTER	06
SSI, SSI, SSI		11:20							3 samples including one Dup	07-014

Sampler's Signature: Ch... Sampled By (Print Name) CHRISTOPHER BURKHARDT Affiliation FALCON
Received By (Signature): [Signature] Received By (Signature): [Signature]
Received By (Signature): [Signature] Received For Prism Laboratories By: [Signature]

Upon relinquishing, this Chain of Custody is your authorization for Prism to proceed with the analyses as requested above. Any changes must be submitted in writing to the Prism Project Manager. There will be charges for any changes after analyses have been initialized.

Additional Comments: 6070302

Site Arrival Time: 1630
Site Departure Time: 1140
Field Tech Fee: 1525
Mileage: 6070302

Method of Shipment: Fed Ex UPS Hand-delivered Prism Field Service Other

NPDES: NC SC NC SC IHW'S

GROUNDWATER: NC SC IHW'S

DRINKING WATER: NC SC

SOLID WASTE: NC SC

RCRA: NC SC

CERCLA: NC SC

LANDFILL: NC SC

OTHER: NC SC

*CONTAINER TYPE CODES: A = Amber C = Clear G = Glass P = Plastic; TL = Teflon-Lined Cap VOA = Volatile Organics Analysis (Zero Head Space)

SEE REVERSE FOR TERMS & CONDITIONS

ORIGINAL



Full-Service Analytical & Environmental Solutions

449 Springbrook Road • Charlotte, NC 28217
Phone 704/529-6364 • Fax: 704/525-0409

Client Company Name: FALCON
Report To/Contact Name: CHRISTOPHER BURKHARDT
Reporting Address: 1310 TRIMPT LK
FA NC 27609
Phone: 919 7300064 Fax (Yes) (No):
Email Address: Churbkhardt@FalconOrganics.com
EDD Type: PDF Excel Other
Site Location Name: TOUCH R / CAL 451
Site Location Physical Address: MIL Blvd. C.ri

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING:

Project Name: TOUCH R
Short Hold Analysis: (Yes) (No) UST Project: (Yes) (No)
*Please ATTACH any project specific reporting (QC LEVEL I II III IV) provisions and/or QC Requirements
Invoice To: Same
Address:

Purchase Order No./Billing Reference
Requested Due Date 1 Day 2 Days 3 Days 4 Days 5 Days
"Working Days" 6-9 Days Standard 10 days Pre-Approved
Samples received after 14:00 will be processed next business day.
Turnaround time is based on business days, excluding weekends and holidays.
(SEE REVERSE FOR TERMS & CONDITIONS REGARDING SERVICES RENDERED BY PRISM LABORATORIES, INC. TO CLIENT)

LAB USE ONLY

Samples INTACT upon arrival? YES NO N/A
 Received ON WET ICE? _____
 PROPER PRESERVATIVES indicated? _____
 Received WITHIN HOLDING TIMES? _____
 CUSTODY SEALS INTACT? _____
 VOLATILES rec'd W/OUT HEADSPACE? _____
 PROPER CONTAINERS used? _____
 TEMP: Therm ID: _____ Observed: _____ °C / Corr: _____ °C

TO BE FILLED IN BY CLIENT/SAMPLING PERSONNEL
Certification: NELAC DoD FL NC X
SC OTHER N/A
Water Chlorinated: YES NO X
Sample Iced Upon Collection: YES NO

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER		PRESERVATIVES	ANALYSIS REQUESTED	REMARKS	PRISM LAB ID NO.
				*TYPE SEE BELOW	NO. SIZE				
MW3A ADP	2/17/16	1800	H ₂ O	P		None		2 samples (DUP) * Receiving to 284940	
MW4A	2/18/16	1400				None		Plus Filter	
MW4A ADP		1630				None		Please Filter	
MW1		1635				None		8 samples (DUP) ON DUP	
MW1 CW		11:20							
SS151857									

Sampled By (Print Name) CHRISTOPHER BURKHARDT Affiliation FALCON
Samplyer's Signature [Signature]

Upon relinquishing, this Chain of Custody is your authorization for Prism to proceed with the analyses as requested above. Any changes must be submitted in writing to the Prism Project Manager. There will be charges for any changes after analyses have been initialized.

