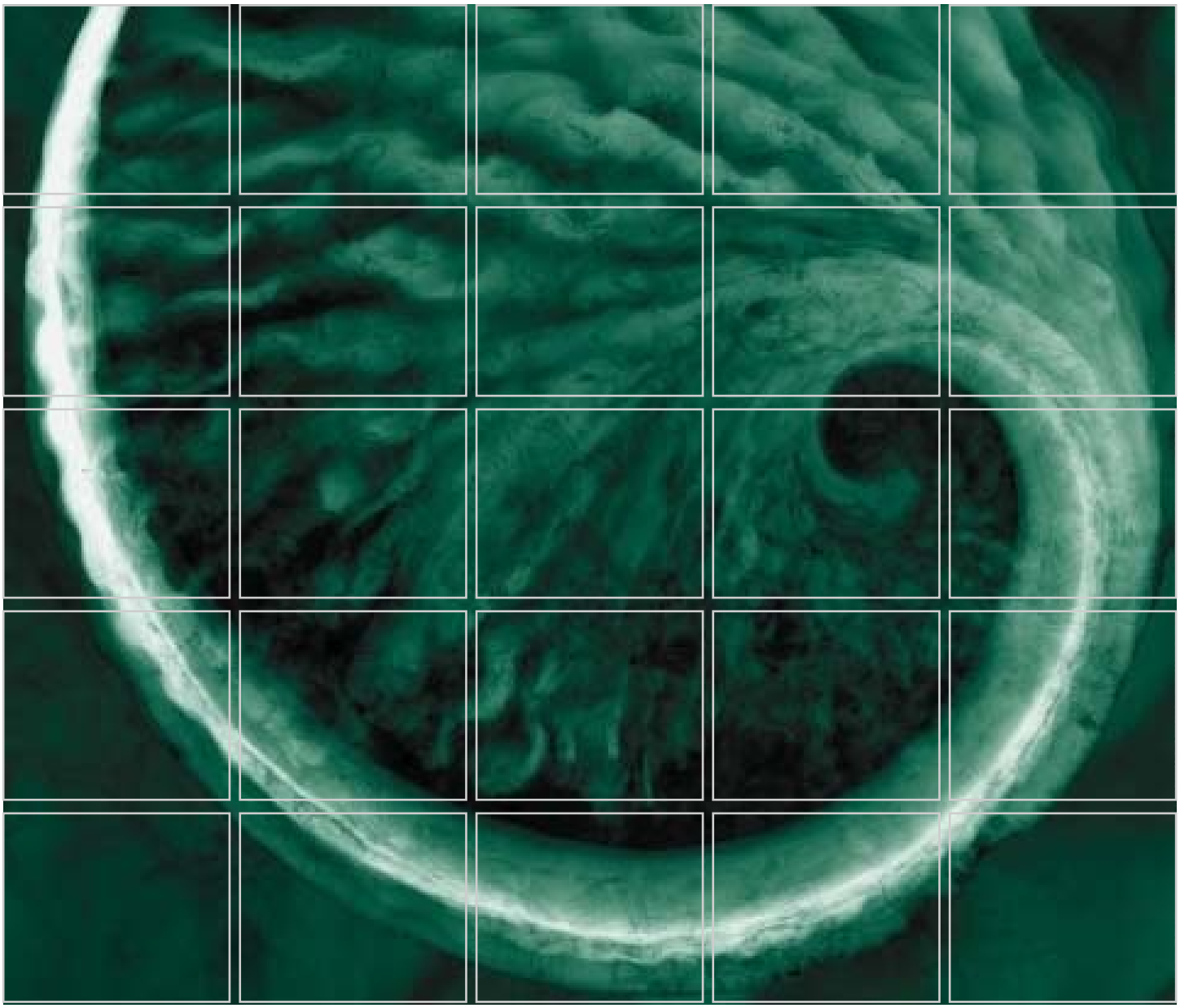

R.J. Reynolds Tobacco Company

Summary Report - Preliminary Site Assessment
Ash Landfill - Permit No. 34-05
Rural Hall, Forsyth County, North Carolina

October 2009

Delivering sustainable solutions in a more competitive world

ERM

ERM NC, PC

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October 29, 2009

North Carolina Department of Environment and Natural Resources
Division of Waste Management
1646 Mail Service Center
Raleigh, North Carolina 27699-1646
Attention: Ms. Jaclynne Drummond

Via Overnight Courier

Subject: Summary Report - Preliminary Site Assessment Activities
R.J. Reynolds Ash Landfill – Permit #34-05
Edwards Road
Rural Hall, Forsyth County, North Carolina

Dear Ms. Drummond:

On behalf of R.J. Reynolds Tobacco Company, ERM NC, PC (ERM) is submitting the Summary Report for the Preliminary Site Assessment activities associated with the subject property. Please contact Steve Curl of R.J. Reynolds Tobacco Company at 336-741-5146 or myself if you have any questions or comments.

Sincerely,

Alan Martin, P.G.
Project Manager

Attachment: Summary Report - Preliminary Site Assessment

cc: Mr. John Patrone – NCDENR DWM Winston-Salem Regional Office
Mr. Jason Watkins - NCDENR DWM Winston-Salem Regional Office
Mr. and Mrs. Grady Hawks
Mr. Steve Curl, P.E. - R.J. Reynolds Tobacco Company

R.J. Reynolds Tobacco Company

Summary Report - Preliminary Site Assessment
Ash Landfill - Permit No. 34-05
Rural Hall, Forsyth County, North Carolina

October 29, 2009

Project No. 0103137

10-29-09

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1.0 INTRODUCTION

This report presents the results of preliminary environmental site assessment (ESA) activities conducted at landfills previously operated by R.J. Reynolds Tobacco Company (RJRT) located on adjacent parcels northeast of the jurisdictional boundaries of Rural Hall, Forsyth County, North Carolina. For the purpose of this ESA report, Landfill Permit Number 34-D is referred to as the "Hawks Landfill" and Permit Number 34-05 is referred to as the "Edwards Road Landfill". The locations of the landfills are shown on Figure 1.

The ESA activities were conducted by ERM NC, PC (ERM) in accordance with the *Preliminary Site Assessment Work Plan* by ERM dated July 17, 2009 and approved by the North Carolina Department of Environment and Natural Resources, Division of Waste Management (NCDENR DWM) on July 30, 2009. The assessment plan was required by a compliance order issued by NCDENR to address iron, manganese, selenium, sulfates and other inorganic compounds that have been detected in ground water and surface water samples collected from the Edwards Road Landfill in concentrations above the applicable North Carolina Ground Water Standards (15A NCAC 2L .0200).

1.1 OBJECTIVES

The objective of the ESA activities is to evaluate ground water and surface water quality related to the Edwards Road Landfill. This objective will be executed by performing the following tasks:

- Evaluate regional and site-specific hydrogeologic characteristics;
- Evaluate background conditions for surface water and ground water;
- Evaluate the extent of ground water and surface water affected by the inorganic compounds;
- Evaluate water supply wells within 1,500 feet of the Edwards Road Landfill.
- Evaluate composition and integrity of the Edwards Road Landfill closure cap.

1.2 ASSESSMENT STRATEGY

In accordance with the *Preliminary Site Assessment Work Plan* (*Work Plan*), the site assessment will be conducted in a phased approach to direct further investigative efforts as additional data is gathered and studied. The phases are summarized below.

1.2.1 Summary of Phase I Activities

The initial phase of site assessment includes:

- Surrounding ground water user survey and sampling program;
- Hydrogeologic research and site reconnaissance on a regional and site-specific basis, including a down-hole camera inspection of the existing water supply well on-site identified as PW-1;
- Upgradient and downgradient surface water sampling program;
- Sampling and geotechnical laboratory testing of the Edwards Road Landfill closure soils; and,
- Modeling of rainfall infiltration into and through the Edwards Road Landfill along with leachate generation analysis based on existing site conditions and geotechnical laboratory testing results.

This report presents the results of the Phase I assessment activities.

1.2.2 Summary of Phase II Activities

The second phase of work presented in the *Work Plan* includes provisions for the following potential tasks, as necessary:

- Supplemental assessment activities, if necessary, based on results of the Phase I activities; and
- Preparation of a Comprehensive Site Assessment Report including the development of a conceptual site model based on the assessment data, potential exposure pathways analysis, risk assessment and, if necessary, the evaluation and selection of potential interim remedial measures.

2.0 BACKGROUND

Both the Edwards Road and Hawks Landfills were permitted by NCDENR DWM for disposal of coal ash and construction and demolition debris generated at off-site RJRT manufacturing facilities. The landfills were not permitted to accept waste materials from other sources.

The Edwards Road Landfill encompasses approximately 18 acres of disposal area within a 145-acre tract of land. This landfill was operated by RJRT from 1986 to 2002 under DWM Permit # 34-05 issued to RJRT. The landfill ceased receiving waste in December 2002 and placement of final cover soils over the disposal limits was completed in 2004. The property containing the Edwards Road Landfill was sold to Grady and Mary Hawks in 2007 upon RJRT being approached by the Hawks' realtor. Monitoring of the ground water and surface water during operations and post-closure has detected certain inorganic compounds in excess of the 2L ground water and 15A NCAC 2B surface water standards.

The Hawks Landfill comprises approximately 5.8 acres of disposal area within a 32-acre tract of land owned by Grady and Mary Hawks. This landfill operated from 1980 to 1986 under DWM permit # 34-D issued to RJRT. This landfill was operated by RJRT in accordance with a land use lease agreement with the property owners, Grady and Mary Hawks. The landfill was closed in 1986 with termination of the lease agreement and notification to DWM in accordance with the permit. Monitoring of the ground water or surface water was not a condition of the permit or post-closure requirements.

HISTORICAL GROUND WATER AND SURFACE WATER QUALITY

Ground water and surface water quality monitoring has been conducted in the vicinity of the Edwards Road Landfill since 1989 in accordance with the conditions of Permit Number 34-05. Ground water and surface water quality monitoring were not required as a permit condition for operation of the Hawks Landfill, Permit Number 34-D.

Ground water quality in the vicinity of the Edwards Road Landfill is currently evaluated via five monitoring wells identified as W-1, W-2, W-3, W-3B and W-6. Four of the monitor wells are located between the eastern limits of the landfill and the eastern property boundary generally defined in this area by Leak Creek. The fifth monitoring well (W-6) is located west of the limits of the landfill and is utilized to evaluate "background" ground water quality upgradient of the landfill. Monitoring well W-4 served as the background ground water quality sampling location from 1993 until 2003 when it was damaged and replaced by W-6. Four additional monitoring wells were installed as part of a hydrogeologic evaluation in 1993 for a proposed expansion of the Edwards Road Landfill (Permit 34-05). Figure 2 depicts the locations of the monitor wells and Table 1 presents a summary of available well construction details.

Surface water quality is monitored east of the Edwards Road Landfill at two locations along Leak Creek. These locations, identified as SS-01 and SS-02, are presented on Figure 2. Water quality samples were also previously collected from two water retention ponds east of the Edwards Road Landfill located in close proximity to ground water monitoring wells W-1 and W-3B.

Ground water and surface water samples from the Edwards Road Landfill site have been analyzed for inorganic compounds including 13 metals, nitrates, sulfates, total dissolved solids, total organic carbon as well as pH, specific conductivity and temperature. These analytical parameters were established as part of the landfill operation permit. Historical laboratory analytical results for available ground water and quality assurance samples are summarized on Tables 2A and 2B. Table 3 presents historical surface water quality sample results. Water quality trend graphs for selected constituents are presented in Appendix A.

Historically, iron, manganese, sulfates and total dissolved solids are the primary constituents detected in ground water samples collected from monitor wells at the Edwards Road Landfill at concentrations above the applicable North Carolina Ground Water Standards (see Table 2A). In addition, intermittent exceedances of barium, cadmium, chromium, selenium and lead have been observed in the ground water. No other constituents have been detected in concentrations above the applicable North Carolina Ground Water Standards. Ground water samples collected upgradient of the landfills have contained background levels of primarily iron and manganese and, occasionally, cadmium, chromium, lead and selenium at concentrations above applicable ground water quality standards.

Based on the historical surface water analyses at the site, manganese and sulfate are the primary constituents detected in surface water samples collected from the streams adjacent to the Edwards Road Landfill at concentrations above the applicable North Carolina Surface Water Standards (see Table 3). In addition, intermittent exceedances of cadmium, copper, iron and zinc have been observed in the surface water. Surface water samples collected upstream of the landfills have contained background levels of aluminum, cadmium, iron, zinc and other metals at concentrations above applicable surface water quality standards.

The site assessment activities associated with the Edwards Road Landfill are focused on the following constituents.

INORGANICS		FIELD PARAMETERS
Iron	Barium	pH
Manganese	Cadmium	Specific Conductivity
Selenium	Chromium	Temperature
Sulfates	Lead	Oxidation-Reduction Potential
Total Dissolved Solids		

Note: The primary constituents associated with the ash landfill are shown in bold font.

3.0 PHYSICAL SETTING

The landfills are located in the northern portion of Forsyth County, North Carolina less than one mile northeast of jurisdictional limits of Rural Hall. The physical setting and locations of the landfills are shown on Figures 1 and 2.

The area surrounding the sites is comprised of sparsely to moderately populated land used for livestock grazing and partially wooded land with a few single-family residences. The landfills are located in the northern portion of the Piedmont Physiographic Province. The Piedmont Province generally consists of hills and ridges which are intertwined with an established system of draws and streams. The Piedmont Province is predominately underlain by igneous rock and metamorphic rocks which were initially formed during the late Proterozoic and to middle Paleozoic eras.

In this northern area of the Piedmont, topographic relief is well pronounced with elevations varying greatly over short distances. In the vicinity of the landfill sites, elevations range from a high of 1,000 feet above mean sea level located west of the sites to a low of 700 feet above mean sea level located along Town Fork Creek northeast of the Edwards Road Landfill. Topographic relief generally slopes sharply to well-defined drainage basins with the presence of creeks or streams flowing from the southwest to the northeast.

3.1 REGIONAL GEOLOGY

The sites are located within the Inner Piedmont geologic belt of North Carolina and specifically within the Sauratown Mountain Anticlinorium which is comprised of metamorphic rocks including biotite gneiss and kyanite schist according to the Geologic Map of North Carolina (1985) and Goldsmith, et. al. (1988).

The native undisturbed soils encountered in this area are the residual product of in-place chemical weathering of rock. In areas not altered by erosion or disturbed by the activities of man, the typical residual soil profile consists of clayey soils near the surface, where soil weathering is more advanced, underlain by sandy silts and silty sands. The boundary between soil and rock is not sharply defined. This transitional zone termed "partially weathered rock" is normally found overlying the parent bedrock. Partially weathered rock (PWR) is defined, for engineering purposes, as residual material with Standard Penetration Resistances in excess of 100 blows per foot. Weathering is facilitated by fractures, joints and by the presence of less resistant rock types. Consequently, the profile of the partially weathered rock and hard rock is irregular and erratic, even over short horizontal distances. Also, it is common to find lenses and boulders of hard rock and zones of partially weathered rock within the soil mantle, well above the general bedrock level.

3.2 REGIONAL HYDROGEOLOGY

The occurrence and movement of ground water in the Piedmont province is within two separate, but interconnected, water bearing zones. A shallow water-bearing zone typically occurs within the saprolite zone, and a deeper zone occurs within the underlying bedrock. Ground water in the shallow saprolite zone occurs in the interstitial pore space of the saprolite. The depth to ground water in the saprolitic zone can range from 20 to 45 feet along ridges and upland areas. In low lying stream valleys, the ground water level will approach the local surface water elevations in stream channels. Ground water flow in this zone is typically governed by water table conditions. This means that ground water will flow under unconfined conditions and generally mimic topography. Therefore, ground water movement will be from upland areas (recharge zones) to nearby surface streams (discharge zones).

The occurrence and movement of ground water in the deeper water-bearing zone within crystalline bedrock is controlled by secondary joints, fractures, and faults within the bedrock. Ground water within the bedrock zone may be under confined or unconfined conditions. The occurrence and movement of ground water is difficult to predict on a small scale due to the erratic nature of the secondary openings that control ground water flow in bedrock. Small surface water features generally do not provide an indication of the direction of ground water movement in bedrock. However, on a regional scale, the direction of ground water movement will generally be from upland areas to major surface streams downgradient.

3.3 LOCAL GEOLOGY

Soil test borings and ground water monitoring wells have been installed at the Edwards Road Landfill site beginning in 1987 through 2004. The locations of these soil test borings and monitoring wells are shown on Figure 2. Based on a review of the previous information, a general subsurface pattern can be implied for the site. Borings and monitoring wells executed at the topographically higher portions of the site generally reveal a residual soil layer varying from 23 feet to 48 feet below ground surface. A transition to partially weathered rock is typically encountered within the lower 10 feet of this stratum prior to encountering bedrock. The residual soils are primarily comprised of fine sandy silty clays near the surface transitioning to fine sandy silts with depth. In the topographically lower areas of the site, bedrock is encountered within 12 feet below ground surface with similar residual soils in place above. No soil test borings have been conducted or monitor wells established in the vicinity of the Hawks Landfill and none have been required.

Based on the available information, the top of bedrock beneath the Edwards Road Landfill generally follows the surficial topography sloping in the same direction as natural relief but at a lesser degree of slope (not as steep). The Edwards Road Landfill is underlain by sulfidic biotite gneiss (metagraywacke) with minor amphibolite and kyanite schist of the Ashe Formation group. The biotite gneiss has a strongly developed

planar cleavage with moderate to shallow dip to the southeast, averaging 35°. Cores advanced into bedrock during soil test boring and monitoring well installation describe the presence of fractures at varying depths. Based on previous studies, the top of bedrock generally strikes between 10 and 45 degrees east of north with dip angles ranging from 28 to 43 degrees toward the east-southeast.

3.4 LOCAL HYDROGEOLOGY

Based on topography, it appears that overland run-off from both landfills would ultimately drain to the northeast toward Town Fork Creek. Therefore, it is likely that ground water flows generally to the northeast. Surface water from the Edwards Road Landfill area primarily flows east into Leak Creek though a portion of the surface water may flow to the northwest toward an unnamed tributary to Town Fork Creek. Locally, surface water from the Hawks Landfill flows to the north into Leak Creek, a tributary to Town Fork Creek.

In 1987, Law Engineering conducted soil test borings at the Edwards Road Landfill but did not encounter ground water. These soil test borings were advanced to "auger refusal" or assumed top of bedrock. Available monitoring well installation records indicate the presence of ground water within the upper few feet of the bedrock layer at the topographically low areas. Records of monitoring wells installed in the topographically higher areas indicate encountering first ground water within fractures located at varying depths below top of bedrock elevations. Monitoring well construction details and depth-to-water measurements for available monitor wells from the April and October 2009 ground water and surface water sampling event are presented in Table 1.

Depth-to-ground water measurements from monitor wells on the Edwards Road Landfill have been recorded during routine sampling since 1989 but elevations for the monitor well top-of-casings have not been surveyed and ground water elevation data are not available.

In general terms, the surficial aquifer in the area of the Edwards Road Landfill appears to be recharged by rainfall infiltration through the residual soils into fractures located within bedrock in the topographically higher regions. With the absence of ground water in the residual soils, it may be assumed that the residual soils are well drained and fractures are abundant enough to prevent significant storage of water above the bedrock. Based on previous site reconnaissance reported by others, the major fractures dip in similar direction with topographic relief towards surface discharge creeks and streams at a somewhat constant rate from topographic highs to topographic lows. In some cases this may lend to an artesian effect created by the fracture dip angles as seen at monitoring well W-3B located near Leak Creek. Additional details regarding local geology and hydrogeology are presented in Section 5.2 of this report.

4.0 SENSITIVE RECEPTORS

4.1 WATER SUPPLY

Water in the vicinity of the Edwards Road Landfill is provided via supply wells installed into bedrock. The nearest municipal water supply piping operated by Forsyth County is located near the center of the Town of Rural Hall approximately 3,200 feet west of the Hawks Landfill and 3,800 feet southwest of the Edwards Road Landfill.

4.2 WATER SUPPLY WELLS

FORMER ONSITE WATER SUPPLY WELL

One inactive water supply well is located on the Edwards Road Landfill property immediately west of the limits of the landfill. This well, identified as PW-1, provided non-potable water to the property for equipment wash down. This well was not used as a potable water source by RJRT or the current property owner, Mr. and Mrs. Hawks. As approved by NCDENR (June 5, 2009), this well was removed from service on August 11, 2009. This was accomplished by disconnecting the power and plumbing to the down-hole pump and the well is now utilized for ground water quality monitoring purposes only. The location of the PW-1 well is depicted on Figure 2.

Historical and recent water quality analytical results of samples from the PW-1 supply well are summarized in Table 2A and graphically depicted in Appendix A. Concentrations of iron, manganese and sulfates were detected in concentrations above the applicable 2L ground water quality standards in the sample from this well collected in August 2009.

ERM contacted the well driller, Clayton Well & Pump Service of Winston-Salem, North Carolina to obtain construction details regarding this supply well. According to Mr. Clayton, this well was installed on May 26, 1987 to a total depth of 405 feet with galvanized casing set approximately five feet into bedrock to a depth of 21.5 feet below ground surface. Mr. Clayton reports that a water-bearing fracture was encountered at approximately 100 feet below ground surface which yielded between eight and ten gallons per minute of water. The total yield of the well was observed to be approximately 25 gallons per minute though no other obvious water-bearing fractures were observed during the drilling.

As approved by NCDENR, additional details regarding this well were obtained during a down-hole video inspection of the borehole conducted on August 26, 2009. Prior to the video inspection, efforts were made to remove the submersible pump from the well however an obstruction prevented removal of the pump which limited the depth for video inspection. Video inspection of the borehole was terminated at 114 feet below ground surface where a tangle of another pump wire (separate from the wire for the

submersible pump) was encountered. This bundle of wire has clustered together at 114 feet and apparently acts as a wedge to prevent removal of the submersible pump present beneath the wire. Alternative methods for retrieving the submersible pump are under consideration but it may be infeasible to remove the pump. A graphical depiction of PW-1 and its down-hole appurtenances is presented in Appendix B.

OFF-SITE WATER SUPPLY WELLS

In July 2009 ERM conducted a survey for water supply wells in the area in July 2009. Six off-site water supply wells were identified within 1,500 feet of the limits of the Edwards Road Landfill and six additional water supply wells were identified between 1,500 and 2,100 feet from the limits of the Edwards Road Landfill. The nearest off-site water supply well is located approximately 1,090 feet east of the landfill limits. All but one of these wells are active. Each of the 12 identified water wells are completed in the bedrock aquifer. A summary of nearby water supply wells, owner information and available well construction details is presented in Table 5. The locations of the identified water supply wells are depicted on Figure 3.

Samples were collected from 11 of the 12 off-site supply wells to evaluate ground water quality at these locations. Results of the sampling are summarized in Section 5.3.

4.3 SURFACE WATER

Topographic map coverage of the vicinity is illustrated on Figure 1. The nearest water body to the Edwards Road Landfill is Leak Creek which defines the eastern boundary of the property. An unnamed tributary to Leak Creek is located to the north and northwest of the Edwards Road Landfill. A piped reach of an unnamed tributary to Leak Creek is the nearest surface water body to the Hawks Road Landfill.

4.4 SUBSURFACE UTILITIES

Subsurface utilities at the site and in the surrounding areas are limited to local water piping from wells to structures, sanitary wastewater discharge piping to septic tanks and associated leach fields. These subsurface utilities should be relatively shallow, and located above the water table, which at the subject site has been found at depths from 7 to 98 feet bgs. Therefore, it is unlikely that underground utilities would serve as preferential pathways for contaminant migration in ground water.

5.0 PHASE I ENVIRONMENTAL SITE ASSESSMENT SUMMARY

Phase I activities consisted of detailed geologic mapping, a survey and sampling of water supply wells in the vicinity, sampling of surface water quality and evaluation of the Edwards Road Landfill soil cap. The following section summarizes the Phase I assessment activities and results which were conducted in accordance with the *Work Plan* (ERM, July 2009).

5.1 VIDEO OF PW-1 BOREHOLE

In accordance with ERM's May 29, 2009 correspondence to NCDENR, EGIS, P.A. of Chapel Hill, North Carolina conducted a video inspection of the PW-1 borehole on August 26, 2009 to evaluate site-specific geologic information and construction details of the PW-1 well. Prior to the video inspection, ERM attempted to remove the submersible pump in the well via chain hoist on August 11, 2009 and via well service truck on August 25, 2009. Multiple attempts to remove the pump were unsuccessful and efforts to remove the pump were discontinued pending video inspection of the borehole to determine what was preventing removal of the pump. A log and graphical representation of observations from the borehole camera inspection along with additional well construction details and geologic information provided by the driller are provided in Appendix B.

Major findings of the video inspection of the PW-1 borehole are summarized below:

- Galvanized casing is installed in bedrock to a depth of 21.5 feet bgs. The depth to bedrock is estimated to be between 16 and 19 feet.
- Bedrock throughout the available portion of the borehole consists of biotite gneiss exhibiting strong planar cleavage with moderate to shallow dip to the southeast, averaging 35° (estimated).
- A slightly moist seam with iron-oxide staining was noted in the bedrock at approximately 42 feet bgs (above the static water level).
- The static water level in the borehole is 72.0 feet bgs. The saprolite aquifer is absent at this location of the site.
- An open fracture zone present between 102 and 103 feet bgs dips approximately 35° southeast, parallel to the dip angle of the plane of cleavage. Records maintained by the driller of this well indicate this fracture zone yields water at eight to ten gallons per minute.
- At 114 feet bgs, a bundle of wire to another previously unknown pump acts a wedge preventing removal of the recently active pump from the well. This bundle of wire prevents further video inspection of the borehole.

As noted in Section 4.2, additional information provided by Clayton Well and Pump Service regarding construction and geologic details of this well include a total well depth of 405 feet and a total yield of the well of approximately 25 gallons per minute. Mr. Clayton reports that no other obvious water-bearing fractures were observed during the drilling other than the fracture noted at 102-103 feet bgs.

5.2 DETAILED GEOLOGIC SITE RECONNAISSANCE AND MAPPING

To refine understanding of the site geologic conditions, particularly structures that may control discharge from ground water to surface water and flow within the downgradient affected streams, ERM conducted geologic mapping of the downgradient site. The following activities were conducted in August 2009 as part of the geologic mapping process:

- Desktop review of existing site-specific hydrogeologic data and publicly available data;
- Video inspection of the PW-1 water supply well borehole;
- Magnetic geophysical survey of the site using a proton precession magnetometer;
- Topographic lineament analysis; and,
- Geologic mapping of exposed rock outcrops and features.

Supporting documentation of the geologic review and mapping is provided in Appendix C.

5.2.1 Methods

MAGNETIC GEOPHYSICAL SURVEY

The magnetic geophysics survey was conducted using a proton precession magnetometer mounted on a 6-foot pole. Readings were taken at 25-foot intervals along reconnaissance survey lines that were surveyed using a Silva® compass and a calibrated wheel distance measurement system. Two of the lines were surveyed along the creeks surrounding the site.

The magnetic geophysics readings were not corrected for diurnal variation and are presented in profile graphs in order to identify magnetic anomalies and correlate the identified anomalies between survey lines to determine orientation and extent of the anomalies. The primary objective of the magnetic geophysics survey was to identify diabase dikes that occur in the region and could control ground water flow and contaminant migration. While one northwest trending magnetic anomaly was found using the magnetic geophysics, no physical evidence of a diabase dike (e.g. outcrop or float) could be found.

GEOLOGIC MAPPING

Rock types and orientations were mapped along each of the magnetic geophysics survey lines. Outcrop measurements were made using a Brunton® compass. Due to the volume of measurements made, not all outcrop measurements are shown in the geologic map that resulted from the geologic mapping fieldwork.

5.2.2 Site Hydrogeological Conceptual Model

The site is underlain by sulfidic biotite gneiss (metagraywacke) with minor amphibolite and kyanite schist of the Ashe Formation group. The biotite gneiss has a strongly developed planar cleavage with a general northeast orientation and a moderate to shallow dip to the southeast, averaging 35°. The southeast dip reflects the regional thrust faulting in the region and low angle faulting is expected to be common within the study area. The other rock type found in the study area is vein quartz, also known as "bull quartz". Massive "bull" quartz veins occur sporadically within the study area. One measured outcrop indicates a north-south strike and moderate eastern dip. A general north-south orientation of quartz veins in the study area is inferred as shown in the site geologic map. No diabase dike outcrops or float were found within the study area. Magnetic geophysics identified one possible magnetic signature of a diabase dike at survey line location A3850. Bull quartz float and anomalous magnetic peaks are aligned along a N45W trend from A3850, but no physical evidence of a diabase dike could be found.

The drainage pattern surrounding the Edwards Road Landfill is controlled by the generally northeast-trending strike of the biotite gneiss foliation and cleavage which is also parallel to thrust faulting that has been mapped in the region. The N45W-oriented structural features are likely vertical based on topographic lineaments in the area.

The saprolite aquifer is largely absent in the study area. However, the presence of perched ground water along the transition zone at the bedrock-saprolite interface is evident based on ground water levels in shallow monitor wells (i.e. W-2 & W-3) and surface water quality data collected from locations northwest and east of the landfill. The bedrock aquifer is both quasi-confined and unconfined. Ground water flow within the bedrock aquifer appears to be controlled by low angle geologic structures or stratigraphically controlled transmissive and/or confining zones. In the upper bedrock aquifer zone, secondary fracture sets may provide lateral ground water flow paths and interconnection between low angle geologic structures.

Magnetic data collected over the older sections of the landfill indicate the presence of metallic debris scattered within the landfill. The magnetic data could not be reliably used to infer geologic features beneath the limits of the landfill.

The key features of the site hydrogeological conceptual model include the following:

- The orientation of the creeks and streams in the study area are primarily controlled by the orientation of the stratigraphy (northeast). Bedrock is present along almost the entirety of these streams.
- The depth to ground water ranges from 0 feet bgs at the creeks to more than 97 feet along topographic ridges. The saprolite aquifer is largely absent within the study area due to the shallow level of bedrock across the site (0 – 30 feet bgs). However, some of the water that infiltrates the ash landfill appears to be migrating laterally along the top of bedrock surface. Surficial expressions of this "perched water" migration are discharges on the side slope between Leak Creek and the access road near the base of the landfill.
- Based on the fundamental concepts of ground water flow in a watershed, the regional ground water flow regime within the lower portion of the bedrock aquifer flows to the northeast toward the nearest regional drainage feature, Town Fork Creek. This ground water may discharge into Town Fork Creek or continue to flow toward the northeast.
- Ground water in the bedrock aquifer locally flows from areas of higher elevation to areas of low elevation. Ground water in the uppermost portion of the bedrock aquifer discharges into the creeks adjacent to the landfill.
- Rainfall infiltration through the landfill cap migrates vertically downward through the ash under the influence of gravity. Constituents within the ash may be dissolved by the infiltration water and become mobile.
- Infiltration water also enters into the bedrock along stratigraphically or structurally controlled permeable zones, particularly the foliation or cleavage planes. The predominant strike and dip of these zones beneath the landfill is northeast and approximately 35° southeast respectively. Vertically oriented northwest striking structures may also act as conduits to the bedrock aquifer.
- Once the infiltration water enters the bedrock aquifer, it migrates laterally and vertically along the stratigraphically and structurally controlled permeable zones and secondary fracture sets. With increasing depth, there is a general decrease in the frequency and interconnectivity of the fractures resulting in reduced permeability and an upward vertical hydraulic gradient in the lower bedrock aquifer, as indicated by artesian flow in bedrock monitor well W-3B at the site.
- The creeks surrounding the landfill act as a "perimeter drain" and much of the ground water derived from infiltration through the landfill migrates along the permeable zones in the bedrock and discharges into these creeks.
- The contaminant levels within the creeks adjacent to the landfill decrease with distance from the landfill due to dilution with unaffected water entering the creeks from other drainage basins.
- Some of the ground water derived from infiltration of the landfill migrates vertically within the bedrock aquifer and does not discharge into the creeks unless

a conduit through a confining unit, such as monitor well W-3B, or a naturally occurring permeable feature, allows upward migration of the affected ground water. Ground water within the deeper portion of the bedrock aquifer would be expected to eventually enter the deep regional flow regime and flow northeastward toward the Town Creek drainage.

- The lateral and vertical extent of the landfill-related constituents in ground water within the bedrock aquifer is not yet determined. However, based on the absence of elevated levels of sulfates and manganese in the ground water samples collected from the off-site water supply wells in the area (see section 5.3), affected ground water is not present in the vicinity of the nearest off-site water wells located approximately 1,100 feet east of the landfill.
- Aquifer testing has not been conducted at the site to determine of hydraulic conductivity values for the bedrock aquifer. As such, ground water flow velocity and contaminant migration rates have not been calculated at this time.

Geologic cross-sections of a portion of the Edwards Road Landfill and to the southeast of the landfill depicting the site hydrogeologic conceptual model are presented on Figure 4.

5.3 GROUND WATER USER SURVEY AND SAMPLING PROGRAM

In July 2009 ERM conducted a survey for water supply wells in the area of the Edwards Road Landfill. Six off-site water supply wells were identified within 1,500 feet of the limits of the landfill and six additional water supply wells were identified between 1,500 and 2,100 feet from the limits of the landfill. The nearest off-site water supply well is located approximately 1,090 feet east of the landfill limits. All of the identified supply wells are located along Crestbrook Road east of the landfill or along Highway 65 south of the landfill. All identified wells are screened in bedrock between 185 and 705 feet below ground surface and all but one are active. The locations of the identified water supply wells are depicted on Figure 3.

Samples were collected from all of the active supply wells identified on Table 5 to evaluate ground water quality at these locations. Samples from the water supply wells were collected in July and August 2009 and submitted to Prism Laboratories of Charlotte, North Carolina, a North Carolina Division of Public Health-certified laboratory. Prior to initiation, the Forsyth County Health Department was notified of the proposed survey and sampling.

The wells were purged for a minimum of ten minutes prior to sample collection and samples were collected from the nearest spigot to the well head. Samples were analyzed for the following parameters:

INORGANICS BY EPA METHODS 200.8 / 300		FIELD PARAMETERS
Iron	Barium	pH
Manganese	Cadmium	Specific Conductivity
Selenium	Chromium	Temperature
Sulfates	Lead	Oxidation-Reduction Potential
		Dissolved Oxygen
		Turbidity

Analytical laboratory results and field parameters are summarized in Table 6 and copies of laboratory reports are included in Appendix D. The sample results are compared to the 2L standards applicable for ground water utilized as a potable water supply. Laboratory sample analytical results have been provided to each well owner. Maximum detected concentrations of laboratory-analyzed compounds are summarized below:

ANALYTE	MAXIMUM CONCENTRATION DETECTED (mg/L)	NC 2L STANDARD (mg/L)	WELL ID / OWNER
Iron	1.24 [1]	0.300	4A – D. Stewart
Manganese	0.0052	0.050	2A – Hawks
Barium	0.200	2.0	3A – Freedom Church
Cadmium	Not detected	0.00175	All
Chromium	0.0017	0.050	5 – M. Stewart
Lead	0.039	0.015	4A – D. Stewart
Selenium	Not detected	0.050	All
Sulfates	10	250	4B – D. Stewart

[1] – *Iron level attributed to elevated turbidity as a result of running well dry during sampling.*

Analysis of nine of the 11 water supply well samples indicated no concentrations of the constituents related to the ash landfills above the applicable 2L ground water standards. Lead was detected in samples from two water supply wells in concentrations above the applicable 2L standard and iron was detected in one sample above the applicable 2L standard. Details regarding the elevated levels of lead and iron are presented below.

5.3.1 Sprinkle Residence - 8390 Crestbrook Road

Lead was reported in July 2009 sample collected from the Sprinkle well (well ID# 8) at 0.030 mg/L which exceeds the 2L standard of 0.015 mg/L. No iron, manganese, selenium, cadmium or chromium were detected in the Sprinkle well and barium and sulfate concentrations detected in the sample are within the naturally occurring levels for these compounds. This sample was collected from a spigot on the well head after purging approximately 130 gallons of water from the well. The source of the lead in this sample has not been determined. This well is located approximately 1,170 feet east and topographically side-gradient from the limits of the Edwards Road Landfill.

RJRT notified the Forsyth County Health Department of the lead concentration detected in this sample and the Health Department contacted the Sprinkles to recommend the well water not be utilized for drinking. On behalf of RJRT, ERM also notified the Sprinkles and RJRT voluntarily provided bottled water for potable use to the residence upon receipt of the initial analytical laboratory report.

At the recommendation of the Health Department, this well was re-sampled on August 3, 2009 to verify the previous lead concentration. ERM collected a "first draw" sample from a spigot on the south side of the house as well as a sample from the well head spigot following a 35 minute purge of the well. The Health Department also collected samples for analysis. Samples collected by the Health Department included "first draw" samples from spigots on the well head and on the east side of the house as well as a sample from the well head spigot following the 35 minute well purge. A total of five additional samples were collected on August 3 by ERM and the Health Department for analysis. Laboratory results from the additional analyses are summarized in Table 6 and copies of analytical reports are provided in Appendix D.

The maximum concentration of lead detected in the re-sample results is 0.011 mg/L which is below the 2L standard of 0.015 mg/L. The maximum concentration of lead detected by the Health Department is 0.006 mg/L. Based on the results of the five additional samples, lead concentrations in ground water at the Sprinkle parcel do not exceed the applicable 2L ground water standard.

5.3.2 Don Stewart Residence - 1160 Sixty Five Highway

Lead was reported in July 2009 sample collected from Don Stewart's residential well (well ID# 4A) at 0.028 mg/L which exceeds the 2L standard of 0.015 mg/L. No iron, manganese, selenium, cadmium or sulfates were detected in the Stewart well and the barium, chromium and sulfate concentrations detected in the sample are within the naturally occurring levels for these compounds. The initial sample was collected from a spigot on the south side (front) of the house after purging approximately 80 gallons of water from the well. The source of the lead in this sample has not been determined. This well is located approximately 1,670 feet southeast and topographically upgradient of the limits of the Edwards Road Landfill.

RJRT notified the Forsyth County Health Department of the lead concentration detected in this sample and the Health Department contacted Mr. Stewart to recommend that the well water not be utilized for drinking. On behalf of RJRT, ERM also notified Mr. Stewart and RJRT voluntarily provided bottled water for potable use to the residence upon receipt of the initial analytical laboratory report. Mr. Stewart reported to ERM that the well water has not been utilized for drinking for several years and bottled water has been used for consumption.

At the recommendation of the Health Department, this well was re-sampled on August 3, 2009 to verify the previous lead concentration. ERM collected a sample from a spigot immediately upstream of the pressure tank and downstream of a particulate filter following a 20 minute purge of the well. The Health Department also collected samples for analysis. Samples by the Health Department were collected from a spigot on the north side (rear) of the house and included a "first draw" sample and a sample following the 20 minute purge of the well. A total of three additional samples were collected on August 3 by ERM and the Health Department for analysis. Laboratory results from the additional analyses are summarized in Table 6 and copies of analytical reports are provided in Appendix D.

The maximum concentration of lead detected in the re-sample results is 0.039 mg/L which is above the 2L standard of 0.015 mg/L. The maximum concentration of lead detected by the Health Department is 0.019 mg/L. No lead was detected in the "first draw" sample by the Health Department. Two of the three re-sample results indicated the presence of lead in excess of the applicable 2L ground water standard. Iron was detected at 1.24 mg/L in the Health Department's sample following the purge. This concentration of iron exceeds the 2L standard for iron of 0.300 mg/L. ERM analyzed the August 3 re-samples for lead only while the Health Department analyzed for lead only in the "first draw" sample. It should be noted that the purging of the well during the re-sampling efforts resulted in temporarily lowering water table in the well until the pump pressure switch turned off the pump ("dried the well"). The flow rate during the re-sampling purge was approximately eight gallons per minute. Elevated turbidity (58 NTUs) was observed in the well water after approximately 15 minutes to allow partial recovery of the ground water level in the well. Based on the absence of iron in the July sample by ERM and the elevated water turbidity observed during the August sampling, the source of the elevated iron concentration in the Health Department's August 3 re-sample results is attributable to sediment particles dislodged from the borehole wall as a result of the rapid lowering of the water table during the well purge.

The Health Department collected three additional samples for lead analysis on September 16, 2009 to further evaluate lead levels in the plumbing of the structure and the ground water. According to Mr. Brock Turner of the Forsyth County Health Department, samples were collected from the kitchen sink and included a "first draw" sample and then at five and 15 minute intervals. No lead was detected in each of the three samples collected and analyzed by the Health Department in September 2009. Copies of the Health Department's analytical reports are provided in Appendix E.

5.3.3 Lead Source Evaluation

The source of lead detected in the initial sample from the Sprinkle well and three of the seven samples from the Stewart residential water supply well samples has not been determined. However, based on the information summarized below, the Hawks or Edwards Road Landfills do not appear to be the source of the lead. These

data indicate that the elevated lead levels detected in the Sprinkle and Stewart residential wells are localized conditions and are not associated with the affected ground water near the landfill.

No lead was detected in the samples collected from the other supply wells along Crestbrook Road, including the Phipps and Guthrie wells (well #s 7 and 9) located on parcels adjacent to the Sprinkle well and screened at similar depth intervals as the Sprinkle well. No lead was detected in Don Stewart's livestock well (well #4B) which is located approximately 560 feet closer to the Edwards Road Landfill than the residential well. Additionally, no significant concentrations of lead were detected in samples from other wells near Don Stewart's residential well. The maximum lead concentration detected in samples from wells surrounding Don Stewart's residential well on three sides is 0.0055 mg/L (Freedom Church (well #3B). No significant concentrations of sulfates or manganese, which are the primary constituents associated with the Edwards Road Landfill, were detected in any of the well samples.

Lead concentrations in ground water or surface water samples from the Edwards Road Landfill site have not exceeded the applicable 2L or 2B standards since 2004 when 0.021 mg/L was detected in the W-2 monitoring well sample. As discussed below in Section 5.4, lead was not detected in the 12 surface water samples collected in August 2009 both upstream and downstream of the landfills. The maximum concentration of lead detected in historical ground water or surface water samples from the Edwards Road Landfill site is 0.330 mg/L in ground water at monitor well W-3 in 1991. The lead concentrations at W-3 have not exceeded the 2L ground water standard since 1997.

5.4 ADDITIONAL SURFACE WATER SAMPLING

5.4.1 Surface Water Sampling Methodology

Surface water samples from Leak Creek along the eastern boundary of the Edwards Road Landfill property (SS-01 & SS-02) have indicated the presence of iron, manganese, and sulfates in concentrations above the North Carolina Surface Water Quality Standards. Cadmium and lead were also detected from 1990 to 1992 in several surface water samples slightly above the applicable NC Surface Water Standards.

An expanded surface water monitoring program was implemented at the site in August 2009 to further characterize the surface water quality impacts in the drainage basins adjacent to the Edwards Road Landfill as well as the Hawks Landfill. The locations of the historical and recent surface water sampling points are shown on Figure 5.

Six additional surface water monitoring stations were established and sampled within the Leak Creek basin and associated tributaries upstream of the Edwards

Road Landfill. These samples also assist with characterization of surface water quality downgradient of the Hawks Landfill located south and upstream of the Edwards Road Landfill in the Leak Creek basin. Samples were also collected from the current SS-01 and SS-02 monitoring points in Leak Creek for comparison to the additional surface water sample analytical results.

Four additional surface water monitoring stations were established and sampled along the unnamed tributary to Town Fork Creek located northwest of the Edwards Road Landfill. Results from these sample locations assist with determining if surface water quality in this basin is affected by stormwater runoff or ground water migration from the Edwards Road Landfill in this direction.

Based on the locations of the historic surface water sampling points, it is not evident that actual background surface water quality has been documented at the Edwards Road Landfill. The SS-01 surface water sampling point may be receiving a component of overland flow draining from southwestern extent of the Edwards Road Landfill. The SS-10, SS-20 and SS-50 surface water sample locations were established upstream of the Edwards Road Landfill for the purpose of determining background surface water quality for the assessment activities.

Samples were collected in general accordance with EPA Region 4's *Field Branches Quality System and Technical Procedures* and the *NCDENR Solid Waste Section Guidelines for Groundwater, Soil, and Surface Water Sampling* (April 2008). Samples were collected via decontaminated suction bulb sampler to minimize sediment disturbance in the shallow creek beds and turbidity in the samples. Six surface water samples were collected on August 11, 2009. Rainfall in the afternoon of August 11 delayed collecting the remaining six samples until August 26, 2009. All samples were submitted to Prism Laboratories of Charlotte, North Carolina, a NCDENR Division of Water Quality-certified laboratory and analyzed for the following parameters:

INORGANICS BY EPA METHODS 6010B / 9056		FIELD PARAMETERS
Iron	Barium	pH
Manganese	Cadmium	Specific Conductivity
Selenium	Chromium	Temperature
Sulfates	Lead	Oxidation-Reduction Potential
		Dissolved Oxygen
		Turbidity

5.4.2 Additional Surface Water Sampling Results

Analytical laboratory results and field parameters are summarized in Table 3 and copies of laboratory reports are included in Appendix E. The sample results are compared to the 2B standards applicable for surface water. Figure 5 depicts the sample locations along with iron, manganese and sulfate concentrations detected at each location.

No cadmium, chromium, lead or selenium was detected in any of the surface water samples. Concentrations of barium detected in the samples did not exceed the applicable 2B surface water standard and are within the range of naturally occurring barium concentrations for the Inner Piedmont. Concentrations of iron, manganese and sulfates were detected in surface water samples above the applicable surface water standards and are discussed below.

BACKGROUND CONCENTRATIONS

Concentrations of iron in the three background surface water samples ranged from 0.80 mg/L in the SS-20 sample, which is slightly below the 2B standard, to 2.9 mg/L in the SS-50 sample and 12.0 mg/L in the SS-10 sample, both of which exceed the 2B standard of 1.0 mg/L. The maximum iron concentration detected in all 12 of the surface water samples is 12.0 mg/L from the SS-10 sample location representing background conditions upstream of the Edwards Road and Hawks Landfills. The background manganese concentrations ranged from 0.046 mg/L in the SS-20 sample, 0.18 mg/L in the SS-50 sample and 0.4 mg/L in the SS-10 sample, which exceeds the 2B standard of 0.2 mg/L. Concentrations of sulfate in the background samples ranged from 5.6 to 11 mg/L in the SS-50 and SS-10 samples, respectively, which are below the 2B standard of 250 mg/L.

Turbidity levels in the background samples were low and were comparable to turbidity levels in all other samples. Additionally, oxidation-reduction potential (ORP) values for both the SS-10 and SS-50 background samples indicated reducing conditions suggesting that the surface water at these locations is derived primarily of ground water discharge. These background values indicate that naturally occurring iron and manganese concentrations in surface water in the area are variable and may exceed the applicable surface water standards.

UNNAMED TRIBUTARY NORTHWEST OF EDWARDS ROAD LANDFILL

The elevated concentrations of manganese and sulfates at the SS-60 sample location along the unnamed tributary northwest of the Edwards Road Landfill indicate that ground water discharge from the landfill is affecting surface water quality in this area. Approximately 300 feet downstream of SS-60 the concentrations decrease at sample station SS-70 though the manganese concentration remains slightly above the applicable surface water standard. The elevated iron reported in the SS-70 sample may be attributable to background surface water quality in the stream.
All concentrations are below the applicable surface water standards at sample location SS-80, located approximately 300 feet upstream of the confluence of the northwest tributary with Leak Creek. These data indicate that the extent of surface water concentrations exceeding the applicable 2B standards has been delineated along the unnamed tributary northwest of the Edwards Road Landfill.

LEAK CREEK

The elevated concentrations of manganese and sulfates at the SS-02 sample location along Leak Creek indicate that ground water discharge from the landfill is affecting surface water quality in this area. The concentrations decrease at the next downstream sample station, SS-40, though the sulfate concentration decreases only slightly. The manganese concentration decreases to below the applicable surface water standard. The iron concentrations at the historical sample locations SS-01 and SS-02 are below the applicable surface water standard and are comparable to previous results. The elevated sulfate concentration reported in the SS-40 sample indicates that sulfate-affected surface water within Leak Creek extends to near the downstream property line. Manganese and iron concentrations in the SS-40 sample do not exceed the applicable 2B standards.