Relinquished By: (Signature) [Signature] Received By: (Signature) [Signature] Date 2-18-16 Military/Hours 1630
 Relinquished By: (Signature) [Signature] Received By: (Signature) [Signature] Date _____
 Relinquished By: (Signature) [Signature] Received For Prism Laboratories By: _____ Date _____

Method of Shipment: NOTE: ALL SAMPLE COOLERS SHOULD BE TAPED SHUT WITH CUSTODY SEALS FOR TRANSPORTATION TO THE LABORATORY. SAMPLES ARE NOT ACCEPTED AND VERIFIED AGAINST COC UNTIL RECEIVED AT THE LABORATORY.
 Fed Ex UPS Hand-delivered Prism Field Service Other

NPDES: NC SC NC SC NC SC NC SC NC SC
 GROUNDWATER: GWH THW
 DRINKING WATER: NC SC NC SC
 SOLID WASTE: NC SC NC SC
 RCRA: NC SC NC SC
 CERCLA: NC SC NC SC
 LANDFILL: NC SC NC SC
 OTHER: NC SC

*CONTAINER TYPE CODES: A = Amber C = Clear G = Glass P = Plastic; TL = Teflon-Lined Cap VOA = Volatile Organics Analysis (Zero Head Space)

Additional Comments:

PRISM USE ONLY

Site Arrival Time: _____
 Site Departure Time: _____
 Field Tech Fee: _____
 Mileage: _____

SEE REVERSE FOR TERMS & CONDITIONS





APPENDIX E
SUPPORTING DOCUMENTATION



List of Acronyms

2L Standard	North Carolina Department of Environmental Quality 15A NCAC Subchapter 2L Groundwater Classification and Standards
AMSL	Above Mean Seal Level
BGS	Below Ground Surface
BRL	Below Reporting Limits
CCPs	Coal Combustion Products
COC	Constituent of Concern
DEQ	North Carolina Department of Environmental Quality
DRO	Diesel Range Organics
EPA Document	Environmental Protection Agencies' Science & Ecosystem Support Division Groundwater Sampling Procedure document dated March 6, 2013
ESA	Environmental Site Assessment
ESC	Environmental Site Characterization
Falcon	Falcon Engineering
GP	Geoprobe
Guidelines	October 2015 Inactive Hazardous Sites Program's Guidelines for Assessment and Cleanup
GW	Groundwater
mg/kg	Milligrams per kilogram
MW1	Monitoring Well Number 1
N/A	Not Applicable
No.	Number
NS	Not Sampled
NPDWRs	National Primary Drinking Water Regulations
NTU	Nephelometric Turbidity Units
PSRG	Preliminary Soil Remediation Goals
QA/QC	Quality Control and Quality Assurance
S4, SS4	Soil Sample Identification
µg/l	Micrograms per Liter
WLM	Water Level Meter

References

- October 2015 Inactive Hazardous Sites Program's Guidelines for Assessment and Cleanup
 - <https://ncdenr.s3.amazonaws.com/s3fs-public/Waste%20Management/DWM/SF/IHS/guidance/IHSB%20GUIDANCE%20Assessment%20and%20Remediation%20saved%202-9-2016.pdf>
- Orange County N.C. GIS
 - <http://server2.co.orange.nc.us/OrangeNCGIS/default.aspx>
- NCAC 15A Subchapter 2L - Groundwater Classification and Standards
 - <http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2002%20-%20environmental%20management/subchapter%20I/subchapter%20I%20rules.pdf>
- NCAC 15A Subchapter 2C – Well Construction Standards
 - <http://www.wakegov.com/water/wells/Documents/State2CRules.pdf>
- Preliminary Soil Remediation Goals
 - <https://ncdenr.s3.amazonaws.com/s3fs-public/Waste%20Management/DWM/SF/IHS/guidance/SoilTable%20September%20202015.pdf>
- National Primary Drinking Water Regulations
 - <http://www.epa.gov/your-drinking-water/table-regulated-drinking-water-contaminants>
- Environmental Protection Agencies' Science and Ecosystem Support Division
Groundwater Sampling Procedure document dated March 6, 2013
 - <https://www.epa.gov/sites/production/files/2015-06/documents/Groundwater-Sampling.pdf>
- EPA Contaminant Candidate List
 - <http://www.epa.gov/ccl/contaminant-candidate-list-3-ccl-3>
- North Carolina DEQ, Division of Land Resources, NC Geological Survey Map Data
 - <https://mrdata.usgs.gov/geology/state/state.php?state=NC>
- Natural Resource and Conservation Service Orange County Soil Survey
 - <http://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>
- EPA Table of Regulated Drinking Water Contaminants
 - <http://www.epa.gov/your-drinking-water/table-regulated-drinking-water-contaminants#Inorganic>
- Maximum Soil Contamination Concentration Table
 - <https://ncdenr.s3.amazonaws.com/s3fs-public/Waste%20Management/DWM/UST/Corrective%20Action/Guidelines%20forSIRA%20tables%20Chng5%20112013.pdf>

Axon, Amy

From: Axon, Amy
Sent: Wednesday, January 13, 2016 9:07 AM
To: Christopher Burkhardt (cburkhardt@falconengineers.com)
Cc: Qi, Qu; Curtis Brooks (cbrooks@townofchapelhill.org) (cbrooks@townofchapelhill.org)
Subject: Revised List of Parameters for Chapel Hill PD Site
Attachments: Revised Sampling Parameter List for Chapel Hill.xlsx

Hi Chris:

As we discussed last week, the list of sample parameters for the Chapel Hill PD site has been revised. We have updated the list to target parameters that pose an environmental and/or human health risk and have a regulatory standard. Note that the list is specifically for laboratory analysis. All field parameters should be collected as required in our guidance.

Please see the attached list and contact me if you have any questions.

Thanks

Amy

Amy Axon
Hydrogeologist
DWM, Superfund Section
Department of Environmental Quality

919 707 8371 office
amy.axon@ncdenr.gov

217 West Jones Street
1646 Mail Service Center
Raleigh, NC 27699



Email correspondence to and from this address is subject to the North Carolina Public Records Law and may be disclosed to third parties.

Parameter	All Media
Antimony	X
Arsenic	X
Barium	X
Beryllium	X
Boron	X
Cadmium	X
Cobalt	X
Chromium (total)	X
Copper	X
Lead	X
Manganese	X
Molybdenum	X
Mercury	X
Nickel	X
Selenium	X
Silver	X
Strontium	X
Thallium	X
Vanadium	X
Zinc	X



NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2986-A

1. WELL CONTRACTOR:

Landa M. Shaver
 Well Contractor (Individual) Name
American Environmental Drilling, Inc.
 Well Contractor Company Name
324 Fields Drive, Suite C
 Street Address
Aberdeen NC 28315
 City or Town State Zip Code
(910)-944-3140
 Area code- Phone number

2. WELL INFORMATION:

WELL CONSTRUCTION PERMIT # MW #1
 OTHER ASSOCIATED PERMIT #(if applicable) _____
 SITE WELL ID #(if applicable) _____

3. WELL USE (Check Applicable Box) Monitoring Municipal/Public

Industrial/Commercial Agricultural Recovery Injection
 Irrigation Other (list use) _____

DATE DRILLED 4/29/2013

4. WELL LOCATION:

828 Martin Luther King Blvd. 27599
 (Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

CITY: Chapel Hill COUNTY Orange

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

Slope Valley Flat Ridge Other _____

LATITUDE 35° 55' 602 " DMS OR 3X.XXXXXXXXXX DD
 LONGITUDE 79° 03' 194 " DMS OR 7X.XXXXXXXXXX DD

Latitude/longitude source: GPS Topographic map (location of well must be shown on a USGS topo map and attached to this form if not using GPS)

5. FACILITY- is the name of the business where the well is located.

Chapel Hill Police Dept.
 Facility Name Facility ID #(if applicable) _____
828 Martin Luther King Blvd
 Street Address
Chapel Hill NC 27599
 City or Town State Zip Code

Contact Name _____

Mailing Address _____

City or Town State Zip Code _____

Area code - Phone number _____

6. WELL DETAILS:

a. TOTAL DEPTH: 40

b. DOES WELL REPLACE EXISTING WELL? YES NO

c. WATER LEVEL Below Top of Casing: _____ FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS -.06 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm) N/A METHOD OF TEST N/A

f. DISINFECTION: Type N/A Amount N/A

g. WATER ZONES (depth):
 Top 30 Bottom 40 Top _____ Bottom _____
 Top _____ Bottom _____ Top _____ Bottom _____
 Top _____ Bottom _____ Top _____ Bottom _____

7. CASING:		Depth	Diameter	Weight	Material
Top	<u>-.06</u>	Bottom	<u>30'</u>	<u>Ft. 2"</u>	<u>SCH40 PVC</u>
Top	_____	Bottom	_____	_____	_____
Top	_____	Bottom	_____	_____	_____

8. GROUT:		Depth	Material	Method
Top	<u>26'</u>	Bottom	<u>28'</u>	<u>Ft. Bentonite Tremie</u>
Top	<u>-.06</u>	Bottom	<u>26'</u>	<u>Ft. Portland Tremie</u>
Top	_____	Bottom	_____	_____

9. SCREEN:		Depth	Diameter	Slot Size	Material
Top	<u>30'</u>	Bottom	<u>40'</u>	<u>Ft. 2" in. .010 in.</u>	<u>PVC</u>
Top	_____	Bottom	_____	_____	_____
Top	_____	Bottom	_____	_____	_____

10. SAND/GRAVEL PACK:		Depth	Size	Material
Top	<u>28'</u>	Bottom	<u>40'</u>	<u>Ft. #3 Sand</u>
Top	_____	Bottom	_____	_____
Top	_____	Bottom	_____	_____

11. DRILLING LOG:

Top	Bottom	Formation Description
<u>0'</u>	<u>/ 5'</u>	<u>Top Soil</u>
<u>5'</u>	<u>/ 9'</u>	<u>Fill</u>
<u>9'</u>	<u>/ 40'</u>	<u>Black Ash</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

12. REMARKS

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Landa M. Shaver
 SIGNATURE OF CERTIFIED WELL CONTRACTOR

4/30/2013
DATE

Landa M. Shaver
 PRINTED NAME OF PERSON CONSTRUCTING THE WELL



NON RESIDENTIAL WELL CONSTRUCTION RECORD

North Carolina Department of Environment and Natural Resources- Division of Water Quality