There are no unacceptable surface water quality impacts to the unnamed tributary to Leak Creek located approximately 450 feet south of the Edwards Road Landfill. Sulfate was reported at 8.2 mg/L in the upstream sample (SS-20), at 28 mg/L in the sample from the middle of this stream (SS-25) and at 95 mg/L in the most downstream sample in this tributary (SS-30). None of the sulfate concentrations exceed the applicable 2B standard. The iron and manganese concentrations detected in these samples do not exceed the 2B standards and are within the range of background concentrations.

Iron, manganese and sulfate concentrations in the surface water sample downstream of the Hawks Landfill (SS-15) are below their respective 2B standards and are within the range of their naturally occurring concentrations. These data indicate that the Hawks Landfill does not impact surface water quality in Leak Creek.

5.5 LANDFILL COVER SAMPLING AND LEACHATE MODELING

ERM performed an evaluation for the existing condition of the final soil cover closure at the Edwards Road Landfill (Permit #34-05). The evaluation consisted of a detailed site reconnaissance, collection of undisturbed samples within the upper landfill footprint, hand auger borings along the eastern side slope, subsequent laboratory testing and leachate generation modeling ("HELP Model"). The purpose of the evaluation was to determine closure integrity and performance as well as predict the average and peak daily values for leachate generated. Based on historical documents and recordation, the limits of waste appear to encompass an area of approximately 18 acres.

DETAILED SITE RECONNAISSANCE

A site reconnaissance was performed by "walking" the existing landfill surface following mowing of the vegetation. An excellent stand of grass vegetation is present over the entire landfill surface. There were no observed areas of erosion, rills or

gullies along the landfill slopes. Existing storm water slope drains and structures are present to convey storm water from the upper portions of the landfill to the toe of landfill slope. The closure condition appears stabilized and adequate for covering and reducing exposure to previously disposed ash.

UNDISTURBED SAMPLING

ERM subcontracted Geologic Exploration, Inc. to use a geoprobe pushing 3-inch diameter Shelby tubes through the final cover soils to extract undisturbed samples for laboratory testing. Based on the accessible locations, a sampling frequency of approximately 1 sample for every 40,000 square feet (13 undisturbed samples) were retrieved across the upper elevations of the landfill. The approximate locations of the sampling, UD-1 through UD-13, are shown on Figure 6. An attempt to push the Shelby tubes to a depth of 24-inches below ground surface was executed at each location. At several locations, machine refusal was encountered prior to reaching the desired depth. At these locations, ash was observed at the bottom of the open hole remaining following retrieval of the Shelby tube. The total depth pushed along with noting the presence of ash was recorded for each location and is included in Table 7. Ash remaining in the bottom of the Shelby tube was removed prior to sealing the samples with wax and transporting to a geotechnical laboratory for testing. All of the holes were backfilled with bentonite pellets and hydrated with water following extraction of samples.

COVER THICKNESS VERIFICATION ON SLOPES

Hand auger borings were performed along the side slopes of the landfill to verify soil material type and depth of cover. Based on physical examination of soils retrieved at the hand auger borings, the cover soils in place on the side slopes are consistently the same material type as those used within the upper portions of the landfill. The hand auger locations are shown on Figure 6 and subsequent depth of cover is included in Table 7.

LABORATORY TESTING

Soils contained in the undisturbed samples were visually inspected and classified upon extraction at a geotechnical laboratory operated by ESP Associates, P.A. (ESP) in Fort Mill, South Carolina. In general, the final cover soils are a tan orange brown, micaceous, clayey to slightly clayey fine sandy silt with varying levels of rock fragments present. Following extraction, an accurate measurement of consistent cover soil thickness was also performed to verify or amend previously recorded cover thickness. During this process, 3-inch long representative specimens were selected for each Shelby tube for laboratory coefficient of permeability testing.

Each specimen was tested for coefficient of permeability using a tri-axial cell apparatus and flexible wall permeameter for constant head state (ASTM D 5084). Results of the testing for each sample location are included in Table 7. In summary,

coefficient of permeability values range from a high of 1.9×10^{-4} centimeters per second (cm/sec) in the UD-2 sample to a low of 1.6×10^{-5} cm/sec in the UD-4 sample for an average coefficient of permeability of 6.5×10^{-5} cm/sec across the landfill surface.

As shown at the bottom of Table 7, the average final cover soil thickness and average coefficient of permeability were calculated from laboratory measurements and testing for use in leachate generation modeling.

"HELP" MODEL ANALYSIS

The "HELP Model", made available by the United States Army Corp of Engineers (USACOE), is widely accepted as the standard for modeling leachate generation from landfills at varying states of operation and final closure. Results of the detailed site reconnaissance, most recent topographic information (NC Floodplain Mapping Program, 2008) and laboratory testing of closure soils were used to input data into the "HELP" model and calculate current leachate generation rates.

In order to evaluate the existing conditions, the landfill was divided into three distinct categories: areas with topography less than one percent drainage slopes, areas of approximately 5 percent drainage slopes and side slopes at an approximate 3H:1V slope. The locations of these category areas are shown on the attached Figure 7. These areas were simulated independently using the same average existing closure conditions to facilitate modeling for leachate generation. In all areas, a good stand of vegetation was inserted into the model to represent existing conditions as observed. Climatology data for Greensboro, North Carolina was used for all modeling purposes.

For the purpose of modeling the existing site conditions, based on the preceding information, a closure cross section consisting of 16 inches of final cover soils containing a good stand of vegetation is located above disposed ash. An average of 50 feet (600 inches) of ash is directly below the final cover soils. Both of these layers act as vertical percolation zones. Beneath the ash, a 120-inch thick, vertical percolation zone representative of natural soils encountered during previous permitting activities is used. A lateral drainage layer 24 inches thick is located beneath the previously mentioned vertical percolation zone with an average slope of 10 percent and average drainage length of 250 feet. This zone is also located immediately above underlying bedrock. The bedrock layer is used as a barrier layer with a slope of 10 percent and average drainage length of 250 feet. Based on the modeling, approximately 13 percent of rainfall received in the landfill footprint becomes leachate received at the base of the landfill either at the natural in-place soils or at the bedrock layer. Results of the "HELP Model" analysis are included in Appendix F.

RESULTS

Based on the field investigations and laboratory testing, the Edwards Road Landfill (Permit # 34-05) contains final closure cover soils 16 inches thick on average across the landfill footprint with an average coefficient of permeability of 6.5×10^{-5} cm/sec. The design specification for the permeability of the soil cover was 1.0×10^{-6} cm/sec, according to the *Solid Waste Transition Plan* and associated modifications (Shield, January 3, 2001). The higher elevations of the landfill contain a drainage slope of 1 percent or less except for small areas of approximately 5 percent. The side slopes are approximately 3H:1V with no erosion problems observed. The surface of the closed landfill maintains a good to excellent stand of vegetation consisting of grasses and no apparent erosion problems. The "HELP Model" simulations indicate an average leachate generation rate of approximately 7,500 gallons per day and a peak generation rate of approximately 46,000 gallons per day based on existing conditions and a landfill footprint of 18 acres. A summary table for leachate generation rates for both average and peak daily values is attached as Table 8.

6.0 SUMMARY AND CONCLUSIONS

Between July and September 2009, ERM conducted site assessment activities in accordance with the *Preliminary Site Assessment Work Plan* at inactive landfills previously operated by RJRT near Rural Hall, Forsyth County North Carolina. Iron, manganese, selenium, sulfates and other inorganic compounds have been detected in ground water and surface water samples collected from the Edwards Road Landfill in concentrations above the applicable North Carolina Ground Water Standards (15A NCAC 2L .0200). The objective of the ESA activities was to evaluate ground water and surface water quality related to the landfills. The ESA activities consisted of detailed geologic mapping, survey and sampling of water supply wells in the vicinity, sampling of surface water quality and evaluation of the Edwards Road Landfill soil cap. The major findings are summarized and discussed below.

Elevated concentrations of iron and manganese are naturally occurring in background ground water and surface water quality samples upgradient of the landfill. Sulfate is a primary constituent related to the landfill and is used as an indicator of impact to ground water or surface water quality. Detections of other constituents above the applicable ground water or surface water standard, including cadmium and selenium, are intermittent or are limited in geographic area.

SITE HYDROGEOLOGIC CHARACTERISTICS

- The site is underlain by fractured bedrock (gneiss and schist) that is characterized by a strongly developed stratigraphic layering (foliation or cleavage planes) with a general northeast orientation and a moderate to shallow dip to the southeast, averaging 35°. The orientation of the creeks and streams in the study area are primarily controlled by the orientation of the bedrock stratigraphy (northeast). Bedrock is present along almost the entirety of these streams. The ground water flow at the site is also strongly influenced by the northeast-trending bedrock fabric because fractures tend to develop along the stratigraphic layers and provide permeable zones for ground water flow and contaminant migration.
- Based on water level data from monitor well PW-1, the first occurrence of ground water beneath the upper portion of the site is within the fractured bedrock. The shallow saprolite aquifer that typically occurs in the soil zone of the Piedmont region is largely absent at the site. However, at the Edwards Road Landfill, the presence of perched ground water along the transition zone at the bedrock-saprolite interface is evident based on ground water levels in shallow monitor wells (i.e. W-2 & W-3). The depth to ground water in the top-of-rock aquifer zone ranges from approximately 0 feet at the creeks to 15 feet in shallow monitor wells. The depth to water in the bedrock aquifer ranges from artesian conditions to 97 feet.
- At the Edwards Road Landfill, rainwater infiltration through the landfill cap migrates vertically through the ash and encounters the top of the fractured bedrock. Some of the infiltration water migrates laterally along the top of bedrock

towards the adjacent creeks. The rest of the infiltration water enters into the underlying bedrock along stratigraphically or structurally controlled permeable zones, particularly the northeast-trending and southeast-dipping fracture planes that develop along foliation or cleavage planes. Vertically oriented northwest striking structures identified at the site may also act as conduits to the bedrock aquifer.

- Once the infiltration water enters the bedrock aquifer, it migrates laterally and vertically along the stratigraphically and structurally controlled permeable zones and secondary fracture sets. With increasing depth, there is a general decrease in the frequency and interconnectivity of the fractures resulting in reduced permeability and an upward vertical hydraulic gradient in the lower bedrock aquifer, as indicated by artesian flow in bedrock monitor well W-3B at the site.
- The creeks surrounding the landfill act as a "perimeter drain" and much of the ground water derived from infiltration through the landfill migrates either along the top of bedrock or along the permeable zones within the shallow fractured bedrock zone and discharges into these creeks.
- Based on the fundamental concepts of ground water flow in a watershed, the regional ground water flow regime within the lower portion of the deep bedrock aquifer is northeastward toward the nearest regional drainage feature, Town Fork Creek.

WATER SUPPLY WELLS

- Ground water in the vicinity of the Edwards Road Landfill is utilized for potable uses. Six off-site water supply wells were identified within 1,500 feet of the limits of the Edwards Road Landfill and six additional water supply wells were identified between 1,500 and 2,100 feet from the limits of the landfill. The nearest off-site water supply well is located approximately 1,090 feet east of the landfill limits. All identified wells are screened in bedrock between 185 and 705 feet below ground surface and all but one are active.
- Samples were collected from the 11 active supply wells to evaluate ground water quality at these locations. Analysis of nine of the 11 water supply well samples indicated no concentrations of the constituents above the applicable 2L ground water standards.
- The source of elevated lead detected in the initial sample from the Sprinkle well and three of the seven samples from the Stewart residential water supply well has not been determined. Evidence indicates that the elevated concentrations of lead reported in the Sprinkle and Stewart residential well samples are localized conditions and are unrelated to the Hawks or Edwards Road Landfills based on the following:
  - The absence of lead detected in the three additional samples from water supply wells along Crestbrook Road and the absence or low concentrations of lead in the other six well samples surrounding the Stewart residential well

indicate that the lead affected ground water is not a wide-spread condition; and,

  - No significant concentrations of sulfates or manganese, which are the primary constituents associated with the Edwards Road Landfill, were detected in any of the well samples.

- The water supply well on the Edwards Road Landfill property, identified as PW-1, was taken out of service in August 2009 by disconnecting the aboveground pump equipment. Attempts to remove the pump system from the borehole were unsuccessful due to an obstruction in the well. Driller's records for this well indicate it is 405 feet deep with casing set to 21.5 feet below ground surface, approximately 5 feet into bedrock. The depth to water in this well is 72 feet. This well is now used for ground water quality monitoring purposes only.

SURFACE WATER QUALITY

- Historical and recent surface water quality data from the long-term sample station immediately downstream of the Edwards Road Landfill along Leak Creek (SS-02) indicate an increasing trend in sulfate concentrations. These data indicate that sulfate-affected ground water from the landfill is currently migrating to Leak Creek and resulting in surface water quality impacts. The elevated sulfate concentration reported in the SS-40 sample indicates that sulfate-affected surface water within Leak Creek extends to near the downstream property line. Manganese and iron concentrations in the SS-40 sample do not exceed the applicable 2B standards.
- Background surface water quality samples from upstream of the Edwards Road and Hawks Landfills indicate that iron and manganese occur naturally in concentrations exceeding the applicable surface water quality standards.
- The elevated concentrations of manganese and sulfates at the SS-60 sample location along the unnamed tributary northwest of the Edwards Road Landfill indicate that some affected ground water from the landfill site is migrating northward and affecting surface water quality in the northwest tributary. The monitoring data indicate that the surface water quality impacts are limited to an approximate 800-foot segment of the northwest tributary and are attenuated by dilution prior to reaching Leak Creek.
- Iron, manganese and sulfate concentrations in the surface water sample downstream of the Hawks Landfill (SS-15) are below their respective 2B standards and are within the range of their naturally occurring concentrations. These data indicate that the Hawks Landfill does not impact surface water quality in Leak Creek.

GROUND WATER QUALITY

- Historical ground water quality data from the long-term ground water monitoring well samples at the Edwards Road Landfill indicate stable or increasing trends for manganese and sulfate concentrations in ground water. These data indicate that the landfill continues to serve as a source area for ground water quality impacts at the site.
- The extent of sulfate-affected ground water in the bedrock aquifer has not been delineated. Based on the monitoring data and the site conceptual model, most of the affected ground water from the site is migrating toward and is intercepted by Leak Creek and the unnamed northwest tributary.

EDWARDS ROAD LANDFILL COVER SAMPLING AND LEACHATE MODELING

- The soil cover thickness ranged from 10 to 25 inches with an average thickness of 16 inches. Permeability values for the soil cover range from a high of 1.9×10^{-4} cm/sec to a low of 1.6×10^{-5} cm/sec for an average permeability of 6.5×10^{-5} cm/sec across the landfill surface. The surface of the closed landfill maintains a good to excellent stand of vegetation consisting of grasses and no apparent erosion problems.
- Results of the "HELP Model" simulations indicate an average leachate generation rate of approximately 7,500 gallons per day and a peak generation rate of approximately 46,000 gallons per day based on existing conditions and a landfill footprint of approximately 18 acres.

HAWKS LANDFILL

- Based on the surface water and ground water monitoring data at the site, in conjunction with the analytical results of water supply well samples from near the Hawks Landfill, there are no significant impacts to surface water or ground water quality from the Hawks Landfill. No additional environmental assessment of the Hawks Landfill is warranted.

7.0 PROPOSED PHASE II ASSESSMENT ACTIVITIES

Recommendations for additional assessment activities to evaluate the extent of affected ground water and surface water are summarized below. The locations of the proposed additional monitoring points are depicted on Figure 8. A work plan for the Phase II assessment activities will be prepared and submitted to the NCDWM for approval.

GROUND WATER MONITORING

Delineation of the extent of the affected ground water near the Edwards Road Landfill is necessary. The following ground water assessment activities are proposed:

- One bedrock monitoring well approximately 300 feet northeast of the limits of the landfill to evaluate bedrock water quality downgradient of the landfill;
- One bedrock monitoring well approximately 650 feet northwest of the limits of the landfill to evaluate bedrock water quality northwest and side-gradient of the landfill; and,
- Two off-site bedrock monitoring wells approximately 500 feet east and 900 feet southeast of the limits of the landfill to evaluate bedrock water quality east-southeast and side-gradient of the landfill.
- Three piezometers along the southern bank of the unnamed tributary northwest of the landfill to evaluate ground water quality in the top-of-rock aquifer discharging into the creek.
- Two piezometers along the western bank of Leak Creek downstream of the landfill to evaluate ground water quality in the top-of-rock aquifer discharging into the creek in this area.
- Surveying the locations of all existing and proposed monitor wells. This will include surveying the top-of-casing elevations of the monitor wells which will be used to develop ground water elevation data and flow maps for the site.

SURFACE WATER MONITORING

Additional evaluation of surface water quality downstream of the Edwards Road Landfill is recommended via sampling of surface water in Leak Creek approximately 400 feet downstream of the confluence of Leak Creek and the unnamed tributary northwest of the landfill.

EDWARDS ROAD LANDFILL COVER FINAL CLOSURE ASSESSMENT

Additional evaluation and modeling are recommended to evaluate specific landfill cap enhancements to reduce the current rainfall infiltration quantities.

8.0 REFERENCES

Geologic Map of the East Half of the Winston-Salem Quadrangle, North Carolina-Virginia; Map I-709-B; U.S. Geological Survey; 1975.

Diabase Dikes of the Eastern Piedmont of North Carolina; Information Circular 23, North Carolina Department of Natural Resources and Community Development; 1978.

Solid Waste Management Permit No. 34-D issued to R.J. Reynolds Tobacco Company March 3, 1980; State of North Carolina Department of Human Resources, Division of Health Services.

Geologic Map of North Carolina; North Carolina Department of Natural Resources and Community Development; 1985.

Solid Waste Permit No. 34-05 issued to R.J. Reynolds Tobacco Company May 29, 1986; State of North Carolina Department of Human Resources, Division of Health Services.

R. J. Reynolds Tobacco Company Ash Landfill Transition Plan; Geo-Environmental Consultants, Inc.; October 19, 1999.

Work Plan for Upgrading Groundwater Monitoring, Phase II Ash Fill Area, R.J. Reynolds Tobacco Company; Geo-Environmental Consultants, Inc.; January 25, 2000.

Upgrade of Groundwater Monitoring Program, Phase II Ash Fill Area, R.J. Reynolds Tobacco Company; Shield Environmental Associates, Inc.; March 13, 2000.

Modifications to Transition Plan, Permit #34-05; Shield Environmental Associates, Inc.; January 2, 2001.

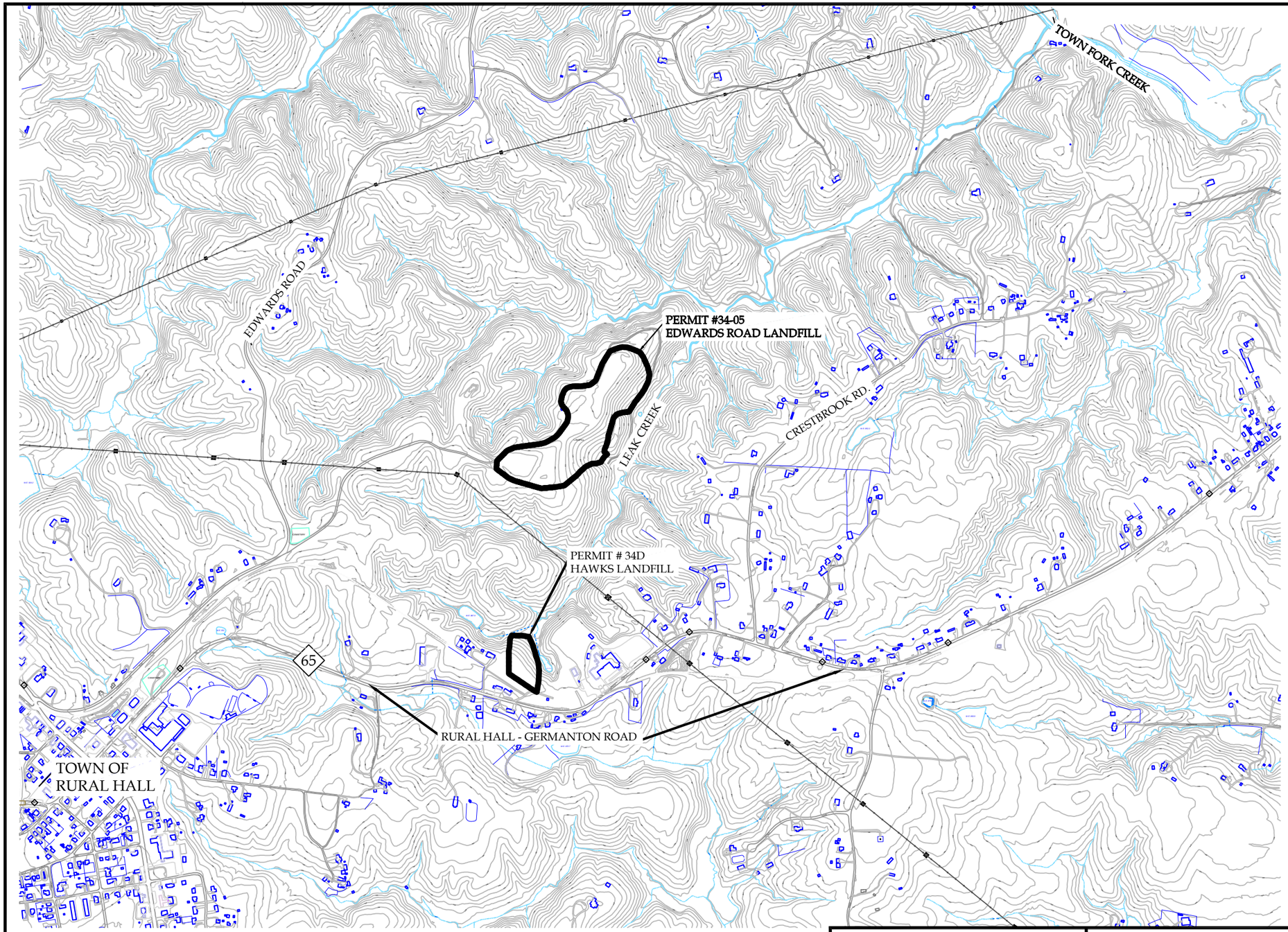
Compliance Order with Administrative Penalty, Facility #34-05, R.J. Reynolds Tobacco Company, Forsyth County; State of North Carolina Department of Environment and Natural Resources, Division of Waste Management; April 17, 2009.

Correspondence from ERM NC, PC to North Carolina Department of Environment and Natural Resources – Division of Waste Management; May 29, 2009; Subject: Abandonment of Well PW-1, R.J. Reynolds Ash Landfill – Permit #34-05, Rural Hall, Forsyth County, North Carolina.

Correspondence from ERM NC, PC to North Carolina Department of Environment and Natural Resources – Division of Waste Management, June 30, 2009, Subject: Water Supply Well Survey and Sampling, R.J. Reynolds Ash Landfill – Permit #34-05, Rural Hall, Forsyth County, North Carolina.

Preliminary Site Assessment Work Plan, Rural Hall Ash Landfill, Permit No. 34-05, Rural Hall, Forsyth County, North Carolina; ERM NC, PC; July 17, 2009.

FIGURES



NOTES:

TOPOGRAPHIC INFORMATION SHOWN IS A COMPILATION OF NC FLOODPLAIN MAPPING PROGRAM 2008 AND FORSYTH COUNTY INFORMATION 2005.

CONTOUR INTERVAL IS 10-FT.

LIMITS OF LANDFILL ARE APPROXIMATE BASED ON AVAILABLE HISTORIC DATA.

PARCEL BOUNDARY INFORMATION TAKEN FROM FORSYTH COUNTY GIS SYSTEM.

N

SCALE IN FEET
0 250 500 1000

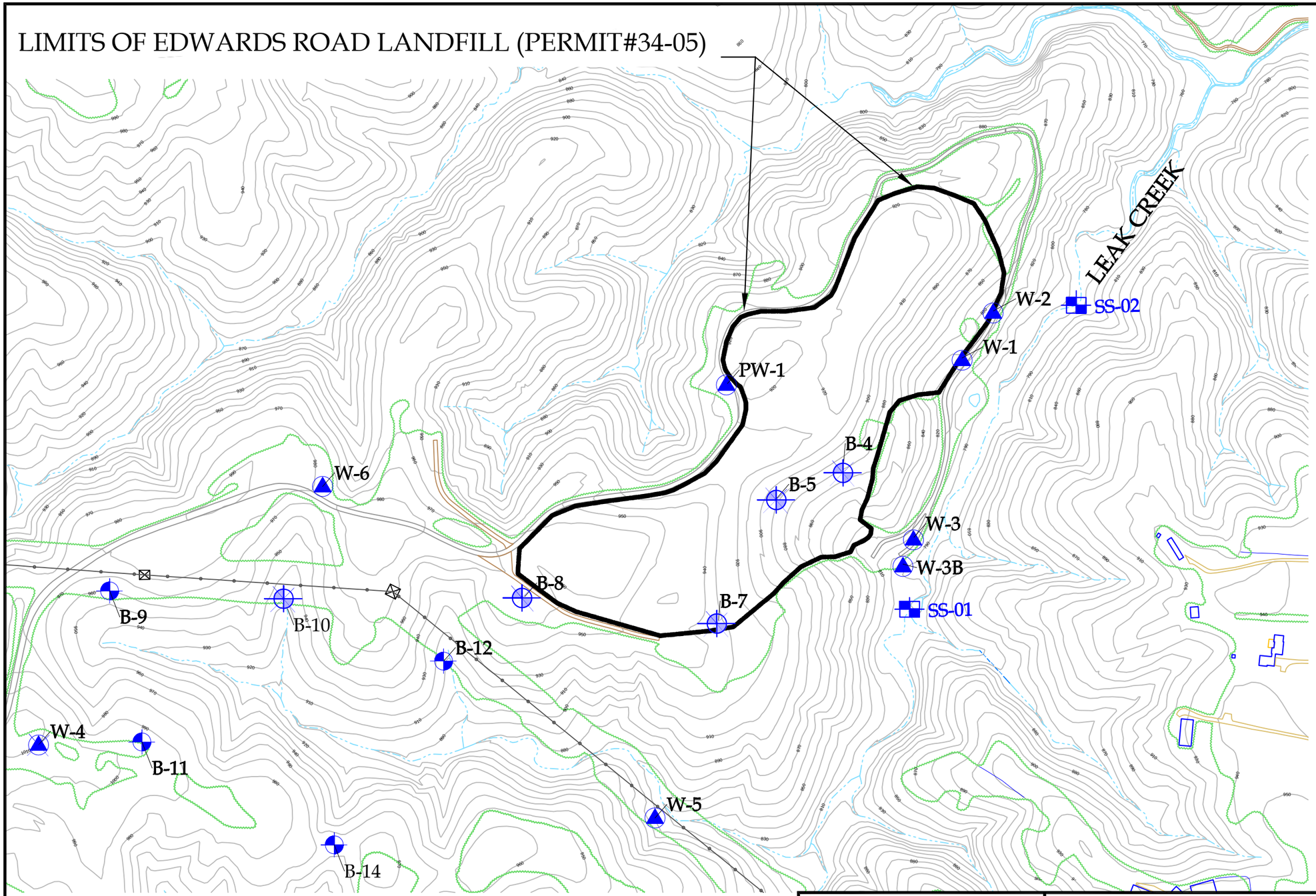
ERM NC, PC

ERM

SITE LOCATION PLAN
RURAL HALL ASH LANDFILLS
R.J. REYNOLDS TOBACCO COMPANY
RURAL HALL, NORTH CAROLINA

FIGURE
1

LIMITS OF EDWARDS ROAD LANDFILL (PERMIT#34-05)



LEGEND

- WELL LOCATION
- SOIL TEST BORING LOCATION
- WELL LOCATION PREVIOUSLY ABANDONED
- SOIL TEST BORING LOCATION WITH NO EXISTING PIEZOMETER
- EXISTING SURFACE WATER SAMPLING LOCATION

NOTES:

WELL PW-1 PREVIOUSLY SERVED AS A BACKGROUND MONITORING WELL.

WELL W-6 IS CURRENT BACKGROUND MONITORING WELL.

WELLS W-1, W-2, W-3 & W-3B SERVE AS COMPLIANCE MONITORING WELLS.

SOIL TEST BORINGS WERE PERFORMED IN 1987 BY OTHERS.

TOPOGRAPHIC INFORMATION IS A COMPILATION OF NC FLOODPLAIN MAPPING PROGRAM, 2008 AND FORSYTH COUNTY TOPOGRAPHY, 2005.

LANDFILL LIMITS ARE APPROXIMATE BASED ON AVAILABLE HISTORIC DATA.

CONTOUR INTERVAL IS 10-FT.

LOCATIONS OF WELLS AND SOIL TEST BORINGS ARE APPROXIMATE BASED ON HISTORICAL AVAILABLE DATA.

WELL W-5 AND SOIL TEST BORINGS B-9, B-10, B-11 & B-12 WITH PIEZOMETERS WERE INSTALLED BY OTHERS FOR FORMER PROPOSED PHASE III.

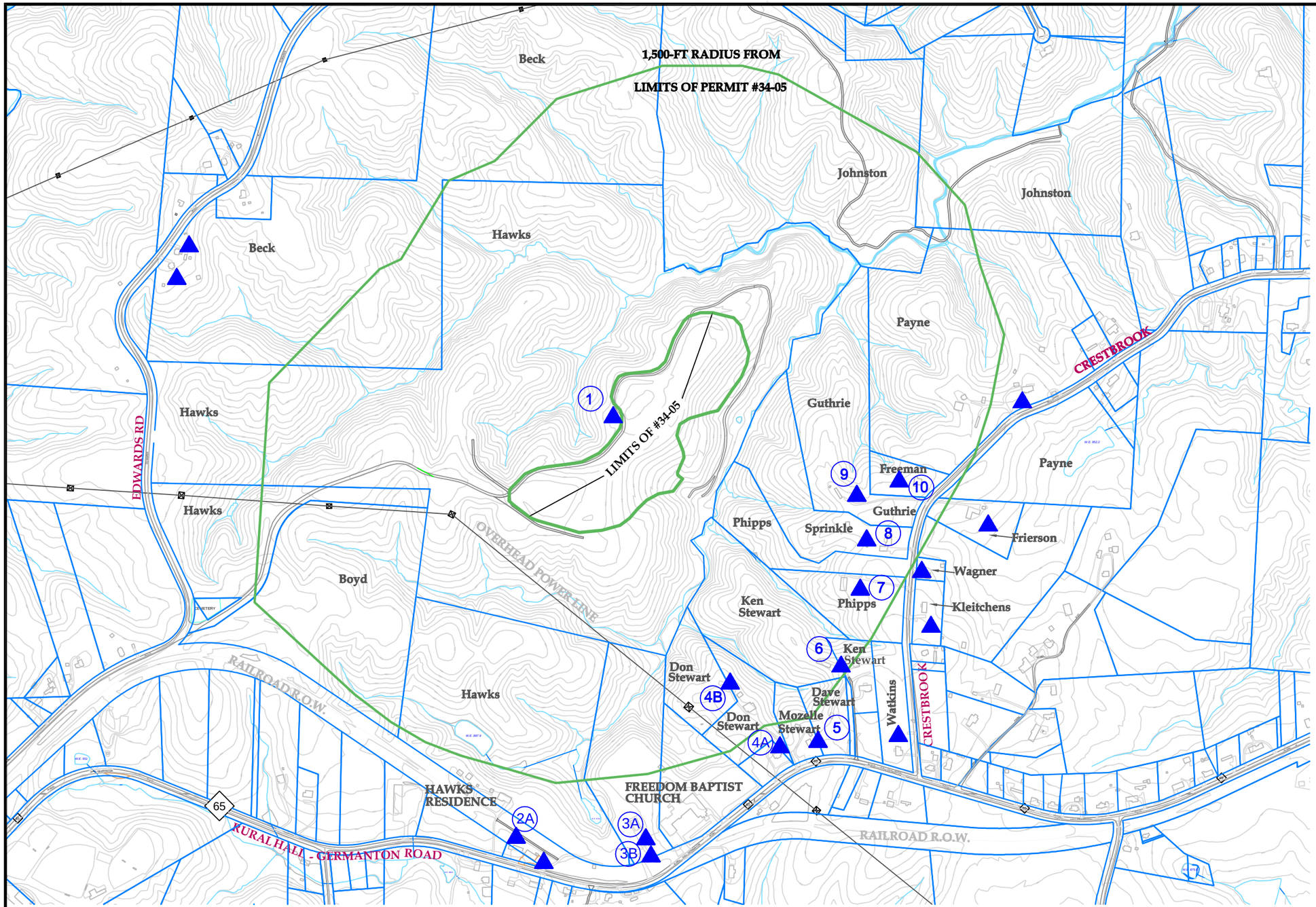
N

SCALE IN FEET
0 75 150 300

ERM NC, PC

SITE PLAN
ASH LANDFILL PERMIT #34-05
R.J. REYNOLDS TOBACCO COMPANY
RURAL HALL, NORTH CAROLINA

FIGURE
2



NOTES:

TOPOGRAPHIC INFORMATION SHOWN IS A COMPILATION OF NC FLOODPLAIN MAPPING PROGRAM 2008 AND FORSYTH COUNTY INFORMATION 2005.

CONTOUR INTERVAL IS 10-FT.

LIMITS OF LANDFILL ARE APPROXIMATE BASED ON AVAILABLE HISTORIC DATA.

PARCEL BOUNDARY INFORMATION TAKEN FROM FORSYTH COUNTY GIS SYSTEM.

WELL ID ASSIGNED DURING SAMPLING

5

WELL ID CORRESPONDS TO TABLE 1

WATER SUPPLY WELL IDENTIFIED

N

SCALE IN FEET

0 150 300 600

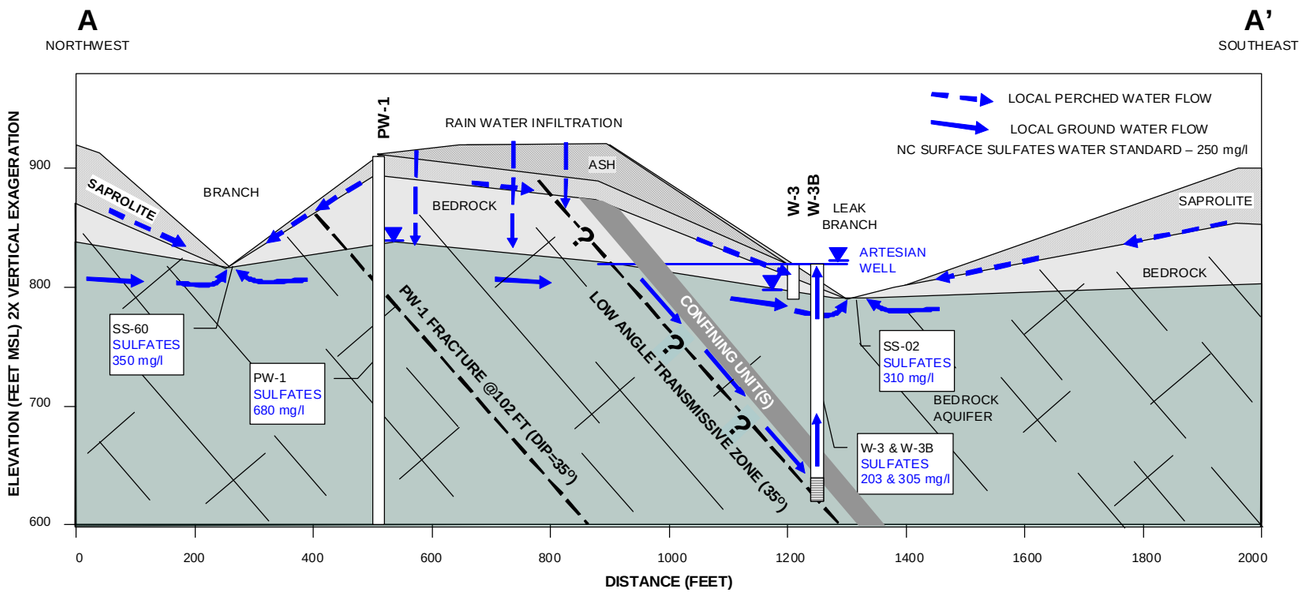
ERM NC, PC

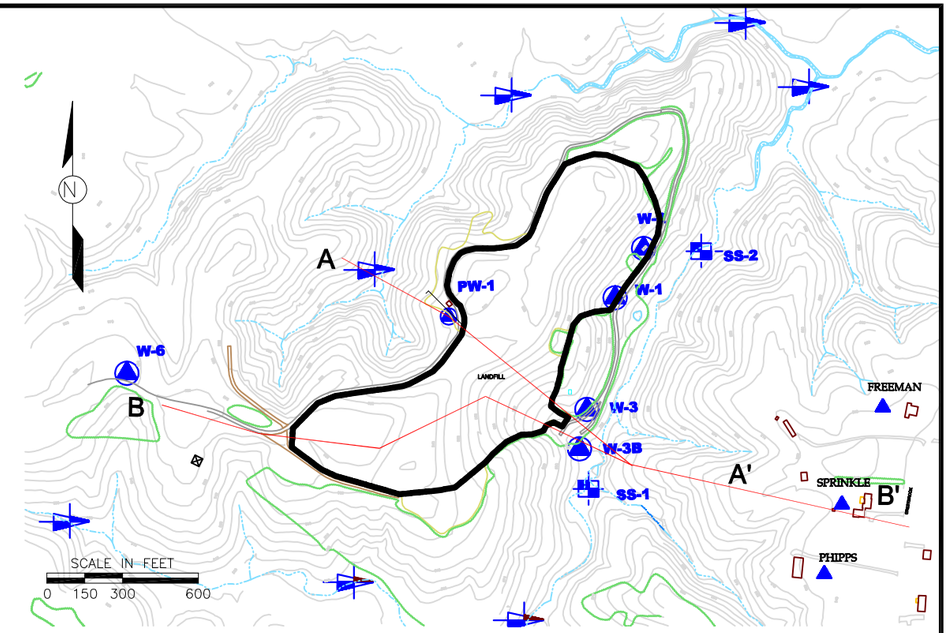
ERM

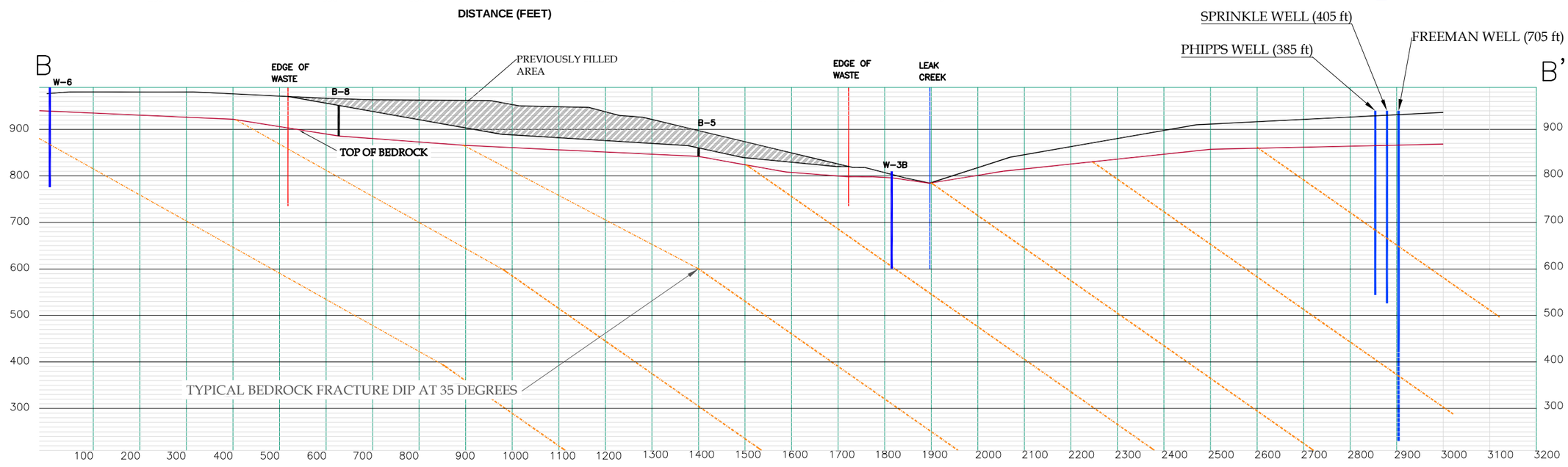
WATER SUPPLY WELLS WITHIN 1,500 FEET
ASH LANDFILL PERMIT #34-05
R.J. REYNOLDS TOBACCO COMPANY
RURAL HALL, NORTH CAROLINA

FIGURE

3







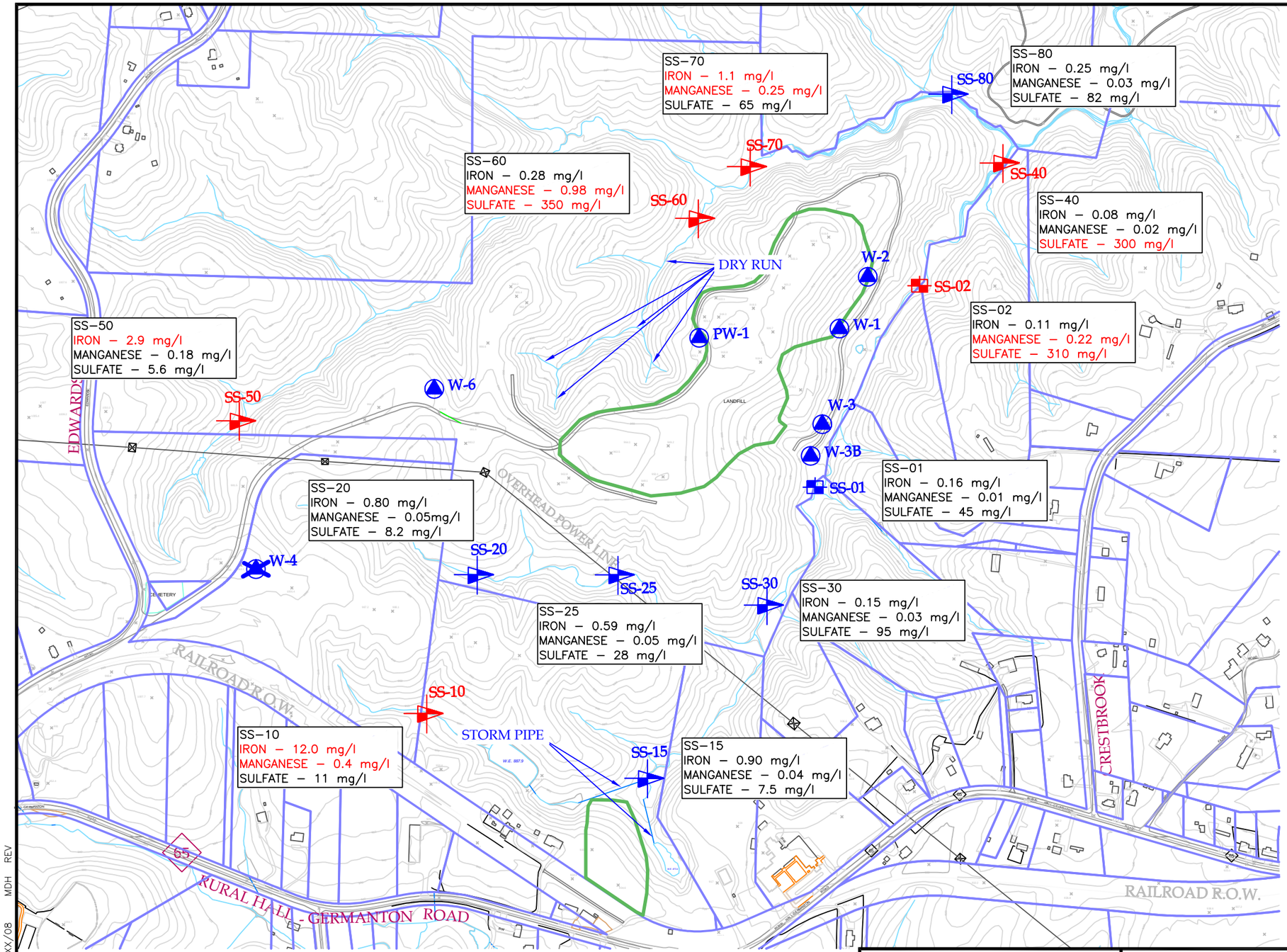
ERM NC, PC

ERM

GEOLOGIC CROSS SECTIONS
ENVIRONMENTAL ASSESSMENT REPORT
R.J. REYNOLDS TOBACCO COMPANY
RURAL HALL, NORTH CAROLINA

FIGURE
4

ERM.DWG MM/DD/05 1=1 INIT REV



LEGEND

W-6	EXISTING MONITORING WELL
W-4	ABANDONED MONITORING WELL
SS-01	EXISTING SURFACE WATER MONITORING LOCATION
SS-01	SURFACE WATER MONITORING LOCATION - AUGUST 2009 NO EXCEEDANCE OF STANDARDS
SS-50	SURFACE WATER MONITORING LOCATION - AUGUST 2009 EXCEEDANCE OF STANDARDS
	EXISTING CONTOUR 10-FT INTERVAL

NC 2B Surface Water Standards	
Barium	1
Cadmium	0.002
Chromium (Total)	0.05
Iron	1
Lead	0.025
Manganese	0.2
Selenium	0.005
Sulfate	250
pH	6.0 - 9.0
Temperature (Celsius)	NE
Conductivity (µmhos/cm)	NE
Turbidity (NTUs)	NE
ORP (mV)	NE
Dissolved Oxygen (mg/L)	NE

NOTES: CONCENTRATIONS SHOWN ARE MILLIGRAMS PER LITRE (mg/l) UNLESS OTHERWISE INDICATED.

CONCENTRATIONS EXCEEDING THE APPLICABLE NC2B SURFACE WATER STANDARD ARE SHOWN IN RED..

N

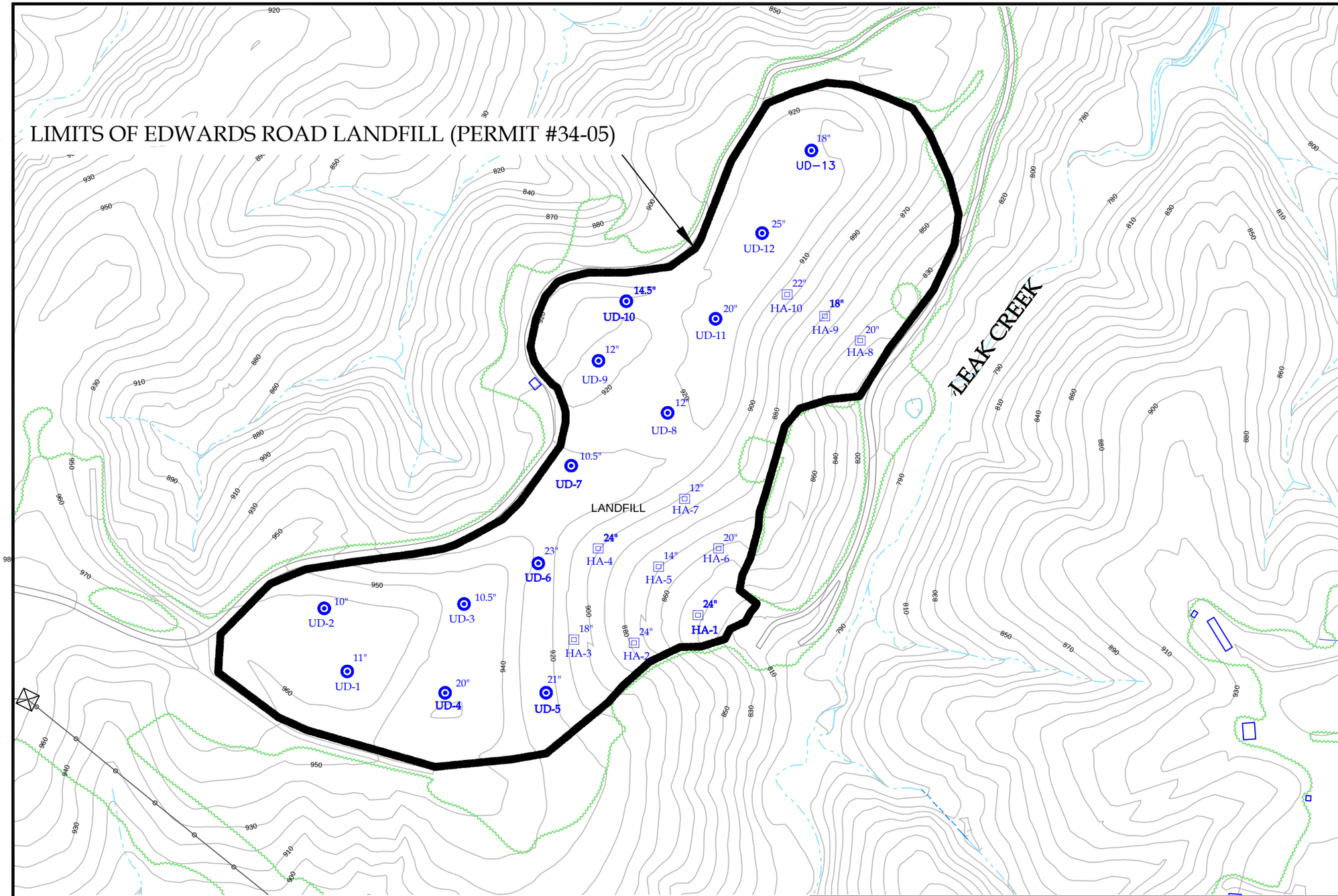
SCALE IN FEET
0 125 250 500

ERM NC, PC
ERM

SURFACE WATER SAMPLING RESULTS - AUGUST 2009
ASH LANDFILLS
R. J. REYNOLDS TOBACCO COMPANY
RURAL HALL, NC

FIGURE
5

SITE.DWG XX/XX/08 MDH REV



LEGEND

UNDISTURBED SAMPLING LOCATION — COVER THICKNESS 18" — UD-1

HAND AUGER LOCATION — COVER THICKNESS 18" — HA-1

EXISTING CONTOUR 10-FT INTERVAL

NOTES:

TOPOGRAPHIC INFORMATION IS A COMPILATION OF NC FLOODPLAIN MAPPING PROGRAM, 2008 AND FORSYTH COUNTY TOPOGRAPHY, 2005.