MW-3

WELL CONTRACTOR CERTIFICATION # 2075

1. WELL CONTRACTOR:

Ronald Toothman

Well Contractor (Individual) Name
Trigon Exploration

Well Contractor Company Name
510 Industrial Ave

Street Address
510 Industrial Ave NC 27406
City or Town State Zip Code

(336) 553-1115
Area code Phone number

2. WELL INFORMATION:

WELL CONSTRUCTION PERMIT# N/A

OTHER ASSOCIATED PERMIT#(if applicable)

SITE WELL ID #(if applicable) MW-3

3. WELL USE (Check One Box) Monitoring Municipal/Public

Industrial/Commercial Agricultural Recovery Injection
Irrigation Other (list use)

DATE DRILLED 1-27-14

4. WELL LOCATION:

828 Martin Luther King Blvd 27599

(Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)

CITY: Chapel Hill COUNTY: Orange

TOPOGRAPHIC / LAND SETTING: (check appropriate box)

Slope Valley Flat Ridge Other

LATITUDE 35°59'46.12941"N " DMS OR 3X.XXXXXXXXXX DD

LONGITUDE 78°53'58.03641"W OR 7X.XXXXXXXXXX DD

Latitude/longitude source: GPS Topographic map
(location of well must be shown on a USGS topo map and attached to this form if not using GPS)

5. FACILITY (Name of the business where the well is located.)

Chapel Hill Police Department

Facility Name Facility ID# (if applicable)
828 Martin Luther King Blvd

Street Address
Chapel Hill NC 27599
City or Town State Zip Code

Contact Name

Mailing Address

City or Town State Zip Code

()
Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 11'

b. DOES WELL REPLACE EXISTING WELL? YES NO

c. WATER LEVEL Below Top of Casing: 6.4 FT.
(Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.5 FT. Above Land Surface*
*Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):
Top Bottom Top Bottom
Top Bottom Top Bottom
Top Bottom Top Bottom

7. CASING: Depth Diameter Thickness/ Weight Material
Top Bottom Ft. 2" SCH 40 PVC
Top Bottom Ft.
Top Bottom Ft.

8. GROUT: Depth Material Method
Top 0 Bottom 4 Ft. Sakrete Pour
Top Bottom Ft.
Top Bottom Ft.

9. SCREEN: Depth Diameter Slot Size Material
Top 6 Bottom 11 Ft. 2 in. .10 in. PVC
Top Bottom Ft. in. in.
Top Bottom Ft. in. in.

10. SAND/GRAVEL PACK: Depth Size Material
Top 4 Bottom 11 Ft. #2 Sand
Top Bottom Ft.
Top Bottom Ft.

11. DRILLING LOG		Formation Description
Top	Bottom	
0	0.3	Top soil and some top layer ash material
0.3	11	brown silty clay into weathered rock (streambed)

12. REMARKS:

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

SIGNATURE OF CERTIFIED WELL CONTRACTOR 1-27-14 DATE

PRINTED NAME OF PERSON CONSTRUCTING THE WELL



NON RESIDENTIAL WELL CONSTRUCTION RECORD

MW-4

North Carolina Department of Environment and Natural Resources- Division of Water Quality

WELL CONTRACTOR CERTIFICATION # 2075

1. WELL CONTRACTOR:

Ronald Toothman
 Well Contractor (Individual) Name
 Trigon Exploration
 Well Contractor Company Name
 510 Industrial Ave
 Street Address
 Greensboro NC 27406
 City or Town State Zip Code
 (336) 553 - 1115
 Area code Phone number

2. WELL INFORMATION:

WELL CONSTRUCTION PERMIT# N/A
 OTHER ASSOCIATED PERMIT#(if applicable)
 SITE WELL ID #(if applicable) MW-4

3. WELL USE (Check One Box) Monitoring Municipal/Public

Industrial/Commercial Agricultural Recovery Injection
 Irrigation Other (list use)

DATE DRILLED 1-27-14

4. WELL LOCATION:

828 Martin Luther King Blvd 27599
 (Street Name, Numbers, Community, Subdivision, Lot No., Parcel, Zip Code)
 CITY: Chapel Hill COUNTY: Orange
 TOPOGRAPHIC / LAND SETTING: (check appropriate box)
 Slope Valley Flat Ridge Other
 LATITUDE 35°59'46.12941"N " DMS OR 3X.XXXXXXXXXX DD
 LONGITUDE 78°53'58.03641"W " DMS OR 7X.XXXXXXXXXX DD
 Latitude/longitude source: GPS Topographic map
 (location of well must be shown on a USGS topo map and attached to this form if not using GPS)

5. FACILITY (Name of the business where the well is located.)

Chapel Hill Police Department
 Facility Name Facility ID# (if applicable)
 828 Martin Luther King Blvd
 Street Address
 Chapel Hill NC 27594
 City or Town State Zip Code
 Contact Name
 Mailing Address
 City or Town State Zip Code

()
 Area code Phone number

6. WELL DETAILS:

a. TOTAL DEPTH: 9'2"
 b. DOES WELL REPLACE EXISTING WELL? YES NO
 c. WATER LEVEL Below Top of Casing: 7.1 FT.
 (Use "+" if Above Top of Casing)

d. TOP OF CASING IS 2.5 FT. Above Land Surface*
 *Top of casing terminated at/or below land surface may require a variance in accordance with 15A NCAC 2C .0118.

e. YIELD (gpm): METHOD OF TEST

f. DISINFECTION: Type Amount

g. WATER ZONES (depth):
 Top Bottom Top Bottom
 Top Bottom Top Bottom
 Top Bottom Top Bottom

7. CASING:	Depth	Diameter	Thickness/Weight	Material
Top	4'2"	Bottom 9'2"	Ft. 2"	SCH 40 PVC
Top		Bottom	Ft.	
Top		Bottom	Ft.	

8. GROUT:	Depth	Material	Method
Top	0	Bottom 2'2"	Ft. Sakrete Pour
Top		Bottom	Ft.
Top		Bottom	Ft.

9. SCREEN:	Depth	Diameter	Slot Size	Material
Top	4'2"	Bottom 9'2"	Ft. 2" in. .10 in.	PVC
Top		Bottom	Ft. in. in.	
Top		Bottom	Ft. in. in.	

10. SAND/GRAVEL PACK:	Depth	Size	Material
Top	3'2"	Bottom 9'2"	Ft. #2 Sand
Top		Bottom	Ft.
Top		Bottom	Ft.

11. DRILLING LOG

Top	Bottom	Formation Description
0	0.5	Top soil and some top layer ash material
0.5	9.2	Light brown silty clay into weathered rock (stream-bed)

12. REMARKS:

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15A NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

1-27-14
 SIGNATURE OF CERTIFIED WELL CONTRACTOR DATE

Ronald Toothman
 PRINTED NAME OF PERSON CONSTRUCTING THE WELL

WELL ABANDONMENT RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

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

2077-A
NC Well Contractor Certification Number

TRIGON EXPLORATION
Company Name

2. Well Construction Permit #: N/A
List all applicable well permits (i.e. County, State, Variance, Injection, etc.) if known

3. Well use (check well use):

Water Supply Well:

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

Non-Water Supply Well:

- Monitoring
- Recovery

Injection Well:

- Aquifer Recharge
- Aquifer Storage and Recovery
- Aquifer Test
- Experimental Technology
- Geothermal (Closed Loop)
- Geothermal (Heating/Cooling Return)
- Groundwater Remediation
- Salinity Barrier
- Stormwater Drainage
- Subsidence Control
- Tracer
- Other (explain under 7g)

4. Date well(s) abandoned: 1-7-15

5a. Well location:

Town of Chapel Hill Facility/Owner Name
N/A Facility ID# (if applicable)
828 Martin Luther King Jr. Blvd Chapel Hill, NC Physical Address, City, and Zip
Orange County
27517 Parcel Identification No. (PIN)
9789413949

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

35°55'32.97" N 79°03'09.98" 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#: MVW3

6b. Total well depth: 11 (ft.)

6c. Borehole diameter: 8 (in.)

6d. Water level below ground surface: 4 (ft.)

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

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

6g. Screen length (if known): 5 (ft.)

For Internal Use ONLY:

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): _____ (gal.)

FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used: _____

7d. Amount of disinfectant used: _____

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

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

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

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

grout bentonite mix treated into well well cover remained pvc well pipe left in hole below ground surface

8. Certification:

[Signature] Signature of Certified Well Contractor or Well Owner
1-7-15 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 address(es) 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 ABANDONMENT RECORD

This form can be used for single or multiple wells

1. Well Contractor Information:

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

2077-A
NC Well Contractor Certification Number

TEIGON EXPLORATION
Company Name

2. Well Construction Permit #: N/A
List all applicable well permits (i.e. County, State, Variance, Injection, etc.) if known

3. Well use (check well use):

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

4. Date well(s) abandoned: 1-6-15

5a. Well location:

Town of Chapel Hill Facility/Owner Name

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

Orange County

N/A Facility ID# (if applicable)

27514 9789413949 Parcel Identification No. (PIN)

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

35°55'32.22" N 79°03'08.40" 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#: NW4

6b. Total well depth: 9.2 (ft.)

6c. Borehole diameter: 8 (in.)

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

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

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

6g. Screen length (if known): 5 (ft.)

For Internal Use ONLY:

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): _____ (gal.)