LANDFILL LIMITS ARE APPROXIMATE BASED ON AVAILABLE HISTORIC DATA.

CONTOUR INTERVAL IS 10-FT.

LOCATIONS OF SAMPLING AND HAND AUGER LOCATIONS ARE APPROXIMATE BASED ON FIELD MEASUREMENTS & OBSERVATIONS.

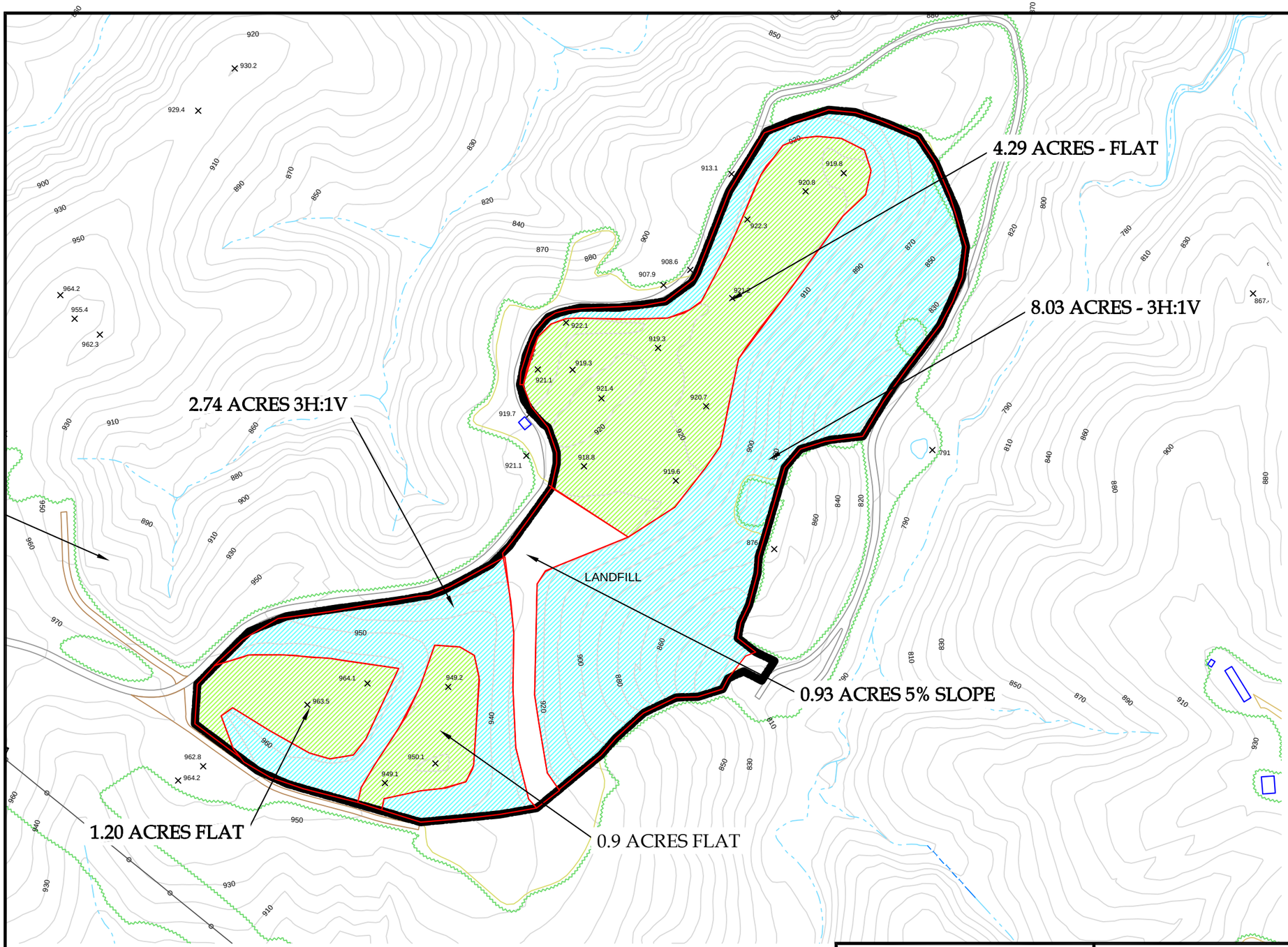
N

SCALE IN FEET
0 50 100 200

ERM NC, PC

CAP EVALUATION SAMPLING LOCATIONS
ASH LANDFILL PERMIT #34-05
R.J. REYNOLDS TOBACCO COMPANY
RURAL HALL, NORTH CAROLINA

FIGURE
6



SUMMARY

6.39 ACRES - FLAT

11.67 ACRES - 3H:1V

0.93 ACRES - 5% SLOPE

ALL AREAS CONTAIN WELL ESTABLISHED VEGETATION WITH EXCELLENT ROOT STRUCTURE.

N

SCALE IN FEET

0 50 100 200

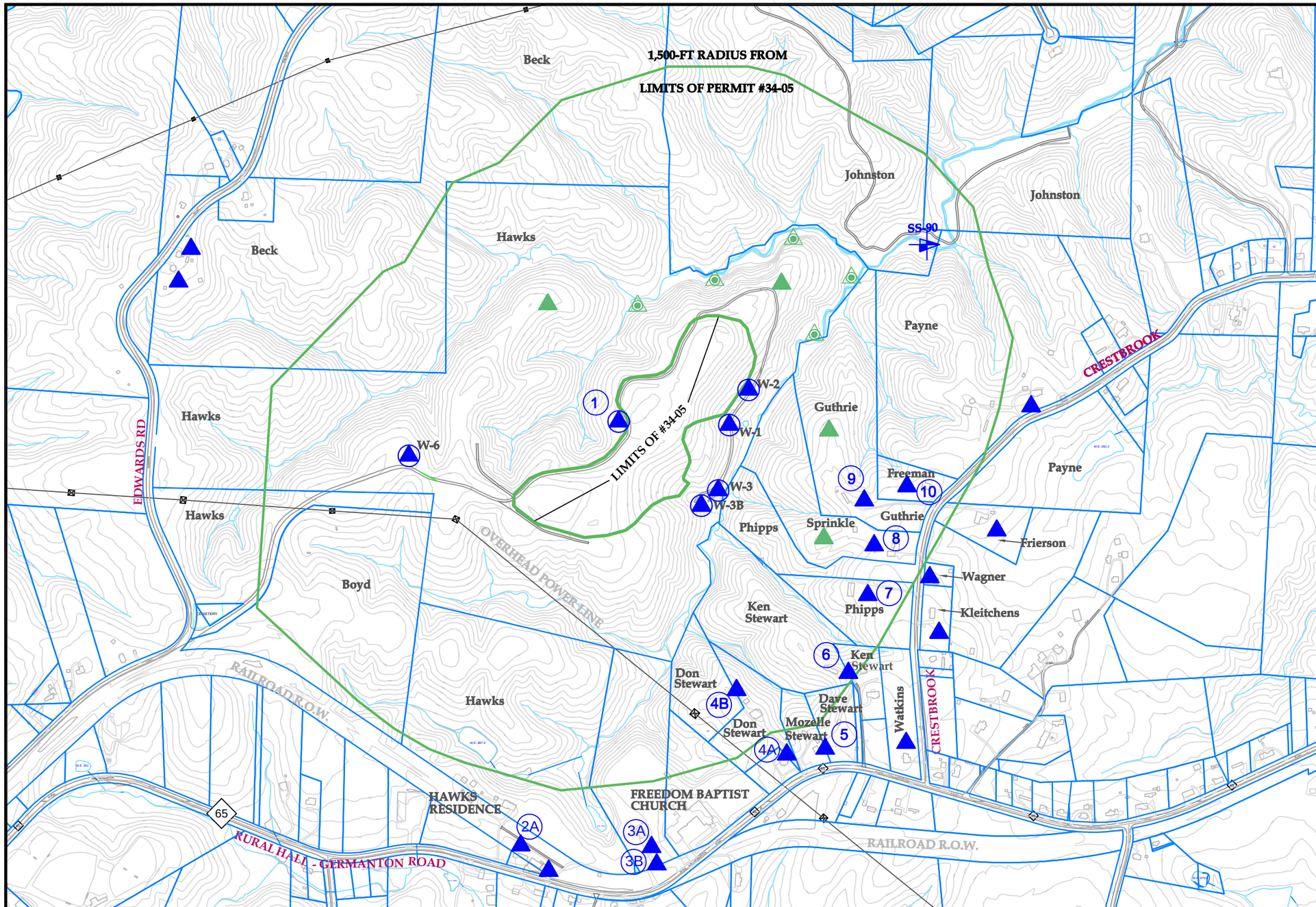
ERM NC, PC

ERM

HELP MODEL SUMMARY
ASH LANDFILL PERMIT #34-05
R.J. REYNOLDS TOBACCO COMPANY
RURAL HALL, NORTH CAROLINA

FIGURE

7



NOTES:

TOPOGRAPHIC INFORMATION SHOWN IS A COMPILATION OF NC FLOODPLAIN MAPPING PROGRAM 2008 AND FORSYTH COUNTY INFORMATION 2005.

CONTOUR INTERVAL IS 10-FT.

LIMITS OF LANDFILL ARE APPROXIMATE BASED ON AVAILABLE HISTORIC DATA.

PARCEL BOUNDARY INFORMATION TAKEN FROM FORSYTH COUNTY GIS SYSTEM.

WELL ID ASSIGNED DURING SAMPLING

5 — WELL ID CORRESPONDS TO TABLE 1

WATER SUPPLY WELL IDENTIFIED

PHASE II PROPOSED WELL LOCATIONS

SS-90 — PHASE II PROPOSED SURFACE WATER SAMPLING LOCATION

EXISTING MONITORING WELL

PROPOSED PIEZOMETER LOCATION

N

SCALE IN FEET
0 150 300 600

ERM NC, PC

PROPOSED ADDITIONAL SAMPLING LOCATIONS
ASH LANDFILL PERMIT #34-05
R.J. REYNOLDS TOBACCO COMPANY
RURAL HALL, NORTH CAROLINA

FIGURE
8

TABLES

TABLE 1
MONITOR WELL CONSTRUCTION DETAILS AND GROUND WATER ELEVATIONS
ASH LANDFILL - PERMIT 34-05
RURAL HALL, NORTH CAROLINA

MONITOR WELL CONSTRUCTION DETAILS

Monitor Well	Installation Date	Northing	Easting	TOC Elevation (ft MSL)	Boring Depth (ft BGL)	Outer Casing Depth (ft BGL)	Screened Interval (ft BGL)	Geologic Zone Screened	Comments
PW-1	5/26/87	--	--	--	405	21.5	21.5-405	Bedrock	6 inch dia. galv. casing; Former supply well, pump removed (8/09): Construction details per Clayton Well Drilling log and video inspection by ERM (8/09); Open rock to 405 ft, TOC 0.1ft ags, Open frac zone 102-103 ft (video) producing 8-10 gpm (Clayton); Total well yield 25 gpm with no other obvious water-bearing zones below 103 ft (Clayton).
W-1	10/13/87	--	--	--	20.5	NA	10-20	Saprolite	2 inch dia. PVC, TOC 0.6 ft above ground surface (ags). Well replaced 11/93, DWM permit-required sample location
W-2	12/6/89	--	--	--	17	NA	7-17	Sap/PWR	2 inch dia. PVC, TOC 3 ft ags, DWM permit-required sample location
W-3	12/7/89	--	--	--	17	NA	7-17	Sap/PWR	2 inch dia. PVC, TOC 2.5 ft ags, (alternate IDs W-3A, W-2A, RH-MW-003), DWM permit-required sample location
W-3B	5/14/04	--	--	--	210	Unknown	190-210	Bedrock	2 inch dia. PVC, TOC 3 ft ags, artesian well, DWM permit-required sample location
W-4	6/8/93	--	--	--	188	NA	138-188	Bedrock	2 inch dia. PVC, damaged, *abandoned 8/27/03*
W-5	5/17/93	--	--	--	24	NA	13-23.5	Bedrock	2 inch dia PVC, Phase 3 permanent MW
W-6	8/22/03	--	--	--	200	NA	170-200	Bedrock	2 inch dia. PVC, TOC 2' ags, (alternate IDs MW-6), DWM permit-required sample location
B-9	5/20/93	--	--	--	23	NA	18-22.5	Saprolite	2 inch dia PVC, Phase 3 temporary piezometer, no protective well box around well
B-10	5/19/93	--	--	--	14	NA	9-13.5	Saprolite	2 inch dia PVC, Phase 3 temporary piezometer, not located October 2009
B-11	5/20/93	--	--	--	54	NA	48-53	Saprolite	2 inch dia PVC, Phase 3 temporary piezometer, no protective well box around well
B-12	5/19/93	--	--	--	8.5	NA	3.5-8	Saprolite	2 inch dia PVC, Phase 3 temporary piezometer, no protective well box around well
B-14	5/20/93	--	--	--	54	NA	48-53	Saprolite	2 inch dia PVC, Phase 3 temporary piezometer, no protective well box around well

GROUND WATER ELEVATION DATA

Monitor Well	TOC Elevation (ft MSL)	Screened Interval (ft BGL)	Geologic Zone Screened	*At Installation*		19-Oct-2006		27-Apr-2007		19-Nov-2007		30-Apr-2008		30-Apr-2009		12-Oct-2009	
				Depth ft BTOC	Date	Depth ft BTOC	Elevation ft MSL	Depth ft BTOC	Elevation ft MSL	Depth ft BTOC	Elevation ft MSL	Depth ft BTOC	Elevation ft MSL	Depth ft BTOC	Elevation ft MSL	Depth ft BTOC	Elevation ft MSL
PW-1	--	21.5-405	Bedrock	NA	5/26/87	--	--	--	--	--	--	--	--	--	--	72.00	--
W-1	--	10-20	Saprolite	13.5	10/13/87	11.59	--	10.88	--	13.29	--	12.84	--	13.23	--	14.53	--
W-2	--	7-17	Sap/PWR	11	12/6/89	13.32	--	13.96	--	16.08	--	14.68	--	15.18	--	17.50	--
W-3	--	7-17	Sap/PWR	14	12/7/89	7.54	--	6.98	--	7.78	--	7.04	--	7.12	--	7.63	--
W-3B	--	190-210	Bedrock	Artesian	2004	Artesian	--	Artesian	--	Artesian	--	Artesian	--	Artesian	--	-1.22[1]	--
W-5	--	13-23.5	Bedrock	6	5/17/93	--	--	--	--	--	--	--	--	--	--	10.08	--
W-6	--	170-200	Bedrock	50	5/17/93	99.00	--	94.48	--	105.00	--	99.29	--	98.28	--	99.64	--
B-9	--	18-22.5	Bedrock	16.8	5/21/93	--	--	--	--	--	--	--	--	--	--	20.40	--
B-10	--	9-13.5	Saprolite	11.2	5/21/93	--	--	--	--	--	--	--	--	--	--	Not located	--
B-11	--	48-53	Saprolite	NA	NA	--	--	--	--	--	--	--	--	--	--	--	--
B-12	--	3.5-8	Saprolite	6.4	5/21/93	--	--	--	--	--	--	--	--	--	--	10.26	--
B-14	--	48-53	Saprolite	NA	5/20/93	--	--	--	--	--	--	--	--	--	--	--	--

MSL - above mean sea level BTOC = Below Top of Casing PWR = Partially Weathered Rock BGL - Below ground level

[1] - Artesian condition, Value represents water level above permanent TOC. Measured via temporary standpipe installed on permanent casing.

TABLE 2A
GROUND WATER ANALYTICAL RESULTS SUMMARY
ASH LANDFILL - PERMIT 34-05
RURAL HALL, NORTH CAROLINA

Sample Location / ID	Date	Aluminum	Arsenic	Barium	Cadmium	Chromium (Total)	Copper	Iron	Lead	Manganese	Mercury	Selenium	Silver	Zinc	Nitrate-nitrogen	Sulfate	Dissolved Solids	Total Organic Carbon	pH	Temperature (degrees Celsius)	Conductivity (µmhos/cm)	Turbidity (NTUs)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)
NC 2L Ground Water Standard		NE	0.050	2.0	0.00175	0.050	1.0	0.300	0.015	0.050	0.00105	0.050	0.0175	1.05	10.0	250	500	NE	6.5 - 8.5	NE	NE	NE	NE	NE
Solid Waste Section Limit		NE	0.010	0.100	0.001	0.010	0.010	0.300	0.010	0.050	0.0002	0.010	0.01	0.01	10.0	250	NE	NE	NE	NE	NE	NE	NE	NE
NC 2B Surface Water Standard		0.087	0.050	1.0 [1]	0.002	0.050	0.007	1.0	0.025	0.200 [1]	0.000012	0.005	0.00006	0.05	10.0 [1]	250 [1]	500 [1]	NE	6.0 - 9.0	NE	NE	NE	NE	NE
W-1	4/29/88	8.03	<0.010	**0.235**	**0.008**	**0.016**	<0.020	**17.4**	<0.005	**1.10**	<0.00020	<0.010	<0.010	**0.031**	2.2	130	156	2.24	5.9					
	7/13/89	NS	<0.010	0.100	<0.002	<0.020	NS	NS	<0.005	NS	<0.00020	0.005	<0.010	<0.020	NS	NS	NS	NS	NS	NS	NS	--	--	--
	9/24/90	5.62	<0.010	**0.189**	<0.002	<0.020	<0.020	**8.90**	<0.005	**0.15**	<0.00020	**0.059**	<0.010	<0.020	0.71	14	185	13	6.3	19.3	195	--	--	--
	10/24/91	0.161	<0.010	**0.346**	<0.002	<0.020	<0.020	0.15	<0.005	**0.097**	<0.00020	**0.0239**	<0.010	<0.020	0.238	126	303	12.0	6.2	20.3	425	--	--	--
(RHMW-001)	3/26/92	2.85	<0.010	**0.736**	<0.002	<0.020	<0.020	**0.83**	<0.005	**1.83**	**0.00032**	**0.0219**	<0.010	**0.038**	1.25	123	482	14.0	6.6	9.3	682	--	--	--
	9/30/92		<0.010	**0.12**	<0.002	<0.020	<0.020		<0.005	**0.31**	<0.00020	**0.0320**	<0.010	<0.020	0.382	**292**	**798**	5.0	5.9	17.8	1,153	--	--	--
	3/31/93	0.364	<0.010	**0.137**	<0.002	<0.020	<0.020	**1.13**	<0.005	**2.23**	<0.00020	**0.0132**	<0.010	**0.033**	0.550	**486**	**1,169**	33.0	5.5	16.1	1,587	--	--	--
	9/17/93	28.6	<0.010	**0.697**	**0.0038**	<0.020	**0.044**	**59.7**	**0.013**	**3.49**	<0.00020	0.0051	<0.010	**0.195**	0.925	**565**	**1,643**	6.0	5.9	18	2,310	--	--	--
well replaced 11/93	3/30/94	5.32	<0.010	**0.545**	<0.002	<0.020	**0.02**	**18.8**	0.008	**0.51**	<0.00020	0.0060	<0.010	**0.107**	0.390	**633**	**1,680**		5.6	15.2	1,250	--	--	--
	9/30/94	1.81	<0.010	<0.250	<0.002	<0.020	**0.022**	**9.96**	<0.005	**4.47**	<0.00020	**0.0130**	<0.010	**0.019**	0.450	**758**	**2,420**	123	6.0	18.1	3,010	--	--	--
	3/31/95	24	<0.010	**1.25**	<0.002	<0.020	**0.026**	**53.9**	**0.011**	**1.58**	<0.00020	**0.0120**	<0.010	**0.115**	0.850	**797**	**2,140**		5.9	15.8	2,820	--	--	--
	9/29/95	7.65	<0.010	**0.367**	**0.004**	<0.020	**0.024**	**18.8**	0.01	**4.0**	<0.00020	**0.0120**	<0.010		1.000	**464**	**2,780**	4.04	4.5	16.2	3,720	--	--	--
	3/20/96	149	<0.010	**0.96**	**0.050**	**0.200**	**0.22**	---	**0.063**	**11.4**	<0.00020	<0.010	<0.010	**0.695**	---	**2,320**	**2,670**	8.75	6.5	15	3,060	--	--	--
	9/27/96	7.11	<0.010	<0.250	<0.002	<0.020	<0.020	**22.6**	0.007	**2.30**	<0.00020	<0.010	<0.010	**0.051**	1.520	**1,320**	**2,970**	3.81	6.1	19	3,350	--	--	--
	3/29/97	2.99	<0.010	<0.250	<0.002	<0.020	<0.020	---	**0.016**	**2.34**	<0.00020	<0.010	<0.010	**0.072**	1.200	**1,360**	**2,860**	6.87	6.0	14	1,890	--	--	--
	9/17/97	2.94	<0.010	<0.250	**0.003**	<0.020	<0.020	**12.9**	0.006	**3.68**	<0.00020	**0.0330**	<0.010	**0.136**	1.700	**1,300**	**3,110**	5.29	6.3	17	3,540	--	--	--
	3/27/98	2.40	<0.010	<0.250	<0.002	<0.020	<0.020	**7.83**	<0.005	**2.34**	<0.00020	**0.0160**	<0.010	<0.020	0.575	**1,060**	**3,040**	3.64	6.5	19.6	627	--	--	--
	9/30/98	2.35	<0.010	<0.250	<0.002	<0.020	<0.020	**5.18**	**0.015**	**2.71**	<0.00020	**0.0210**	<0.010	<0.020	1.050	**1,030**	**3,210**	17.5	6.2	20	1,250	--	--	--
	9/30/98	1.25	<0.010	<0.250	<0.002	<0.020	<0.020	**4.98**	<0.005	**2.72**	<0.00020	**0.030**	<0.010	<0.020	1.10	**1,040**	**3,320**	9.25	NS	NS	NS	--	--	--
	3/31/99	1.82	<0.010	<0.250	<0.002	<0.020	<0.020	**4.69**	0.010	**2.45**	<0.00020	**0.0150**	<0.010	<0.020	0.750	**1,830**	**3,230**	8.82	5.6	17	1,610	--	--	--
duplicate	3/31/99	1.17	<0.010	<0.250	<0.002	<0.020	<0.020	**4.20**	<0.005	**2.56**	<0.00020	**0.018**	<0.010	<0.020	0.45	**1,920**	**3,230**	3.73	NS	NS	NS	--	--	--
	9/29/99	1.65	<0.010	<0.250	<0.002	<0.020	<0.020	**4.78**	0.008	**2.79**	<0.00020	**0.0310**	<0.010	<0.020	0.440	2.1	**3,440**	3.73	5.7	19	1,980	--	--	--
	9/15/00	0.979	<0.010	<0.250	<0.002	<0.020	<0.020	**3.20**	0.008	**2.93**	<0.00020	**0.0220**	<0.010	<0.020	0.800	**1,540**	**3,480**	13.3	5.8	18	1,040	--	--	--
	3/16/00	1.82	<0.010	<0.250	<0.002	<0.020	<0.020	**3.36**	0.006	**2.84**	<0.00020	<0.010	<0.010	**0.031**	0.402	**1,390**	**3,330**	3.93	NS	NS	NS	--	--	--
	3/23/01	0.226	<0.010	<0.250	<0.002	<0.020	<0.020	**1.86**	0.010	**3.18**	<0.00020	<0.010	<0.010	<0.020	0.370	**1,260**	**3,320**	6.13	6.2	17	1,090	--	--	--
	10/4/01	0.728	<0.010	<0.250	**0.002**	<0.020	<0.020	**3.14**	0.009	**2.89**	<0.00020	<0.010	<0.010	**0.037**	0.430	**1,420**	**3,380**	31	8.0	21	3,300	--	--	--
	3/28/02	1.01	<0.010	<0.250	<0.002	<0.020	**0.02**	**3.60**	0.008	**3.27**	NS	<0.010	<0.010	**0.048**	0.350	**1,220**	**3,310**	3.43	6.0	15	1,090	--	--	--
duplicate	3/28/02	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**5.45**	<0.005	**3.58**	NS	<0.010	<0.010	<0.020	0.35	**1,050**	**2,920**	3.43	6.0	15	1,090	--	--	--
	10/3/02	8.96	<0.010	<0.250	**0.002**	<0.020	<0.020	**14.0**	0.008	**3.91**	<0.00020	<0.010	<0.010	**0.051**	0.740	**1,330**	**3,210**	3.19	6.3	18	1,280	--	--	--
	3/25/03	1.42	<0.010	<0.250	<0.002	<0.020	<0.020	**2.77**	0.007	**3.54**	<0.00020	<0.010	<0.010	**0.025**	1.210	**1,130**	**3,310**	3.21	6.4	19	910	--	--	--
	10/2/03	0.402	<0.010	**0.414**	<0.002	<0.020	<0.020	**2.33**	0.005	**3.84**	<0.00020	<0.010	<0.010	<0.020	1.97	**1,350**	**3,470**	3.52	5.9	20	3,210	--	--	--
	4/28/04	1.44	<0.010	<0.250	<0.002	<0.020	<0.020	**6.89**	**0.012**	**3.92**	<0.00020	<0.010	<0.010	<0.020	1.130	**1,350**	**3,580**	5.13	NS	15.1	3,670	--	--	--
	10/26/04	7.45	<0.010	<0.250	<0.002	<0.020	**0.021**	**20.1**	0.010	**4.80**	<0.00020	<0.010	<0.010	<0.020	0.438	**1,310**	**3,630**	3.10	NS	NS	3,510	--	--	--
	4/27/05	0.697	<0.010	<0.250	**0.002**	<0.020	<0.020	**3.99**	0.010	**4.08**	<0.00020	<0.010	<0.010	<0.020	0.408	**1,820**	**3,601**	3.45	NS	NS	3,610	--	--	--
	10/20/05	9.03	<0.010	<0.250	<0.002	<0.020	**0.283**	**18.4**	**0.015**	**3.92**	<0.00020	<0.010	<0.010	**0.104**	0.449	**790**	**3,520**	52.0	NS	NS	2,370	--	--	--
	10/19/06	0.214	<0.010	<0.250	<0.002	<0.020	<0.020	**0.926**	0.006	**4.16**	<0.00020	<0.010	<0.010	**0.056**	0.383	**1,790**	**3,310**	3.74	NS	NS	2,120	--	--	--
	4/27/07	0.787	<0.010	<0.250	<0.002	<0.020	<0.020	**1.250**	<0.005	**3.55**	<0.00020	<0.010	<0.010	<0.020	0.484	**1,300**	**3,390**	6.35	NS	NS	4,510	--	--	--
	11/19/07	0.186	<0.010	<0.250	<0.002	<0.020	<0.020	**0.778**	<0.005	**4.08**	<0.00020	<0.010	<0.010	<0.020	0.178	**1,950**	**3,430**	3.95	NS	NS	3,460	--	--	--
	4/30/08	0.291	<0.010	<0.250	<0.002	<0.020	<0.020	**0.536**	<0.005	**3.87**	<0.00020	<0.010	<0.010	<0.020	0.158	**1,920**	**3,410**	2.99	NS	NS	3,590	--	--	--
duplicate	4/30/08	0.349	<0.010	<0.250	<0.002	<0.020	<0.020	**0.698**	<0.005	**3.91**	<0.00020	<0.010	<0.010	<0.020	0.149	**1,860**	**3,380**	2.85	NS	NS	3,600	--	--	--
	10/29/08	<0.100	<0.010	0.0258	0.00032	<0.010	<0.010	**0.427**	0.0049	**3.99**	<0.0002	<0.010	<0.010	<0.010	0.240	**1,640**	**3,310**	4.95	NS	NS	3,840	--	--	--
	4/30/09	<0.100	<0.010	0.0305	**0.00344**	<0.010	0.0049	**0.599**	**0.0131**	**4.56**	<0.0002	<0.010	0.00144	<0.010	0.101	**1,890**	**3,370**	6.06	NS	NS	3,860	--	--	--

TABLE 2A
GROUND WATER ANALYTICAL RESULTS SUMMARY
ASH LANDFILL - PERMIT 34-05
RURAL HALL, NORTH CAROLINA

Sample Location / ID	Date	Aluminum	Arsenic	Barium	Cadmium	Chromium (Total)	Copper	Iron	Lead	Manganese	Mercury	Selenium	Silver	Zinc	Nitrate-nitrogen	Sulfate	Dissolved Solids	Total Organic Carbon	pH	Temperature (degrees Celsius)	Conductivity (µmhos/cm)	Turbidity (NTUs)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)
NC 2L Ground Water Standard		NE	0.050	2.0	0.00175	0.050	1.0	0.300	0.015	0.050	0.00105	0.050	0.0175	1.05	10.0	250	500	NE	6.5 - 8.5	NE	NE	NE	NE	NE
Solid Waste Section Limit		NE	0.010	0.100	0.001	0.010	0.010	0.300	0.010	0.050	0.0002	0.010	0.01	0.01	10.0	250	NE	NE	NE	NE	NE	NE	NE	NE
NC 2B Surface Water Standard		0.087	0.050	1.0 [1]	0.002	0.050	0.007	1.0	0.025	0.200 [1]	0.000012	0.005	0.00006	0.05	10.0 [1]	250 [1]	500 [1]	NE	6.0 - 9.0	NE	NE	NE	NE	NE
W-2 (RHMW-002, MW-1A)	1/16/90	NS	<0.010	**0.21**	<0.002	<0.020	NS	NS	<0.005	NS	0.00020	<0.010	<0.010	NS	NS	NS	NS	NS	6.1	NS	NS	--	--	--
	9/24/90	0.85	<0.010	**0.219**	**0.0083**	<0.020	<0.020	**1.40**	<0.005	**9.90**	<0.00020	<0.010	<0.010			41	**533**	14.0	6.2	16.7	717	--	--	--
	10/24/91	0.169	<0.010	0.082	<0.002	<0.020	<0.020	**9.30**	0.0074	**16.5**	<0.00020	<0.010	<0.010		1.67	**1,150**	**1,937**	15.0	6.0	18.7	2,080	--	--	--
	3/26/92	2.79	<0.010	<0.250	**0.0034**	<0.020	<0.020	**38.4**	**0.016**		<0.00020	<0.010	<0.010			**1,860**	**2,611**	12.0	5.8	13.8	2,880	--	--	--
	9/30/92		<0.010	<0.250	<0.002	<0.020	<0.020		<0.005	**21.3**	<0.00020	<0.010	<0.010		1.03	**1,320**	**2,525**	6.0	6.1	17.9	2,670	--	--	--
	3/31/93	0.417	<0.010	**0.177**	<0.002	<0.020	<0.020	**1.28**	0.0076	**0.053**	<0.00020	<0.010	<0.010	**0.04**	0.05	**600**	**948**	2.0	5.6	15.2	167	--	--	--
	9/17/93	5.65	<0.010	**0.508**	**0.0038**	<0.020	**0.079**	**34.7**	**0.012**	**22.3**	<0.00020	<0.010	<0.010	**0.062**	0.166	**1,570**	**3,350**	12.0	6.4	20.8	4,030	--	--	--
	3/30/94	18.7	<0.010	**2.77**	**0.003**	**0.076**	<0.020	**50.9**	**0.034**	**2.40**	<0.00020	<0.010	<0.010	**0.025**	6	200	**555**		5.7	16	1,640	--	--	--
	9/30/94	21.4	<0.010	**0.942**	<0.002	**0.037**	**0.058**	**0.36**	**0.013**	**3.71**	<0.00020	<0.010	<0.010	**0.088**	0.45	**415**	**969**	15.9	6.2	18.3	1,440	--	--	--
	3/31/95	45	<0.010	**1.71**	<0.002	**0.078**	**0.058**	**5.05**	**0.028**	**3.66**	<0.00020	<0.010	<0.010	**0.172**	0.85	155	460		6.2	13.7	930	--	--	--
	9/29/95	109	<0.010	**3.95**	**0.03**	**0.209**	**0.142**	**206**	**0.068**	**3.75**	<0.00020	0.005	<0.010	**0.292**	0.313	**379**	**944**	7.37	5.6	16.4	1,345	--	--	--
	3/30/96	66.5	<0.010	**1.25**	**0.012**	**0.105**	**0.078**	**96.6**	**0.044**	**3.61**	<0.00020	<0.010	<0.010	**0.183**	---	13	127	4.68	5.6	14	316	--	--	--
	9/27/96	89.1	<0.010	**1.51**	<0.002	<0.020	0.0088	**150**	**0.015**	**3.06**	<0.00020	<0.010	<0.010	**0.098**	0.11	---	373	9.22	7.0	21	840	--	--	--
	3/29/97	64.4	<0.010	**1.10**	**0.02**	**0.102**	**0.072**	**98**	**0.047**	**2.50**	<0.00020	<0.010	<0.010	**0.15**	0.09	**1,010**	**2,020**	10.8	6.4	14	1,300	--	--	--
	9/17/97	56.5	<0.010	**1.62**	**0.013**	**0.087**	**0.088**	**99.9**	**0.035**	**20.20**	<0.00020	<0.005	<0.010	**0.201**	1.13	**1,410**	**3,600**	11.3	6.6	17	3,780	--	--	--
	3/27/98	10.9	<0.010	**0.584**	<0.002	<0.020	<0.020	**26.0**	<0.005	**6.16**	<0.00020	<0.010	<0.010	<0.020	<0.050	116	**1,130**	6.34	6.8	19.9	743	--	--	--
	9/30/98	15.4	<0.010	**0.518**	<0.002	**0.039**	**0.034**	**28.8**	**0.022**	**15.0**	<0.00020	<0.010	<0.010	**0.060**	0.78	**762**	**3,380**	15.7	6.4	21	753	--	--	--
	3/31/99	2.38	<0.010	**0.852**	<0.002	**0.045**	**0.035**	**47.0**	**0.021**	**6.92**	<0.00020	<0.010	<0.010	**0.073**	0.32	26	262	1.41	6.2	18	126	--	--	--
	9/29/99	9.7	<0.010	**0.296**	<0.002	**0.036**	<0.020	**26.9**	0.009	**0.20**	<0.00020	<0.010	<0.010	<0.020	0.08	**293**	458	15.3	6.2	20	182	--	--	--
	9/15/00	5.49	<0.010	**0.508**	<0.002	<0.020	<0.020	**1.60**	0.007	**1.140**	<0.00020	<0.010	<0.010	<0.020	0.06	93	374	1.89	6.6	19	170	--	--	--
	3/16/00	12.70	<0.010	**0.434**	<0.002	**0.028**	**0.025**	**19.4**	<0.005	**2.160**	<0.00020	<0.010	<0.010	**0.028**	0.136	**281**	**642**	7.36	NS	NS	NS	--	--	--
	3/23/01	2.60	<0.010	<0.250	<0.002	<0.020	<0.020	**4.74**	0.006	**0.234**	<0.00020	<0.010	<0.010	**0.037**	0.08	26	173	6.82	6.5	18	270	--	--	--
	3/28/02	17.9	<0.010	<0.250	<0.002	**0.047**	**0.046**	**45.3**	**0.016**	**3.03**	NS	<0.010	<0.010	**0.088**	<0.050	23	219	11.9	6.7	14	140	--	--	--
	10/3/02	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	--	--	--
	3/25/03	6.07	<0.010	**0.264**	<0.002	<0.020	<0.020	**8.42**	<0.005	**0.115**	<0.00020	<0.010	<0.010	**0.025**	0.069	14	118	5.29	6.1	18	140	--	--	--
	10/2/03	4.63	<0.010	**0.277**	<0.002	<0.020	<0.020	**10.9**	0.008	**11.1**	<0.00020	<0.010	<0.010	<0.020	0.122	**1,270**	**3,380**	7.78	6.1	20	3,020	--	--	--
	4/28/04	3.6	<0.010	<0.250	<0.002	<0.020	<0.020	**11.0**	0.006	**2.63**	<0.00020	<0.010	<0.010	**0.036**	0.193	233	**634**	8.13	NS	14.4	1,460	--	--	--
	10/26/04	30.2	<0.010	**2.14**	**0.009**	**0.112**	**0.083**	**65.6**	**0.021**	**5.08**	<0.00020	<0.010	<0.010	**0.144**	4.17	**1,710**	**3,800**	7.22	NS	NS	3,690	--	--	--
	4/27/05	2.75	<0.010	<0.250	**0.006**	<0.020	<0.020	**9.15**	0.008	**8.95**	<0.00020	<0.010	<0.010	**0.026**	1.08	**1,260**	**2,868**	13.8	NS	NS	3,170	--	--	--
	10/20/05	9.38	<0.010	**0.377**	**0.002**	**0.020**	**0.203**	**26.2**	0.009	**6.8**	<0.00020	<0.010	<0.010	**0.116**	0.550	**1,510**	**1,700**	22	NS	NS	1,110	--	--	--
	10/19/06	3.63	<0.010	<0.250	<0.002	<0.020	<0.020	**8.08**	0.006	**1.90**	<0.00020	<0.010	<0.010	**0.044**	0.133	**749**	**1,210**	8.99	NS	NS	1,050	--	--	--
	4/27/07	46.5	<0.010	**0.451**	<0.002	0.002		**55.9**			<0.00020	<0.010	<0.010	**0.046**	0.452	**1,570**	**2,800**	9.01	NS	NS	1,880	--	--	--
	11/19/07	5.75	<0.010	<0.250	<0.002	<0.020	<0.020	**12.0**	0.008	**3.03**	<0.00020	<0.010	<0.010	<0.020	<0.050	**1,330**	**1,310**	9.71	NS	NS	1,330	--	--	--
	4/30/08	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**4.45**	0.005	**0.334**	<0.00020	<0.010	<0.010	**0.072**	0.071	246	330	7.26	NS	NS	609	--	--	--
	4/30/09	5.17	<0.010	**0.268**	<0.001	**0.0139**	**0.0113**	**12.5**	**0.0118**	**0.441**	<0.0002	<0.010	<0.010	**0.0375**	0.072	10.4	157	7.57	NS	NS	93.7	--	--	--

TABLE 2A
GROUND WATER ANALYTICAL RESULTS SUMMARY
ASH LANDFILL - PERMIT 34-05
RURAL HALL, NORTH CAROLINA

Sample Location / ID	Date	Aluminum	Arsenic	Barium	Cadmium	Chromium (Total)	Copper	Iron	Lead	Manganese	Mercury	Selenium	Silver	Zinc	Nitrate-nitrogen	Sulfate	Dissolved Solids	Total Organic Carbon	pH	Temperature (degrees Celsius)	Conductivity (µmhos/cm)	Turbidity (NTUs)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)
NC 2L Ground Water Standard		NE	0.050	2.0	0.00175	0.050	1.0	0.300	0.015	0.050	0.00105	0.050	0.0175	1.05	10.0	250	500	NE	6.5 - 8.5	NE	NE	NE	NE	NE
Solid Waste Section Limit		NE	0.010	0.100	0.001	0.010	0.010	0.300	0.010	0.050	0.0002	0.010	0.01	0.01	10.0	250	NE	NE	NE	NE	NE	NE	NE	NE
NC 2B Surface Water Standard		0.087	0.050	1.0 [1]	0.002	0.050	0.007	1.0	0.025	0.200 [1]	0.000012	0.005	0.00006	0.05	10.0 [1]	250 [1]	500 [1]	NE	6.0 - 9.0	NE	NE	NE	NE	NE
	1/16/90	NS	<0.010	**0.300**	<0.002	<0.020	NS	NS	<0.005	NS	<0.00020	<0.010	<0.010	NS	NS	NS	NS	NS	7.0	NS	NS	--	--	--
	9/6/90	NS	<0.010	**8.990**	**0.02**	**0.81**	NS	NS	**0.33**	NS	**0.0005**	0.0059	<0.005	NS	NS	NS	NS	NS	6.7	NS	NS	--	--	--
	9/21/90	2.17	<0.010	**0.134**	**0.0081**	<0.040	<0.020	**2.00**	<0.005	**0.08**	<0.00020	<0.005	<0.010	<0.020	0.67	8.5	174	12	6.5	16.2	238	--	--	--
W-3	10/23/91	0.213	<0.010	**0.149**	<0.002	<0.040	<0.020	0.24	**0.33**	**0.116**	<0.00020	<0.005	<0.010	<0.020	<0.050	<10.00	214	12	6.7	19.7	207	--	--	--
	3/25/92	<0.200	<0.010	**0.119**	<0.002	<0.020	<0.020	<0.100	<0.005	<0.020	<0.00020	<0.005	<0.010	<0.020	6.81	22.5	136	10	6.1	13.1	307	--	--	--
	9/29/92	0.67	<0.010	**0.120**	<0.002	<0.020	<0.020	**0.580**	<0.005	**0.410**	**0.0003**	<0.005	<0.010	<0.020	0.232	20	189	1	5.9	17.1	223	--	--	--
	3/31/93	1.17	<0.010	**0.180**	<0.002	<0.020	<0.020	**2.30**	<0.005	<0.020	<0.00020	<0.005	<0.010	**0.055**	<0.050	14.9	163	2	5.5	15.7	207	--	--	--
(RHMW-003 /	9/17/93	9.46	<0.010	**0.444**	**0.0028**	<0.020	**0.071**	**20.7**	0.010	**0.173**	<0.00020	<0.005	<0.010	**0.106**	0.25	12	207	2	6.2	18.3	282	--	--	--
003A, W-2A)	3/30/94	4.42	<0.010	**0.259**	<0.002	<0.020	**0.024**	**10.7**	**0.15**	**0.264**	<0.00020	<0.005	<0.010	**0.107**	1.48	17	180	<5	5.7	15.9	180	--	--	--
	9/30/94	25.4	<0.010	**0.485**	<0.002	**0.026**	**0.067**	**32.0**	**0.017**	**0.526**	<0.00020	<0.005	<0.010	**0.086**	<0.050	<20	193	26.1	6.3	18	202	--	--	--
	3/31/95	31.3	<0.010	**0.466**	<0.002	**0.027**	**0.055**	**36.4**	**0.025**	**0.430**	<0.00020	<0.005	<0.010	**0.186**	0.28	133	206	<5	6.6	12.7	220	--	--	--
	9/29/95	55.4	<0.010	**0.813**	**0.007**	**0.051**	**0.122**	**70.1**	**0.042**	**1.020**	<0.00020	<0.005	<0.010	**0.183**	0.2	139	302	1.32	5.4	15.4	245	--	--	--
	3/30/96	17.1	<0.010	**0.436**	**0.002**	**0.02**	**0.046**	**25.9**	**0.019**	**0.409**	<0.00020	<0.005	<0.010	**0.1**	1.25	20	217	3.41	5.6	13	285	--	--	--
	9/27/96	11.2	<0.010	**0.257**	<0.002	<0.020	<0.020	**16.4**	**0.015**	**0.235**	<0.00020	<0.005	<0.010	**0.094**	0.11	59.8	215	1.1	7.8	18	243	--	--	--
	3/29/97	16.4	<0.010	**0.347**	**0.003**	<0.020	**0.043**	**23.0**	**0.013**	**0.384**	<0.00020	<0.005	<0.010	**0.051**	0.12	21	223	7.86	6.6	12	153	--	--	--
	9/17/97	32.2	<0.010	**0.478**	**0.004**	**0.027**	**0.067**	**40.2**	**0.024**	**0.590**	<0.00020	<0.005	<0.010	**0.280**	1.10	89	262	1.29	6.9	16	366	--	--	--
	3/27/98	12.2	<0.010	**0.491**	<0.002	<0.020	<0.020	**21.3**	<0.005	**0.604**	<0.00020	<0.010	<0.010	<0.020	0.130	19.1	248	1.26	6.1	19.9	542	--	--	--
	9/30/98	4.15	<0.010	<0.250	<0.002	<0.020	<0.020	**5.69**	<0.005	**0.151**	<0.00020	<0.010	<0.010	**0.039**	0.300	5.1	238	1.34	6.8	20	276	--	--	--
	3/31/99	2.38	<0.010	<0.250	<0.002	<0.020	<0.020	**3.93**	<0.005	**0.126**	<0.00020	<0.010	<0.010	**0.073**	0.32	26.3	262	1.41	6.2	18	126	--	--	--
	9/29/99	2.13	<0.010	<0.250	<0.002	<0.020	<0.020	**4.23**	<0.005	**0.090**	<0.00020	<0.010	<0.010	<0.020	0.21	27.3	272	1.71	6.8	19	315	--	--	--
	9/15/00	6.59	<0.010	**0.323**	<0.002	<0.020	**0.026**	**9.90**	**0.011**	**0.309**	<0.00020	**0.017**	<0.010	<0.020	0.12	20.9	187	1.53	6.7	18	390	--	--	--
	3/16/00	11.7	<0.010	**0.356**	<0.002	<0.020	**0.035**	**15.70**	0.007	**0.334**	<0.00020	**0.016**	<0.010	**0.036**	0.208	17.8	193	2.63	NS	NS	NS	--	--	--
	3/23/01	0.828	<0.010	<0.250	<0.002	<0.020	<0.020	**1.02**	0.009	0.045	<0.00020	<0.010	<0.010	**0.023**	0.20	27.4	175	1.56	6.7	17	310	--	--	--
	10/4/01	3.64	<0.010	<0.250	<0.002	<0.020	<0.020	**6.02**	0.008	**0.221**	<0.00020	**0.013**	<0.010	<0.020	0.22	24.7	186	3.2	6.1	17	200	--	--	--
	3/28/02	1.72	<0.010	<0.250	<0.002	<0.020	<0.020	**2.82**	<0.005	**0.100**	NS	<0.010	<0.010	<0.020	0.40	38.5	203	1.45	6.7	14	470	--	--	--
	3/28/02	2.37	<0.010	<0.250	<0.002	<0.020	<0.020	**2.82**	<0.005	**0.100**	<0.00020	**0.017**	<0.010	<0.020	0.287	25.6	177	<1.0	NS	NS	238	--	--	--
duplicate	10/3/02	8.77	<0.010	**0.387**	<0.002	<0.020	**0.022**	**16.40**	<0.005	**0.450**	<0.00020	<0.010	<0.010	**0.035**	0.35	58.2	231	1.02	8.1	19	210	--	--	--
	3/25/03	15.3	<0.010	**0.362**	<0.002	<0.020	**0.026**	**23.8**	0.008	**0.622**	<0.00020	<0.010	<0.010	**0.045**	0.520	42.6	194	<1.0	6.2	19	210	--	--	--
	10/2/03	2.46	<0.010	**0.646**	<0.002	<0.020	<0.020	**4.08**	<0.005	**0.212**	<0.00020	<0.010	<0.010	<0.020	0.371	28.3	199	<1.0	6.7	17	243	--	--	--
	4/28/04	1.49	<0.010	<0.250	<0.002	<0.020	<0.020	**2.82**	<0.005	**0.080**	<0.00020	**0.013**	<0.010	<0.020	0.259	**1,350**	171	<1.0	NS	14.6	225	--	--	--
	10/26/04	2.37	<0.010	<0.250	<0.002	<0.020	<0.020	**3.49**	<0.005	**0.129**	<0.00020	**0.017**	<0.010	<0.020	0.287	25.6	177	<1.0	NS	NS	238	--	--	--
	4/27/05	0.874	<0.010	<0.250	<0.002	<0.020	<0.020	**1.58**	<0.005	**0.066**	<0.00020	**0.016**	<0.010	**0.040**	0.254	34.4	192	0.74	NS	NS	277	--	--	--
	10/20/05	3.50	<0.010	**0.252**	<0.002	<0.020	**0.107**	**4.23**	<0.005	**0.072**	<0.00020	**0.030**	<0.010	**0.071**	0.356	44.0	218	18	NS	NS	317	--	--	--
	10/19/06	0.553	<0.010	**0.277**	<0.002	<0.020	<0.020	**1.02**	<0.005	0.037	<0.00020	**0.048**	<0.010	<0.020	0.389	70.4	237	0.69	NS	NS	330	--	--	--
	4/27/07	<0.10	<0.010	**0.262**	<0.002	<0.020	<0.020	**0.708**	<0.005	<0.010	<0.00020		<0.010	<0.020	0.452	89.4	251	1.51	NS	NS	388	--	--	--
	11/19/07	0.124	<0.010	**0.263**	<0.002	<0.020	<0.020	0.156	<0.005	<0.010	<0.00020	**0.065**	<0.010	<0.020	0.190	53.0	293	0.86	NS	NS	403	--	--	--
duplicate	11/19/07	0.139	<0.010	**0.254**	<0.002	<0.020	<0.020	0.158	<0.005	0.012	<0.00020	**0.065**	<0.010	<0.020	0.203	64.2	278	0.88	NS	NS	402	--	--	--
	4/30/08	<0.100	<0.010	**0.261**	<0.002	<0.020	<0.020	0.148	<0.005	<0.010	<0.00020	**0.094**	<0.010	<0.020	0.553	91.0	331	0.76	NS	NS	470	--	--	--
	10/29/08	<0.100	<0.010	**0.274**	0.00033	**0.0106**	<0.010	0.216	0.0033	**0.124**	0.00010	**0.0955**	0.00515	<0.010	0.474	96.0	360	1.04	NS	NS	571	--	--	--
	4/30/09	0.442	<0.010	**0.368**	<0.001	<0.010	<0.010	**0.638**	0.0085	**0.0616**	<0.0002	**0.154**	<0.010	**0.0682**	0.535	199	399	0.94	NS	NS	603	--	--	--
duplicate	4/30/09	0.571	<0.010	**0.268**	<0.0010	<0.010	0.0025	**0.332**	0.0071	0.0308	<0.0002	**0.153**	<0.010	**0.0324**	0.510	203	389	1.07	NS	NS	617	--	--	--