FOR WATER SUPPLY WELLS ONLY:

7c. Type of disinfectant used: _____

7d. Amount of disinfectant used: _____

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

- | | |
|--|--|
| <input type="checkbox"/> Neat Cement Grout | <input type="checkbox"/> Bentonite Chips or Pellets |
| <input type="checkbox"/> Sand Cement Grout | <input type="checkbox"/> Dry Clay |
| <input type="checkbox"/> Concrete Grout | <input type="checkbox"/> Drill Cuttings |
| <input type="checkbox"/> Specialty Grout | <input type="checkbox"/> Gravel |
| <input type="checkbox"/> Bentonite Slurry | <input checked="" type="checkbox"/> Other (explain under 7g) |

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

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

grout bentonite mix tremied into well well cover removed pvc pipe left in hole below ground surface

8. Certification:

Colby M. Dick Signature of Certified Well Contractor or Well Owner

1-6-15 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 address(es) 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:

Kelly Grant

Well Contractor Name

2730 A

NC Well Contractor Certification Number

American Environmental Drilling, Inc.

Company Name

2. Well Construction Permit #:

List all applicable well permits (i.e. County, State, Variance, ~~HP~~geokp, 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: **5-12-15** Well ID# **MW-3A**

5a. Well Location:

CITY OF CHAPEL HILL

Facility/Owner Name

Facility ID# (if applicable)

828 Martin Luther King Blvd.

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)

35.925603 N **-79.052656** 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: **16** (ft.)
For multiple wells list all depths if different (example- 3@200' and 2@100')

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

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

12. Well construction method: **AIR ROTARY**
(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
10 ft.	16 ft.	
ft.	ft.	

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

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		

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

FROM	TO	DIAMETER	THICKNESS	MATERIAL
-.6 ft.	1 ft.	2 in.	SCH40	PVC
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
1 ft.	16 ft.	2 in.	.010	SCH40	PVC
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
.6 ft.	1 ft.	BENTONITE	POUR
0 ft.	.6 ft.	NEAT CEMEN	POUR
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)


FROM	TO	MATERIAL	EMPLACEMENT METHOD
1 ft.	16 ft.	#2	POUR
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	5 ft.	BROWN CLAY AND ROCK
5 ft.	16 ft.	GRAY BLACK ROCK
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

22. Certification:

 **5-18-15**
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:

Kelly Grant

Well Contractor Name

2730 A

NC Well Contractor Certification Number

American Environmental Drilling, Inc.

Company Name

2. Well Construction Permit #:

List all applicable well permits (i.e. County, State, Variance, ~~HP/GEV/KP~~, 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: **5-14-15** Well ID# **MW-4A**

5a. Well Location:

CITY OF CHAPEL HILL

Facility/Owner Name

Facility ID# (if applicable)

828 Martin Luther King Blvd.

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)

35.925526 N **-79.052109** 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: **19** (ft.)
For multiple wells list all depths if different (example- 3@200' and 2@100')

10. Static water level below top of casing: **4** (ft.)
If water level is above casing, use "+"

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

12. Well construction method: **AIR ROTARY**
(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
4 ft.	19 ft.	
ft.	ft.	

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

FROM	TO	DIAMETER	THICKNESS	MATERIAL
ft.	ft.	in.		

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

FROM	TO	DIAMETER	THICKNESS	MATERIAL
-1.6 ft.	4 ft.	2 in.	SCH40	PVC
ft.	ft.	in.		

17. SCREEN

FROM	TO	DIAMETER	SLOT SIZE	THICKNESS	MATERIAL
4 ft.	19 ft.	2 in.	.010	SCH40	PVC
ft.	ft.	in.			

18. GROUT

FROM	TO	MATERIAL	EMPLACEMENT METHOD & AMOUNT
1 ft.	2 ft.	BENTONITE	POUR
0 ft.	1 ft.	NEAT CEMENT	POUR
ft.	ft.		

19. SAND/GRAVEL PACK (if applicable)


FROM	TO	MATERIAL	EMPLACEMENT METHOD
2 ft.	19 ft.	#2	POUR
ft.	ft.		

20. DRILLING LOG (attach additional sheets if necessary)

FROM	TO	DESCRIPTION (color, hardness, soil/rock type, grain size, etc.)
0 ft.	15 ft.	BROWN CLAY AND ROCK
15 ft.	19 ft.	GRAY BLACK ROCK
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	
ft.	ft.	