TABLE 2A
GROUND WATER ANALYTICAL RESULTS SUMMARY
ASH LANDFILL - PERMIT 34-05
RURAL HALL, NORTH CAROLINA

Sample Location / ID	Date	Aluminum	Arsenic	Barium	Cadmium	Chromium (Total)	Copper	Iron	Lead	Manganese	Mercury	Selenium	Silver	Zinc	Nitrate-nitrogen	Sulfate	Dissolved Solids	Total Organic Carbon	pH	Temperature (degrees Celsius)	Conductivity (µmhos/cm)	Turbidity (NTUs)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)
NC 2L Ground Water Standard		NE	0.050	2.0	0.00175	0.050	1.0	0.300	0.015	0.050	0.00105	0.050	0.0175	1.05	10.0	250	500	NE	6.5 - 8.5	NE	NE	NE	NE	NE
Solid Waste Section Limit		NE	0.010	0.100	0.001	0.010	0.010	0.300	0.010	0.050	0.0002	0.010	0.01	0.01	10.0	250	NE	NE	NE	NE	NE	NE	NE	NE
NC 2B Surface Water Standard		0.087	0.050	1.0 [1]	0.002	0.050	0.007	1.0	0.025	0.200 [1]	0.000012	0.005	0.00006	0.05	10.0 [1]	250 [1]	500 [1]	NE	6.0 - 9.0	NE	NE	NE	NE	NE
W-3B	10/26/04	2.33	<0.010	<0.250	<0.002	<0.020	<0.020	**3.17**	<0.005	**0.157**	<0.00020	<0.010	<0.010	**0.024**	<0.050	174	**545**	2.71	NS	NS	862	--	--	--
	4/27/05	0.203	<0.010	<0.250	**0.002**	<0.020	<0.020	**1.83**	**0.015**	**0.907**	<0.00020	**0.041**	<0.010	**0.036**	<0.050	**590**	**840**	10.1	NS	NS	1,180	--	--	--
	10/20/05	3.63	<0.010	<0.250	<0.002	<0.020	**0.029**	**4.29**	0.005	**0.068**	<0.00020	<0.010	<0.010	**0.075**	<0.050	146	**627**	30	NS	NS	550	--	--	--
	10/19/06	0.135	<0.010	<0.250	<0.002	<0.020	<0.020	**0.95**	0.005	**0.811**	<0.00020	<0.010	<0.010	**0.042**	<0.050	**318**	**750**	5.24	NS	NS	739	--	--	--
(RHMW-003B)	4/27/07	0.238	<0.010	<0.250	<0.002	<0.020	<0.020	**0.901**	<0.005	**1.28**	<0.00020	<0.010	<0.010	<0.020	<0.050	**475**	**1,050**	2.57	NS	NS	1,240	--	--	--
	11/19/07	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**1.17**	<0.005	**1.27**	<0.00020	<0.010	<0.010	<0.020	<0.050	**582**	101	22.6	NS	NS	1,310	--	--	--
	4/30/08	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**0.505**	<0.005	**1.01**	<0.00020	<0.010	<0.010	<0.020	<0.050	**570**	**955**	1.18	NS	NS	1,270	--	--	--
	10/29/08	<0.100	<0.010	0.048	<0.001	0.0049	<0.010	**1.95**	<0.010	**0.946**	0.00007	<0.010	<0.010	**0.0105**	<0.05	**305**	**760**	0.83	NS	NS	1,080	--	--	--
	4/30/09	<0.100	<0.010	0.0426	<0.001	<0.010	<0.010	**0.49**	**0.0105**	**0.999**	<0.0002	0.0097	0.0015	0.0087	<0.050	185	**827**	5.56	NS	NS	1,150	--	--	--
PW-1	4/29/88	0.152	<0.011	0.059	**0.008**	<0.016	**0.057**	0.06	<0.024	**0.314**	<0.00020	<0.005	<0.014	**0.576**	1.520	37	500	1.28	6.9	NS	NS	NS	NS	NS
	7/13/89	NS	<0.010	0.100	<0.008	NS	<0.020	NS	<0.100	NS	<0.00020	<0.005	<0.006	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
	9/6/90	NS	<0.010	0.090	<0.0010	<0.010	NS	NS	0.0099	NS	<0.00020	<0.005	<0.005	NS	NS	NS	NS	NS	6.8	NS	NS	NS	NS	NS
	10/23/91	0.130	<0.010	<0.080	<0.002		<0.020	**0.62**	<0.005	**1.23**	<0.00020	<0.005	<0.010	**3.31**	0.050	**460**	**850**	8	6.4	15.1	1,247	NS	NS	NS
	8/10/09	--	--	0.035	<0.0010	<0.005	--	**4.8**	<0.005	**1.8**	--	<0.020	--	--	--	**680**	--	--	7.0	15.3	2,860	32.1	13	0.0
W-4	4/4/95	9.72	<0.010	<0.250	<0.002	<0.020	<0.020	**15.6**	0.007	**0.564**	<0.00020	<0.010	<0.010	**0.058**	1	7.88	231	136	6.1	19	234	--	--	--
	9/17/97	4.42	<0.010	<0.250	**0.002**	<0.020	<0.020	**10.0**	0.006	**0.406**	<0.00020	<0.010	<0.010	**0.190**	0.550	8.86	212	3.19	7.5	18	366	--	--	--
	3/27/98	3.41	<0.010	<0.250	<0.002	<0.020	<0.020	**6.25**	<0.005		<0.00020	<0.010	<0.010	**0.044**	<0.050	7.12	226	2.69	6.7	19.2	390	--	--	--
	9/30/98	0.219	<0.010	<0.250	<0.002	<0.020	<0.020	**1.61**	<0.005	**0.299**	<0.00020	<0.010	<0.010	<0.020	<0.050	6.42	200	7.26	5.9	21	322	--	--	--
(Background)	3/31/99	0.637	<0.010	<0.250	<0.002	<0.020	<0.020	**2.15**	<0.005	**0.285**	<0.00020	<0.010	<0.010	<0.020	<0.050	5.71	202	8.53	6.5	16	279	--	--	--
(damaged &	9/29/99	0.127	<0.010	<0.250	<0.002	<0.020	<0.020	**1.44**	0.005	**0.271**	<0.00020	<0.010	<0.010	**0.024**	<0.050	<5.00	207	2.85	6.4	18	315	--	--	--
replaced 2003 with	3/16/00	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**1.47**	<0.005	**0.298**	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	191	6.05				--	--	--
W-6)	9/15/00	0.165	<0.010	<0.250	<0.002	<0.020	<0.020	**1.09**	<0.005	**0.252**	<0.00020	<0.010	<0.010	<0.020	0.08	5.30	241	15.5	6.2	17	310	--	--	--
	3/23/01	2.75	<0.010	<0.250	**0.004**	<0.020	<0.020	**9.91**	**0.016**	**0.447**	<0.00020	<0.010	<0.010	**0.028**	<0.050	6.53	219	5.99	6.4	16	240	--	--	--
	10/4/01	0.204	<0.010	<0.250	<0.002	<0.020	<0.020	**0.915**	0.007	**0.229**	<0.00020	<0.010	<0.010	<0.020	<0.05	<5.00	186	7.8	6.3	20	300	--	--	--
	3/28/02	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**1.46**	<0.005	**0.212**	NS	<0.010	<0.010	<0.020	<0.050	5.16	196	1.68	6.2	14	190	--	--	--
	10/3/02	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**1.13**	<0.005	**0.237**	<0.00020	<0.010	<0.010	**0.029**	<0.050	5.08	202	4.07	6.1	19	280	--	--	--
	3/25/03	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**0.976**	<0.005	**0.212**	<0.00020	<0.010	<0.010	<0.020	<0.050	6.05	185	1.61	6.2	16	260	--	--	--
W-6	10/2/03	1.92	<0.010	<0.250	<0.002	**0.268**	**0.024**	**3.22**	<0.005	**0.154**	<0.00020	<0.010	<0.010	**0.44**	0.207	95	466	34	7.3	19	661	--	--	--
	4/28/04	1.16	<0.010	<0.250	<0.002	**0.030**	**0.026**	**0.917**	0.007	0.037	<0.00020	<0.010	<0.010	**0.149**	0.137	**370**	**692**	139	NS	14.7	937	--	--	--
	10/26/04	0.790	<0.010	<0.250	<0.002	**0.089**	**0.032**	0.259	<0.005	0.012	<0.00020	<0.010	<0.010	**0.087**	0.096	116	**630**	79.2	NS	NS	917	--	--	--
	4/27/05	0.389	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	0.005	<0.010	<0.00020	<0.010	<0.010	**0.056**	<0.050	87.5	**565**	13.2	NS	NS	932	--	--	--
(Background)	10/20/05	<0.100	<0.010	<0.250	<0.002	<0.020	**0.040**	**0.3557**	<0.005	<0.010	<0.00020	<0.010	<0.010	**0.060**	0.064	35.4	**553**	27	NS	NS	939	--	--	--
Replaced W-4	10/19/06	0.529	<0.010	<0.250	<0.002	<0.020	<0.020	0.077	<0.005	0.012	<0.00020	<0.010	<0.010	**0.066**	<0.050	46.4	471	29.3	NS	NS	655	--	--	--
9/2003	4/27/07	2.66	<0.010	<0.250	<0.002	**0.029**	<0.020	**2.79**	<0.005	**0.106**	<0.00020	<0.010	<0.010	**0.168**	<0.050	29.5	442	8.84	NS	NS	776	--	--	--
	11/19/07	0.627	<0.010	<0.250	<0.002	<0.020	<0.020	**0.711**	<0.005	0.024	<0.00020	<0.010	<0.010	**0.038**	<0.050	11.2	431	8.98	NS	NS	694	--	--	--
	4/30/08	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	**0.037**	<0.050	<10.0	392	5.61	NS	NS	615	--	--	--
	10/29/08	0.235	<0.010	0.0358	0.00041	0.0068	<0.010	0.268	<0.010	0.0093	<0.00020	<0.010	<0.010	**0.067**	<0.050	<10.0	393	4.13	NS	NS	724	--	--	--
duplicate	10/29/08	0.222	<0.010	**0.293**	0.001	<0.010	0.0027	**0.460**	0.0049	**0.0846**	0.00016	**0.101**	<0.010	<0.010	0.488	98.8	384	0.860	NS	NS	574	--	--	--
	4/30/09	0.139	<0.010	0.0366	<0.001	0.007	<0.010	0.0331	0.0029	0.0015	<0.0002	0.0081	<0.010	**0.0332**	<0.050	10.5	463	10.3	NS	NS	807	--	--	--

All concentrations in milligrams per liter.
NS - Not sampled
NE - Not established
[1] - No freshwater aquatic life standard established. Water Supply criteria presented.
Bold indicates exceedance of Solid Waste Section Limits (SWSL)
Gray background indicates exceedance of NC Ground Water Standard

TABLE 2B
QUALITY CONTROL ANALYTICAL RESULTS SUMMARY
ASH LANDFILL - PERMIT 34-05
RURAL HALL, NORTH CAROLINA

Sample Location / ID	Date	Aluminum	Arsenic	Barium	Cadmium	Chromium (Total)	Copper	Iron	Lead	Manganese	Mercury	Selenium	Silver	Zinc	Nitrate-nitrogen	Sulfate	Dissolved Solids	Total Organic Carbon	pH	Temperature (degrees Celsius)	Conductivity (µmhos/cm)
NC 2L Ground Water Standard		NE	0.050	2.0	0.00175	0.050	1.0	0.300	0.015	0.050	0.00105	0.050	0.0175	1.05	10.0	250	500	NE	6.5 - 8.5	NE	NE
Solid Waste Section Limit		NE	0.010	0.100	0.001	0.010	0.010	0.300	0.010	0.050	0.0002	0.010	0.01	0.01	10.0	250	NE	NE	NE	NE	NE
Field Blank	9/30/98	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	<5.00	<1.0	NS	NS	NS
	3/31/99	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	0.19	<5.00	<5.00	2.18	NS	NS	NS
	9/15/00	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	<5.0	<1.0	NS	NS	NS
	3/23/01	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	0.006	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	14	<1.0	NS	NS	NS
	10/4/01	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	0.006	<0.010	<0.00020	<0.010	<0.010	<0.020	0.3	<5.00	15	<2.0	NS	NS	NS
	3/28/02	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	NS	<0.010	<0.010	<0.020	<0.050	<5.00	14	<1.0	NS	NS	NS
	10/3/02	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	6	<1.0	NS	NS	NS
	3/25/03	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	0.198	<5.00	<5.00	<1.0	NS	NS	NS
	10/2/03	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	<5.00	<1.0	NS	NS	NS
	4/28/04	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	6	<1.0	NS	NS	NS
	10/26/04	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	0.151	<5.00	10	2.18	NS	NS	NS
	4/27/05	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	12	1.79	NS	NS	<30
	10/20/05	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	0.101	<5.00	<5.00	<0.50	NS	NS	<30
	10/19/06	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	<5.00	<0.50	NS	NS	<30
	4/27/07	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	<5.00	<0.50	NS	NS	<30
	11/19/07	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	<5.00	<0.50	NS	NS	<30
	4/30/08	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	0.336	<5.00	<5.00	<0.50	NS	NS	<30
	10/29/08	<0.100	<0.010	0.0031	<0.001	<0.010	<0.010	<0.050	<0.010	<0.010	0.00002	<0.010	0.0022	0.010	<0.050	<10	<5.00	<0.50	NS	NS	<30
	4/30/09	<0.100	<0.010	0.0077	<0.001	<0.010	<0.010	<0.050	0.0045	0.008	<0.0002	<0.010	<0.010	<0.010	<0.050	<10	90	<0.50	NS	NS	109
Travel Blank (Trip)	9/30/98	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	<5.00	<1.0	NS	NS	NS
	3/31/99	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	0.22	<5.00	15	<1.00	NS	NS	NS
	9/15/00	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	<5.0	<1.0	NS	NS	NS
	3/23/01	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	14	1.03	NS	NS	NS
	10/4/01	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	0.4	<5.00	12	2.0	NS	NS	NS
	3/28/02	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	NS	<0.010	<0.010	<0.020	<0.050	<5.00	14	1.03	NS	NS	NS
	10/3/02	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	<5.00	<0.50	NS	NS	NS
	3/25/03	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	0.197	<5.00	7	<1.0	NS	NS	NS
	10/2/03	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	7	<1.0	NS	NS	NS
	4/28/04	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	16	<1.0	NS	NS	NS
	10/26/04	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	8	1.29	NS	NS	NS
	4/27/05	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	14	1.76	NS	NS	<30
	10/20/05	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	6	<0.50	NS	NS	<30
	10/19/06	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	<5.00	<0.50	NS	NS	<30
	4/27/07	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	<5.00	<0.50	NS	NS	<30
	11/19/07	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	<5.00	<0.50	NS	NS	<30
	4/30/08	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	<0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	<5.00	<5.00	<0.50	NS	NS	<30
	10/29/08	<0.100	<0.010	0.0046	<0.001	<0.010	<0.010	<0.050	<0.010	<0.010	0.00001	<0.010	<0.010	<0.010	<0.050	<10	<5.00	<0.50	NS	NS	<30
	4/30/09	<0.100	<0.010	0.0086	0.0003	<0.010	<0.010	<0.050	<0.010	0.0071	<0.0002	<0.010	<0.010	<0.010	<0.050	<10	85	<0.50	NS	NS	115

All concentrations in milligrams per liter. NE - Not established NS - Not sampled

TABLE 3
SURFACE WATER ANALYTICAL RESULTS SUMMARY
ASH LANDFILL - PERMIT 34-05
RURAL HALL, NORTH CAROLINA

Sample Location / ID	Date	Aluminum	Arsenic	Barium	Cadmium	Chromium (Total)	Copper	Iron	Lead	Manganese	Mercury	Selenium	Silver	Zinc	Nitrate-nitrogen	Sulfate	Dissolved Solids	Total Organic Carbon	pH	Temperature (degrees Celsius)	Conductivity (µmhos/cm)	Turbidity (NTUs)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)
NC 2L Ground Water Standard		NE	0.050	2.0	0.00175	0.050	1.0	0.300	0.015	0.050	0.00105	0.050	0.0175	1.05	10.0	250	500	NE	6.5 - 8.5	NE	NE	NE	NE	NE
Solid Waste Section Limit		NE	0.010	0.100	0.001	0.010	0.010	0.300	0.010	0.050	0.0002	0.010	0.01	0.01	10.0	250	NE	NE	NE	NE	NE	NE	NE	NE
NC 2B Surface Water Standard		0.087	0.050	1.0 [1]	0.002	0.050	0.007	1.0	0.025	0.200 [1]	0.000012	0.005	0.00006	0.05	10.0 [1]	250 [1]	500 [1]	NE	6.0 - 9.0	NE	NE	NE	NE	>5.0
	4/29/88	<0.152	<0.010	0.118	**0.008**	<0.016	<0.019	0.086	<0.024	<0.014	<0.00020	<0.005	<0.014	0.015	0.22	64	220	2.81	6.8	NS	NS	--	--	--
SS-01	7/13/89	NS	<0.010	0.100	<0.002	<0.020	NS	NS	<0.005	NS	<0.00020	<0.010	<0.010	NS	NS	NS	NS	NS	NS	NS	NS	--	--	--
	9/6/90	NS	<0.010	0.064	<0.001	NS	NS	NS	<0.0025	NS	<0.00020	<0.005	<0.005	NS	NS	NS	NS	NS	7.9	NS	NS	--	--	--
(RHSS-001)	9/21/90	**0.14**	<0.010	<0.080	**0.0048**	<0.040	<0.020	0.2	<0.005	<0.020	<0.00020	<0.005	<0.010	<0.020	0.52	40	352	12	7.2	11.6	490	--	--	--
Surface Water -	10/23/91	**0.109**	<0.010	<0.080	<0.002	<0.020	<0.020	<0.100	<0.005	<0.020	<0.00020	<0.005	<0.010	<0.020	0.15	108	248	12	7.9	17.2	381	--	--	--
Upstream	3/25/92	**4.15**	<0.010	<0.080	**0.0034**	<0.020	<0.020	**5.0**	0.0158	0.064	<0.00020	<0.005	<0.010	<0.020	0.25	9.4	185	14	5.8	11.3	126	--	--	--
	9/29/92	<0.100	<0.010	<0.100	<0.002	<0.040	<0.020	0.16	<0.005	0.085	<0.00020	<0.005	<0.010	<0.020	0.19	84	241	2.0	5.7	13.8	356	--	--	--
	3/31/93	<0.200	<0.010	<0.100	<0.002	<0.020	<0.020	0.400	<0.005	0.077	<0.00020	<0.005	<0.010	0.029	1.34	70.4	127	2.0	5.9	13	207	--	--	--
	9/17/93	**0.24**	<0.010	<0.125	<0.002	<0.020	<0.020	0.598	<0.005	0.028	<0.00020	<0.005	<0.010	<0.020	0.45	77.4	251	3.0	7.1	20.9	360	--	--	--
	3/30/94	**0.220**	<0.010	<0.120	<0.002	<0.020	<0.020	0.873	<0.005	0.03	<0.00020	<0.005	<0.010	<0.020	0.25	30.6	108	5	5.9	14	380	--	--	--
	9/30/94	**1.300**	<0.010	<0.250	<0.002	<0.020	<0.020	**1.69**	0.006	0.084	<0.00020	<0.005	<0.010	<0.020	0.43	64.8	255	30.0	7.1	19.1	332	--	--	--
	3/31/95	**3.580**	<0.010	<0.250	<0.002	<0.020	<0.020	**2.44**	<0.005	0.106	<0.00020	<0.005	<0.010	**0.246**	0.19	48.9	211	<5.0	7.8	13.9	290	--	--	--
	9/29/95	**0.2**	<0.010	<0.250	<0.002	<0.020	<0.020	0.358	0.007	0.038	<0.00020	<0.005	<0.010	<0.020	0.5	70.0	264	3.74	5.2	13.9	458	--	--	--
	3/30/96	**0.279**	<0.010	<0.250	<0.002	<0.020	<0.020	0.547	<0.005	0.014	<0.00020	<0.005	<0.010	<0.020	0.185	31.3	129	1.79	6.7	11	193	--	--	--
	9/27/96	**0.125**	<0.010	<0.250	<0.002	<0.020	<0.020	0.3	0.005	0.021	<0.00020	<0.005	<0.010	**0.095**	0.29	56.1	225	2.36	7.7	19	336	--	--	--
	3/29/97	**0.307**	<0.010	<0.250	<0.002	<0.020	<0.020	0.552	<0.005	0.016	<0.00020	<0.005	<0.010	0.013	0.225	30.0	138	3.04	7.6	16	94	--	--	--
	9/17/97	**0.476**	<0.010	<0.250	<0.002	<0.020	<0.020	0.835	<0.005	0.040	<0.00020	<0.005	<0.010	**0.169**	0.625	47.4	224	1.67	7.9	19	319	--	--	--
	3/27/98	**0.190**	<0.010	<0.250	<0.002	<0.020	<0.020	0.685	<0.005	0.012	<0.00020	<0.010	<0.010	**0.061**	0.680	38.7	163	5.23	7.6	18.6	473	--	--	--
	9/30/98	**0.126**	<0.010	<0.250	<0.002	<0.020	<0.020	0.54	0.006	0.033	<0.00020	<0.010	<0.010	<0.020	0.300	28.0	177	4.09	7.2	18	322	--	--	--
	3/31/99	**0.239**	<0.010	<0.250	<0.002	<0.020	<0.020	0.332	<0.005	0.044	<0.00020	<0.010	<0.010	<0.020	0.12	63.2	191	2.49	7.1	16	247	--	--	--
	9/29/99	**1.53**	<0.010	<0.250	<0.002	<0.020	<0.020	**3.33**	0.005	0.088	<0.00020	<0.010	<0.010	<0.020	0.09	23.2	143	8.81	7.8	16	308	--	--	--
	9/15/00	**0.327**	<0.010	<0.250	<0.002	<0.020	<0.020	0.166	<0.005	0.038	<0.00020	<0.010	<0.010	<0.020	0.16	26.1	157	5.08	7.3	19	410	--	--	--
	3/16/00	**0.117**	<0.010	<0.250	<0.002	<0.020	<0.020	**1.94**	<0.005	**0.922**	<0.00020	<0.010	<0.010	<0.020	0.199	50.9	202	3.78				--	--	--
	3/23/01	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	0.158	<0.005	0.010	<0.00020	<0.010	<0.010	<0.020	<0.050	26.1	113	2.81	6.9	16	150	--	--	--
	10/4/01	**0.116**	<0.010	<0.250	<0.002	<0.020	<0.020	<0.100	<0.005	0.029	<0.00020	<0.010	<0.010	<0.020	0.3	99.0	343	5.30	7.4	19	440	--	--	--
	3/28/02	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	0.201	<0.005	0.010	NS	<0.010	<0.010	0.027	0.32	41.9	177	3.18	7.0	11	400	--	--	--
	10/3/02	**0.317**	<0.010	<0.250	<0.002	<0.020	<0.020	0.767	<0.005	0.052	<0.00020	<0.010	<0.010	<0.020	0.75	73.3	300	3.07		19	330	--	--	--
	3/25/03	**0.673**	<0.010	<0.250	<0.002	<0.020	<0.020	0.607	<0.005	0.024	<0.00020	<0.010	<0.010	<0.020	0.115	31.6	119	2.08	6.9	18	440	--	--	--
	10/2/03	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	0.705	<0.005	0.072	<0.00020	<0.010	<0.010	<0.020	0.446	29.4	181	2.38	6.3	15	249	--	--	--
	4/28/04	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	0.179	<0.005	0.080	<0.00020	<0.010	<0.010	<0.020	0.374	70.4	176	2.06	NS	11.7	281	--	--	--
	10/26/04	**0.145**	<0.010	<0.250	<0.002	<0.020	<0.020	0.132	<0.005	0.036	<0.00020	<0.010	<0.010	<0.020	0.209	58.8	217	2.62	NS	NS	397	--	--	--
	4/27/05	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	0.105	<0.005	0.011	<0.00020	<0.010	<0.010	<0.020	0.149	41.4	174	2.15	NS	NS	294	--	--	--
	10/20/05	**0.347**	<0.010	<0.250	<0.002	<0.020	**0.084**	0.453	<0.005	0.015	<0.00020	<0.010	<0.010	**0.055**	0.288	47.6	213	9.50	NS	NS	232	--	--	--
	10/19/06	**0.937**	<0.010	<0.250	<0.002	<0.020	<0.020	**1.63**	<0.005	0.130	<0.00020	<0.010	<0.010	0.022	0.226	59.2	168	2.97	NS	NS	423	--	--	--
	4/27/07	**0.446**	<0.010	<0.250	<0.002	<0.020	<0.020	**1.24**	<0.005	0.018	<0.00020	<0.010	<0.010	<0.020	0.188	27.4	128	3.60	NS	NS	209	--	--	--
	11/19/07	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	0.104	<0.005	0.011	<0.00020	<0.010	<0.010	<0.020	0.117	61.5	243	3.54	NS	NS	371	--	--	--
	4/30/08	**0.170**	<0.010	<0.250	<0.002	<0.020	<0.020	0.242	<0.005	0.021	<0.00020	<0.010	<0.010	<0.020	0.238	56.3	171	2.69	NS	NS	260	--	--	--
	10/29/08	<0.100	<0.010	0.0564	0.0003	<0.010	0.003	0.0206	<0.010	0.006	**0.00005**	<0.010	<0.010	**0.051**	0.229	76.3	254	2.87	NS	NS	392	--	--	--
	4/30/09	<0.100	<0.010	0.0648	<0.001	<0.010	<0.010	0.0778	0.0054	0.0083	<0.0002	**0.0099**	<0.010	0.0159	0.302	52.3	211	4.47	NS	NS	325	--	--	--
	8/26/09	--	--	0.072	<0.001	<0.005	--	0.16	<0.005	0.014	--	<0.020	--	--	--	45	--	--	8.1	22.0	1,490	10.0	94	9.1

TABLE 3
SURFACE WATER ANALYTICAL RESULTS SUMMARY
ASH LANDFILL - PERMIT 34-05
RURAL HALL, NORTH CAROLINA

Sample Location / ID	Date	Aluminum	Arsenic	Barium	Cadmium	Chromium (Total)	Copper	Iron	Lead	Manganese	Mercury	Selenium	Silver	Zinc	Nitrate-nitrogen	Sulfate	Dissolved Solids	Total Organic Carbon	pH	Temperature (degrees Celsius)	Conductivity (µmhos/cm)	Turbidity (NTUs)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)
NC 2L Ground Water Standard		NE	0.050	2.0	0.00175	0.050	1.0	0.300	0.015	0.050	0.00105	0.050	0.0175	1.05	10.0	250	500	NE	6.5 - 8.5	NE	NE	NE	NE	NE
Solid Waste Section Limit		NE	0.010	0.100	0.001	0.010	0.010	0.300	0.010	0.050	0.0002	0.010	0.01	0.01	10.0	250	NE	NE	NE	NE	NE	NE	NE	NE
NC 2B Surface Water Standard		0.087	0.050	1.0 [1]	0.002	0.050	0.007	1.0	0.025	0.200 [1]	0.000012	0.005	0.00006	0.05	10.0 [1]	250 [1]	500 [1]	NE	6.0 - 9.0	NE	NE	NE	NE	>5.0
SS-02	9/21/90	**0.130**	<0.010	0.094	**0.0046**	<0.020	<0.020	0.1	<0.005		<0.00020	<0.010	<0.010	<0.020	1.14	47	141	15.0	7.5	14.6	607	--	--	--
	10/23/91		<0.010	0.17	<0.002	<0.020	<0.020	0.82	<0.005	**0.711**	<0.00020	<0.010	<0.010	**0.08**	1.02	**490**	**806**	10.0	7.8	18	1,280	--	--	--
	3/26/92	**7.650**	<0.010	<0.250	**0.0021**	<0.020	<0.020	**8.07**	0.0129	0.130	<0.00020	<0.010	<0.010	<0.020	0.25	13	149	12.0	6.0	11.5	111	--	--	--
	9/30/92	**0.330**	<0.010	<0.250	<0.002	<0.020	<0.020		<0.005		<0.00020	**0.0073**	<0.010	<0.020	0.55	183	474	3.0	6.1	15.1	778	--	--	--
RHSS-002	3/31/93	**0.208**	<0.010	<0.250	<0.002	<0.020	<0.020	0.675	<0.005	**0.327**	<0.00020	<0.010	<0.010	<0.020	0.35	70	185	4.0	5.8	14.1	341	--	--	--
Surface Water - Downstream	9/17/93	**0.470**	<0.010	<0.250	<0.002	<0.020	<0.020	**1.27**	<0.005	**0.722**	<0.00020	<0.010	<0.010	<0.020	2.3	154	**523**	4.0	7.5	22.2	754	--	--	--
	3/30/94	**0.220**	<0.010	<0.250	<0.002	0.032	<0.020	**1.12**	<0.005	0.117	<0.00020	<0.010	<0.010	**0.165**	0.32	40	143		6.0	14.4	692	--	--	--
	9/30/94	**0.120**	<0.010	<0.250	<0.002	<0.020	**0.028**	0.47	<0.005	**0.356**	<0.00020	<0.010	<0.010	0.024	0.325	135	397	37.9	7.4	18.6	573	--	--	--
	3/31/95	**0.165**	<0.010	<0.250	<0.002	<0.020	<0.020	0.526	<0.005	**0.332**	<0.00020	<0.010	<0.010	0.041	0.75	102	342		7.9	14.5	496	--	--	--
	9/29/95	**0.406**	<0.010	<0.250	<0.002	<0.020	<0.020	**1.02**	0.006	**0.598**	<0.00020	<0.010	<0.010	<0.020	1.03	155	**505**	2.68	5.6	13.5	1,095	--	--	--
	3/30/96	**0.426**	<0.010	<0.250	<0.002	<0.020	<0.020	0.787	<0.005	**0.250**	<0.00020	<0.010	<0.010	<0.020	0.19	31	198	2.99	6.5	12	282	--	--	--
	9/27/96	0.061	<0.010	<0.250	<0.002	<0.020	<0.020	0.227	0.01	**0.262**	<0.00020	<0.010	<0.010	0.047	0.75	147	409	3.19	7.6	20	613	--	--	--
	3/29/97	**0.209**	<0.010	<0.250	<0.002	<0.020	<0.020	0.644	<0.005	**0.246**	<0.00020	<0.010	<0.010	0.01	0.45	73	255	2.47	7.8	16	224	--	--	--
	9/17/97	**0.165**	<0.010	<0.250	<0.002	<0.020	<0.020	0.428	0.006	**0.333**	<0.00020	<0.005	<0.010	**0.153**	2.21	160	**562**	2.43	7.8	18	826	--	--	--
	3/27/98	**0.220**	<0.010	<0.250	<0.002	<0.020	<0.020	0.960	<0.005	**0.363**	<0.00020	<0.010	<0.010	0.032	0.550	94	324	3.96	7.8	17.5	724	--	--	--
	9/30/98	**0.100**	<0.010	<0.250	<0.002	<0.020	<0.020	0.595	<0.005	**0.351**	<0.00020	<0.010	<0.010	<0.020	1.55	89	444	6.85	7.4	19	368	--	--	--
	3/31/99	**0.129**	<0.010	<0.250	<0.002	<0.020	<0.020	0.947	<0.005	**0.587**	<0.00020	<0.010	<0.010	<0.020	1.55	204	420	3.26	7.4	17	340	--	--	--
	9/29/99	**1.380**	<0.010	<0.250	<0.002	<0.020	<0.020	**3.03**	<0.005	0.147	<0.00020	<0.010	<0.010	0.021	0.16	46	173	8.10	7.6	17	623	--	--	--
	9/15/00	**0.283**	<0.010	<0.250	<0.002	<0.020	<0.020	0.225	<0.005	**0.416**	<0.00020	<0.010	<0.010	<0.020	1.24	170	439	6.58	7.4	20	640	--	--	--
	3/16/00	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	0.96	<0.005	**0.464**	<0.00020	<0.010	<0.010	<0.020	1.18	175	500	3.75				--	--	--
	3/23/01	**0.108**	<0.010	<0.250	<0.002	<0.020	<0.020	0.26	0.007	0.135	<0.00020	<0.010	<0.010	0.034	0.103	72	224	3.08	6.6	16	170	--	--	--
	10/4/01	**0.166**	<0.010	<0.250	<0.002	<0.020	<0.020	0.746	0.008	**0.91**	<0.00020	<0.010	<0.010	<0.020	6.32	**421**	**1,250**	27	7.2	19	680	--	--	--
	3/28/02	**0.121**	<0.010	<0.250	<0.002	<0.020	<0.020	0.502	<0.005	**0.206**	NS	<0.010	<0.010	<0.020	0.32	127	405	2.97	7.4	11	510	--	--	--
	10/3/02	**0.220**	<0.010	<0.250	<0.002	<0.020	<0.020	0.494	<0.005	**0.549**	<0.00020	<0.010	<0.010	<0.020	1.11	**266**	**517**	4.28	5.8	18	130	--	--	--
	3/25/03	**1.57**	<0.010	<0.250	<0.002	<0.020	<0.020	**1.28**	0.006	**0.264**	<0.00020	<0.010	<0.010	0.024	0.162	90	234	1.91	6.0	18	1,260	--	--	--
duplicate	3/25/03	**1.75**	<0.010	<0.250	<0.002	<0.020	<0.020	**1.32**	<0.005	**0.265**	<0.00020	<0.010	<0.010	0.024	0.194	95	235	2.00	6.0	18	1,260	--	--	--
	10/2/03	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**1.01**	<0.005	**0.546**	<0.00020	<0.010	<0.010	<0.020	0.61	115	395	2.50	6.5	14	556	--	--	--
	4/28/04	**0.109**	<0.010	<0.250	<0.002	<0.020	<0.020	0.40	<0.005	**0.417**	<0.00020	<0.010	<0.010	<0.020	0.608	220	394	2.26	NS	12.7	623	--	--	--
	10/26/04	**0.216**	<0.010	<0.250	<0.002	<0.020	<0.020	0.839	<0.005	**0.582**	<0.00020	<0.010	<0.010	<0.020	2.00	**276**	**554**	3.06	NS	NS	807	--	--	--
	4/27/05	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	0.356	<0.005	**0.272**	<0.00020	<0.010	<0.010	<0.020	0.648	38	460	2.48	NS	NS	737	--	--	--
	10/20/05	<0.100	<0.010	<0.250	<0.002	<0.020	**0.072**	**1.12**	<0.005	**0.33**	<0.00020	<0.010	<0.010	0.048	0.546	240	**571**	3.4	NS	NS	419	--	--	--
	10/19/06	**0.530**	<0.010	<0.250	<0.002	<0.020	<0.020	**1.06**	<0.005	**0.534**	<0.00020	<0.010	<0.010	0.032	0.299	204	422	3.49	NS	NS	550	--	--	--
	4/27/07	**0.389**	<0.010	<0.250	<0.002	<0.020	<0.020	0.811	<0.005	**0.488**	<0.00020	<0.010	<0.010	<0.020	0.333	**439**	303	4.42	NS	NS	511	--	--	--
	11/19/07	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	0.136	<0.005	**0.308**	<0.00020	<0.010	<0.010	0.023	0.258	**300**	**647**	3.54	NS	NS	908	--	--	--
	4/30/08	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	0.278	<0.005	**0.254**	<0.00020	<0.010	<0.010	0.046	0.285	159	371	2.74	NS	NS	569	--	--	--
	10/29/08	<0.100	<0.010	0.0563	0.00024	<0.010	<0.010	0.128	<0.010	**0.318**	<0.00020	<0.010	<0.010	0.0142	0.407	**342**	**708**	3.43	NS	NS	1,070	--	--	--
	4/30/09	<0.100	<0.010	0.0608	<0.001	<0.010	<0.010	0.0894	<0.010	**0.222**	<0.0002	<0.010	<0.010	0.0192	0.499	201	**518**	3.39	NS	NS	821	--	--	--
	8/26/09	--	--	0.071	<0.001	<0.005	--	0.11	<0.005	**0.220**	--	<0.020	--	--	--	**310**	--	--	7.8	21.6	2,120	6.4	101	6.4

TABLE 3
SURFACE WATER ANALYTICAL RESULTS SUMMARY
ASH LANDFILL - PERMIT 34-05
RURAL HALL, NORTH CAROLINA

Sample Location / ID	Date	Aluminum	Arsenic	Barium	Cadmium	Chromium (Total)	Copper	Iron	Lead	Manganese	Mercury	Selenium	Silver	Zinc	Nitrate-nitrogen	Sulfate	Dissolved Solids	Total Organic Carbon	pH	Temperature (degrees Celsius)	Conductivity (µmhos/cm)	Turbidity (NTUs)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)
NC 2L Ground Water Standard		NE	0.050	2.0	0.00175	0.050	1.0	0.300	0.015	0.050	0.00105	0.050	0.0175	1.05	10.0	250	500	NE	6.5 - 8.5	NE	NE	NE	NE	NE
Solid Waste Section Limit		NE	0.010	0.100	0.001	0.010	0.010	0.300	0.010	0.050	0.0002	0.010	0.01	0.01	10.0	250	NE	NE	NE	NE	NE	NE	NE	NE
NC 2B Surface Water Standard		0.087	0.050	1.0 [1]	0.002	0.050	0.007	1.0	0.025	0.200 [1]	0.000012	0.005	0.00006	0.05	10.0 [1]	250 [1]	500 [1]	NE	6.0 - 9.0	NE	NE	NE	NE	>5.0
SS-10	8/11/09	--	--	0.065	<0.001	<0.005	--	**12**	<0.005	**0.40**	--	<0.020	--	--	--	11	--	--	7.1	20.6	1,890	42.9	-40	3.4
SS-15	8/11/09	--	--	0.052	<0.001	<0.005	--	0.90	<0.005	0.035	--	<0.020	--	--	--	7.5	--	--	7.8	20.7	1,840	52.5	114	9.7
SS-20	8/11/09	--	--	0.058	<0.001	<0.005	--	0.80	<0.005	0.046	--	<0.020	--	--	--	8.2	--	--	8.4	23.9	1,112	27.3	58	7.6
SS-25	8/11/09	--	--	0.060	<0.001	<0.005	--	0.59	<0.005	0.053	--	<0.020	--	--	--	28	--	--	8.4	22.1	1,830	32.1	75	7.6
SS-30	8/11/09	--	--	0.072	<0.001	<0.005	--	0.15	<0.005	0.025	--	<0.020	--	--	--	95	--	--	8.5	22.8	5,250	21.7	57	8.1
SS-40	8/26/09	--	--	0.091	<0.001	<0.005	--	0.08	<0.005	0.022	--	<0.020	--	--	--	**300**	--	--	7.8	21.3	2,050	7.1	89	7.9
SS-50	8/11/09	--	--	0.029	<0.001	<0.005	--	**2.90**	<0.005	0.180	--	<0.020	--	--	--	5.6	--	--	7.8	25.4	1,180	32.0	-21	8.5
SS-60	8/26/09	--	--	0.14	<0.001	<0.005	--	0.28	<0.005	**0.980**	--	<0.020	--	--	--	**350**	--	--	7.1	20.3	4,040	65.9	10	6.7
SS-70	8/26/09	--	--	0.12	<0.001	<0.005	--	**1.10**	<0.005	**0.250**	--	<0.020	--	--	--	65	--	--	6.9	20.6	2,520	6.8	91	6.4
SS-80	8/26/09	--	--	0.12	<0.001	<0.005	--	0.25	<0.005	0.025	--	<0.020	--	--	--	82	--	--	7.1	20.6	5,190	5.8	100	8.3
	9/30/94	**2.58**	0.016	<0.250	<0.002	<0.020	**0.044**	**23.2**	<0.005	**6.49**	<0.00020	<0.010	<0.010	0.035	2.95	**787**	**2,230**	258.00	7.4	22.5	3,140	--	--	--
RETENTION	3/31/95	**0.66**	<0.010	<0.250	<0.002	<0.020	<0.020	**5.15**	<0.005	**2.36**	<0.00020	<0.010	<0.010	**0.155**	8.88	**794**	**2,540**	459	7.8	17.5	3,680	--	--	--
POND MW-001	9/29/95	**0.156**	<0.010	<0.250	<0.002	<0.020	<0.020	**5.24**	0.008	**4.88**	<0.00020	<0.010	<0.010	<0.020	1.03	**801**	**2,660**	4.95	5.4	14.8	4,220	--	--	--
	3/30/96	**0.112**	<0.010	<0.250	0.002	<0.020	<0.020	**5.02**	<0.005	**5.4**	<0.00020	<0.010	<0.010	<0.020	2.08	--	**2,340**	6.65	7.2	15	3,050	--	--	--
	9/27/96	**0.167**	<0.010	<0.250	<0.002	<0.020	<0.020	--	0.009	**4.53**	<0.00020	<0.010	<0.010	**0.066**	1.70	**1,010**	**2,700**	4.04	7.3	23	1,510	--	--	--
Water from	3/29/97	**0.097**	<0.010	<0.250	<0.002	<0.020	<0.020	**6.18**	<0.005	**5.46**	<0.00020	<0.010	<0.010	0.010	1.29	**1,050**	**2,460**	4.31	7.5	22	1,770	--	--	--
Sediment Basin at	3/17/97	**0.164**	<0.010	<0.250	<0.002	<0.020	<0.020	**3.66**	<0.005	**5.40**	<0.00020	<0.010	<0.010	**0.055**	0.608	**1,160**	**3,000**	6.43	7.2	22	3,660	--	--	--
W-1 *duplicate*	3/27/98	<0.100	0.010	<0.250	<0.002	<0.020	<0.020	**11.4**	<0.005	**5.90**	<0.00020	<0.010	<0.010	0.021	0.290	**942**	**2,780**	4.43	7.2	23.4	1,419	--	--	--
	9/30/98	**0.274**	<0.010	<0.250	<0.002	<0.020	<0.020		<0.005	**4.94**	<0.00020	<0.010	<0.010	<0.020		**666**	**2,700**	15.4	7.6	20	1,200	--	--	--
	3/31/99	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**7.55**	0.006	**4.45**	<0.00020	<0.010	<0.010	<0.020	0.600	**1,560**	**2,930**	7.92	7.3	18	1,021	--	--	--
	9/29/99	**0.877**	<0.010	<0.250	<0.002	<0.020	<0.020	**6.77**	<0.005	**0.862**	<0.00020	<0.010	<0.010	**0.08**	3.36	**330**	**715**	13.30	7.1	18	2,930	--	--	--
	3/16/00	**0.41**	<0.010	<0.250	<0.002	<0.020	<0.020	**72**	<0.005	**4.54**	<0.00020	<0.010	<0.010	<0.020	1.09	**948**	**2,610**	10.60				--	--	--
	9/15/00	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**2.02**	<0.005	**3.48**	<0.00020	<0.010	<0.010	<0.020	6.27	**894**	**2,470**	5.21	6.6	19	980	--	--	--
	3/23/01	**0.144**	<0.010	<0.250	**0.004**	<0.020	<0.020	**35.9**	0.012	**4.07**	<0.00020	<0.010	<0.010	<0.020	0.48	**926**	**2,630**	5.85	6.5	17	480	--	--	--
duplicate	3/23/01	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**6.9**	0.007	**4.19**	<0.00020	<0.010	<0.010	<0.020	0.35	**939**	**2,640**	7.52	6.5	17	480	--	--	--
	10/4/01	**0.204**	<0.010	<0.250	<0.002	<0.020	<0.020	0.915	0.007	**0.229**	<0.00020	<0.010	<0.010	<0.020	<0.05	<5.00	186	7.8	6.3	20	300	--	--	--
	3/28/02	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**5.1**	<0.005	**3.66**	NS	<0.010	<0.010	<0.020	0.28	**1,000**	**3,010**	3.77	6.4	12	1,080	--	--	--
	10/3/02	<0.100	<0.010	<0.250	0.002	<0.020	**0.027**	**1.52**	<0.005	**3.34**	<0.00020	<0.010	<0.010	<0.020	1.82	**1,030**	**2,940**	4.94	6.7	18	370	--	--	--
duplicate	10/3/02	<0.100	<0.010	<0.250	0.002	<0.020	**0.024**	**1.58**	<0.005	**3.33**	<0.00020	<0.010	<0.010	<0.020	1.78	**1,040**	**2,860**	5.12	5.7	18	370	--	--	--
	3/25/03	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**6.69**	0.006	**3.56**	<0.00020	<0.010	<0.010	0.025	0.406	**846**	**2,530**	3.72	6.6	17	330	--	--	--
	10/2/03	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**11.3**	0.007	**3.88**	<0.00020	<0.010	<0.010	0.042	0.174	**916**	**2,710**	3.92	5.6	15	3,050	--	--	--
duplicate	10/2/03	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**11.4**	0.006	**3.88**	<0.00020	<0.010	<0.010	<0.020	<0.050	**958**	**2,690**	3.9	5.6	15	3,170	--	--	--
	4/28/04	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**11.1**	0.006	**6.08**	<0.00020	<0.010	<0.010	<0.020	<0.050	**1,460**	**2550**	5.36	NS	17.3	2860	--	--	--
	10/26/04	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**5.25**	<0.005	**4.55**	<0.00020	<0.010	<0.010	<0.020	0.287	**1,190**	**2,950**	3.64	NS	NS	3,480	--	--	--
	4/27/05	<0.100	<0.010	<0.250	0.002	<0.020	<0.020	**7.63**	0.007	**5.73**	<0.00020	<0.010	<0.010	<0.020	<0.050	**1,100**	**2,550**	4.71	NS	NS	2,870	--	--	--
	10/20/05	**1.63**	<0.010	<0.250	**0.004**	<0.020	**0.028**	**103**	0.006	**4.88**	<0.00020	<0.010	<0.010	**0.057**	0.428	**403**	**3,010**	89	NS	NS	529	--	--	--
	10/19/06	**0.172**	<0.010	<0.250	0.002	<0.020	**0.347**	**27.4**	<0.005	**3.60**	<0.00020	<0.010	<0.010	0.027	0.139	**1,320**	**2,850**	4.37	NS	NS	2,000	--	--	--
	4/27/07	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**5.36**	<0.005	**2.38**	<0.00020	<0.010	<0.010	<0.020	0.287	**1,380**	**2,750**	4.01	NS	NS	4,830	--	--	--
	11/19/07	<0.100	0.042	<0.250	0.002	<0.020	<0.020	**48.2**	<0.005	**3.28**	<0.00020	<0.010	<0.010	0.025	<0.050	**1,560**	**3,060**	3.82	NS	NS	3,300	--	--	--
	4/30/08	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**9.68**	<0.005	**2.99**	<0.00020	<0.010	<0.010	0.022	0.155	**1,100**	**2,910**	3.38	NS	NS	4,880	--	--	--
	10/29/08	<0.100	<0.010	0.0687	<0.001	<0.010	<0.010	**4.84**	0.0035	**2.88**	<0.00020	<0.010	<0.010	<0.010	<0.050	188	**3,060**	3.510	NS	NS	4,200	--	--	--
	4/30/09	<0.100	<0.010	0.0774	0.0018	<0.010	0.0036	**4.08**	0.0044	**3.10**	<0.0002	<0.010	<0.010	<0.010	0.264	37.7	**2,904**	3.940	NS	NS	4,070	--	--	--

TABLE 3
SURFACE WATER ANALYTICAL RESULTS SUMMARY
ASH LANDFILL - PERMIT 34-05
RURAL HALL, NORTH CAROLINA

Sample Location / ID	Date	Aluminum	Arsenic	Barium	Cadmium	Chromium (Total)	Copper	Iron	Lead	Manganese	Mercury	Selenium	Silver	Zinc	Nitrate-nitrogen	Sulfate	Dissolved Solids	Total Organic Carbon	pH	Temperature (degrees Celsius)	Conductivity (µmhos/cm)	Turbidity (NTUs)	Oxidation-Reduction Potential (mV)	Dissolved Oxygen (mg/L)
NC 2L Ground Water Standard		NE	0.050	2.0	0.00175	0.050	1.0	0.300	0.015	0.050	0.00105	0.050	0.0175	1.05	10.0	250	500	NE	6.5 - 8.5	NE	NE	NE	NE	NE
Solid Waste Section Limit		NE	0.010	0.100	0.001	0.010	0.010	0.300	0.010	0.050	0.0002	0.010	0.01	0.01	10.0	250	NE	NE	NE	NE	NE	NE	NE	NE
NC 2B Surface Water Standard		0.087	0.050	1.0 [1]	0.002	0.050	0.007	1.0	0.025	0.200 [1]	0.000012	0.005	0.00006	0.05	10.0 [1]	250 [1]	500 [1]	NE	6.0 - 9.0	NE	NE	NE	NE	>5.0
RETENTION POND MW-003	9/30/94	**1.77**	<0.010	<0.250	<0.002	<0.020	**0.113**	**3.37**	<0.005	**2.2**	<0.00020	<0.010	<0.010	**0.096**	0.20	159	415	20.1	6.9	19.6	519	--	--	--
	3/31/95		<0.010	<0.250	<0.002	<0.020	<0.020	**4.86**	<0.005	**5.98**	<0.00020	<0.010	<0.010	0.032	0.10	**294**	**625**		7.6	13.6	896	--	--	--
	9/29/95	**1.64**	<0.010	<0.250	<0.002	<0.020	<0.020	**3.42**	0.007	**2.94**	<0.00020	<0.010	<0.010	**0.104**	0.463	**314**	**740**	3.74	4.9	14	1,040	--	--	--
	3/30/96	**11.4**	<0.010	<0.250	0.002	<0.020	<0.020	**23.3**	0.009	**3.16**	<0.00020	<0.010	<0.010	**0.126**	0.13	222	**552**	3.83	7.2	12	750	--	--	--
Water from Sediment Basin at W-3	9/27/96	**0.11**	<0.010	<0.250	<0.002	<0.020	<0.020	**1.01**	0.007	**2.36**	<0.00020	<0.010	<0.010	0.03	0.16	**283**	**737**	6.73	7.6	20	974	--	--	--
	3/29/97	**0.238**	<0.010	<0.250	<0.002	<0.020	<0.020	**1.93**	<0.005	**3.05**	<0.00020	**0.013**	<0.010	0.02	0.18	**809**	**807**	4.17	7.8	16	590	--	--	--
	9/17/97	**0.169**	<0.010	<0.250	<0.002	<0.020	<0.020	0.715	0.005	**3.06**	<0.00020	**0.006**	<0.010	**0.212**	0.330	**562**	**1,290**	5.29	7.7	19	1,650	--	--	--
	3/27/98	**0.270**	<0.010	<0.250	<0.002	<0.020	<0.020	**2.50**	<0.005	**3.37**	<0.00020	**0.013**	<0.010	0.041	0.250		**929**	6.98	7.2	20.0	1,214	--	--	--
	9/30/98	**0.353**	<0.010	<0.250	<0.002	<0.020	<0.020	**1.38**	<0.005		<0.00020	**0.017**	<0.010	<0.020	0.780	**367**	**1,280**	10.1	6.9	19	920	--	--	--
	3/31/99	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**4.83**	<0.005	**5.55**	<0.00020	<0.010	<0.010	<0.020	0.19	**482**	**842**	7.58	7.1	16	592	--	--	--
	9/29/99	**0.677**	<0.010	<0.250	<0.002	<0.020	<0.020	**1.94**	<0.005	**0.894**	<0.00020	<0.010	<0.010	<0.020	0.10	**258**	413	8.14	7.7	19	741	--	--	--
	9/15/00	**0.224**	<0.010	<0.250	<0.002	<0.020	<0.020	**2.38**	<0.005	**2.8**	<0.00020	<0.010	<0.010	<0.020	0.16	**550**	**1,260**	8.58	7.1	21	680	--	--	--
	3/23/01	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**3.69**	0.010	**2.25**	<0.00020	<0.010	<0.010	0.030	0.23	**530**	**1,230**	5.72	6.6	17	640	--	--	--
	10/4/01	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**4.24**	0.006	**3.65**	<0.00020	<0.010	<0.010	<0.020	0.08	**592**	**1,440**	30	7.0	20	600	--	--	--
	3/28/02	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**5.62**	<0.005	**2.18**	NS	<0.010	<0.010	<0.020	0.11	**682**	**1,590**	5.36	6.4	13	680	--	--	--
	10/3/02	<0.100	<0.010	<0.250	0.002	<0.020	<0.020	**6.51**	<0.005	**5.29**	<0.00020	<0.010	<0.010	<0.020	<0.050	**932**	**1,900**	8.51	6.2	19	150	--	--	--
	3/25/03	**3.28**	<0.010	<0.250	<0.002	<0.020	<0.020	**6.17**	0.008	**4.29**	<0.00020	<0.010	<0.010	**0.078**	0.088	**784**	**1,520**	1.34	6.4	18	110	--	--	--
	10/2/03	**0.634**	<0.010	<0.250	<0.002	<0.020	<0.020	**5.95**	0.008	**6.75**	<0.00020	<0.010	<0.010	0.05	0.174	**765**	**1,420**	3.97	6.1	14	1,460	--	--	--
	4/28/04	**0.152**	<0.010	<0.250	<0.002	<0.020	<0.020	**8.37**	<0.005	**6.72**	<0.00020	<0.010	<0.010	<0.020	0.224	**1,040**	**1810**	3.89	NS	12.1	2030	--	--	--
	10/26/04	**0.554**	<0.010	<0.250	**0.005**	<0.020	<0.020	**16.3**	<0.005	**4.22**	<0.00020	<0.010	<0.010	0.036	0.289	**1,070**	**2,140**	5.16	NS	NS	2,150	--	--	--
	4/27/09	<0.100	<0.010	<0.250	0.002	<0.020	<0.020	**4.47**	<0.005	**6.11**	<0.00020	<0.010	<0.010	<0.020	0.246	**1,075**	**2,090**	4.05	NS	NS	2,320	--	--	--
	10/20/05	<0.100	<0.010	<0.250	**0.005**	<0.020	**0.027**	**7.90**	<0.005	**5.87**	<0.00020	<0.010	<0.010	0.044	0.279	**1,300**	**2,090**	30	NS	NS	1,060	--	--	--
	10/19/06	<0.100	<0.010	**1.46**	<0.002	<0.020	<0.020	**6.04**	<0.005	**4.55**	<0.00020	<0.010	<0.010	0.021	0.281	**1,170**	**1,920**	4.2	NS	NS	1,370	--	--	--
	4/27/07	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**8.33**	<0.005	**4.19**	<0.00020	<0.010	<0.010	<0.020	0.290	**1,130**	**2,130**	3.83	NS	NS	2,230	--	--	--
	11/19/07	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**8.20**	<0.005	**6.00**	<0.00020	<0.010	<0.010	<0.020	0.064	**1,680**	**2,550**	4.59	NS	NS	2,710	--	--	--
	4/30/08	<0.100	<0.010	<0.250	<0.002	<0.020	<0.020	**3.36**	<0.005	**3.80**	<0.00020	<0.010	<0.010	0.037	0.297	**2,090**	**2,110**	3.56	NS	NS	2,290	--	--	--
	10/29/08	<0.100	<0.010	0.0593	<0.001	<0.010	<0.010	**2.88**	0.0023	**4.36**	<0.0002	<0.010	<0.010	<0.010	0.171	**988**	**2,360**	3.48	NS	NS	2,740	--	--	--
	4/30/09	<0.100	<0.010	0.0532	<0.001	<0.010	<0.010	**4.62**	0.0072	**4.96**	<0.0002	<0.010	<0.010	0.0146	0.337	**261**	**2,460**	4.11	NS	NS	2,930	--	--	--

All concentrations in milligrams per liter.
NS - Not sampled

NE - Not established
[1] - No freshwater aquatic life standard established. Water Supply criteria presented.

Gray background indicates exceedance of NC 2B Surface Water Standard

TABLE 4
WATER SUPPLY WELLS WITHIN 1,500 FEET
ASH LANDFILL - PERMIT 34-05
RURAL HALL, NORTH CAROLINA

MAP ID#	PARCEL ID#	SITE OCCUPANT AND ADDRESS	PROPERTY OWNER	WELL IN SERVICE?	DISTANCE/ DIRECTION / GRADIENT FROM LIMIT OF PERMIT NO. 34-05 LANDFILL (FEET)			CONSTRUCTION DETAILS / COMMENTS
1	6921-22-4389	***SUBJECT PROPERTY*** Edwards Road	Grady & Mary Hawks P.O. Box 651 Rural Hall, NC 27045 Phone: 336-969-6174	No as of May 2009. Previously used for vehicle wash-down	70	W	Side	PW-1, 6" dia., per downhole video (8/25/09) casing to 21.5 ft, depth to rock estimated at 17 ft based on casing depth; total well depth= 405 ft (per Clayton Drilling), DTW = 72 ft, open fracture zone 102-103 ft, minor water-bearing fracture @ 42 ft
2A	6921-20-5455	Grady & Mary Hawks 810 Sixty Five Hwy Phone: 336-969-6174	Grady & Mary Hawks 810 Sixty Five Hwy, P.O. Box 651 Rural Hall, NC 27045	2A - Yes serves Hawks' residence & florist shop	1,890	S-SW	Up	6" dia., total depth = 200 ft (est.), casing to 80 ft (est.), installed late 1970s; no pre-treatement system on well well located near florist's parcel (PIN # 6920-29-5624) well located near NWC of florist bldg
2B	6920-29-5624	Hawks Florist 840 Sixty Five Hwy Phone: 336-969-6551	Susan Gordon 840 Sixty Five Hwy, P.O. Box 651 Rural Hall, NC 27045	2B - No previously served former trailer & florist's garden	2,035	S-SW	Up	6" dia., construction details unknown no pre-treatement system on well well located at SEC of florist's parcel near telephone pole
3A	6921-30-2220	Freedom Baptist Church 1000 Sixty Five Hwy Contact: Jerry Beeson	Freedom Baptist Church 214 Dunleith Ave Winston-Salem, NC 27101 Phone: 336-969-6937	3A - Yes located in well house	1,860	S	Up	3A - 6" dia., construction details unknown
3B	6921-30-2220			3B - Yes located in yard, 115 feet south of well house	1,975	S	Up	3B - 6" dia., total depth = 605 ft, casing to 61 ft, yield = 15 gpm, installed 1990, Wells 3A & 3B manifolded together then H2O routed thru softener & iron removal unit (sodium hydroxide) prior to delivery to church
4A	6921-40-1108 (residence)	Same	Don Stewart 1160 Sixty Five Hwy Rural Hall, NC 27045 Phone: 336-969-6362	4A - Yes All water for house, except drinking/cooking (bottled for drinking/cooking)	1,670	SE	Up	4A - 6" dia., total depth 200 ft (est.), installed 1978 no pre-treatement system on well
4B	6921-30-9647 (at barn)			4B - Yes Livestock, at barn	1,110	SE	Up	4B - 6" dia., total depth 425 ft, casing depth = 40 ft; yield = 3 gpm, installed 2004; no pre-treatement system on well
5	6921-40-2442	Same	Mozelle Stewart 1180 Sixty Five Hwy Rural Hall, NC 27045 Phone: 336-969-5382	Yes	1,700	SE	Up	6" dia., total depth = 185 ft, casing depth - unknown, installed 1970s, no pre-treatment system on well
6	6921-40-6606	Same	Ken Stewart 1234 Sixty Five Hwy Rural Hall, NC 27045 Phone: 336-650-2408 (cell)	Yes	1,450	SE	Up	6" dia., total depth = 285 ft, casing depth = 40 ft (est), installed 1985, Sediment filter for pre-treatment yield = 20 gpm

TABLE 4
WATER SUPPLY WELLS WITHIN 1,500 FEET
ASH LANDFILL - PERMIT 34-05
RURAL HALL, NORTH CAROLINA

MAP ID#	PARCEL ID#	SITE OCCUPANT AND ADDRESS	PROPERTY OWNER	WELL IN SERVICE?	DISTANCE/ DIRECTION / GRADIENT FROM LIMIT OF PERMIT NO. 34-05 LANDFILL (FEET)			CONSTRUCTION DETAILS / COMMENTS
7	6921-41-5108	Same	Mack Phipps 8320 Crestbrook Rd Rural Hall, NC 27045 Phone: H: 336-969-5382, C: 336-978-2683	Yes	1,210	SE	Up	6" dia., total depth = 358 ft, casing depth = unknown installed 1985, no pre-treatement system on well yield = 2.5 gpm
8	6921-41-4516	Same	Michael & Susan Sprinkle 8390 Crestbrook Rd Rural Hall, NC 27045 Phone: 336-969-4440	Yes	1,170	E	Side	6" dia., total depth = 405 ft, casing depth = 68 ft per tag installed 1988, no pre-treatement system on well yield = 7 gpm
9	6921-42-6412	Mildred Nunn 8420 Crestbrook Dr	Jack Guthrie 5340 Seward Cir Pfafftown, NC 27040 Phone: H: 336-924-5857, W: 336-716-4747, C:	Yes	1,090	E	Side	6" dia., total depth = >200 ft, casing depth = unknown sediment filter on well, no other pre-treatement system Ms. Nunn is Jack Guthrie's mother
10	6921-41-8950	Same	Joshua & Tasha Freeman 8450 Crestbrooks Rd Rural Hall, NC 27045 Phone: 336-969-5369	Yes	1,140	E	Side	6" dia., total depth = 705 ft, casing depth = 95 ft yield = 5 gpm, pump set at 300 ft, installed May 2005; Static water level = 180 ft; well info per tag on well head

TABLE 5
WATER SUPPLY WELL SAMPLING RESULTS
ASH LANDFILL - PERMIT 34-05
RURAL HALL, NORTH CAROLINA

Map ID	Owner	Water Supply Well Location	Distance/ Direction/ Gradient From Limit of Permit No. 34-05 Landfill (Feet)			Well Use	Sample Date	METALS by EPA METHOD 200.8 (mg/l)							SULFATES by EPA METHOD 300 (mg/l)	FIELD PARAMETERS[1]					
								Iron	Manganese	Selenium	Barium	Cadmium	Chromium	Lead		pH (Standard Units)	Conductivity (mS/cm)	Dissolved Oxygen (mg/l)	Oxidation-Reduction Potential (millivolts)	Turbidity (NTUs)	Temperature (degrees Celsius)
NC GROUND WATER STANDARD (2L)								0.300	0.050	0.050	2.0	0.00175	0.050	0.015	250	6.5-8.5	NE	NE	NE	NE	NE
EPA MAXIMUM CONTAMINANT LEVEL (MCL)								0.300 [2]	0.050 [2]	0.050	2.0	0.005	0.100	0.015	250 [2]	6.5-8.5 [2]	NE	NE	NE	NE	NE
EPA TAPWATER SCREENING LEVEL [3]								26.0	0.880	0.180	7.30	0.018	0.110	NE	NE	NE	NE	NE	NE	NE	NE
2A	Hawks	810 Sixty Five Hwy	1,890	S-SW	Up	Potable	7/21/09	<0.050	0.0052	<0.001	0.041	<0.001	<0.001	0.0014	4.3	7.53	0.334	0.00	87	7.1	16.8
3A	Freedom Church	1000 Sixty Five Hwy	1,860	S	Up	Potable	7/20/09	<0.050	<0.005	<0.001	0.200	<0.001	0.0013	0.0040	4.0	5.62	1.15	3.62	186	16.9	16.9
3B	Freedom Church	1000 Sixty Five Hwy	1,975	S	Up	Potable	7/20/09	<0.050	<0.005	<0.001	0.086	<0.001	0.0012	0.0055	1.3	5.74	1.36	5.53	240	16.5	17.8
4A	Don Stewart	1160 Sixty Five Hwy	1,670	SE	Up	Potable	7/20/09	<0.050	<0.005	<0.001	0.150	<0.001	0.0013	**0.028**	<1.0	5.70	1.62	7.38	218	0.8	16.7
4A	Don Stewart	1160 Sixty Five Hwy	1,670	SE	Up	Potable	8/3/09	*Resampled well for lead - from spigot upstream of pressure tank after 20 mins*						**0.039**	--	5.99	0.166	7.61	255	58.0	17.8
4A	Don Stewart	1160 Sixty Five Hwy	1,670	SE	Up	Potable	8/3/09 [4]	--	*"First Draw" from back spigot for lead only* [4]				--	<0.005	--	--	--	--	--	--	--
4A	Don Stewart	1160 Sixty Five Hwy	1,670	SE	Up	Potable	8/3/09 [4]	**1.24**	<0.030	*From back spigot after 20 mins* [4]			--	**0.019**	--	6.00	--	--	--	--	--
4A	Don Stewart	1160 Sixty Five Hwy	1,670	SE	Up	Potable	9/16/09 [4]	--	--	*From kitchen sink "first draw"* [4]			--	<0.005	--	--	--	--	--	--	--
4A	Don Stewart	1160 Sixty Five Hwy	1,670	SE	Up	Potable	9/16/09 [4]	--	--	*From kitchen sink after 5 mins* [4]			--	<0.005	--	--	--	--	--	--	--
4A	Don Stewart	1160 Sixty Five Hwy	1,670	SE	Up	Potable	9/16/09 [4]	--	--	*From kitchen sink after 15 mins* [4]			--	<0.005	--	--	--	--	--	--	--
4B	Don Stewart	1160 Sixty Five Hwy	1,110	SE	Up	Livestock	7/20/09	<0.050	<0.005	<0.001	0.039	<0.001	<0.001	<0.001	10	6.95	0.90	1.84	38	4.4	15.5
5	Mozelle Stewart	1180 Sixty Five Hwy	1,700	SE	Up	Potable	7/20/09	0.110	<0.005	<0.001	0.170	<0.001	0.0017	<0.001	<1.0	5.79	3.35	5.93	189	4.9	16.1
6	Ken Stewart	1234 Sixty Five Hwy	1,450	SE	Up	Potable	7/20/09	<0.050	<0.005	<0.001	0.085	<0.001	0.0013	0.0013	1.2	6.45	1.46	4.95	214	2.1	15.3
7	Phipps	8320 Crestbrook	1,210	SE	Up	Potable	7/20/09	<0.050	<0.005	<0.001	0.039	<0.001	<0.001	<0.001	7.1	7.34	0.99	3.50	191	6.1	15.6
8	Sprinkle	8390 Crestbrook	1,170	E	Side	Potable	7/28/09	<0.050	<0.005	<0.001	0.099	<0.001	<0.001	**0.030**	2.5	5.13	0.12	meter error	376	4.9	15.8
8	Sprinkle	8390 Crestbrook	1,170	E	Side	Potable	8/3/09	*Resampled at well head for lead*			--	--	--	0.0011	--	5.99	0.15	7.22	329	1.0	17.2
8	Sprinkle	8390 Crestbrook	1,170	E	Side	Potable	8/3/09	*"First draw" sample from spigot at south side of house*					--	0.011	--	--	--	--	--	--	--
8	Sprinkle	8390 Crestbrook	1,170	E	Side	Potable	8/3/09 [4]	--	*"First Draw" from back spigot for lead only* [4]				--	0.006	--	--	--	--	--	--	--
8	Sprinkle	8390 Crestbrook	1,170	E	Side	Potable	8/3/09 [4]	--	*First Draw at well head for lead only*			--	--	<0.005	--	--	--	--	--	--	--
8	Sprinkle	8390 Crestbrook	1,170	E	Side	Potable	8/3/09 [4]	<0.100	<0.030	*From welll head after 35 mins* [4]			--	<0.005	--	6.10	--	--	--	--	--
9	Guthrie	8420 Crestbrook	1,090	E	Side	Potable	7/20/09	<0.050	<0.005	<0.001	0.095	<0.001	<0.001	<0.001	6.4	6.36	0.90	5.44	235	9.1	16.5
10	Freeman	8450 Crestbrook	1,140	E	Side	Potable	7/21/09	<0.050	<0.005	<0.001	0.046	<0.001	<0.001	<0.001	1.9	5.88	0.90	6.09	236	35.6	15.5

mg/l = Milligrams per Liter
NE = Not established
< = Less than presented laboratory reporting limit (not detected)

Bold indicates concentration exceeds applicable NC Ground Water Standard

[1] - Field parameters measured via Horiba U-22 water quality meter
[2] - No primary MCL established, EPA secondary standard presented

[3] - EPA "Regional Screening Levels for Chemical Contaminants at Superfund Sites" for Tapwater (April 2009).
[4] - Sample collected and analyzed by Forsyth County Health Dept.

TABLE 6
LANDFILL CLOSURE SOILS SAMPLING AUGUST 10, 2009
ASH LANDFILL - SOLID WASTE PERMIT #34-05
RURAL HALL, NORTH CAROLINA

Sample ID	Depth Pushed BGS (in.)	Cover Thickness (in.)	Ash Present? (Y/N)	Geoprobe Refusal (Y/N)	Coefficient of Permeability (cm/sec)
UD-1	22	11	Y	N	7.8×10^{-5}
UD-2	23.5	10	Y	N	1.9×10^{-4}
UD-3	24.5	10.5	Y	N	1.5×10^{-4}
UD-4	23	20	Y	Y	1.6×10^{-5}
UD-5	21	21	Y	Y	2.0×10^{-5}
UD-6	23	23	Y	Y	3.7×10^{-5}
UD-7	19	10.5	Y	Y	5.1×10^{-5}
UD-8	15	12	Y	Y	3.8×10^{-5}
UD-9	22	12	Y	Y	2.0×10^{-5}
UD-10	15	14.5	Y	Y	1.5×10^{-4}
UD-11	20	20	Y	Y	4.6×10^{-5}
UD-12	25.5	25	Y	Y	1.7×10^{-5}
UD-13	18	18	Y	Y	3.0×10^{-5}
AVERAGE	**20.9**	**16.0**			**6.5×10^{-5}**

HAND AUGERS		
HA-1		24
HA-2		24
HA-3		18
HA-4		24
HA-5		14
HA-6		20
HA-7		12
HA-8		20
HA-9		18
HA-10		22
AVERAGE		**19.6**

Notes:

"Geoprobe Refusal" was found to be an indicator of presence of Ash

"Depth Pushed" based on measurements taken in the field

"Cover Thickness" measured in laboratory during extraction of "UD" samples

Cover measurements taken in the laboratory were used for modeling purposes (UD Samples)

TABLE 7
SUMMARY OF DAILY LEACHATE GENERATION
ASH LANDFILL - SOLID WASTE PERMIT #34-05
RURAL HALL, NORTH CAROLINA

AVERAGE DAILY LEACHATE GENERATION
Based on average annual totals generated from HELP Model simulations reflecting:
Existing Conditions

LANDFILL AREA	CONDITION	AREA (AC)	TOTAL RAINFALL (IN.)	TOTAL VOLUME GENERATED (CF)	% LOST TO RUNOFF	% LOST TO EVAPOTRANSPIRATION	% TRAVELING TO BOTTOM OF ASH	LEACHATE VOLUME GENERATED (CF)	LEACHATE VOLUME GENERATED (gal)
TOP	EXISTING - FLAT	6.4	45.37	1,054,036.0	4.05	54.82	12.86	135,570.1	1,014,064.4
TOP	EXISTING - 5% AREAS	0.9	45.37	153,164.6	4.503	54.771	12.45	19,069.0	142,636.1
SLOPES	EXISTING - 3H:1V	10.77	45.37	1,773,744.9	4.97	54.84	11.95	211,962.5	1,585,479.6
TOTALS/YEAR		18.07		2,980,945.5		AVERAGE ANNUAL TOTALS		366,601.6	2,742,180.1
						AVERAGE DAILY TOTALS		1,004.4	7,512.8

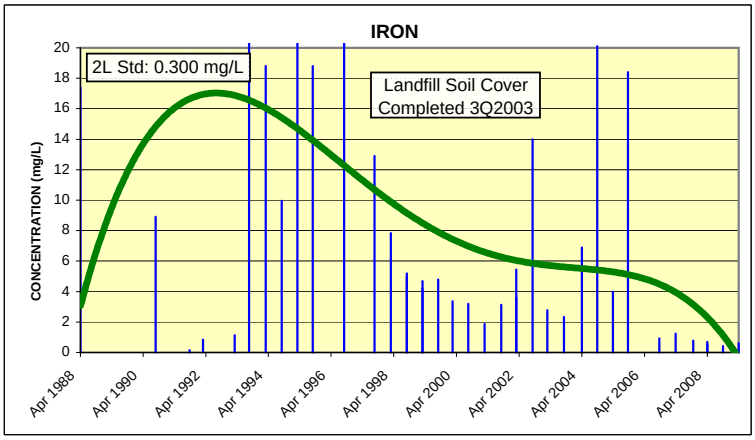
PEAK DAILY LEACHATE GENERATION
Based on peak daily leachate generation from HELP Model simulations reflecting:
Existing Conditions

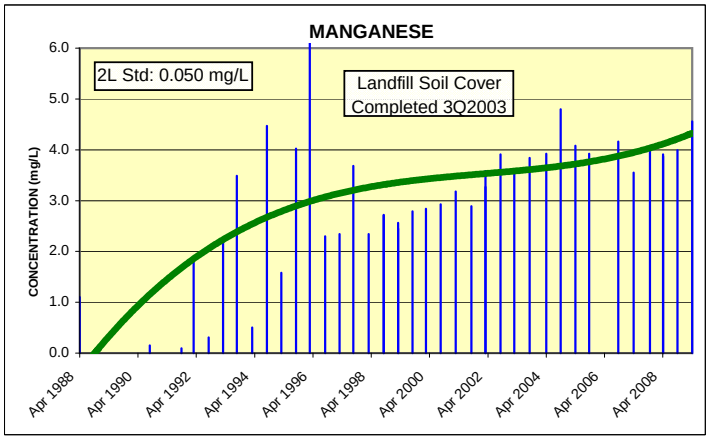
LANDFILL AREA	CONDITION	AREA (AC)	TOTAL RAINFALL (IN.)	TOTAL VOLUME GENERATED (CF)	% LOST TO RUNOFF	% TRAVELING TO BOTTOM OF ASH	LEACHATE VOLUME GENERATED (CF)	LEACHATE VOLUME GENERATED (gal)
TOP	EXISTING - FLAT	6.4	4.73	109,887.0	45.12	1.99	2,186.8	16,356.9
TOP	EXISTING - 5% AREAS	0.9	4.73	15,968.0	45.27	1.97	314.6	2,353.0
SLOPES	EXISTING - 3H:1V	10.77	4.73	184,919.0	45.41	1.973	3,648.5	27,290.4
TOTALS		18.07		310,774.0			6,149.8	46,000.3
					PEAK DAILY TOTALS		6,149.8	46,000.3

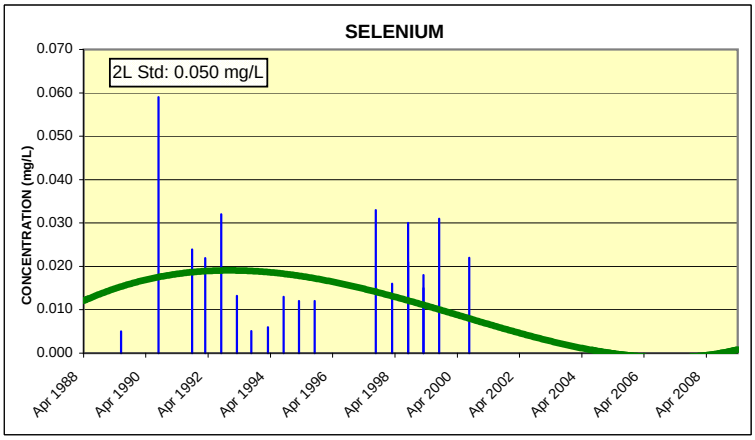
NOTE: HELP Model does not account for Evapotranspiration for "Peak Daily Amounts" due to predominant cloud cover and persistent precipitation.