21. REMARKS

22. Certification:

 **5-18-15**
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.

2-3-16 E16002 TACH PD

9:15 onsite - Drizzling ~ 60° cloudy

- MW 3A -16'

Water level - 2.8'

Purge Volume 5.3g

~~MW 4A~~
~~MW 1~~
~~MW 2~~
~~MW 3~~
~~MW 4~~

9:30 - Surging starts

9:50 1 WV WLP @ 3.0'

10:05 2 WV WLP @ -3.1'

10:17 3 WV WLP @ -3.2'

~~MW 4 WV WLP @ -3.1~~

10:30

break

11:15 5 WV WLP @ -3.1

11:36 6 WV 3.2

11:47 7 WV 3

11:51 -3.6

12:03 -4

12:20 -4.2

3 @ 4.6

3) 104 5.3

1:10 5.6

continuation

1:30 4p 6.6

RAW 3A

1:50 4 WV -8.3'

2:10 4 8.6'

2:20 4 8.6

2:30 ~~4~~ 8.8

4:30 4-6 WV below - Surging
~ 8.6
↓ 5

2-4-16 TACH PD

MW 1 -33.3 9:40

3A -1 9:55

4A -1.6 10:00

MW 4A 19' 8.6g = 1 WV

~~Time~~ # of WV, WLP, WLP

10:30 2 1.6

10:45 2 1.7

11:15 2 1.7

11:23 1.7

11:37 1.8

11:46 1 1.9

12:00 2 2.1 chav. per

12:15 1 2.2

12:27 1 2.4

12:37 1 2.2

1:01 1 2.2

1:20 1 2.7

1:40 1 2.4

2:00 1 2.4

2:30 1 2.6

2:45 1 3.2

3:02 1 3.2

3:30 1 3.2

3:48 1 3.4

4:01 1 3.4

4:30 1 3.6



Fri 2/5 TOCH PD

MW 7 8AM 38° Sunny WL 33.5
I WV = 3.1g

~~9:30~~ WV WL

9AM 1 -37.0

9:30 .5 - Dry - waited 20m

10 1 -34.4

10:30 1 35.2

11: ~~10:15~~ -37.5 Dry

11:30 1 -37

12 1.5 -36 Dry ~~10:30 10:45 10:55 11:05 11:15 11:25 11:35 11:45 11:55 12:05 12:15 12:25 12:35 12:45 12:55~~

~~12:10~~ 1 -36

130 1 -35 -

2:15 1 -34.4

3:10 1 -35.6

4:00 1 -36.2

E16002.01 2/17/16 TOCHPD

onsite 2:30 50's Sunny

Water level from top of casing:

MW1 ^{8:45} -33.5 3A ^{8:55} -1.1 4A ^{9:01} -1.8

MW3A Well volume.

Start purging: ^{9:30} Stop & get data: 11:10 ^{WL} -1.3

SC 857 ⁴Sp/cm Temp 8.1°C

PH 6.74 Turbidity 18.2

- Break to recharge battery

EWU Start ^{5:08} Turb ^{2:01} Stop ^{6:08} ^{WL} -1.2

SC 834 Temp 8.8

PH 6.6 Turbidity 1.2

6:40

SC 866 Temp 8.4

PH 6.7 Turbidity 1.3

645 Sample MW3A

3 well volumes =

MW1 MW3A MW4A

40' 16' 19'

-33.5' -1.1' -1.8'

6.5' 14.9' 17.2'

^{v. 48}
2.12g 7.1g 8.2g

MW4A Start 10:40 Stop 12:30 ^{WL} -1.9

SC 103 Temp 12.4

PH 5.5 Turb 203

stop: 2:06 WL: -1.9

SC 100 Temp 14.9

PH 5.5 Turbidity 149

stop 3:40 WL -1.9

SC 100 Temp 13.3

PH 5.5 Turbidity 129 ^{4:15} 129

8pm Turbidity @ 140 ~~129~~

EWU 7:00 start 8pm EWL & sample

SC 107 Temp 12.0

PH 5.5 Turbidity 199

2-18-16

MW1

8:30 on site
(30°-40°)

START 230

WL -33.2 SMU End 255

SC 989

Temp 17.2

PH 6.8

Turbidity —

Time 3:30 ~~3:30~~

SC 996

Temp 17.6

PH 6.7

Turb. ~~NA~~

4:30 ~~4:30~~

SC 996

Temp 17.4

PH 6.7

Turb. —

8

SS pump set at lowest setting w/ Auto OFF
& not allowed to run continuously

CB TOLIPD 16002.01

MW4A 11:30

~~AW~~ WL-1.9

Time stop

Time	PH	SC	Temp	Turbidity
12:44	5.5	110	12.3	270
1:15	5.4	110	12.1	229
1:45	5.4	107	11.9	225
2:	5.4	106	11.9	189

Sample

Sampled sals 0-2 Discarded CB

compacted 2-15 (when possible)

SS 1-3 Dark & wet } Dark grey

4-5 Dark & moist

6-7 light Brown & Dry

2-18-16 11:30 - 1:30

CHRISTOPHER BURKHARDT ENVIRONMENTAL DEPARTMENT MANAGER

FALCON ENGINEERING, INC. | RALEIGH, NORTH CAROLINA



CERTIFICATIONS

NC State University:

- S&EC/Storm Water Workshop
- Advanced Problems in Hydric Soils Evaluation
- Wetland Identification & Delineation
- Intermittent & Perennial Stream Identification for Riparian Buffer Rules

NC & VA (NC DWQ)