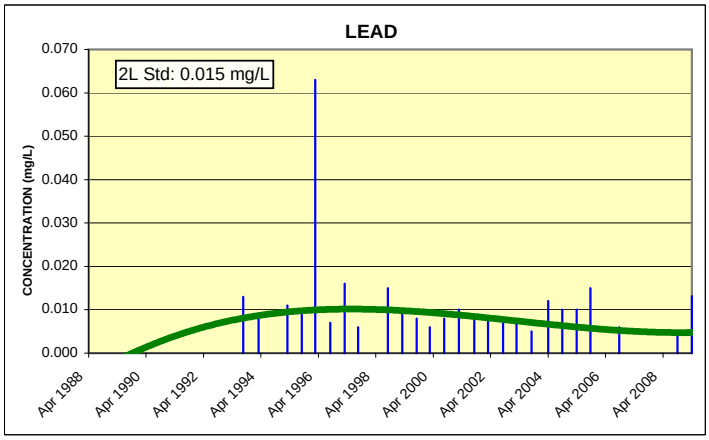
APPENDIX A
WATER QUALITY TREND GRAPHS

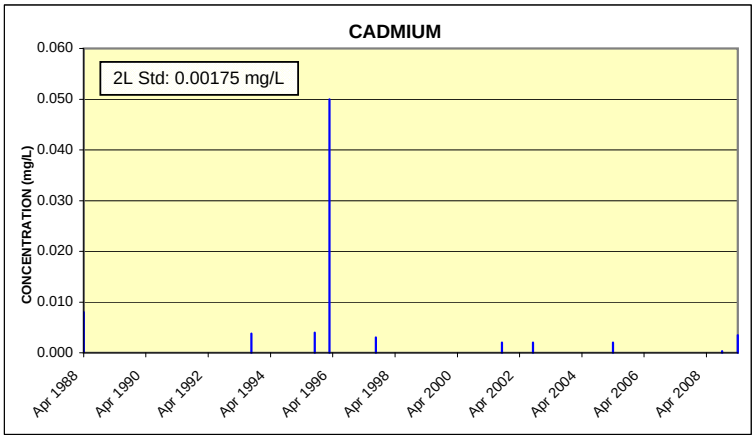
MONITORING WELL W-1

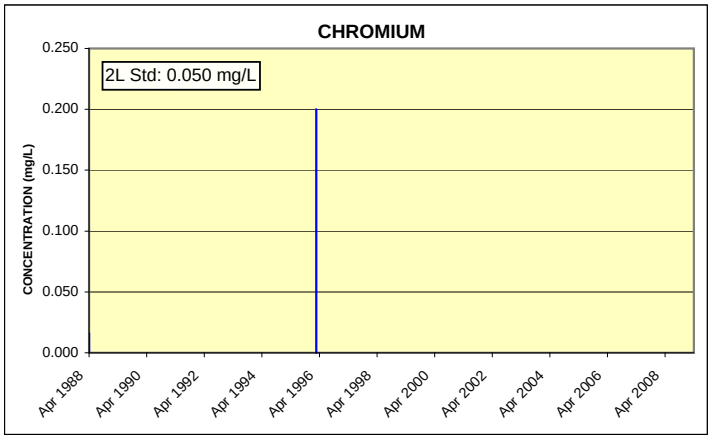


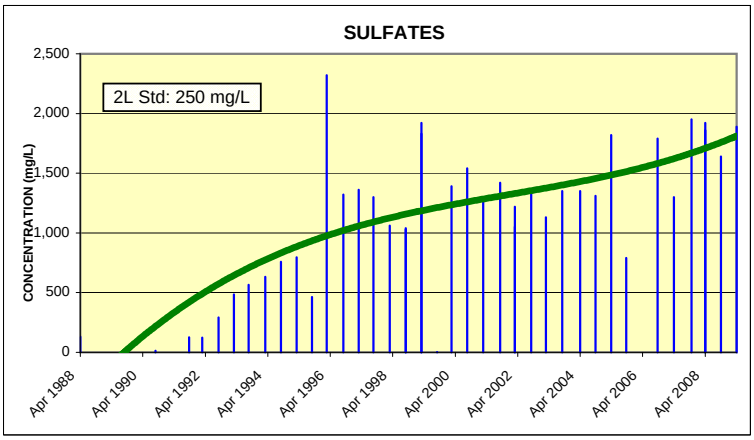


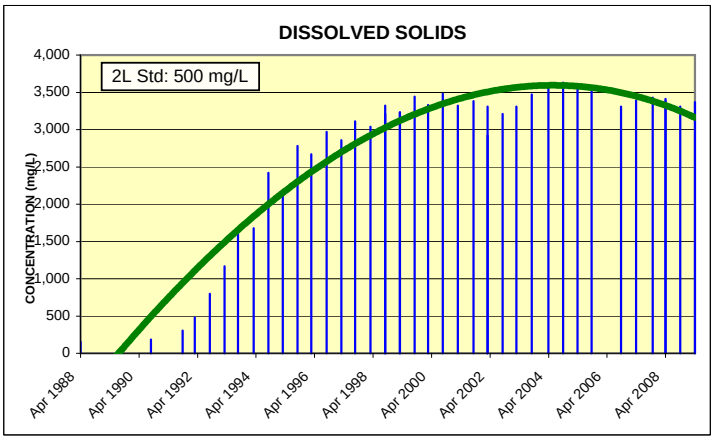




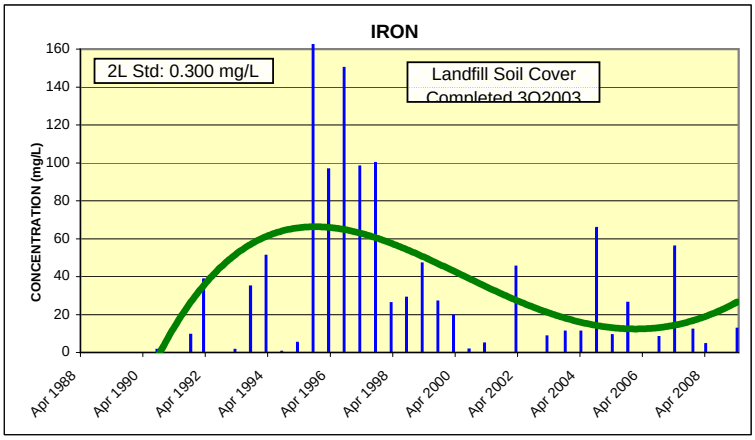


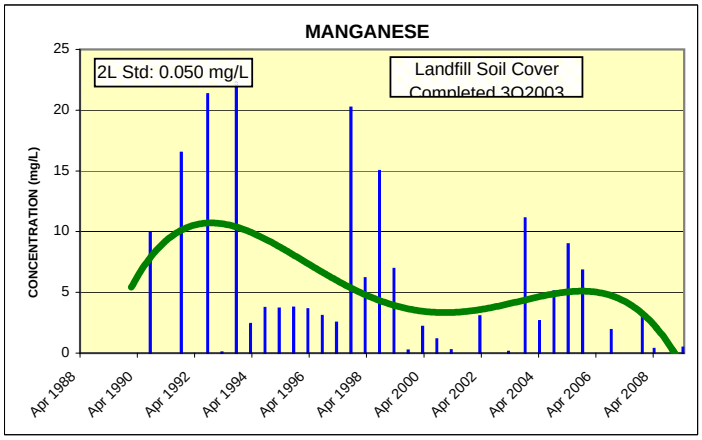


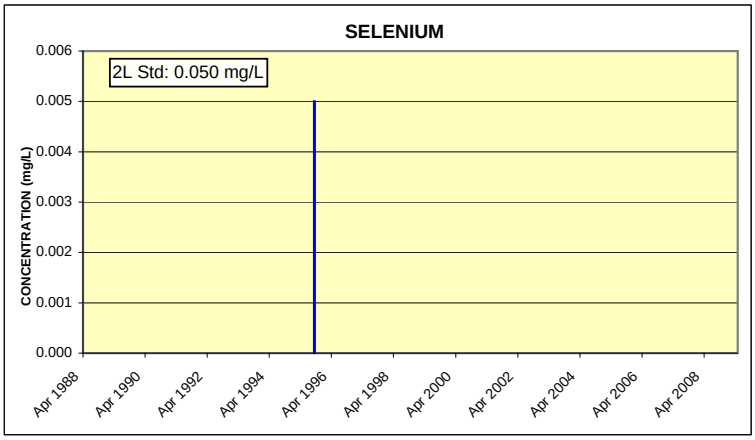


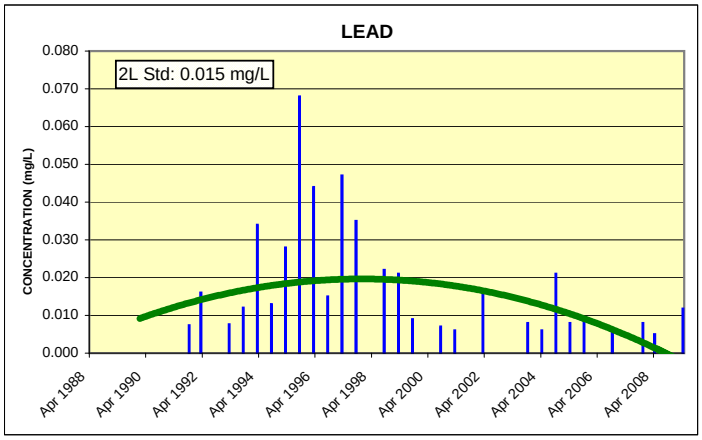


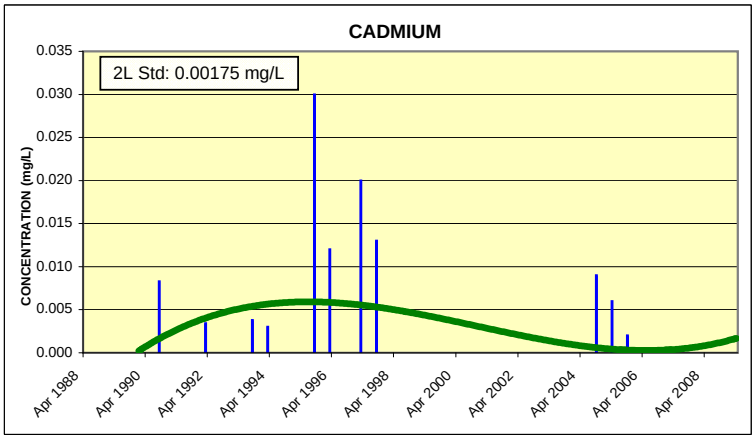
MONITORING WELL W-2

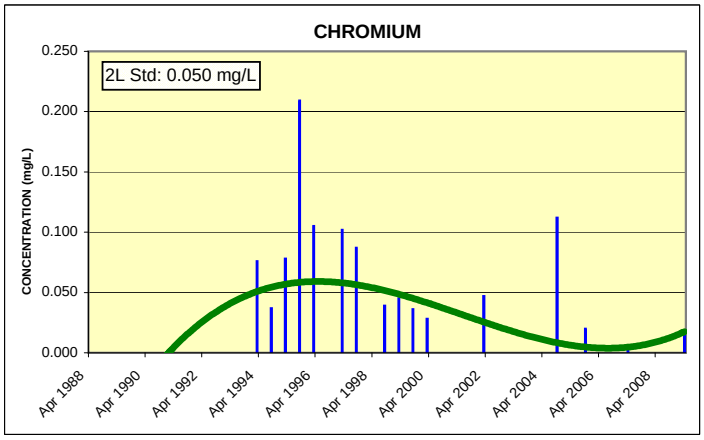


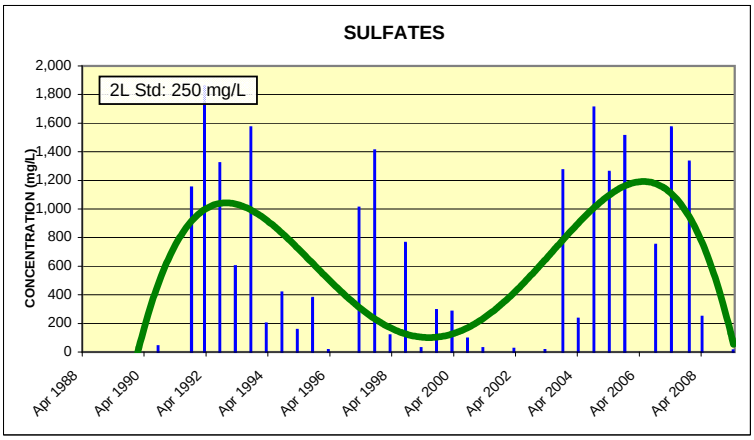


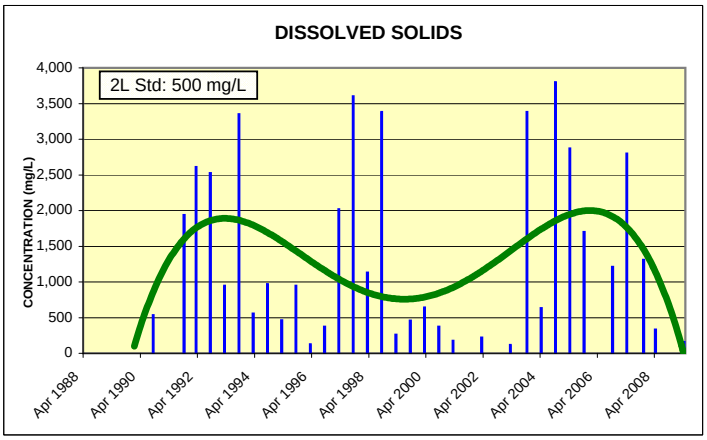




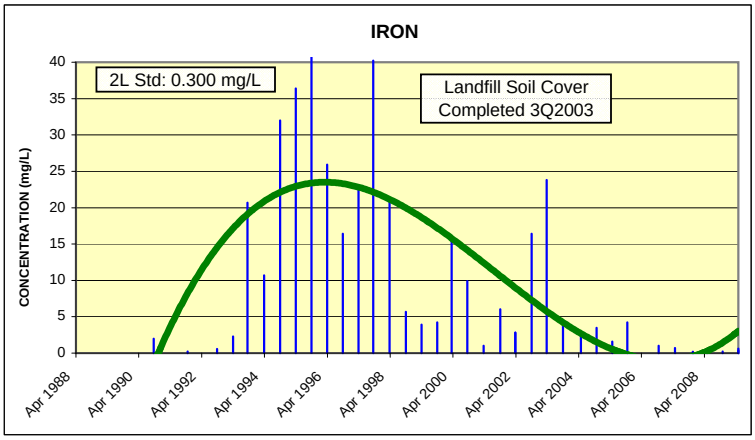


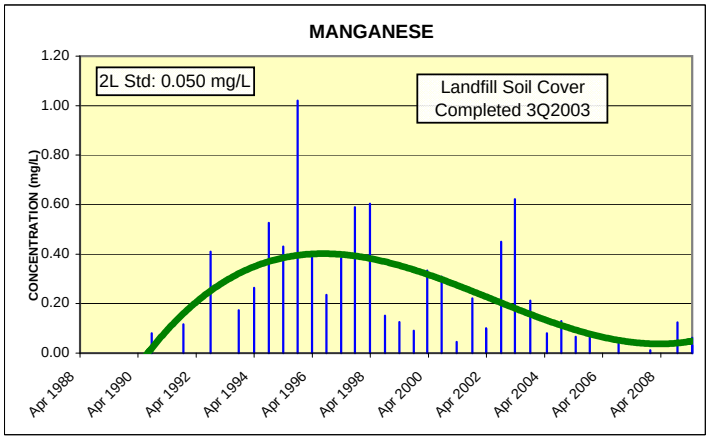


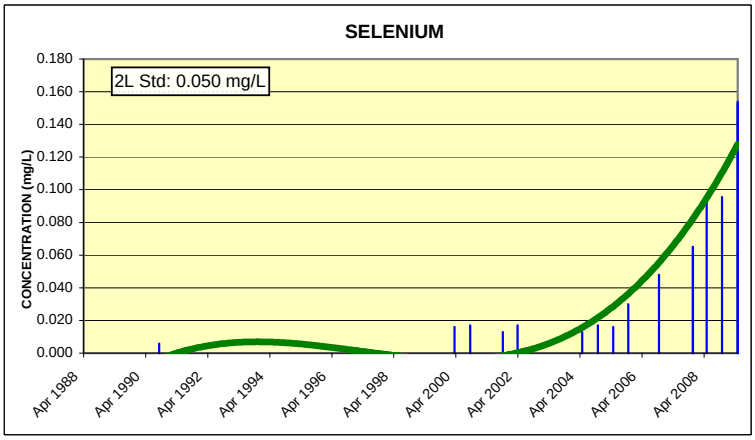


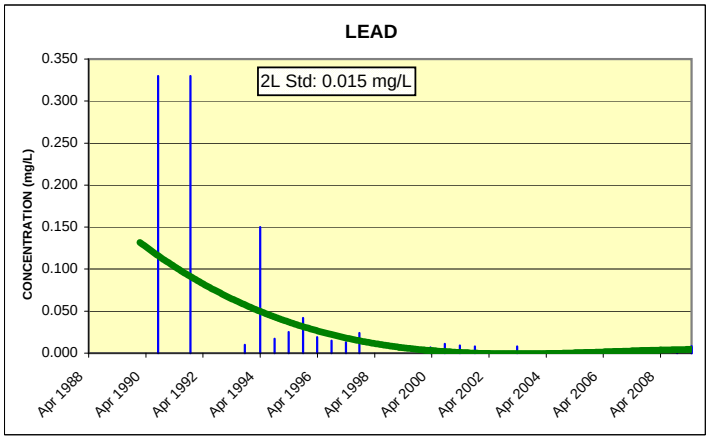


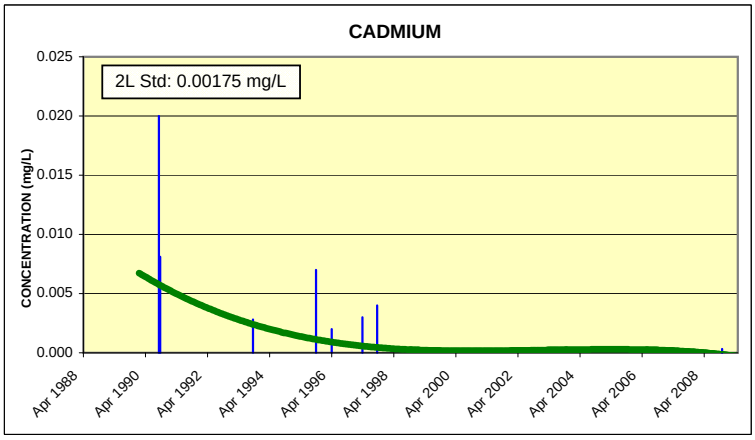
MONITORING WELL W-3

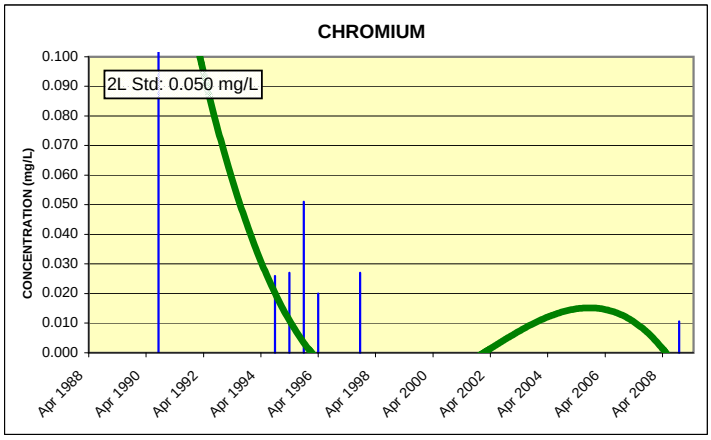


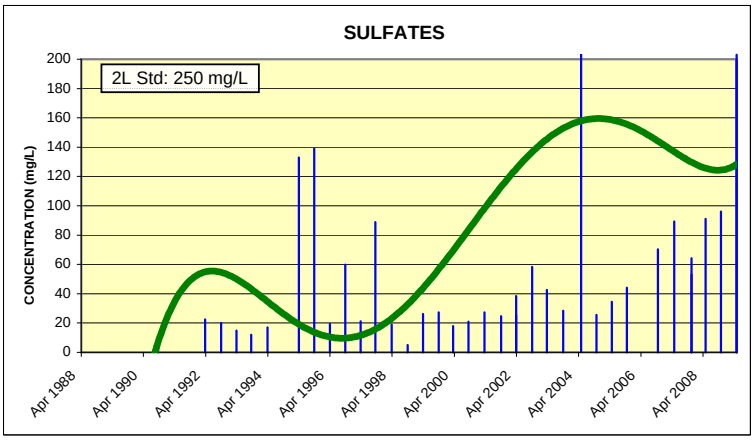


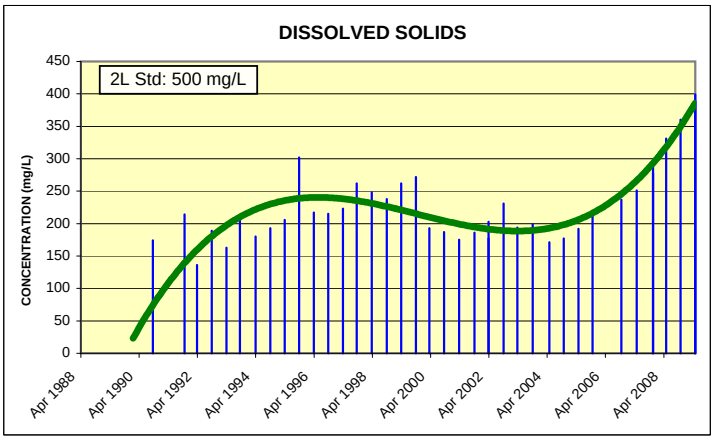




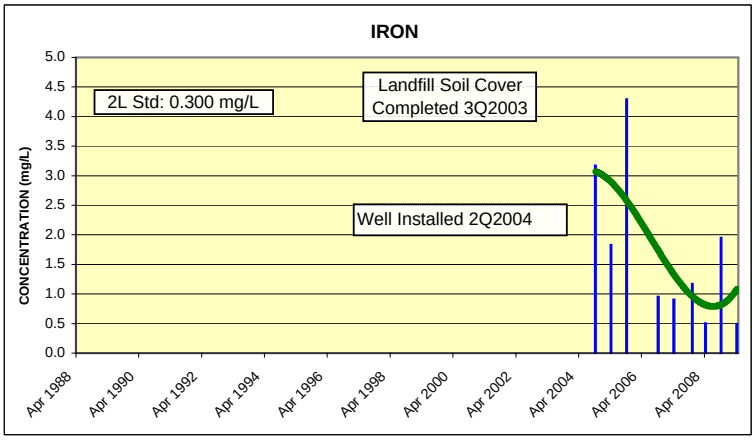


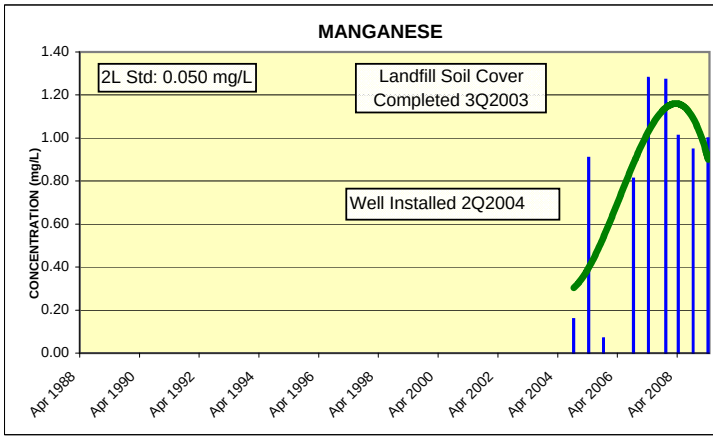


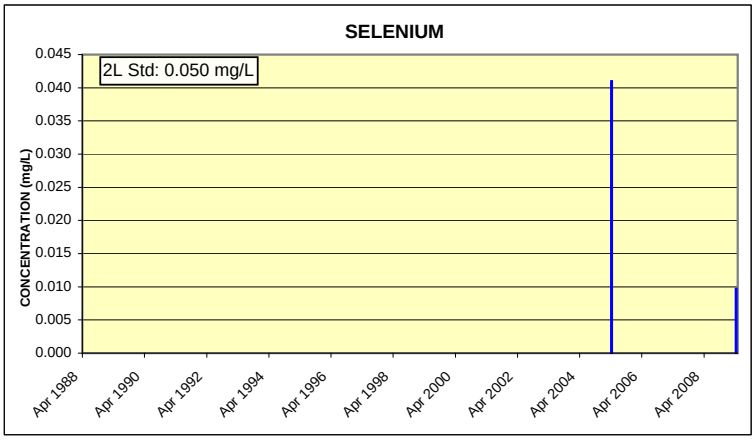


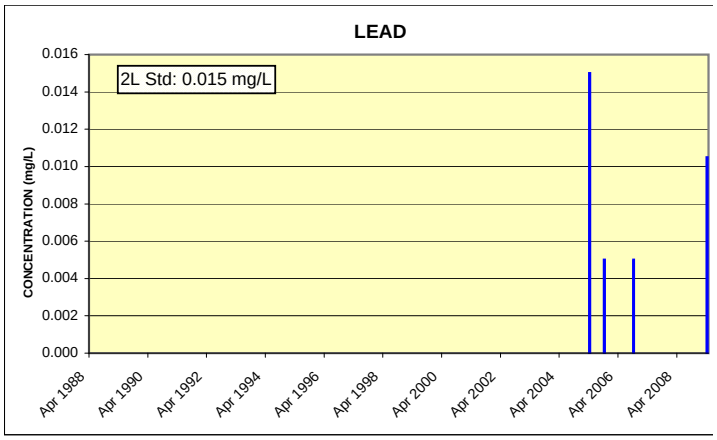


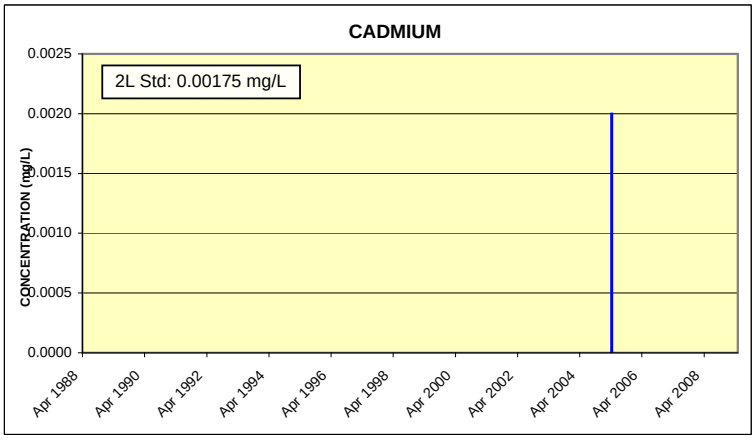
MONITORING WELL W-3B

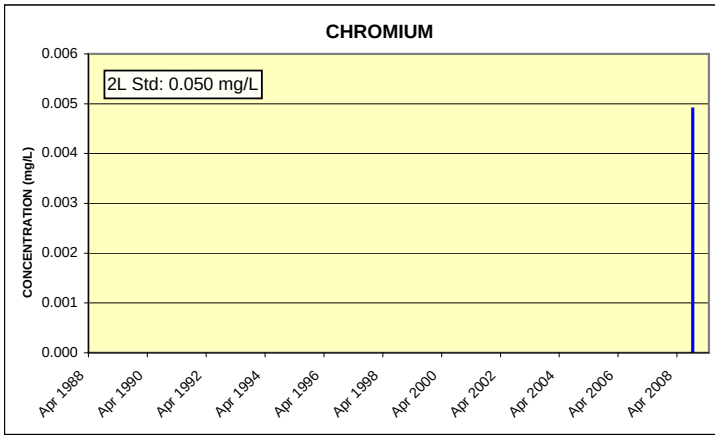


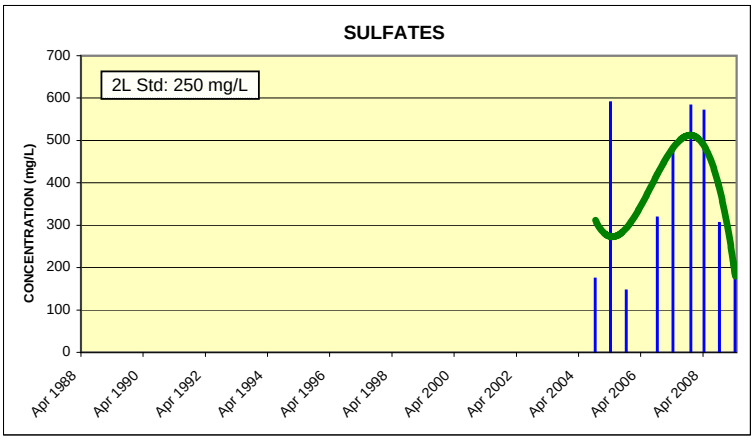


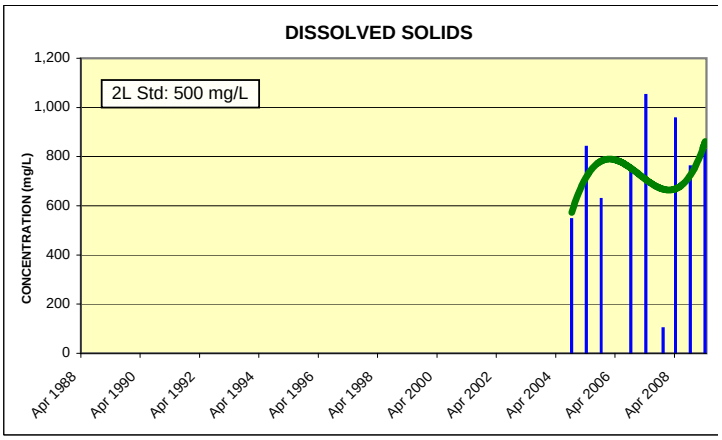




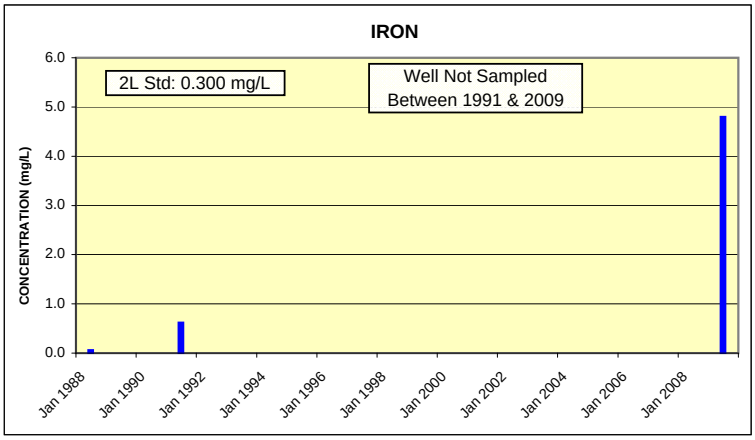


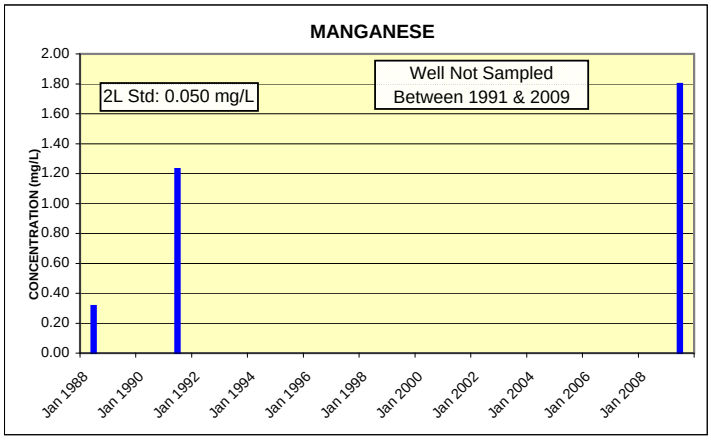


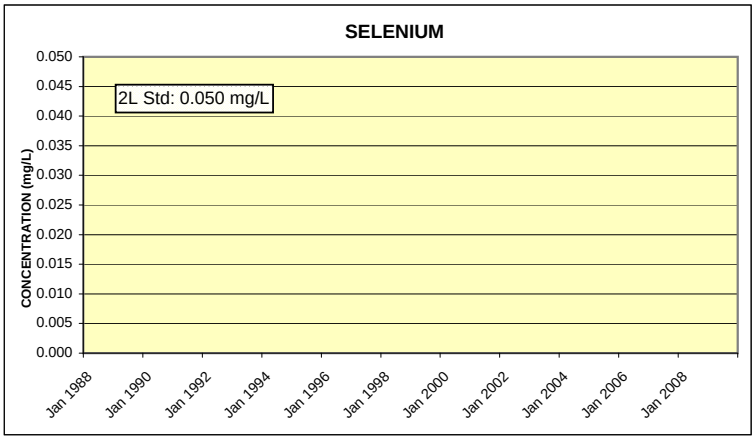


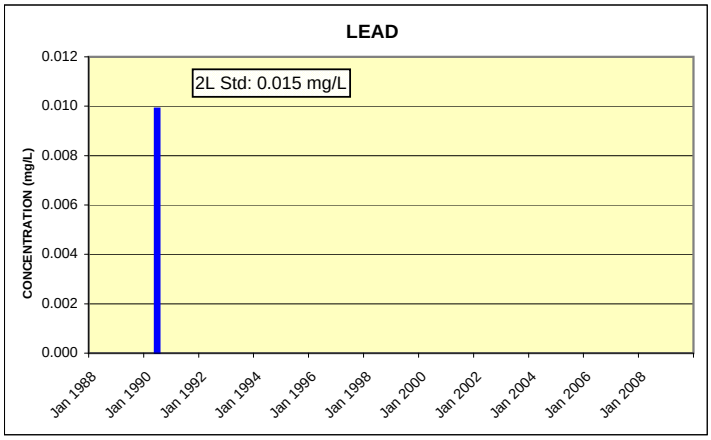


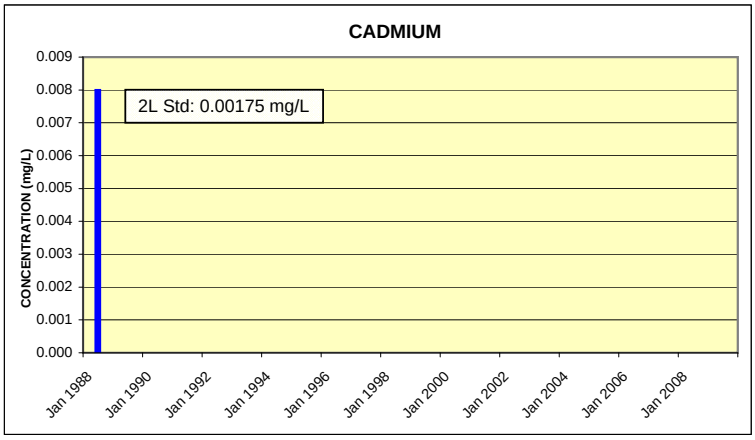
MONITORING WELL PW-1

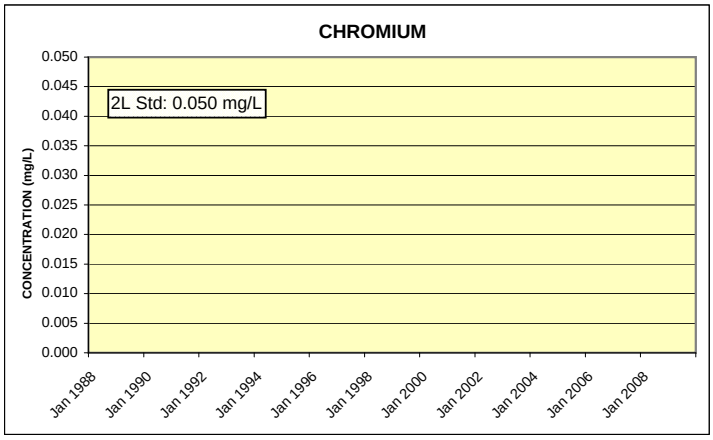


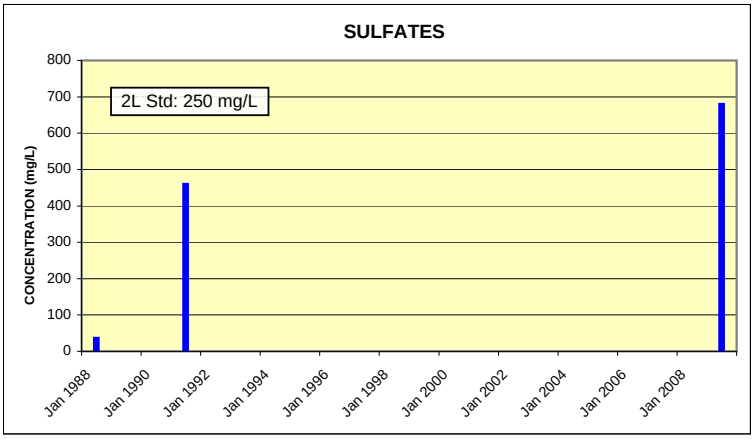


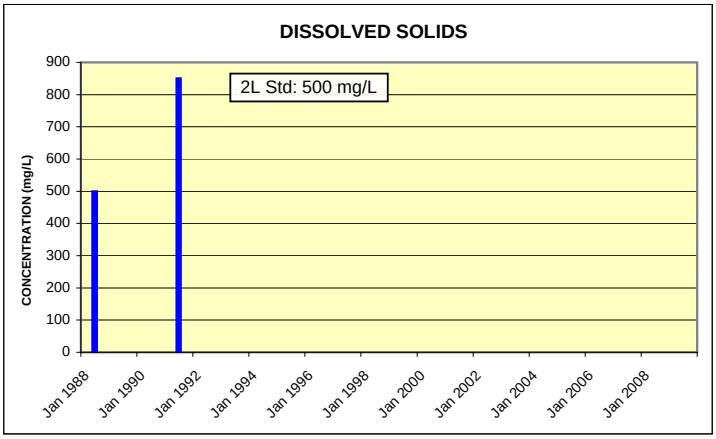




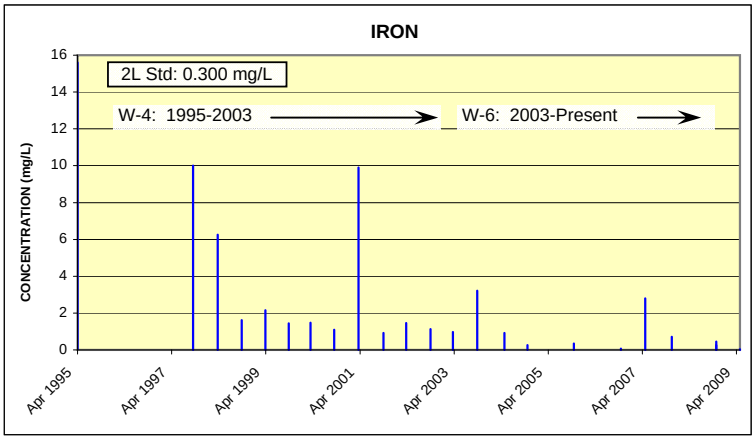


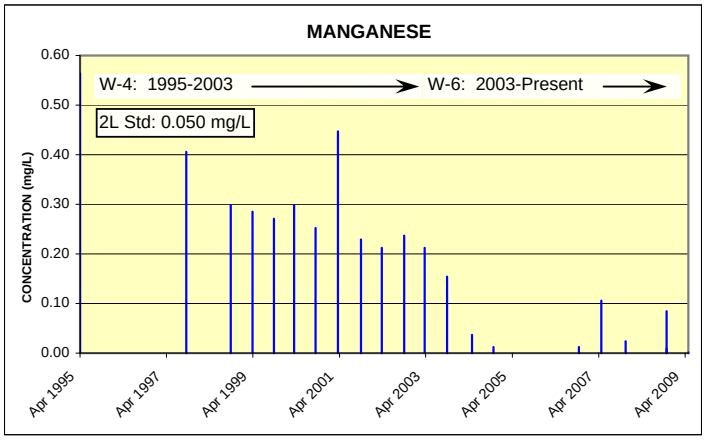


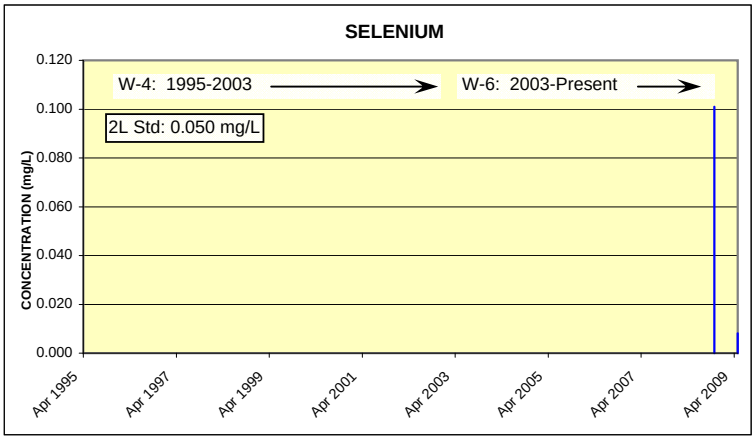


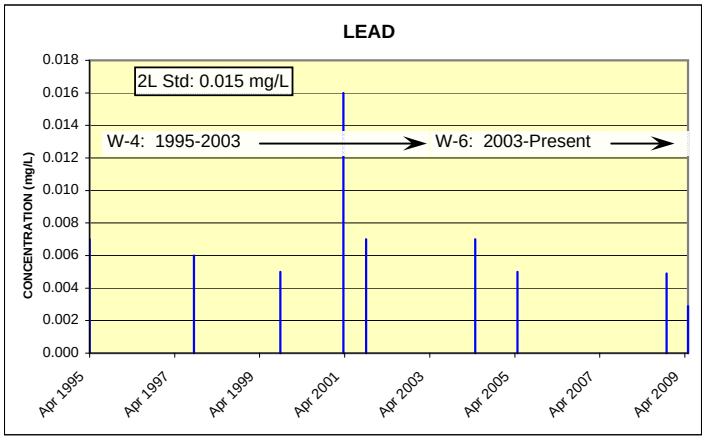


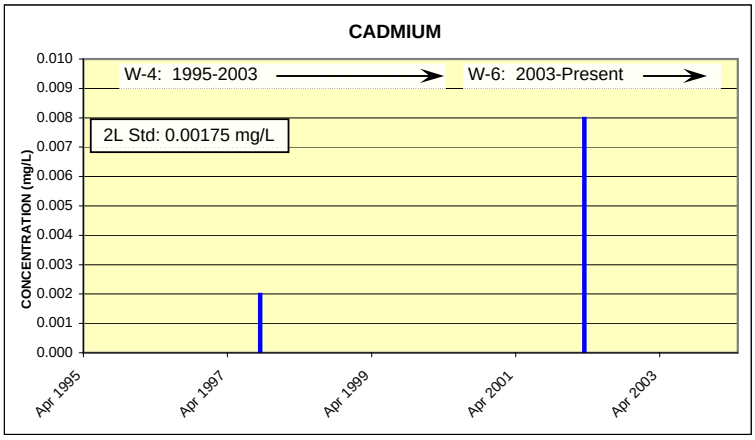
BACKGROUND MONITORING WELLS W-4 & W-6

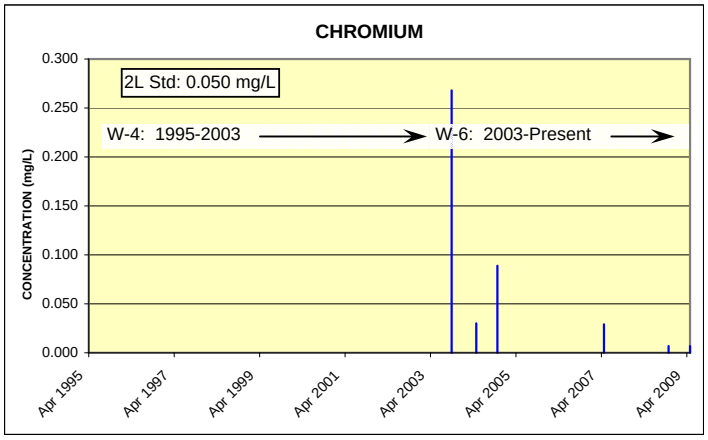


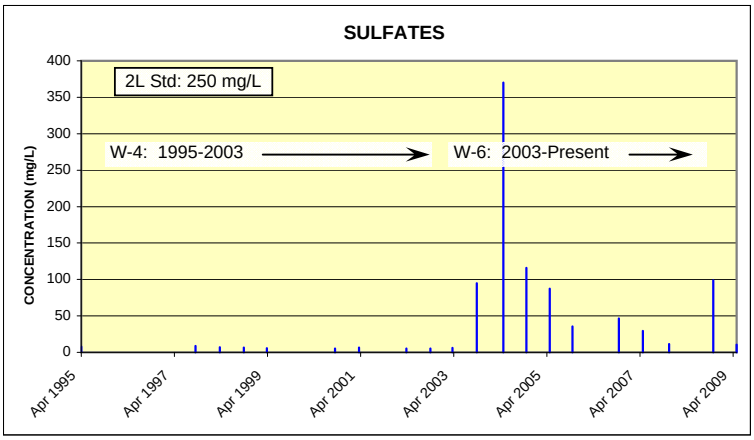


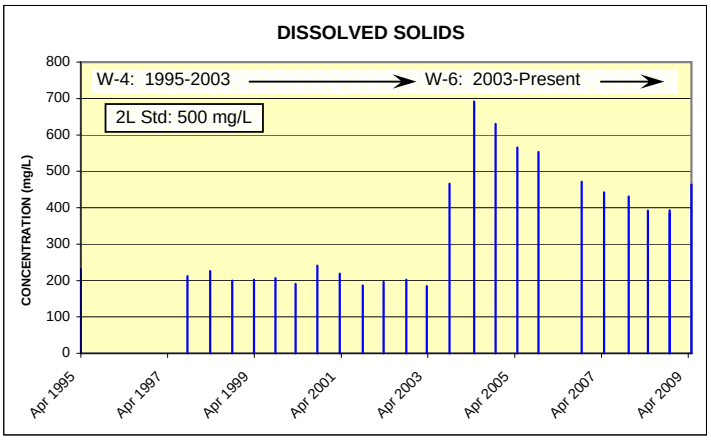




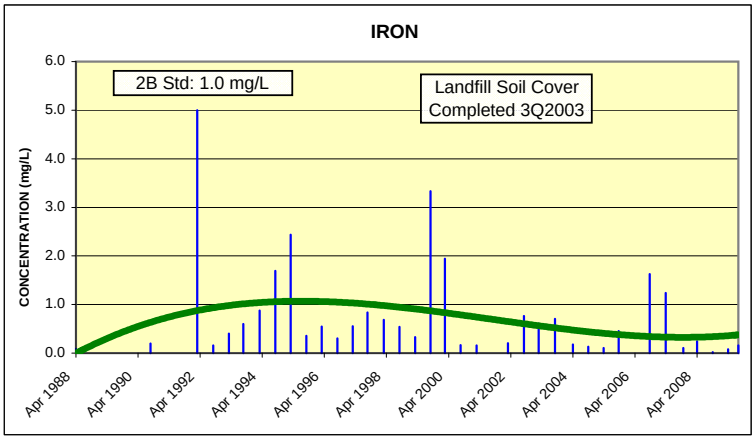


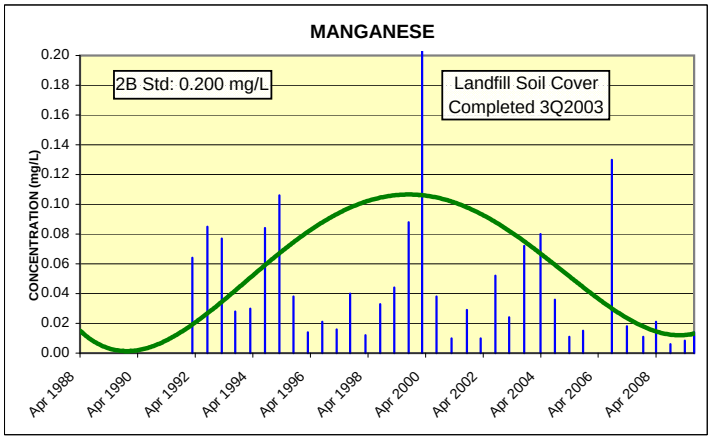


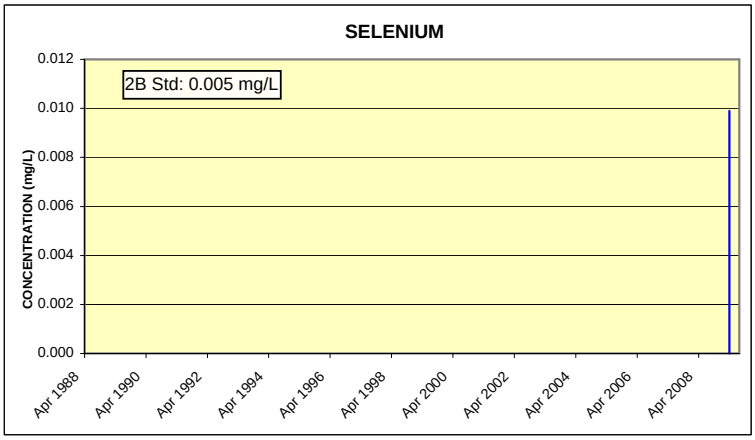


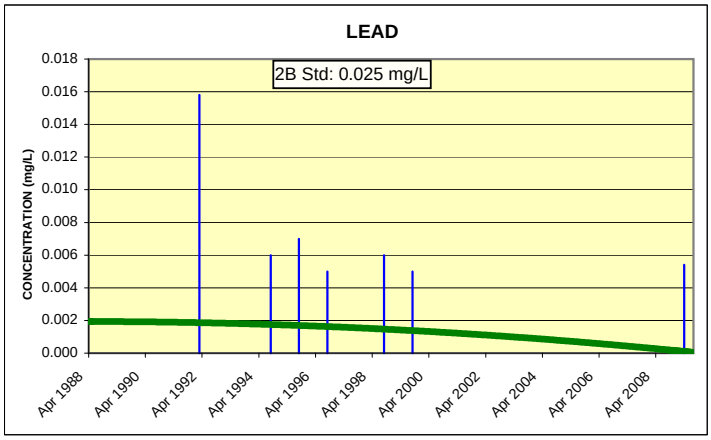


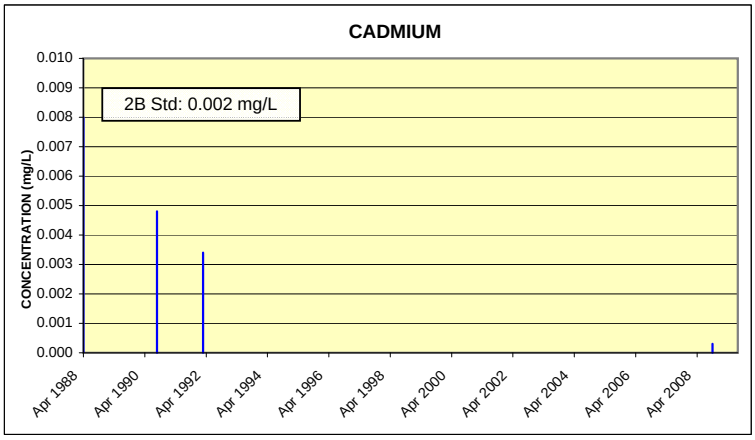
SURFACE WATER SS-01

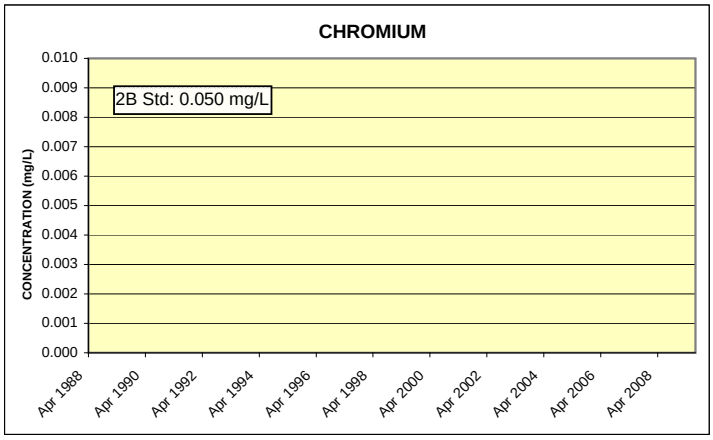


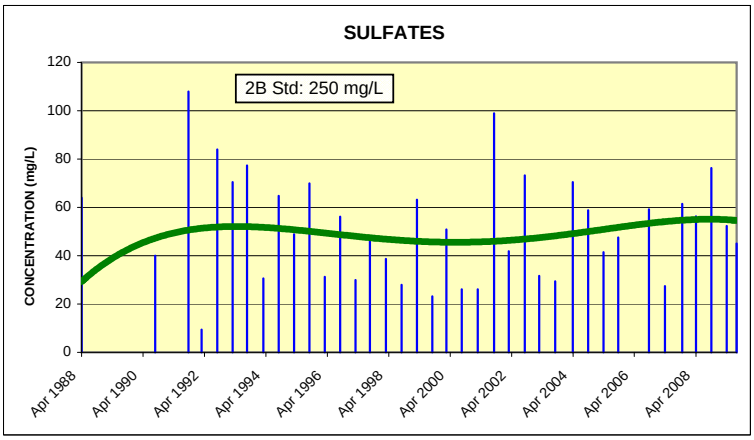


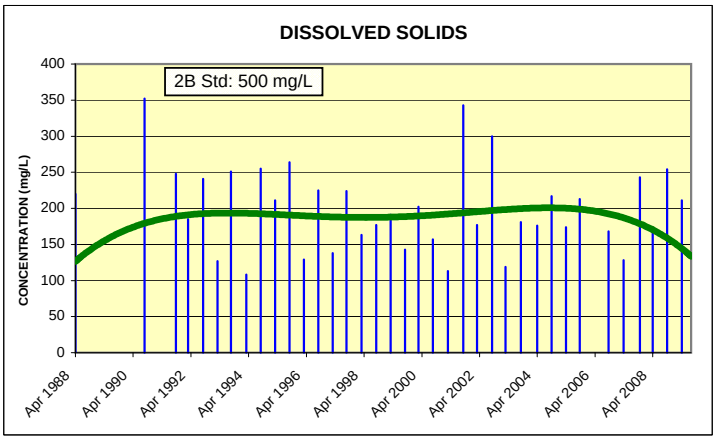




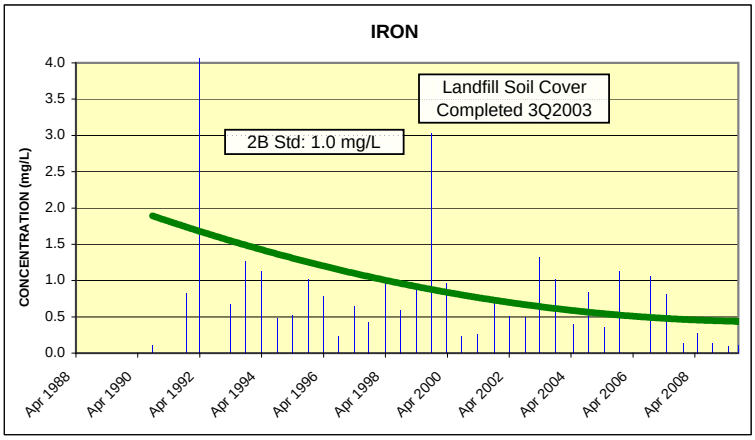


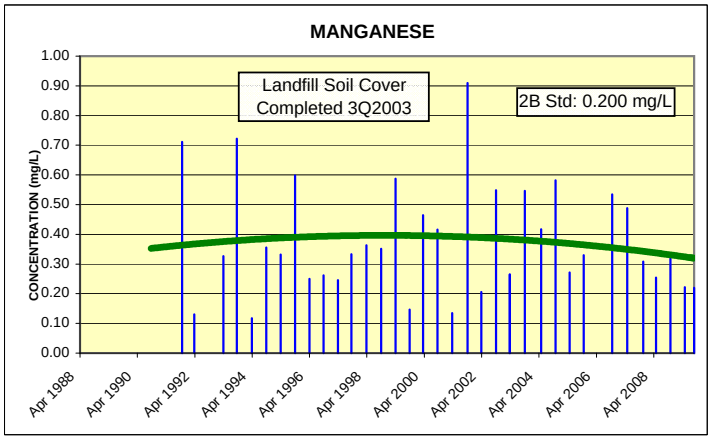


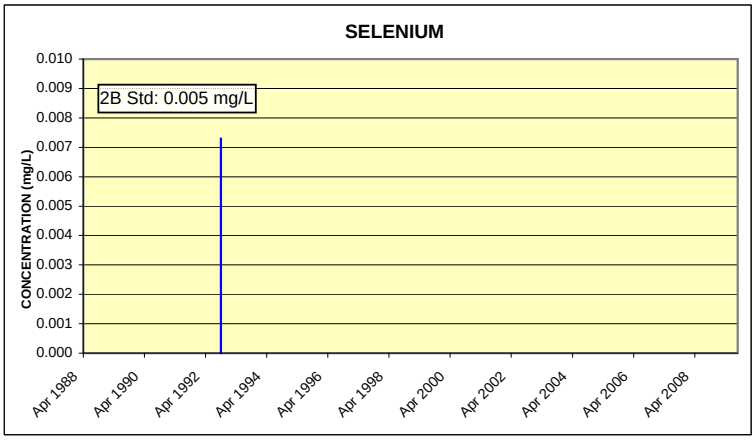


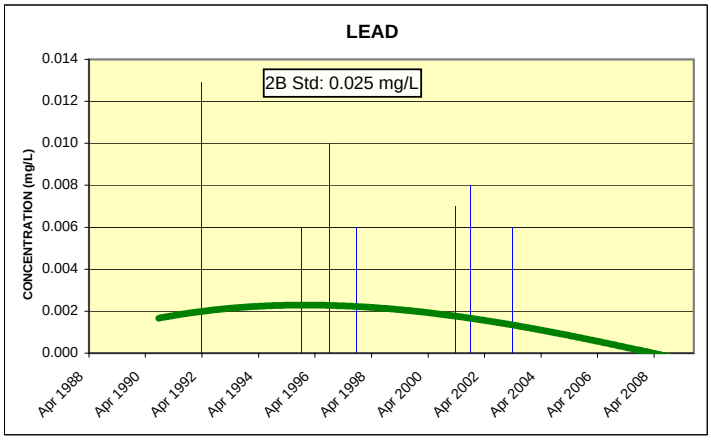


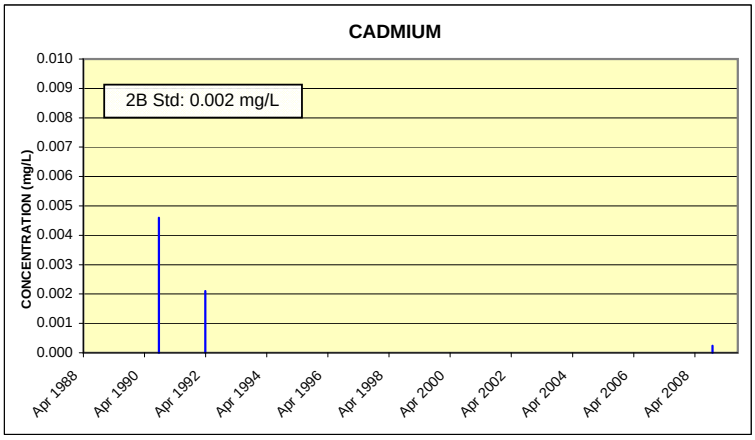
SURFACE WATER SS-02

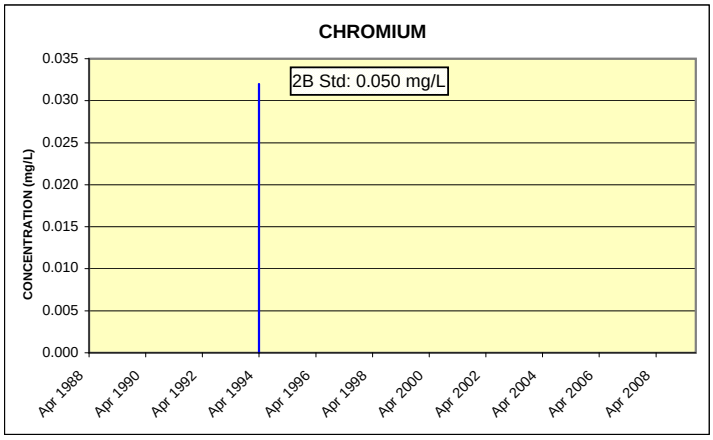


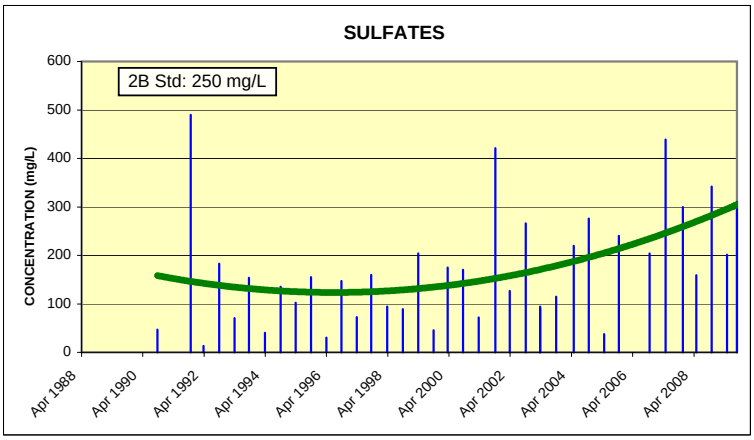


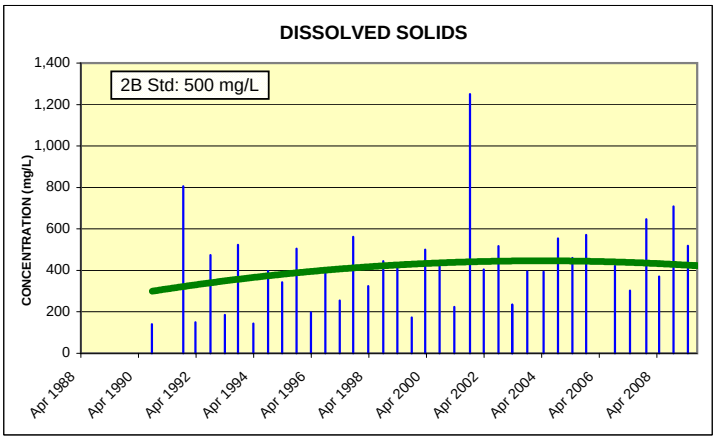












APPENDIX B
PW-1 LOG AND WELL CONSTRUCTION INFORMATION

FIELD LOG OF BORING

ERM

BORING NUMBER	PW-1

SHEET 1 OF 1

PROJECT NAME	PROJECT NUMBER	LOCATION	ELEVATION AND DATUM
R.J. Reynolds Tobacco Edwards Road Landfill	103137	Rural Hall, NC	

DRILLING COMPANY	DRILLER	START DATE/TIME	COMPLETION DATE/TIME
Clayton Well & Pump Service	Unknown	5/26/1987	5/26/87
DRILLING EQUIPMENT	**DRILLING METHOD**	**COMPLETION DEPTH**	**TOTAL NO. OF SAMPLES**
Unknown	Air rotary	405	--

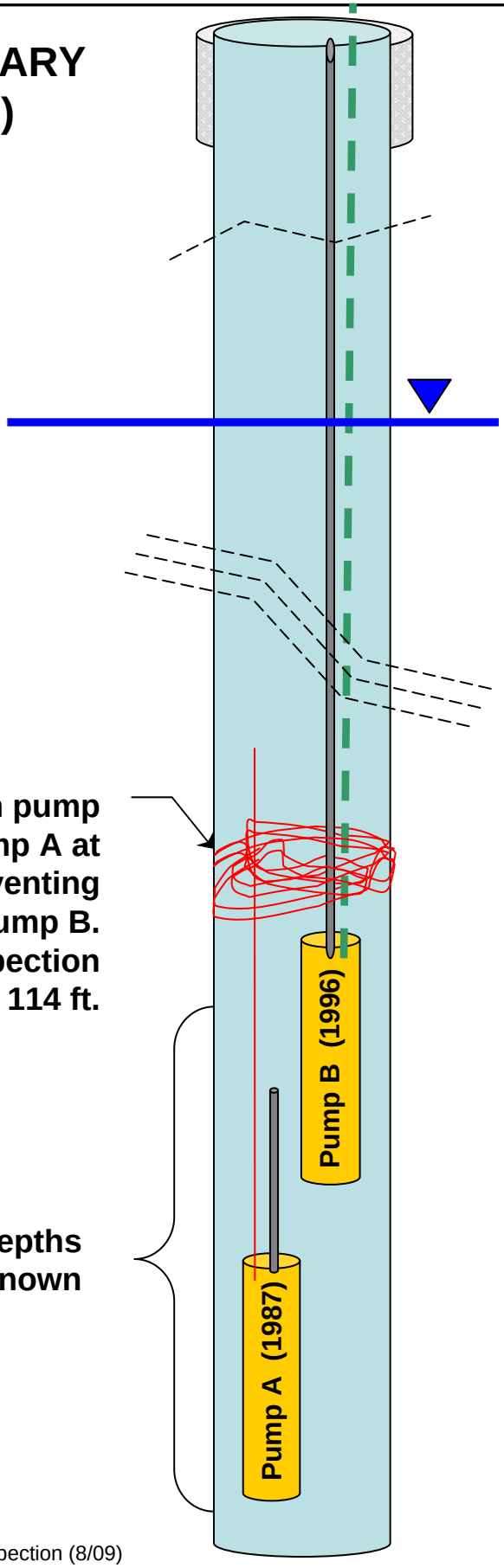
SIZE AND TYPE OF BIT	HOLE DIAMETER	NO. OF SAMPLES	BULK	SS	DRIVE	PITCHER
	6.25 inches					

DRILLING FLUID	DRILLING ANGLE	WATER LEVEL	FIRST	AFTER _____ HOURS
None	0 degrees		72	N/A

SAMPLE HAMMER	GEOLOGIST/DATE	CHECKED BY/DATE
TYPE DPT DRIVING WT. DROP	A. Martin - 8/26/09	

LITHOLOGY	DEPTH (feet)	SAMPLES	RECOVERY %	BLOW COUNT	DESCRIPTION	USCS SYMBOL	ESTIMATED PERCENT OF GR	SA	FI	FID/PID READINGS	COMMENTS/ LAB SAMPLE IDENTIFICATIONS
				N/A	Log of existing PW-1 supply well inspected via downhole	N/A				N/A	
					camera operated by EGIS (Mike Vaught) on Aug. 26, 2009.						
					Additional details provided by well driller, Clayton Well & Pump						
					Service. Well installed 1987 by RJRT for equipment washdown.						
					Camera inspected well to determine geology and source						
					of blockage preventing removal of existing pump						
	0 to 21.5				Galvanized casing from 0 to 21.5 feet						
					Top of bedrock estimated at 18 feet (casing into rock ±3 ft)						
					Bedrock is biotite gneiss with strong planar cleavage with						
					moderate to shallow dip to the southeast, averaging 35°.						
					Fracture set (unsaturated); slight trickle of water down						
					borehole wall on South side. Mineral staining on borehole						
	42				wall following water trickle						
	72 ▼										
					Water level at 72 feet bgs						
					Open fracture zone with loose cobbles evident. Obvious						
	102 to 103				water bearing zone. Visible evidence of water flowing along						
					fracture path. Fracture dip angle of 30-40 degrees.						
					White, organic growth "slime" on portion of borehole wall.						
					8-10 gpm yield per well driller log						
	111				Broken end of another pump wire (white ribbon wire). Wire						
					extends to a previously unknown pump below 1996 pump.						
	114				Bundle of ribbon wire to lower pump acting as wedge preventing						Video terminated at
					removal of uppper pump. Half of sanitary well seal loose on						114 ft due to bundle of
					top of wire bundle.						wire preventing deeper
											access.
	405				Total depth of well per driller. No other significant water-bearing						
					fractures observed during drilling, total yield = 25 gpm						

PW-1 SUMMARY
(not to scale)



Galvanized Casing from 0 to 21.5 ft

Top of Rock = 17 ft (est.)

Minor Fracture Zone - 42 ft with slight water production (wet borehole wall) on south side of borehole wall

Water Level 72 ft

Low-Angle Fracture Zone (est. 35°) at 102-103 ft with yield of 8-10 GPM

Bundle of broken pump wire from Pump A at 114 ft preventing removal of Pump B. Video inspection terminated at 114 ft.

No other obvious water-bearing fractures observed per drillers log. Total well yield of 25 GPM

Pump Depths Unknown

Total Well Depth 405 ft

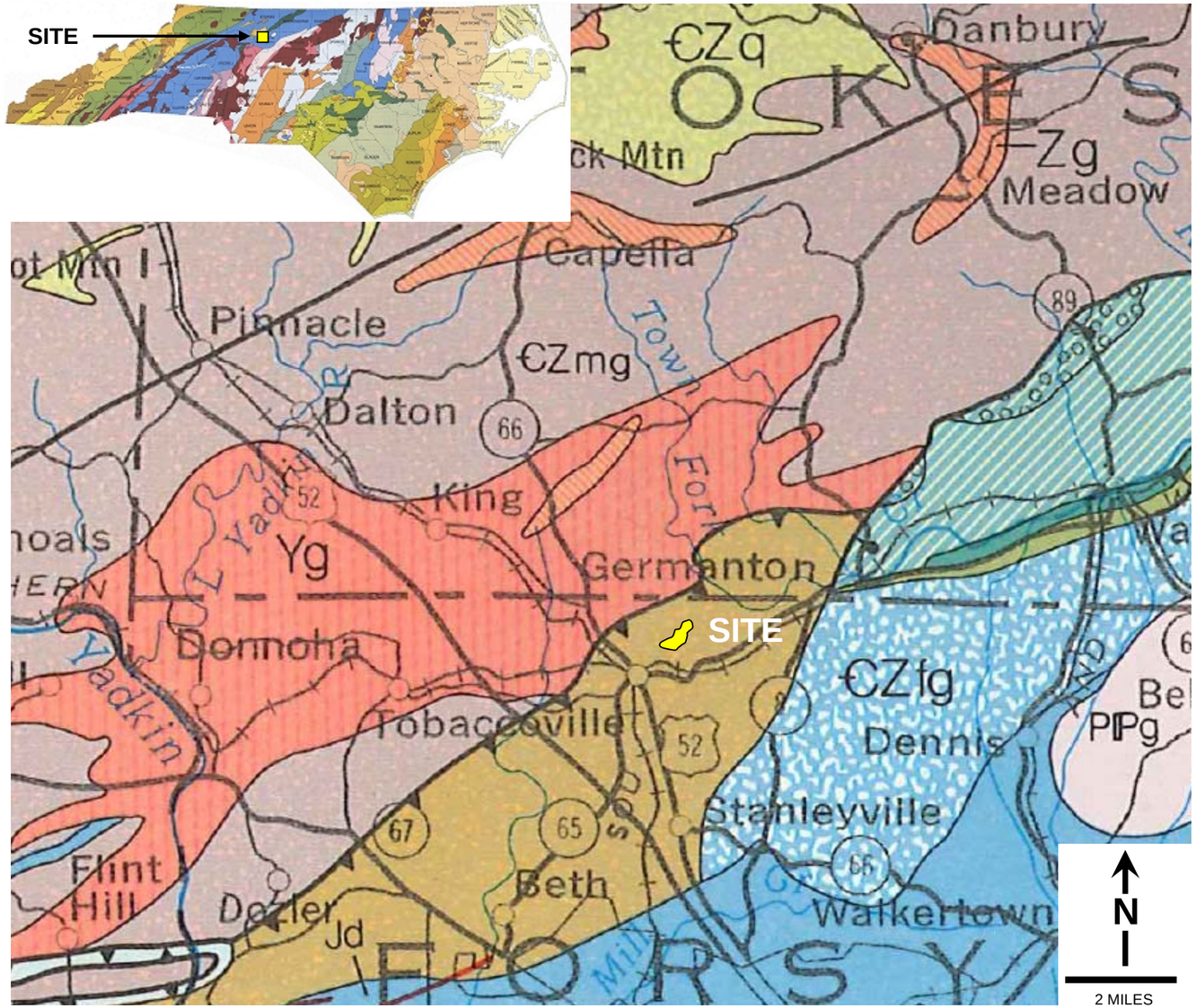
SOURCE:
Drillers log (5/87) & video inspection (8/09)

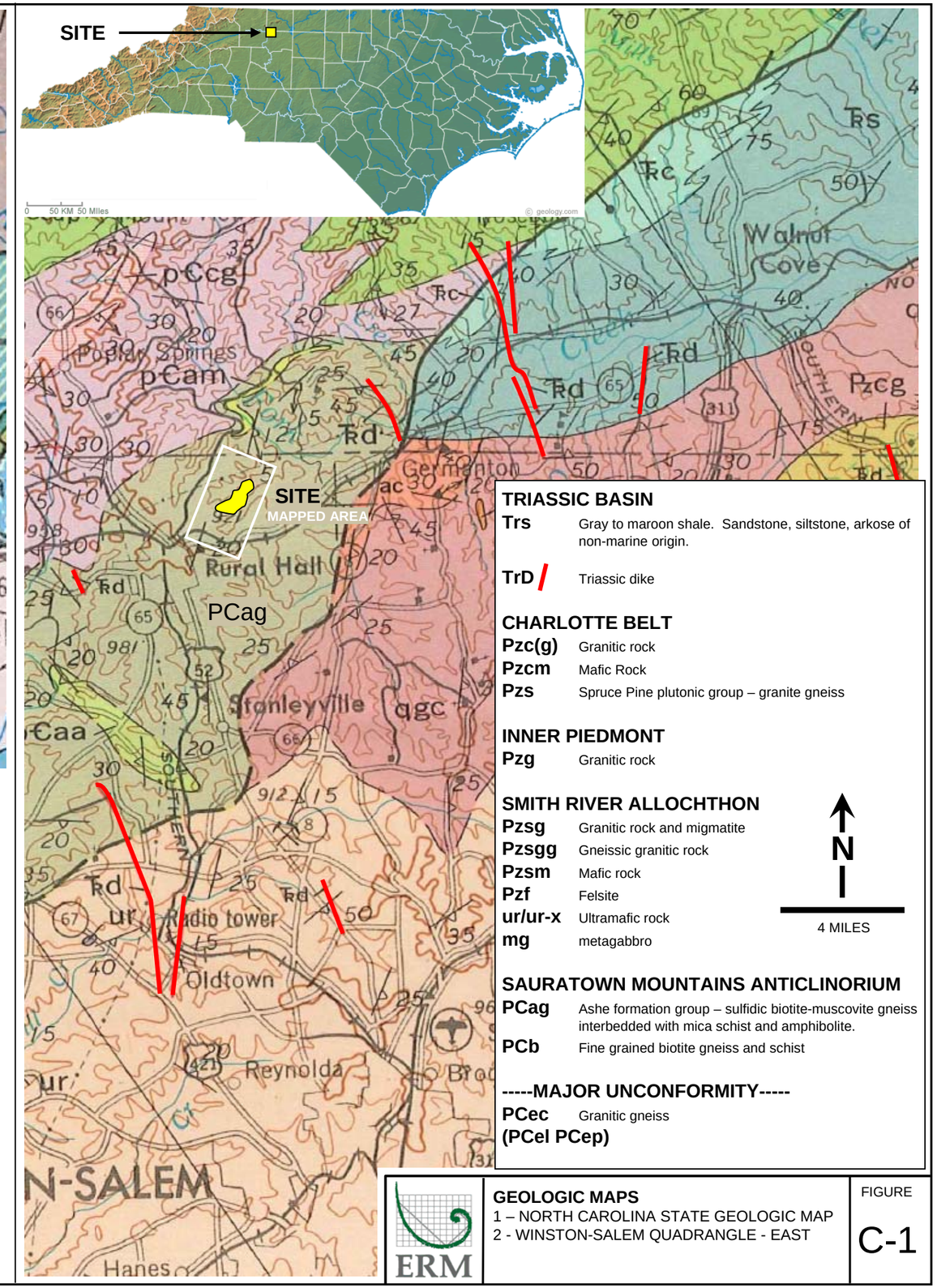
ERM NC, PC

PW-1 WELL CONSTRUCTION INFORMATION
ASH LANDFILL – PERMIT NO. 34-05
RURAL HALL, NORTH CAROLINA

FIGURE
C-1

APPENDIX C
GEOLOGIC MAPS AND MAGNETOMETER SURVEY DATA





INNER PIEDMONT BELT

- CZbg — Biotite gneiss and schist.
- CZfg — Felsic mica gneiss.
- CZms — Fine grained biotite gneiss, strongly foliated.
- CZq — Quartzite interlayered with quartz muscovite schist..
- CZmg — Metagraywacke and muscovite-biotite schist.
- CZbb — Banded gneiss.
- Yg — Proterozoic (1192 my) granitic gneiss.

INTRUSIVE ROCKS

- PPg — Permian (265-325 my)– Granitic rock, megacrystic.
- OCg — Cambrian-Ordovician (455-540 my) – Metamorphosed granitic rock, megacrystic.

GRANDFATHER MOUNTAIN WINDOW

- Zg — late Proterozoic (680-710 my) metamorphosed granite.

TRIASSIC BASINS

- Jd — Jurassic/Triassic diabase dike
- Trdp — Triassic – Pinehall Formation. Yellow-orange sandstone, mudstone, conglomerate.
- Trdc — Triassic – Cow Branch Formation. Gray mudstone with minor sandstone.
- Trds — Triassic – Stoneville Formation. Conglomerate, sandstone, and mudstone.

TRIASSIC BASIN

Trs Gray to maroon shale. Sandstone, siltstone, arkose of non-marine origin.

TrD Triassic dike

CHARLOTTE BELT

Pzc(g) Granitic rock
Pzcm Mafic Rock
Pzs Spruce Pine plutonic group – granite gneiss

INNER PIEDMONT

Pzg Granitic rock

SMITH RIVER ALLOCHTHON

Pzsg Granitic rock and migmatite
Pzsgg Gneissic granitic rock
Pzsm Mafic rock
Pzf Felsite
ur/ur-x Ultramafic rock
mg metagabbro

SAURATOWN MOUNTAINS ANTICLINORIUM

PCag Ashe formation group – sulfidic biotite-muscovite gneiss interbedded with mica schist and amphibolite.
PCb Fine grained biotite gneiss and schist

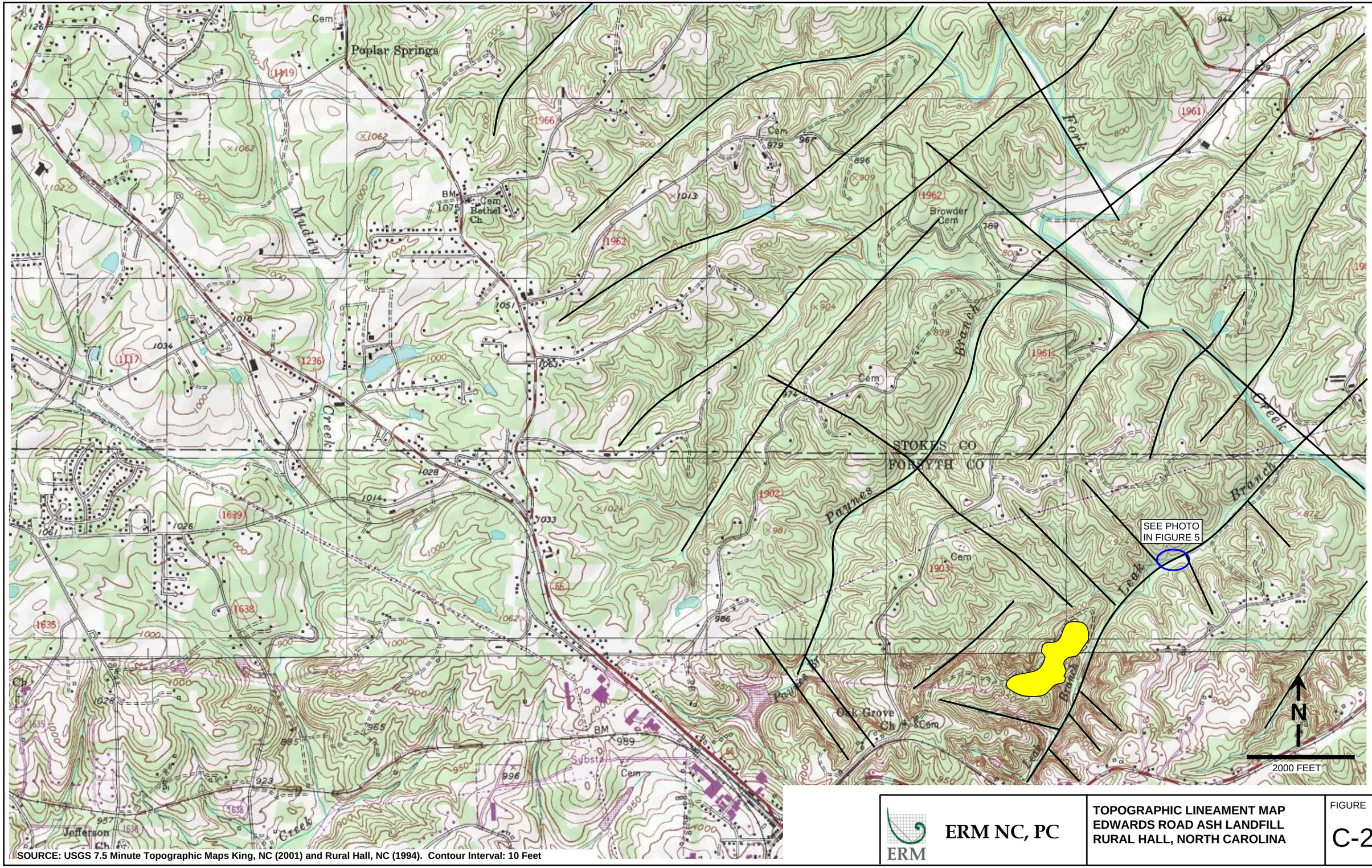
-----MAJOR UNCONFORMITY-----

PCec Granitic gneiss
(PCel PCep)

ERM

GEOLOGIC MAPS
1 – NORTH CAROLINA STATE GEOLOGIC MAP
2 - WINSTON-SALEM QUADRANGLE - EAST

FIGURE
C-1



SOURCE: USGS 7.5 Minute Topographic Maps King, NC (2001) and Rural Hall, NC (1994). Contour Interval: 10 Feet

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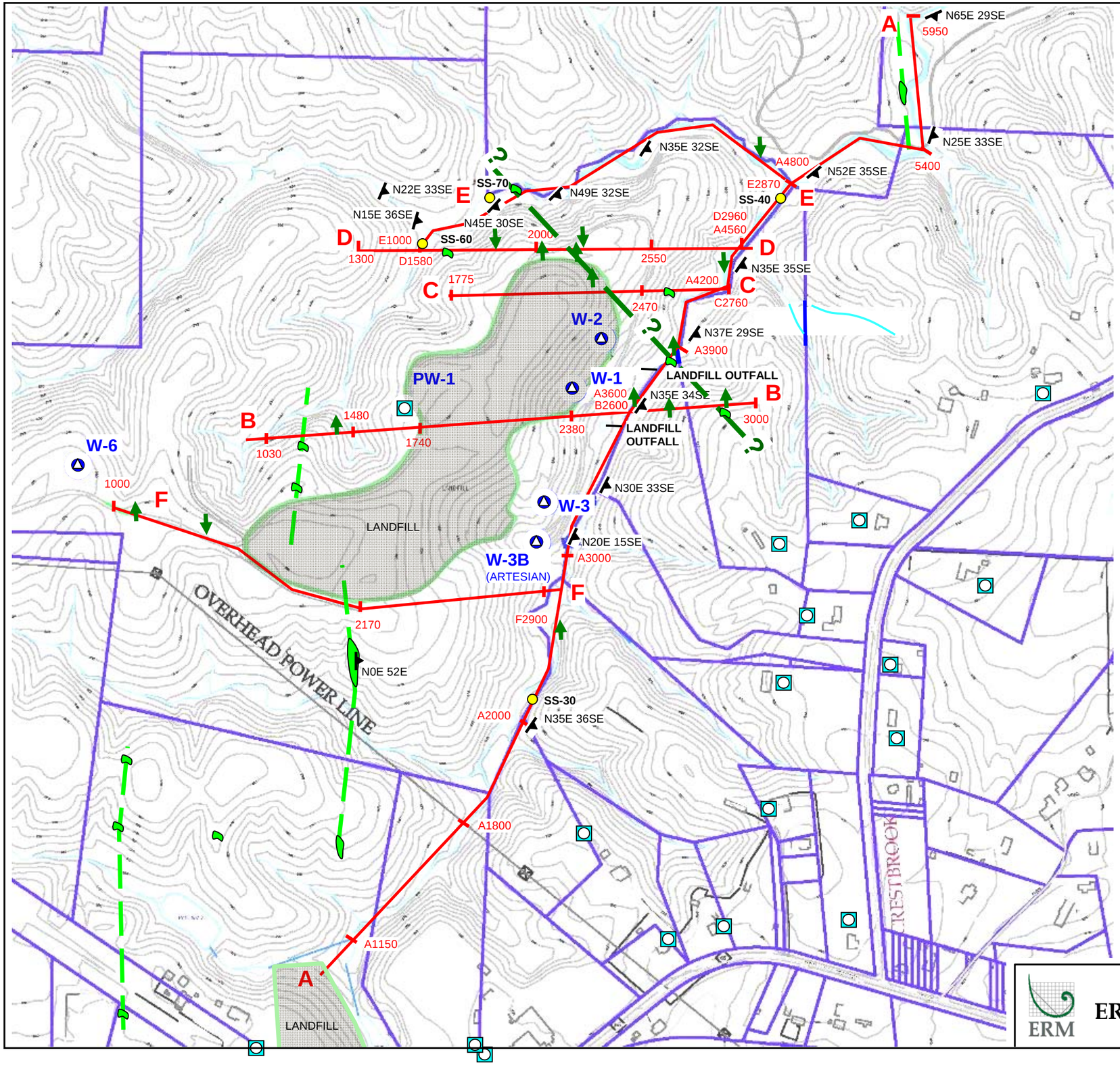
TOPOGRAPHIC LINEAMENT MAP
EDWARDS ROAD ASH LANDFILL
RURAL HALL, NORTH CAROLINA

FIGURE

C-2



LEGEND

- MONITOR WELL
- WATER SUPPLY WELL
- SURFACE WATER SAMPLE LOCATION
- FOLIATION/CLEAVAGE STRIKE AND DIP
- BULL QUARTZ OUTCROP OR FLOAT
- INFERRED QUARTZ VEIN TREND
- MAGNETIC GEOPHYSICS SURVEY LINE
- ANOMALOUSLY HIGH MAGNETIC GEOPHYSICS PEAK
- ANOMALOUSLY LOW MAGNETIC GEOPHYSICS PEAK
- LINEAR ALIGNMENT OF BQV AND ANOMALOUS MAGNETIC PEAKS, POSSIBLE INDICATIVE OF A VERTICAL STRUCTURAL FEATURE.

N

400 FEET

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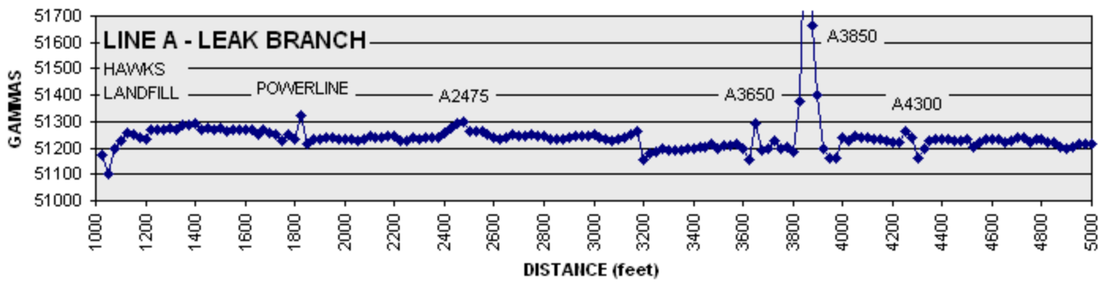
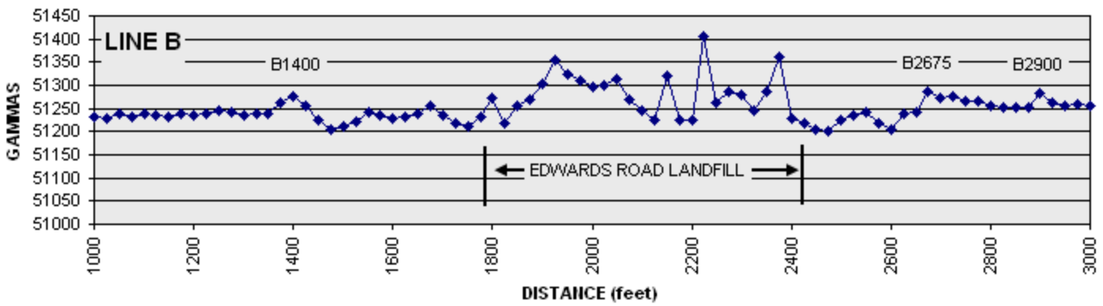
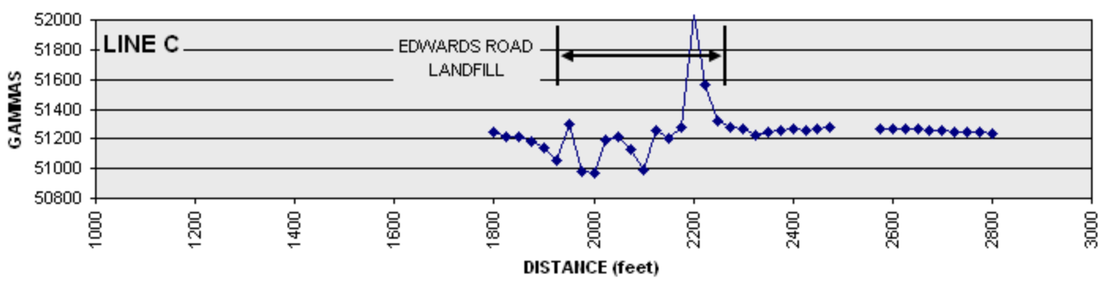
GEOLOGIC AND MAGNETIC GEOPHYSICS MAP
EDWARDS ROAD ASH LANDFILL
RURAL HALL, NORTH CAROLINA

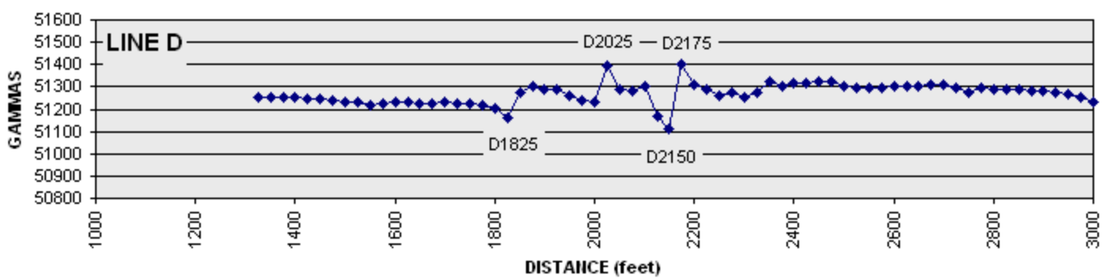
FIGURE

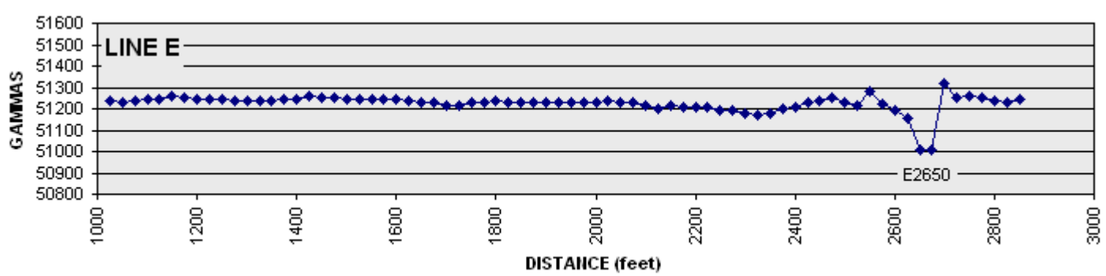
C-3

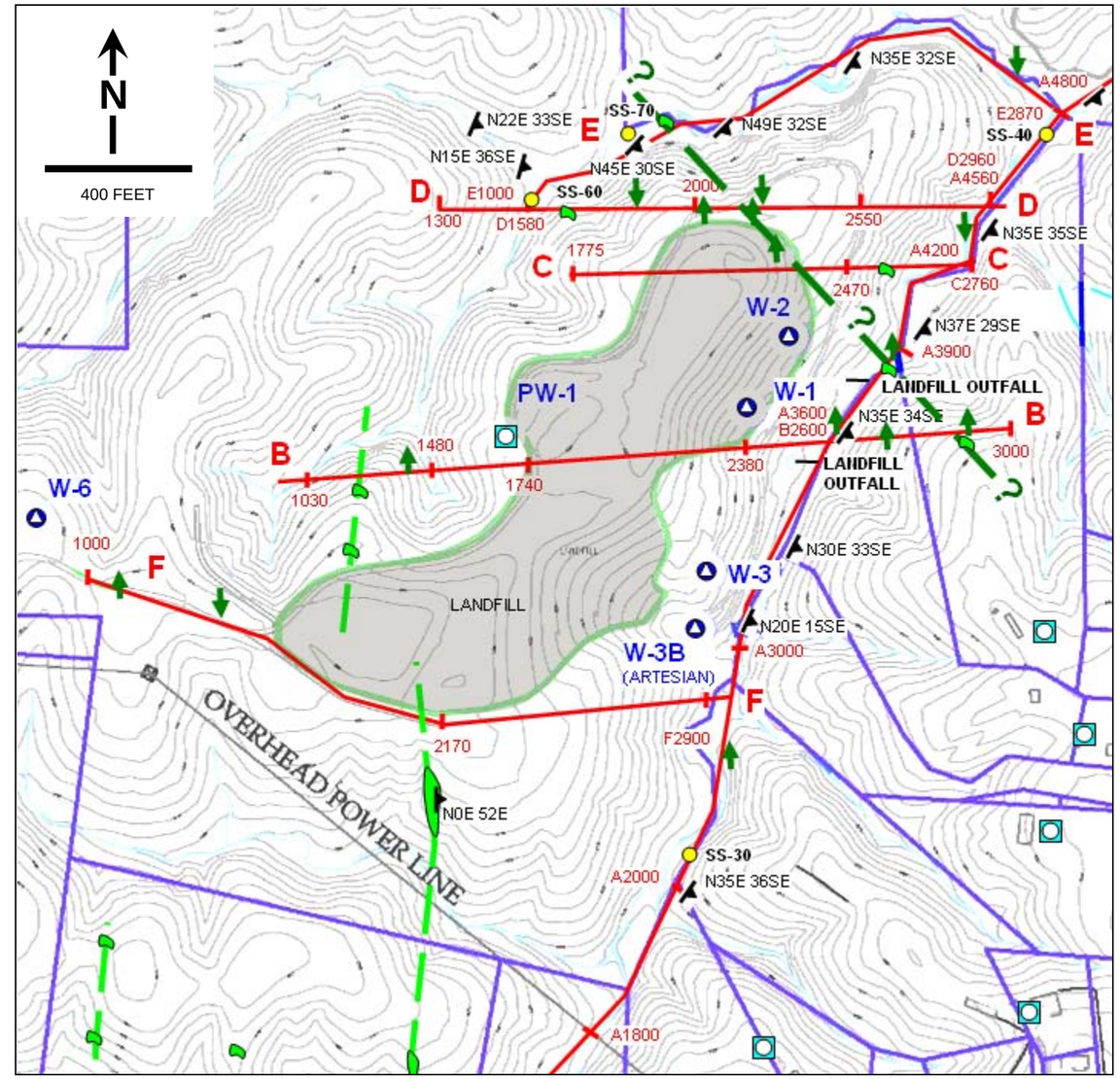


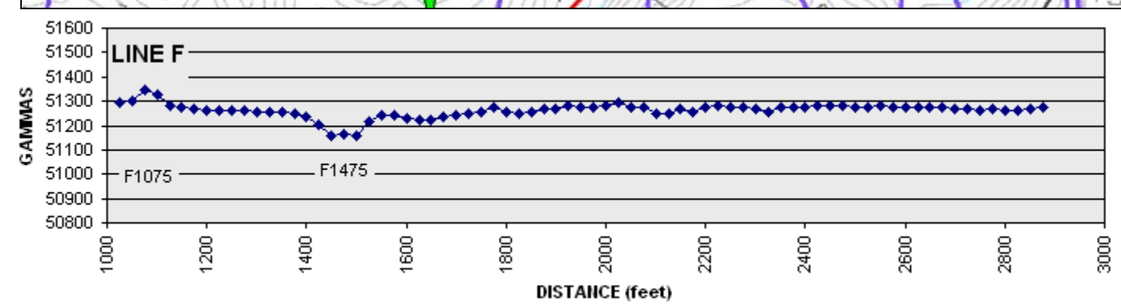












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MAGNETIC GEOPHYSICS SURVEY PROFILES
EDWARDS ROAD ASH LANDFILL
RURAL HALL, NORTH CAROLINA

FIGURE
C-4

FINDINGS

The rock type throughout the study area is pre-Cambrian sulfidic biotite-muscovite gneiss of the Ashe formation (PCag) with strongly developed planar cleavage with a general northeast orientation and a moderate to shallow dip to the southeast, averaging 35°. The SE dip reflects the regional thrust faulting in the area and low angle faulting is expected to be common.

The drainage pattern surrounding the Edwards Road landfill is controlled by the generally northeast-trending strike of the biotite gneiss foliation and cleavage.

Massive "bull" quartz veins occur sporadically within the study area. One measured outcrop indicates a N-S strike and moderate eastern dip. A general north-south orientation of quartz veins in the study area is inferred as shown in the site geologic map.

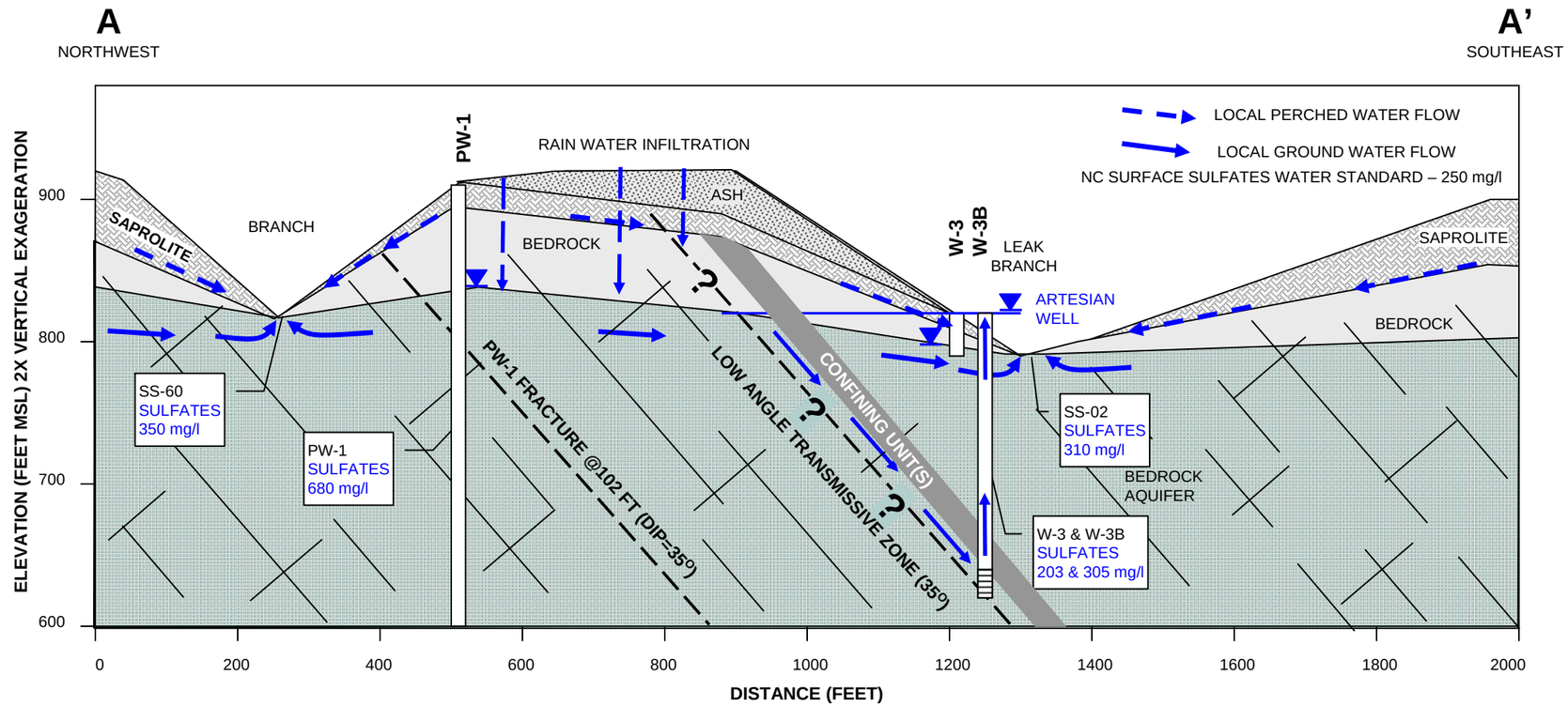
No diabase dike outcrops or float were found within the study area. Magnetic geophysics identified one possible magnetic signature of a diabase dike at location A3850. Bull quartz float and anomalous magnetic peaks are aligned along a N45W trend from A3850, but no physical evidence of a diabase dike could be found.

The N45W oriented structural features are likely vertical based on topographic lineaments in the area.

The saprolite aquifer is largely absent in the study area. However, perched water flow along the bedrock-saprolite interface is evident based on ground water levels in shallow monitor wells and surface water quality data.

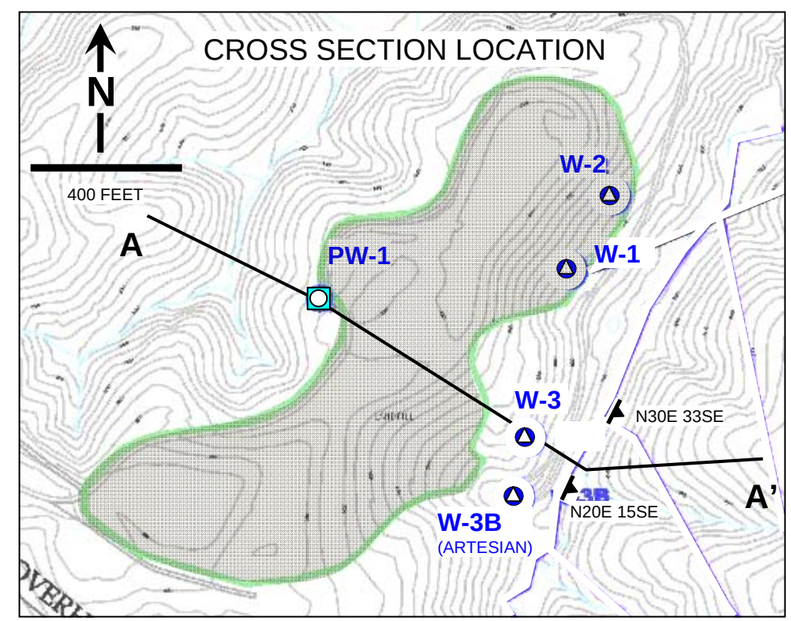
The bedrock aquifer is both quasi-confined and unconfined. Ground water flow within the bedrock aquifer appears to be controlled by low angle geologic structures or stratigraphically controlled transmissive zones. In the upper bedrock aquifer zone, secondary fracture sets may provide lateral ground water flow paths and interconnection between low angle geologic structures.

Magnetic data collected over the older sections of the landfill indicate the presence of metallic debris scattered within the landfill.



BULL QUARTZ VEIN OUTCROP 100 FEET SOUTH OF MAGNETIC DATA POINT F2100.
STRIKE OF THE QUATZ VEIN IS DUE NORTH, DIP IS 52° EAST.

STRATIGRAPHIC CONTROL OF LEAK BRANCH.
SEE FIGURE 3 FOR LOCATION OF PHOTO.



ERM NC, PC

HYDROGEOLOGIC CONCEPTUAL MODEL
EDWARDS ROAD ASH LANDFILL
RURAL HALL, NORTH CAROLINA

FIGURE
C-5

MAGNETOMETER SURVEY DATA
ASH LANDFILL - PERMIT #34-05
RURAL HALL, NORTH CAROLINA

LINE A		Distance		
Date	Time	(FT)	Reading	Notes
08/25/09	14:02	1000	51184	
08/25/09		1025	51173	
08/25/09		1050	51102	
08/25/09		1075	51200	
08/25/09	13:59	1100	51228	
08/25/09		1125	51257	
08/25/09		1150	51252	
08/25/09		1175	51239	
08/25/09	13:57	1200	51233	
08/25/09		1225	51270	
08/25/09		1250	51272	
08/25/09		1275	51270	
08/25/09	13:53	1300	51276	
08/25/09		1325	51269	
08/25/09		1350	51290	
08/25/09		1375	51290	
08/25/09	13:49	1400	51291	
08/25/09		1425	51271	
08/25/09		1450	51275	
08/25/09		1475	51270	
08/25/09	13:46	1500	51278	
08/25/09		1525	51265	
08/25/09		1550	51267	
08/25/09		1575	51271	
08/25/09	13:43	1600	51268	
08/25/09		1625	51270	
08/25/09		1650	51251	
08/25/09		1675	51272	
08/25/09	13:38	1700	51258	
08/25/09		1725	51251	
08/25/09		1750	51225	
08/25/09		1775	51250	
08/25/09	13:35	1800	51236	
08/25/09		1825	51322	
08/25/09		1850	51213	
08/25/09		1875	51234	
08/25/09	13:24	1900	51235	
08/25/09		1925	51240	
08/25/09		1950	51242	
08/25/09		1975	51235	
08/25/09	13:19	2000	51231	
08/25/09		2025	51231	
08/25/09		2050	51228	
08/25/09		2075	51232	
08/25/09	13:13	2100	51243	
08/25/09		2125	51241	
08/25/09		2150	51239	
08/25/09		2175	51243	
08/25/09	13:10	2200	51244	
08/25/09		2225	0:00	
08/25/09		2250	51229	
08/25/09		2275	51237	
08/25/09	13:08	2300	51236	
08/25/09		2325	51237	
08/25/09		2350	51237	
08/25/09		2375	51238	
08/25/09	13:04	2400	51255	
08/25/09		2425	51275	
08/25/09		2450	51292	
08/25/09		2475	51297	
08/25/09	13:01	2500	51262	
08/25/09		2525	51264	
08/25/09		2550	51265	
08/25/09		2575	51252	
08/25/09	12:57	2600	51237	
08/25/09		2625	51236	
08/25/09		2650	51241	
08/25/09		2675	51250	
08/25/09	12:54	2700	51248	
08/25/09		2725	51245	
08/25/09		2750	51252	
08/25/09		2775	51246	
08/25/09	12:51	2800	51246	
08/25/09		2825	51236	
08/25/09		2850	51234	
08/25/09		2875	51236	
08/25/09	12:47	2900	51239	
08/25/09		2925	51245	
08/25/09		2950	51244	

LINE B		Distance		
Date	Time	(FT)	Reading	Notes
08/26/09	11:55	1000	51231	
08/26/09		1025	51230	
08/26/09		1050	51237	
08/26/09		1075	51233	
08/26/09	11:50	1100	51237	
08/26/09		1125	51236	
08/26/09		1150	51232	
08/26/09		1175	51239	
08/26/09	11:45	1200	51235	
08/26/09		1225	51240	
08/26/09		1250	51247	
08/26/09		1275	51242	
08/26/09	11:39	1300	51236	
08/26/09		1325	51237	
08/26/09		1350	51237	
08/26/09		1375	51261	
08/26/09	11:32	1400	51276	
08/26/09		1425	51254	
08/26/09		1450	51226	
08/26/09		1475	51203	
08/26/09	11:28	1500	51212	
08/26/09		1525	51220	
08/26/09		1550	51241	
08/26/09		1575	51235	
08/26/09	11:23	1600	51228	
08/26/09		1625	51233	
08/26/09		1650	51237	
08/26/09		1675	51255	
08/26/09	11:17	1700	51235	
08/26/09		1725	51218	
08/26/09		1750	51213	
08/26/09		1775	51232	
08/26/09	10:48	1800	51274	
08/26/09		1825	51217	
08/26/09		1850	51257	
08/26/09		1875	51271	
08/26/09	10:45	1900	51303	
08/26/09		1925	51356	
08/26/09		1950	51325	
08/26/09		1975	51311	
08/26/09	10:42	2000	51295	
08/26/09		2025	51300	
08/26/09		2050	51312	
08/26/09		2075	51269	
08/26/09	10:37	2100	51244	
08/26/09		2125	51226	
08/26/09		2150	51320	
08/26/09		2175	51224	
08/26/09	10:33	2200	51224	
08/26/09		2225	51404	
08/26/09		2250	51261	
08/26/09		2275	51286	
08/26/09	10:28	2300	51278	
08/26/09		2325	51244	
08/26/09		2350	51287	
08/26/09		2375	51362	
08/26/09	10:24	2400	51229	
08/26/09		2425	51218	
08/26/09		2450	51203	
08/26/09		2475	51200	
08/26/09	10:17	2500	51225	
08/26/09		2525	51235	
08/26/09		2550	51241	
08/26/09		2575	51219	
08/26/09	10:13	2600	51203	
08/26/09		2625	51238	
08/26/09		2650	51242	
08/26/09		2675	51285	
08/26/09	10:06	2700	51273	
08/26/09		2725	51277	
08/26/09		2750	51267	
08/26/09		2775	51266	
08/26/09	9:59	2800	51254	
08/26/09		2825	51251	
08/26/09		2850	51253	
08/26/09		2875	51252	
08/26/09	9:50	2900	51283	
08/26/09		2925	51261	
08/26/09		2950	51257	

MAGNETOMETER SURVEY DATA
ASH LANDFILL - PERMIT #34-05
RURAL HALL, NORTH CAROLINA

LINE A		Distance		
Date	Time	(FT)	Reading	Notes
08/25/09		2975	51245	
08/25/09	12:43	3000	51254	
08/25/09		3025	51237	
08/25/09		3050	51231	
08/25/09		3075	51228	
08/25/09	12:37	3100	51232	
08/25/09		3125	51242	
08/25/09		3150	51253	
08/25/09		3175	51262	
08/25/09	12:30	3200	51158	
08/25/09		3225	51179	
08/25/09		3250	51185	
08/25/09		3275	51196	
08/25/09	12:25	3300	51192	
08/25/09		3325	51190	
08/25/09		3350	51194	
08/25/09		3375	51199	
08/25/09	12:22	3400	51199	
08/25/09		3425	51203	
08/25/09		3450	51205	
08/25/09		3475	51217	
08/25/09	12:18	3500	51200	
08/25/09		3525	51211	
08/25/09		3550	51212	
08/25/09		3575	51214	
08/25/09	12:15	3600	51199	
08/25/09		3625	51157	
08/25/09		3650	51294	
08/25/09		3675	51191	
08/25/09	12:12	3700	51200	
08/25/09		3725	51230	
08/25/09		3750	51199	
08/25/09		3775	51201	
08/25/09	12:05	3800	51185	
08/25/09		3825	51377	
08/25/09		3850	52197	
08/25/09		3875	51663	
08/25/09	12:02	3900	51399	
08/25/09		3925	51196	
08/25/09		3950	51163	
08/25/09		3975	51164	
08/25/09	12:00	4000	51242	
08/25/09		4025	51226	
08/25/09		4050	51247	
08/25/09		4075	51239	
08/25/09	11:56	4100	51237	
08/25/09		4125	51235	
08/25/09		4150	51232	
08/25/09		4175	51225	
08/25/09	11:53	4200	51224	
08/25/09		4225	51220	
08/25/09		4250	51263	
08/25/09		4275	51238	
08/25/09	11:50	4300	51159	
08/25/09		4325	51200	
08/25/09		4350	51229	
08/25/09		4375	51232	
08/25/09	11:46	4400	51232	
08/25/09		4425	51234	
08/25/09		4450	51228	
08/25/09		4475	51228	
08/25/09	11:43	4500	51236	
08/25/09		4525	51205	
08/25/09		4550	51221	
08/25/09		4575	51232	
08/25/09	11:40	4600	51235	
08/25/09		4625	51234	
08/25/09		4650	51222	
08/25/09		4675	51226	
08/25/09	11:35	4700	51238	
08/25/09		4725	51240	
08/25/09		4750	51221	
08/25/09		4775	51235	
08/25/09	11:32	4800	51231	
08/25/09		4825	51223	
08/25/09		4850	51222	
08/25/09		4875	51205	
08/25/09	11:29	4900	51200	
08/25/09		4925	51202	

LINE B		Distance		
Date	Time	(FT)	Reading	Notes
08/26/09		2975	51258	
08/26/09	9:44	3000	51254	END