Aquatic Insect Collection Protocols for Stream Mitigation & Restoration- NC DWQ

NC DENR Rare Plant Identification Workshop- USFWS, NC DENR

Certified Forest Health Data Collector- NC Forest Service

PROFESSIONAL AFFILIATIONS

NCAEP- North Carolina Association of Environmental Professionals

ACEC- Environmental Science and Planning Subcommittee

SPWS- Society of Professional Wetland Scientists

AIA- American Institute of Architects

ULI- Urban Land Institute

SMPS- Society for Marketing Professional Services

NCWRA- North Carolina Water Resources Association

EDUCATION

B.S., Natural Resource Management, North Carolina State University, 2003

Serving as Falcon's Environmental Department Manager, Christopher Burkhardt's duties include project implementation and management; proposal preparation; review of environmental reports (Phase I and II Environmental Site Assessments, Asbestos, Lead Based Paint and Mold Inspections); coordinating and supervising environmental staff & subcontractors; and providing technical expertise for routine to complex projects involving compliance with Sections 401 & 404 of the Clean Water Act, NC Sedimentation Pollution Control Act of 1973, Section 7 of the Endangered Species Act, Section 106 of the National Historic Preservation Act, National and State Environmental Policy Acts (NEPA/SEPA). Through Mr. Burkhardt's professional experiences, he has worked with and developed relationships with a network of regulators across the Mid-Atlantic States, including regulators with the US Army Corps of Engineers, State Water Quality & Land Resources, US Fish & Wildlife Service, and State Historic Preservation Office.

RELEVANT EXPERIENCE

BB&T, Wells Fargo, TD Bank, SunTrust; Environmental Services Approved Vendor

Mr. Burkhardt has managed 100's of Phase I and II ESAs, limited asbestos, lead-based paint and mold surveys, Transaction Screens, UST Sampling and Closure Reports.

NC DOT; Various PSA's

Provided Senior Project Management for the conductance of multiple PSA's for road widening projects throughout North Carolina. The PSA's included areas within the Right-of-Way and PUE as well as entire parcels based on potential risk. Project tasks included the oversight of Geophysical Survey activities, subcontracted Geoprobe Investigations, field sampling activities, UST removal and final report writing.

City of Raleigh Public Utilities Department, Proposed Devereux Meadows Park and Sewer Improvements

Provided Phase I ESA services on the proposed 15 acre park and sewer improvements in downtown Raleigh. The park was located on a former 1950s vehicle maintenance facility that included a service building, fueling station, and car wash along with multiple USTs and oil water separators. In addition, the site was surrounded by gas stations and dry cleaners with known contamination. An appropriate soil and groundwater contamination investigation plan was developed based on the findings.



PROFESSIONAL REGISTRATIONS

Registered Professional Engineer: NC #039779., SC #32235

EDUCATION

B.S., Civil Engineering, North Carolina State University, 2008

Jeremy Hamm has over seven years of experience in geotechnical engineering in North Carolina and the Triangle area. As Manager of Falcon’s Geotechnical Department, Jeremy maintains close project management and geotechnical engineering roles from inception and preliminary planning to construction consultation and project follow-up. Jeremy’s understanding for complex geotechnical/geological conditions allows him to provide early consultation during preliminary planning and alternatives assessments based on published and readily observable data, recognizing pitfalls before mobilizing drill crews and initiating investigations. Jeremy is also uniquely positioned to accurately and efficiently, scope, plan, and manage geotechnical investigations to provide a comprehensive survey of subsurface conditions.

RELEVANT EXPERIENCE

Town of Garner Police Station, Geotechnical Subsurface Investigation, Garner, NC

Role: Geotechnical Engineer

The Town of Garner acquired property to build a new police station, thus the old building was to be renovated with a 3,000 sf addition. Falcon performed a geotechnical subsurface investigation of the proposed building renovations and additions and new parking facilities.

Town of Holly Springs, Law Enforcement Center, Geotechnical Subsurface Investigation, Holly Springs, NC

Role: Geotechnical Engineer

The Town of Holly Springs acquired property to build a new 16,000 sf law enforcement center. Falcon performed a geotechnical subsurface investigation for the new structure and site work.

Town of Holly Springs, Fire-Rescue Station 2, Geotechnical Subsurface Investigation, Holly Springs, NC

Role: Geotechnical Engineer

The Town of Holly Springs’ Fire-Rescue Station 2 was damaged beyond repair by a tornado. The structure was demolished and a new building was built on the same site. Falcon performed a geotechnical subsurface investigation of the proposed building pad, parking facilities, and drainage system improvements.

Town of Cary, Carpenter Park, Cary, NC

Role: Geotechnical Engineer

Falcon performed environmental and geotechnical services for the planning and design of the park. Specifically, Falcon provided a natural resource delineation and field survey of the site, consisting of wetland and stream delineations. The geotechnical investigation included field reconnaissance, soil borings, laboratory testing, and a geotechnical report.