MAGNETOMETER SURVEY DATA
ASH LANDFILL - PERMIT #34-05
RURAL HALL, NORTH CAROLINA

LINE A		Distance		
Date	Time	(FT)	Reading	Notes
08/25/09		4950	51218	
08/25/09		4975	51213	
08/25/09	11:22	5000	51213	
08/25/09		5025	51213	
08/25/09		5050	51239	
08/25/09		5075	51244	
08/25/09	11:19	5100	51251	
08/25/09		5125	51266	
08/25/09		5150	51266	
08/25/09		5175	51242	
08/25/09	11:16	5200	51241	
08/25/09		5225	51230	
08/25/09		5250	51230	
08/25/09		5275	51274	
08/25/09	11:13	5300	51241	
08/25/09		5325	51243	
08/25/09		5350	51234	
08/25/09		5375	51245	
08/25/09	11:10	5400	51246	
08/25/09		5425	51240	
08/25/09		5450	51248	
08/25/09		5475	51224	
08/25/09	11:07	5500	51230	
08/25/09		5525	51278	
08/25/09		5550	51071	
08/25/09		5575	51518	
08/25/09	11:03	5600	51224	
08/25/09		5625	51238	
08/25/09		5650	51250	
08/25/09		5675	51245	
08/25/09	11:00	5700	51248	
08/25/09		5725	51240	
08/25/09		5750	51242	
08/25/09		5775	51241	
08/25/09		5800	51247	
08/25/09		5825	51213	
08/25/09		5850	51220	
08/25/09		5875	51229	
08/25/09	10:52	5900	51247	
08/25/09		5925	51240	
08/25/09	10:50	5950	51235	END

LINE B		Distance		
Date	Time	(FT)	Reading	Notes

MAGNETOMETER SURVEY DATA
ASH LANDFILL - PERMIT #34-05
RURAL HALL, NORTH CAROLINA

LINE C		Distance		
Date	Time	(FT)	Reading	Notes
08/26/09	14:46	1775	51237	
08/26/09	14:45	1800	51242	
08/26/09		1825	51209	
08/26/09		1850	51211	
08/26/09		1875	51186	
08/26/09	14:41	1900	51136	
08/26/09		1925	51050	
08/26/09		1950	51295	
08/26/09		1975	50985	
08/26/09	14:38	2000	50974	
08/26/09		2025	51196	
08/26/09		2050	51214	
08/26/09		2075	51130	
08/26/09	14:34	2100	50990	
08/26/09		2125	51260	
08/26/09		2150	51203	
08/26/09		2175	51274	
08/26/09	14:30	2200	52039	
08/26/09		2225	51561	
08/26/09		2250	51323	
08/26/09		2275	51280	
08/26/09	14:26	2300	51266	
08/26/09		2325	51225	
08/26/09		2350	51245	
08/26/09		2375	51258	
08/26/09	14:21	2400	51263	
08/26/09		2425	51260	
08/26/09		2450	51266	
08/26/09	14:17	2475	51278	
08/26/09		2500		Magnetometer Malfunction (could not get stable reading, did notice that there is an old steel drainage pipe "not attached to anything" close by
08/26/09		2525		Magnetometer Malfunction (could not get stable reading, did notice that there is an old steel drainage pipe "not attached to anything" close by
08/26/09		2550		Magnetometer Malfunction (could not get stable reading, did notice that there is an old steel drainage pipe "not attached to anything" close by
08/26/09		2575	51268	
08/26/09	14:00	2600	51270	
08/26/09		2625	51269	
08/26/09		2650	51268	
08/26/09		2675	51260	
08/26/09	13:56	2700	51258	
08/26/09		2725	51248	
08/26/09		2750	51245	
08/26/09		2775	51250	
08/26/09	13:52	2800	51236	END

MAGNETOMETER SURVEY DATA
ASH LANDFILL - PERMIT #34-05
RURAL HALL, NORTH CAROLINA

LINE D		Distance		
Date	Time	(FT)	Reading	Notes
08/27/09	9:50	1300	51254	
08/27/09		1325	51250	
08/27/09		1350	51253	
08/27/09		1375	51255	
08/27/09	9:45	1400	51251	
08/27/09		1425	51249	
08/27/09		1450	51245	
08/27/09		1475	51239	
08/27/09	9:40	1500	51235	
08/27/09		1525	51234	
08/27/09		1550	51221	
08/27/09		1575	51225	
08/27/09	9:35	1600	51231	
08/27/09		1625	51233	
08/27/09		1650	51228	
08/27/09		1675	51226	
08/27/09	9:31	1700	51232	
08/27/09		1725	51225	
08/27/09		1750	51222	
08/27/09		1775	51221	
08/27/09	9:26	1800	51202	
08/27/09		1825	51164	
08/27/09		1850	51272	
08/27/09		1875	51301	
08/27/09	9:22	1900	51289	
08/27/09		1925	51286	
08/27/09		1950	51259	
08/27/09		1975	51240	
08/27/09	9:18	2000	51230	
08/26/09	16:55	2025	51394	
08/26/09		2050	51289	
08/26/09		2075	51278	
08/26/09	16:52	2100	51304	
08/26/09		2125	51170	
08/26/09		2150	51110	
08/26/09		2175	51405	
08/26/09	16:49	2200	51312	
08/26/09		2225	51287	
08/26/09		2250	51258	
08/26/09		2275	51277	
08/26/09	16:45	2300	51255	
08/26/09		2325	51274	
08/26/09		2350	51325	
08/26/09		2375	51300	
08/26/09	16:41	2400	51319	
08/26/09		2425	51316	
08/26/09		2450	51321	
08/26/09		2475	51322	
08/26/09	16:36	2500	51302	
08/26/09		2525	51294	
08/26/09		2550	51293	
08/26/09		2575	51296	
08/26/09	16:32	2600	51304	
08/26/09		2625	51301	
08/26/09		2650	51300	
08/26/09		2675	51310	
08/26/09	16:28	2700	51309	
08/26/09		2725	51298	
08/26/09		2750	51273	
08/26/09		2775	51293	
08/26/09	16:24	2800	51291	
08/26/09		2825	51288	
08/26/09		2850	51287	
08/26/09		2875	51284	
08/26/09	16:20	2900	51278	
08/26/09		2925	51276	
08/26/09		2950	51266	
08/26/09		2975	51254	
08/26/09	16:13	3000	51232	END

LINE E		Distance		
Date	Time	(FT)	Reading	Notes
08/27/09	10:02	1000	51226	
08/27/09		1025	51236	
08/27/09		1050	51230	
08/27/09		1075	51240	
08/27/09	10:06	1100	51241	
08/27/09		1125	51247	
08/27/09		1150	51262	
08/27/09		1175	51255	
08/27/09	10:21	1200	51248	
08/27/09		1225	51244	
08/27/09		1250	51243	
08/27/09		1275	51238	
08/27/09	10:25	1300	51236	
08/27/09		1325	51237	
08/27/09		1350	51240	
08/27/09		1375	51241	
08/27/09	10:29	1400	51247	
08/27/09		1425	51256	
08/27/09		1450	51253	
08/27/09		1475	51251	
08/27/09	10:33	1500	51244	
08/27/09		1525	51246	
08/27/09		1550	51245	
08/27/09		1575	51245	
08/27/09	10:36	1600	51241	
08/27/09		1625	51236	
08/27/09		1650	51230	
08/27/09		1675	51233	
08/27/09	10:41	1700	51214	
08/27/09		1725	51218	
08/27/09		1750	51228	
08/27/09		1775	51227	
08/27/09	10:45	1800	51237	
08/27/09		1825	51227	
08/27/09		1850	51226	
08/27/09		1875	51230	
08/27/09	10:49	1900	51233	
08/27/09		1925	51226	
08/27/09		1950	51226	
08/27/09		1975	51227	
08/27/09	10:52	2000	51228	
08/27/09		2025	51237	
08/27/09		2050	51233	
08/27/09		2075	51231	
08/27/09	10:57	2100	51216	
08/27/09		2125	51202	
08/27/09		2150	51216	
08/27/09		2175	51205	
08/27/09	11:01	2200	51206	
08/27/09		2225	51205	
08/27/09		2250	51194	
08/27/09		2275	51190	
08/27/09	11:04	2300	51178	
08/27/09		2325	51171	
08/27/09		2350	51179	
08/27/09		2375	51202	
08/27/09	11:07	2400	51208	
08/27/09		2425	51226	
08/27/09		2450	51238	
08/27/09		2475	51255	
08/27/09	11:09	2500	51230	
08/27/09		2525	51218	
08/27/09		2550	51280	
08/27/09		2575	51225	
08/27/09	11:11	2600	51194	
08/27/09		2625	51154	
08/27/09		2650	51011	
08/27/09		2675	51007	
08/27/09	11:14	2700	51321	
08/27/09		2725	51253	
08/27/09		2750	51258	
08/27/09		2775	51250	
08/27/09	11:16	2800	51237	
08/27/09		2825	51232	
08/27/09	11:17	2850	51246	END

MAGNETOMETER SURVEY DATA
ASH LANDFILL - PERMIT #34-05
RURAL HALL, NORTH CAROLINA

LINE F		Distance		
Date	Time	(FT)	Reading	Notes
08/27/09	13:09	1000	51325	
08/27/09		1025	51295	
08/27/09		1050	51303	
08/27/09		1075	51345	
08/27/09	13:13	1100	51324	
08/27/09		1125	51284	
08/27/09		1150	51273	
08/27/09		1175	51267	
08/27/09	13:18	1200	51261	
08/27/09		1225	51259	
08/27/09		1250	51260	
08/27/09		1275	51260	
08/27/09	13:21	1300	51257	
08/27/09		1325	51257	
08/27/09		1350	51255	
08/27/09		1375	51249	
08/27/09	13:25	1400	51235	
08/27/09		1425	51205	
08/27/09		1450	51159	
08/27/09		1475	51162	
08/27/09	13:28	1500	51158	
08/27/09		1525	51215	
08/27/09		1550	51240	
08/27/09		1575	51243	
08/27/09	13:32	1600	51229	
08/27/09		1625	51223	
08/27/09		1650	51225	
08/27/09		1675	51239	
08/27/09	13:34	1700	51240	
08/27/09		1725	51247	
08/27/09		1750	51257	
08/27/09		1775	51274	
08/27/09	13:37	1800	51257	
08/27/09		1825	51250	
08/27/09		1850	51255	
08/27/09		1875	51270	
08/27/09	13:39	1900	51269	
08/27/09		1925	51283	
08/27/09		1950	51273	
08/27/09		1975	51278	
08/27/09	14:06	2000	51281	
08/27/09		2025	51295	
08/27/09		2050	51277	
08/27/09		2075	51273	
08/27/09	14:16	2100	51249	
08/27/09		2125	51246	
08/27/09		2150	51267	
08/27/09		2175	51254	
08/27/09	14:18	2200	51274	
08/27/09		2225	51281	
08/27/09		2250	51277	
08/27/09		2275	51277	
08/27/09	14:21	2300	51266	
08/27/09		2325	51255	
08/27/09		2350	51276	
08/27/09		2375	51277	
08/27/09	14:24	2400	51277	
08/27/09		2425	51281	
08/27/09		2450	51280	
08/27/09		2475	51284	
08/27/09	14:27	2500	51275	
08/27/09		2525	51277	
08/27/09		2550	51283	
08/27/09		2575	51277	
08/27/09	14:31	2600	51278	
08/27/09		2625	51275	
08/27/09		2650	51278	
08/27/09		2675	51275	
08/27/09	14:34	2700	51271	
08/27/09		2725	51267	
08/27/09		2750	51263	
08/27/09		2775	51267	
08/27/09	14:37	2800	51264	
08/27/09		2825	51265	
08/27/09		2850	51268	
08/27/09	14:39	2875	51273	ended at the stream

APPENDIX D
ANALYTICAL LABORATORY
DATA SHEETS – OFF-SITE
WATER SUPPLY WELLS

Included on Enclosed CD

APPENDIX E
ANALYTICAL LABORATORY DATA SHEETS – SURFACE WATER AND PW-1 MONITORING WELL

Included on Enclosed CD

ERM NC, PC

8000 Corporate Center Dr.
Suite 200
Charlotte, NC 28226
(704) 541-8345
(704) 541-8416 (fax)

August 7, 2009

Reference: Notification of Water Supply Well Sample Results
1000 Sixty Five Highway
Forsyth County Parcel ID #: 6921-30-2220
Rural Hall, NC

Freedom Baptist Church – Attn: Jerry Beeson
PO Box 159, 1000 Sixty Five Highway
Rural Hall, NC 27045

Dear Property Owner:

On behalf of R.J. Reynolds Tobacco Company, ERM NC, PC (ERM) would like to thank you for your cooperation in allowing us to sample your water supply wells on July 20, 2009. The water well sampling was conducted as part of a ground water quality assessment required by the North Carolina Department of Environment and Natural Resources (NCDENR).

The water sample obtained from your well was tested for the presence of a number of metals as well as sulfates. None of the analyzed compounds were detected above the applicable North Carolina Ground Water Quality Standards. The laboratory tests were conducted utilizing methods approved by the NCDENR. A copy of the laboratory report is enclosed and a summary of the test results are presented in the table below along with the applicable North Carolina Ground Water Standards.

Owner	Freedom Baptist Church		
Location	Well House	Yard	NC
Well Use	Potable	Potable	Ground Water
Laboratory Sample ID	Freedom #1	Freedom #2	Standard
Inorganic Laboratory Analyses (µg/L)			
Iron	Not Detected	Not Detected	300
Manganese	Not Detected	Not Detected	50
Selenium	Not Detected	Not Detected	50
Barium	200	86	2,000
Cadmium	Not Detected	Not Detected	1.75
Chromium	1.3	1.2	50
Lead	4.0	5.5	15
Sulfates (mg/L)	4.0	1.3	250
Field Measurements			
pH (Standard Units)	5.62	5.74	6.5-8.5
Conductivity (mS/cm)	1.15	1.36	Not Established
Dissolved Oxygen (mg/l)	3.62	5.53	Not Established
Oxidation-Reduction Potential (millivolts)	186	240	Not Established
Turbidity (NTUs)	16.9	16.5	Not Established
Temperature (degrees Celsius)	16.9	17.8	Not Established

µg/L = Micrograms per Liter (equivalent to parts per billion)
mg/L = Milligrams per Liter (equivalent to parts per million)

The levels of barium, chromium, lead and sulfates detected in the water sample are typical of their natural occurrence in ground water within the Piedmont region of North Carolina. The pH of the water samples was also within the natural range of pH for ground water in the Piedmont region. Again, none of these levels were above the applicable North Carolina Ground Water Quality Standards.

These results will be submitted to the NCDENR and Forsyth County Health Department for their records.

If you have any questions, please contact me at 704-541-8345. Thank you for your assistance.

Sincerely,

Alan Martin
Project Manager

Attachment

cc: Jackie Drummond – NCDENR
Brock Turner – Forsyth County Health Department

PRISM
LABORATORIES,INC.

Case Narrative

Date:	07/29/09	**Client Project ID:**	RJRT
Company:	ERM NC, PC	**Prism COC Group No:**	G0709613
Contact:	Alan Martin	**Collection Date(s):**	07/20/09
Address:	Suite 200 8000 Corporate Center Drive Charlotte, NC 28226	**Lab Submittal Date(s):**	07/22/09

This data package contains the analytical results for the project identified above and includes a Case Narrative, Laboratory Report and Quality Control Data totaling 4 pages. A chain-of-custody is also attached for the samples submitted to Prism for this project.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative. Quality control statements and/or sample specific remarks are included in the sample comments section of the laboratory report for each sample affected.

Semi Volatile Analysis

N/A

Volatile Analysis

N/A

Metals Analysis

No Anomalies Reported

Wet Lab and Micro Analysis

Analysis Note for Q43361 LCS Sulfate: No MS/MSD with this batch.

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

Data Reviewed by:	Robbi A. Jones	**Project Manager:**	Angela D. Overcash
Signature:	Robbi A. Jones	**Signature:**	
Review Date:	07/29/09	**Approval Date:**	07/29/09

Data Qualifiers Key Reference:

B: Compound also detected in the method blank.
#: Result outside of the QC limits.
DO: Compound diluted out.
E: Estimated concentration, calibration range exceeded.
J: The analyte was positively identified but the value is estimated below the reporting limit.
H: Estimated concentration with a high bias.
L: Estimated concentration with a low bias.
M: A matrix effect is present.

Notes: This report should not be reproduced, except in its entirety, without the writtten consent of Prism Laboratories, Inc. The results in this report relate only to the samples submitted for analysis.

449 Springbrook Road, P.O. Box 240543, Charlotte NC 28224-0403
Phone: 704/529-6364 Toll Free: 800/529-6364 Fax: 704/525-0409

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Laboratory Report

07/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT
Sample Matrix: Water

Client Sample ID: Freedom #1
Prism Sample ID: 252782
COC Group: G0709613
Time Collected: 07/20/09 15:10
Time Submitted: 07/22/09 10:55

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Metals by ICP/MS									
Barium	**200**	µg/L	5.0	0.18	1	200.8	07/24/09 15:50	mcampbell	Q43293
Cadmium	**BRL**	µg/L	1.0	0.030	1	200.8	07/24/09 15:50	mcampbell	Q43293
Chromium	**1.3**	µg/L	1.0	0.12	1	200.8	07/24/09 15:50	mcampbell	Q43293
Iron	**BRL**	µg/L	50	1.0	1	200.8	07/24/09 15:50	mcampbell	Q43293
Lead	**4.0**	µg/L	1.0	0.054	1	200.8	07/24/09 15:50	mcampbell	Q43293
Manganese	**BRL**	µg/L	5.0	0.28	1	200.8	07/24/09 15:50	mcampbell	Q43293
Selenium	**BRL**	µg/L	1.0	0.58	1	200.8	07/24/09 15:50	mcampbell	Q43293
Sulfate by Ion Chromatography									
Sulfate	**4.0**	mg/L	1.0	0.098	1	300.0	07/28/09 2:01	celfaki	Q43361

Sample Comment(s):

BRL = Below Reporting Limit

Values are reported down to the reporting limits only. No J-flags applied.

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a wet-weight basis

Angela D. Overcash, V.P. Laboratory Services

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Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Full Service Analytical & Environmental Solutions

Laboratory Report

07/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT
Sample Matrix: Water

Client Sample ID: Freedom #2
Prism Sample ID: 252783
COC Group: G0709613
Time Collected: 07/20/09 14:40
Time Submitted: 07/22/09 10:55

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Metals by ICP/MS									
Barium	**86**	µg/L	5.0	0.18	1	200.8	07/24/09 15:58	mcampbell	Q43293
Cadmium	**BRL**	µg/L	1.0	0.030	1	200.8	07/24/09 15:58	mcampbell	Q43293
Chromium	**1.2**	µg/L	1.0	0.12	1	200.8	07/24/09 15:58	mcampbell	Q43293
Iron	**BRL**	µg/L	50	1.0	1	200.8	07/24/09 15:58	mcampbell	Q43293
Lead	**5.5**	µg/L	1.0	0.054	1	200.8	07/24/09 15:58	mcampbell	Q43293
Manganese	**BRL**	µg/L	5.0	0.28	1	200.8	07/24/09 15:58	mcampbell	Q43293
Selenium	**BRL**	µg/L	1.0	0.58	1	200.8	07/24/09 15:58	mcampbell	Q43293
Sulfate by Ion Chromatography									
Sulfate	**1.3**	mg/L	1.0	0.098	1	300.0	07/28/09 2:24	celfaki	Q43361

Sample Comment(s):

BRL = Below Reporting Limit

Values are reported down to the reporting limits only. No J-flags applied.

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a wet-weight basis

Angela D. Overcash, V.P. Laboratory Services

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Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Level II QC Report

7/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT

COC Group Number: G0709613
Date/Time Submitted: 7/22/09 10:55

Metals by ICP/MS, method 200.8

Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
Barium	0.096	5	<2.5	µg/L	Q43293
Cadmium	0.063	1	<0.5	µg/L	Q43293
Chromium	0.036	1	<0.5	µg/L	Q43293
Iron	6.666	50	<25	µg/L	Q43293
Lead	0.076	1	<0.5	µg/L	Q43293
Manganese	0.094	5	<2.5	µg/L	Q43293
Selenium	0.063	1	<0.5	µg/L	Q43293

Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Barium	102.32	100	µg/L	102	85-115	Q43293
Cadmium	100.72	100	µg/L	101	85-115	Q43293
Chromium	100	100	µg/L	100	85-115	Q43293
Iron	99.25	100	µg/L	99	85-115	Q43293
Lead	98.61	100	µg/L	99	85-115	Q43293
Manganese	99.24	100	µg/L	99	85-115	Q43293
Selenium	103.15	100	µg/L	103	85-115	Q43293

Matrix Spike

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
252778	Barium	139.80	100	µg/L	101	70-130	Q43293
	Cadmium	99.740	100	µg/L	100	70-130	Q43293
	Chromium	93.540	100	µg/L	93	70-130	Q43293
	Iron	87.660	100	µg/L	92	70-130	Q43293
	Lead	96.060	100	µg/L	95	70-130	Q43293
	Manganese	93.960	100	µg/L	94	70-130	Q43293
	Selenium	105.600	100	µg/L	105	70-130	Q43293

Matrix Spike Duplicate

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Ranges %	RPD %	RPD Range %	QC Batch ID
252778	Barium	138.700	100	µg/L	100	70-130	1	0 - 10	Q43293
	Cadmium	98.660	100	µg/L	99	70-130	1	0 - 10	Q43293
	Chromium	93.010	100	µg/L	93	70-130	1	0 - 10	Q43293
	Iron	87.380	100	µg/L	92	70-130	0	0 - 10	Q43293
	Lead	95.80	100	µg/L	95	70-130	0	0 - 10	Q43293
	Manganese	93.850	100	µg/L	93	70-130	0	0 - 10	Q43293
	Selenium	105.100	100	µg/L	105	70-130	0	0 - 10	Q43293

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PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Level II QC Report

7/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT

COC Group Number: G0709613
Date/Time Submitted: 7/22/09 10:55

Sulfate by Ion Chromatography, method 300.0

Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
Sulfate	ND	1	<0.5	mg/L	Q43361

Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Sulfate	5.061	5	mg/L	101	90-110	Q43361

#-See Case Narrative

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CHAIN OF CUSTODY RECORD

PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING: ZH 071009ERM

Client Company Name: ERM NC, PC
Report To/Contact Name: A. Martin
Reporting Address: 8000 Corporate Center Dr #200 Charlotte, NC 28226
Phone: (704)541-8345 Fax (Yes) (No):
Email (Yes) (No) Email Address alan.martin@erm.com
EDD Type: PDF X Excel X Other
Site Location Name: Freedom Baptist Ch.
Site Location Physical Address: 1000 Sixty Five Hwy Rural Hall

Project Name: RJRT
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:
Address: SAME

Purchase Order No./Billing Reference 103137
Requested Due Date ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days ☒ 5 Days
"Working Days" ☐ 6-9 Days ☐ Standard 10 days ☐ Rush Work Must Be Pre-Approved
Samples received after 15:00 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

	YES	NO	N/A
Samples INTACT upon arrival?	✓		
Received ON WET ICE? Temp 3.6	✓		
PROPER PRESERVATIVES indicated?	✓		
Received WITHIN HOLDING TIMES?	✓		
CUSTODY SEALS INTACT?			✓
VOLATILES rec'd W/OUT HEADSPACE?			✓
PROPER CONTAINERS used?	✓		

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

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER *TYPE SEE BELOW	NO.	SIZE	PRESERVATIVES	Sulfates	Metals by 200.8					REMARKS	PRISM LAB ID NO.
Freedom #1	7/20/09	1510	W	P	2	~~None/HNO3~~	None/HNO3	X	X					Metals by 200.8	252782
Freedom #2	7/20/09	1440	W	P	2		" "	X	X					Iron, Manganese, Selenium, Barium, Chromium, Cadmium Lead	252783

Sampler's Signature Alan D. Martin Sampled By (Print Name) A. Martin Affiliation ERM

PRESS DOWN FIRMLY - 3 COPIES

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)	Received By: (Signature)	Date	Military/Hours
ADM			
Relinquished By: (Signature)	Received By: (Signature)	Date	
Relinquished By: (Signature)	Received For Prism Laboratories By:	Date	
		7/22/09	1059

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
COC Group No. G0709613

Additional Comments:

PRISM USE ONLY
Site Arrival Time:
Site Departure Time:
Field Tech Fee:
Mileage:

NPDES:	UST:	GROUNDWATER:	DRINKING WATER:	SOLID WASTE:	RCRA:	CERCLA	LANDFILL	OTHER:
☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☒ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ 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

ERM NC, PC

8000 Corporate Center Dr.
Suite 200
Charlotte, NC 28226
(704) 541-8345
(704) 541-8416 (fax)

August 7, 2009

Reference: Notification of Water Supply Well Sample Results
8450 Crestbrook Road
Forsyth County Parcel ID #: 6921-41-8950
Rural Hall, NC

Joshua & Tasha Freeman
8450 Crestbrook Road
Rural Hall, NC 27045

Dear Property Owners:

On behalf of R.J. Reynolds Tobacco Company, ERM NC, PC (ERM) would like to thank you for your cooperation in allowing us to sample your water supply well on July 21, 2009. The water well sampling was conducted as part of a ground water quality assessment required by the North Carolina Department of Environment and Natural Resources (NCDENR).

The water sample obtained from your well was tested for the presence of a number of metals as well as sulfates. None of the analyzed compounds were detected above the applicable North Carolina Ground Water Quality Standards. The laboratory tests were conducted utilizing methods approved by the NCDENR. A copy of the laboratory report is enclosed and a summary of the test results are presented in the table below along with the applicable North Carolina Ground Water Standards.

Owner Address Well Use Laboratory Sample ID	Freeman 8450 Crestbrook Potable Freeman	NC Ground Water Standard
Inorganic Laboratory Analyses (µg/L)		
Iron	Not Detected	300
Manganese	Not Detected	50
Selenium	Not Detected	50
Barium	46	2,000
Cadmium	Not Detected	1.75
Chromium	Not Detected	50
Lead	Not Detected	15
Sulfates (mg/L)	1.9	250
Field Measurements		
pH (Standard Units)	5.88	6.5-8.5
Conductivity (mS/cm)	0.90	Not Established
Dissolved Oxygen (mg/l)	6.09	Not Established
Oxidation-Reduction Potential (millivolts)	236	Not Established
Turbidity (NTUs)	35.6	Not Established
Temperature (degrees Celsius)	15.5	Not Established

µg/L = Micrograms per Liter (equivalent to parts per billion)
mg/L = Milligrams per Liter (equivalent to parts per million)

The levels of barium and sulfates detected in the water sample are typical of their natural occurrence in ground water within the Piedmont region of North Carolina. The pH of the water sample was also within the natural range of pH for ground water in the Piedmont region. Again, none of these levels were above the applicable North Carolina Ground Water Quality Standards.

These results will be submitted to the NCDENR and Forsyth County Health Department for their records.

If you have any questions, please contact me at 704-541-8345. Thank you for your assistance.

Sincerely,

Alan Martin
Project Manager

Attachment

cc: Jackie Drummond – NCDENR
Brock Turner – Forsyth County Health Department

PRISM
LABORATORIES, INC.

Case Narrative

Date:	07/29/09	**Client Project ID:**	RJRT
Company:	ERM NC, PC	**Prism COC Group No:**	G0709616
Contact:	Alan Martin	**Collection Date(s):**	07/21/09
Address:	Suite 200 8000 Corporate Center Drive Charlotte, NC 28226	**Lab Submittal Date(s):**	07/22/09

This data package contains the analytical results for the project identified above and includes a Case Narrative, Laboratory Report and Quality Control Data totaling 4 pages. A chain-of-custody is also attached for the samples submitted to Prism for this project.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative. Quality control statements and/or sample specific remarks are included in the sample comments section of the laboratory report for each sample affected.

Semi Volatile Analysis

N/A

Volatile Analysis

N/A

Metals Analysis

No Anomalies Reported

Wet Lab and Micro Analysis

Analysis Note for Q43361 LCS Sulfate: No MS/MSD with this batch.

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

Data Reviewed by:	Robbi A. Jones	**Project Manager:**	Angela D. Overcash
Signature:	Robbi A. Jones	**Signature:**	
Review Date:	07/29/09	**Approval Date:**	07/29/09

Data Qualifiers Key Reference:

B: Compound also detected in the method blank.
#: Result outside of the QC limits.
DO: Compound diluted out.
E: Estimated concentration, calibration range exceeded.
J: The analyte was positively identified but the value is estimated below the reporting limit.
H: Estimated concentration with a high bias.
L: Estimated concentration with a low bias.
M: A matrix effect is present.

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Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Laboratory Report

07/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT
Sample Matrix: Water

Client Sample ID: Freeman
Prism Sample ID: 252786
COC Group: G0709616
Time Collected: 07/21/09 9:40
Time Submitted: 07/22/09 10:55

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Metals by ICP/MS									
Barium	**46**	µg/L	5.0	0.18	1	200.8	07/24/09 16:34	mcampbell	Q43293
Cadmium	**BRL**	µg/L	1.0	0.030	1	200.8	07/24/09 16:34	mcampbell	Q43293
Chromium	**BRL**	µg/L	1.0	0.12	1	200.8	07/24/09 16:34	mcampbell	Q43293
Iron	**BRL**	µg/L	50	1.0	1	200.8	07/24/09 16:34	mcampbell	Q43293
Lead	**BRL**	µg/L	1.0	0.054	1	200.8	07/24/09 16:34	mcampbell	Q43293
Manganese	**BRL**	µg/L	5.0	0.28	1	200.8	07/24/09 16:34	mcampbell	Q43293
Selenium	**BRL**	µg/L	1.0	0.58	1	200.8	07/24/09 16:34	mcampbell	Q43293
Sulfate by Ion Chromatography									
Sulfate	**1.9**	mg/L	1.0	0.098	1	300.0	07/28/09 3:31	celfaki	Q43361

Sample Comment(s):

BRL = Below Reporting Limit

Values are reported down to the reporting limits only. No J-flags applied.

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a wet-weight basis

Angela D. Overcash, V.P. Laboratory Services

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NC Drinking Water Cert. No. 37735

Level II QC Report

7/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT

COC Group Number: G0709616
Date/Time Submitted: 7/22/09 10:55

Metals by ICP/MS, method 200.8

Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
Barium	0.096	5	<2.5	µg/L	Q43293
Cadmium	0.063	1	<0.5	µg/L	Q43293
Chromium	0.036	1	<0.5	µg/L	Q43293
Iron	6.666	50	<25	µg/L	Q43293
Lead	0.076	1	<0.5	µg/L	Q43293
Manganese	0.094	5	<2.5	µg/L	Q43293
Selenium	0.063	1	<0.5	µg/L	Q43293

Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Barium	102.32	100	µg/L	102	85-115	Q43293
Cadmium	100.72	100	µg/L	101	85-115	Q43293
Chromium	100	100	µg/L	100	85-115	Q43293
Iron	99.25	100	µg/L	99	85-115	Q43293
Lead	98.61	100	µg/L	99	85-115	Q43293
Manganese	99.24	100	µg/L	99	85-115	Q43293
Selenium	103.15	100	µg/L	103	85-115	Q43293

Matrix Spike

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
252778	Barium	139.80	100	µg/L	101	70-130	Q43293
	Cadmium	99.740	100	µg/L	100	70-130	Q43293
	Chromium	93.540	100	µg/L	93	70-130	Q43293
	Iron	87.660	100	µg/L	92	70-130	Q43293
	Lead	96.060	100	µg/L	95	70-130	Q43293
	Manganese	93.960	100	µg/L	94	70-130	Q43293
	Selenium	105.600	100	µg/L	105	70-130	Q43293

Matrix Spike Duplicate

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Ranges %	RPD %	RPD Range %	QC Batch ID
252778	Barium	138.700	100	µg/L	100	70-130	1	0 - 10	Q43293
	Cadmium	98.660	100	µg/L	99	70-130	1	0 - 10	Q43293
	Chromium	93.010	100	µg/L	93	70-130	1	0 - 10	Q43293
	Iron	87.380	100	µg/L	92	70-130	0	0 - 10	Q43293
	Lead	95.80	100	µg/L	95	70-130	0	0 - 10	Q43293
	Manganese	93.850	100	µg/L	93	70-130	0	0 - 10	Q43293
	Selenium	105.100	100	µg/L	105	70-130	0	0 - 10	Q43293

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Level II QC Report

7/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT

COC Group Number: G0709616
Date/Time Submitted: 7/22/09 10:55

Sulfate by Ion Chromatography, method 300.0

Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
Sulfate	ND	1	<0.5	mg/L	Q43361

Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Sulfate	5.061	5	mg/L	101	90-110	Q43361

#-See Case Narrative

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CHAIN OF CUSTODY RECORD

PRISM LABORATORIES, INC. | Full-Service Analytical & Environmental Solutions

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PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING: ZH071009ERM

Client Company Name: ERM NC, PC
Report To/Contact Name: A. Martin
Reporting Address: 8000 Corporate Center Dr #200 Charlotte NC 28226
Phone: (704) 541-8345 Fax (Yes) (No):
Email (Yes) (No) Email Address alan.martin@erm.com
EDD Type: PDF X Excel X Other
Site Location Name: Freeman
Site Location Physical Address: 8450 Crestbrook Rd Rural Hall NC

Project Name: RJRT
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:
Address: SAME

Purchase Order No./Billing Reference 103137
Requested Due Date ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days ☒ 5 Days
"Working Days" ☐ 6-9 Days ☐ Standard 10 days ☐ Rush Work Must Be Pre-Approved
Samples received after 15:00 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

	YES	NO	N/A
Samples INTACT upon arrival?	✓		
Received ON WET ICE? Temp 3.6	✓		
PROPER PRESERVATIVES indicated?	✓		
Received WITHIN HOLDING TIMES?	✓		
CUSTODY SEALS INTACT?			✓
VOLATILES rec'd W/OUT HEADSPACE?			✓
PROPER CONTAINERS used?	✓		

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

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER *TYPE SEE BELOW	SAMPLE CONTAINER NO.	SAMPLE CONTAINER SIZE	PRESERVATIVES	ANALYSES REQUESTED: Sulfates	ANALYSES REQUESTED: Metals by 200.8					REMARKS	PRISM LAB ID NO.
Freeman	7/21/09	0940	W	P	2		None/HNO3	X	X					Metals by 200.8 Iron, Manganese, Selenium, Barium Chromium, Cadmium Lead	252786

Sampler's Signature [signature] Sampled By (Print Name) A. Martin Affiliation ERM

PRESS DOWN FIRMLY - 3 COPIES

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)	Received By: (Signature)	Date	Military/Hours
[signature]			
Relinquished By: (Signature)	Received By: (Signature)	Date	
Relinquished By: (Signature)	Received For Prism Laboratories By: [signature]	Date 7/22/09	1055

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
COC Group No. G0709616

Additional Comments:

PRISM USE ONLY
Site Arrival Time:
Site Departure Time:
Field Tech Fee:
Mileage:

NPDES:	UST:	GROUNDWATER:	DRINKING WATER:	SOLID WASTE:	RCRA:	CERCLA	LANDFILL	OTHER:
☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☒ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ 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

CERTIFIED MAIL™

ERM NC, PC

Woodfield Corporate C
8000 Corporate Center I
Suite 200
Charlotte, NC 28226

ERM

7008 0500 0000 6448 8031

08-10-09 JB

8.15
8.85

Joshua & Tasha Freeman
8450 Crestbrook Road
Ru

UNITED STATES POSTAGE
PITNEY BOWES
02 1P $ 005.71
0004167125 AUG 07 2009
MAILED FROM ZIP CODE 28226

Received back from Post office 8/21/09 as undeliverable. Per Josh Freeman, 9/1/09 8450 is correct address + he is unsure why it was not delivered. Will resend via FedEx. ADM 9/1/09

NIXIE 274 5E 1 08.08/27/09
RETURN TO SENDER
UNCLAIMED
UNABLE TO FORWARD
BC: 28225420550 *1580-10659-08-35

27045[illegible]28226[illegible]20s

PLACE STICKER AT TOP OF ENVELOPE TO THE RIGHT OF THE RETURN ADDRESS, FOLD AT DOTTED LINE

SENDER: COMPLETE THIS SECTION

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:
Joshua + Tasha Freeman
8450 Crestbrook Road
Rural Hall, NC 27045

COMPLETE THIS SECTION ON DELIVERY

A. Signature
X
☐ Agent
☐ Addressee

B. Received by (Printed Name)

C. Date of Delivery

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☑ Certified Mail ☐ Express Mail
☐ Registered ☐ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? (Extra Fee) ☐ Yes

2. Article Number (Transfer from service label) 7008 0500 0000 6448 8031

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

Alan Martin

From: TrackingUpdates@fedex.com
Sent: Friday, September 04, 2009 2:15 PM
To: Alan Martin
Subject: FedEx Shipment 797897931239 Delivered

This tracking update has been requested by:

Company Name:	ERM NC, PC
Name:	Alan Martin
E-mail:	alan.martin@erm.com

Our records indicate that the following shipment has been delivered:

Reference:	103137-02
Ship (P/U) date:	Sep 1, 2009
Delivery date:	Sep 4, 2009 2:10 PM
Sign for by:	Signature not required
Delivered to:	Residence
Service type:	FedEx Express Saver
Packaging type:	FedEx Envelope
Number of pieces:	1
Weight:	0.50 lb.
Special handling/Services:	Residential Delivery Deliver Weekday
Tracking number:	797897931239

Shipper Information	Recipient Information
Alan Martin	Joshua and Tasha Freeman
ERM NC, PC	8450 CRESTBROOK RD
8000 Corporate Center Drive; Suite 200	RURAL HALL
Charlotte	NC
NC	US
US	27045
28226	

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Thank you for your business.

ERM NC, PC

8000 Corporate Center Dr.
Suite 200
Charlotte, NC 28226
(704) 541-8345
(704) 541-8416 (fax)

August 7, 2009

Reference: Notification of Water Supply Well Sample Results
8420 Crestbrook Road
Forsyth County Parcel ID #: 6921-42-6412
Rural Hall, NC

Jack Guthrie
5340 Seward Circle
Pfafftown, NC 27040

Dear Mr. Guthrie:

On behalf of R.J. Reynolds Tobacco Company, ERM NC, PC (ERM) would like to thank you for your cooperation in allowing us to sample your water supply well on July 20, 2009. The water well sampling was conducted as part of a ground water quality assessment required by the North Carolina Department of Environment and Natural Resources (NCDENR).

The water sample obtained from your well was tested for the presence of a number of metals as well as sulfates. None of the analyzed compounds were detected above the applicable North Carolina Ground Water Quality Standards. The laboratory tests were conducted utilizing methods approved by the NCDENR. A copy of the laboratory report is enclosed and a summary of the test results are presented in the table below along with the applicable North Carolina Ground Water Standards.

Owner Address Well Use Laboratory Sample ID	Guthrie 8420 Crestbrook Potable Guthrie	NC Ground Water Standard
Inorganic Laboratory Analyses (µg/L)		
Iron	Not Detected	300
Manganese	Not Detected	50
Selenium	Not Detected	50
Barium	95	2,000
Cadmium	Not Detected	1.75
Chromium	Not Detected	50
Lead	Not Detected	15
Sulfates (mg/L)	6.4	250
Field Measurements		
pH (Standard Units)	6.36	6.5-8.5
Conductivity (mS/cm)	0.90	Not Established
Dissolved Oxygen (mg/l)	5.44	Not Established
Oxidation-Reduction Potential (millivolts)	235	Not Established
Turbidity (NTUs)	9.1	Not Established
Temperature (degrees Celsius)	16.5	Not Established

µg/L = Micrograms per Liter (equivalent to parts per billion)
mg/L = Milligrams per Liter (equivalent to parts per million)

The levels of barium and sulfates detected in the water sample are typical of their natural occurrence in ground water within the Piedmont region of North Carolina. The pH of the water sample was also within the natural range of pH for ground water in the Piedmont region. Again, none of these levels were above the applicable North Carolina Ground Water Quality Standards.

These results will be submitted to the NCDENR and Forsyth County Health Department for their records.

If you have any questions, please contact me at 704-541-8345. Thank you for your assistance.

Sincerely,

Alan Martin
Project Manager

Attachment

cc: Jackie Drummond – NCDENR
Brock Turner – Forsyth County Health Department

PRISM
LABORATORIES,INC.

Case Narrative

Date:	07/29/09	**Client Project ID:**	RJRT
Company:	ERM NC, PC	**Prism COC Group No:**	G0709615
Contact:	Alan Martin	**Collection Date(s):**	07/20/09
Address:	Suite 200 8000 Corporate Center Drive Charlotte, NC 28226	**Lab Submittal Date(s):**	07/22/09

This data package contains the analytical results for the project identified above and includes a Case Narrative, Laboratory Report and Quality Control Data totaling 4 pages. A chain-of-custody is also attached for the samples submitted to Prism for this project.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative. Quality control statements and/or sample specific remarks are included in the sample comments section of the laboratory report for each sample affected.

Semi Volatile Analysis

N/A

Volatile Analysis

N/A

Metals Analysis

No Anomalies Reported

Wet Lab and Micro Analysis

Analysis Note for Q43361 LCS Sulfate: No MS/MSD with this batch.

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

Data Reviewed by:	Robbi A. Jones	**Project Manager:**	Angela D. Overcash
Signature:	Robbi A. Jones	**Signature:**	
Review Date:	07/29/09	**Approval Date:**	07/29/09

Data Qualifiers Key Reference:

B: Compound also detected in the method blank.
#: Result outside of the QC limits.
DO: Compound diluted out.
E: Estimated concentration, calibration range exceeded.
J: The analyte was positively identified but the value is estimated below the reporting limit.
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L: Estimated concentration with a low bias.
M: A matrix effect is present.

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Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Laboratory Report

07/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT
Sample Matrix: Water

Client Sample ID: Guthrie-8420 Crestbrook
Prism Sample ID: 252785
COC Group: G0709615
Time Collected: 07/20/09 16:05
Time Submitted: 07/22/09 10:55

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Metals by ICP/MS									
Barium	**95**	µg/L	5.0	0.18	1	200.8	07/24/09 16:26	mcampbell	Q43293
Cadmium	**BRL**	µg/L	1.0	0.030	1	200.8	07/24/09 16:26	mcampbell	Q43293
Chromium	**BRL**	µg/L	1.0	0.12	1	200.8	07/24/09 16:26	mcampbell	Q43293
Iron	**BRL**	µg/L	50	1.0	1	200.8	07/24/09 16:26	mcampbell	Q43293
Lead	**BRL**	µg/L	1.0	0.054	1	200.8	07/24/09 16:26	mcampbell	Q43293
Manganese	**BRL**	µg/L	5.0	0.28	1	200.8	07/24/09 16:26	mcampbell	Q43293
Selenium	**BRL**	µg/L	1.0	0.58	1	200.8	07/24/09 16:26	mcampbell	Q43293
Sulfate by Ion Chromatography									
Sulfate	**6.4**	mg/L	1.0	0.098	1	300.0	07/28/09 3:09	celfaki	Q43361

Sample Comment(s):

BRL = Below Reporting Limit

Values are reported down to the reporting limits only. No J-flags applied.

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a wet-weight basis

Angela D. Overcash, V.P. Laboratory Services

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PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Level II QC Report

7/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT

COC Group Number: G0709615
Date/Time Submitted: 7/22/09 10:55

Metals by ICP/MS, method 200.8

Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
Barium	0.096	5	<2.5	µg/L	Q43293
Cadmium	0.063	1	<0.5	µg/L	Q43293
Chromium	0.036	1	<0.5	µg/L	Q43293
Iron	6.666	50	<25	µg/L	Q43293
Lead	0.076	1	<0.5	µg/L	Q43293
Manganese	0.094	5	<2.5	µg/L	Q43293
Selenium	0.063	1	<0.5	µg/L	Q43293

Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Barium	102.32	100	µg/L	102	85-115	Q43293
Cadmium	100.72	100	µg/L	101	85-115	Q43293
Chromium	100	100	µg/L	100	85-115	Q43293
Iron	99.25	100	µg/L	99	85-115	Q43293
Lead	98.61	100	µg/L	99	85-115	Q43293
Manganese	99.24	100	µg/L	99	85-115	Q43293
Selenium	103.15	100	µg/L	103	85-115	Q43293

Matrix Spike

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
252778	Barium	139.80	100	µg/L	101	70-130	Q43293
	Cadmium	99.740	100	µg/L	100	70-130	Q43293
	Chromium	93.540	100	µg/L	93	70-130	Q43293
	Iron	87.660	100	µg/L	92	70-130	Q43293
	Lead	96.060	100	µg/L	95	70-130	Q43293
	Manganese	93.960	100	µg/L	94	70-130	Q43293
	Selenium	105.600	100	µg/L	105	70-130	Q43293

Matrix Spike Duplicate

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Ranges %	RPD %	RPD Range %	QC Batch ID
252778	Barium	138.700	100	µg/L	100	70-130	1	0 - 10	Q43293
	Cadmium	98.660	100	µg/L	99	70-130	1	0 - 10	Q43293
	Chromium	93.010	100	µg/L	93	70-130	1	0 - 10	Q43293
	Iron	87.380	100	µg/L	92	70-130	0	0 - 10	Q43293
	Lead	95.80	100	µg/L	95	70-130	0	0 - 10	Q43293
	Manganese	93.850	100	µg/L	93	70-130	0	0 - 10	Q43293
	Selenium	105.100	100	µg/L	105	70-130	0	0 - 10	Q43293

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Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Level II QC Report

7/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT

COC Group Number: G0709615
Date/Time Submitted: 7/22/09 10:55

Sulfate by Ion Chromatography, method 300.0

Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
Sulfate	ND	1	<0.5	mg/L	Q43361

Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Sulfate	5.061	5	mg/L	101	90-110	Q43361

#-See Case Narrative

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CHAIN OF CUSTODY RECORD

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Phone: 704/529-6364 • Fax: 704/525-0409

PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING: 2H071009ERM

Client Company Name: ERM NC, PC
Report To/Contact Name: A. Martin
Reporting Address: 8000 Corporate Center Dr. #200
Charlotte NC 28226
Phone: (704)541-8345 Fax (Yes) (No):
Email (Yes) (No) Email Address alan.martin@erm.com
EDD Type: PDF X Excel X Other
Site Location Name: Guthrie (NUNN)
Site Location Physical Address: 8420 Crestbrook Rd
Rural Hall

Project Name: RJRT
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:
Address: SAME

Purchase Order No./Billing Reference 103137
Requested Due Date ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days (5 Days)
"Working Days" ☐ 6-9 Days ☐ Standard 10 days ☐ Rush Work Must Be Pre-Approved
Samples received after 15:00 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

	YES	NO	N/A
Samples INTACT upon arrival?	✓		
Received ON WET ICE? Temp 3.6	✓		
PROPER PRESERVATIVES indicated?	✓		
Received WITHIN HOLDING TIMES?	✓		
CUSTODY SEALS INTACT?			✓
VOLATILES rec'd W/OUT HEADSPACE?	✓		
PROPER CONTAINERS used?			

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

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER *TYPE SEE BELOW	NO.	SIZE	PRESERVATIVES	Sulfates	Metals by 200.8					REMARKS	PRISM LAB ID NO.
Guthrie-8420 Crestbrook	7/20/09	1605	W	P	2		None/HNO3	X	X					Metals by 200.8 Iron, Manganese, Selenium, Barium, Chromium, Cadmium, Lead	252785

Sampler's Signature Alan Martin Sampled By (Print Name) Alan D. Martin Affiliation ERM

PRESS DOWN FIRMLY - 3 COPIES

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)	Received By: (Signature)	Date	Military/Hours
Relinquished By: (Signature)	Received By: (Signature)	Date	
Relinquished By: (Signature)	Received For Prism Laboratories By:	Date 7/22/09	1055

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
COC Group No. G07B9615

Additional Comments:

PRISM USE ONLY
Site Arrival Time:
Site Departure Time:
Field Tech Fee:
Mileage:

NPDES:	UST:	GROUNDWATER:	DRINKING WATER:	SOLID WASTE:	RCRA:	CERCLA	LANDFILL	OTHER:
☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	(NC) ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ 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

ERM NC, PC

8000 Corporate Center Dr.
Suite 200
Charlotte, NC 28226
(704) 541-8345
(704) 541-8416 (fax)

August 7, 2009

Reference: Notification of Water Supply Well Sample Results
810 Sixty Five Highway
Forsyth County Parcel ID #: 6921-20-5455
Rural Hall, NC

Grady & Mary Hawks
P.O. Box 651
Rural Hall, NC 27045

Dear Mr. and Mrs. Hawks:

On behalf of R.J. Reynolds Tobacco Company, ERM NC, PC (ERM) would like to thank you for your cooperation in allowing us to sample your water supply well on July 21, 2009. The water well sampling was conducted as part of a ground water quality assessment required by the North Carolina Department of Environment and Natural Resources (NCDENR).

The water sample obtained from your well was tested for the presence of a number of metals as well as sulfates. None of the analyzed compounds were detected above the applicable North Carolina Ground Water Quality Standards. The laboratory tests were conducted utilizing methods approved by the NCDENR. A copy of the laboratory report is enclosed and a summary of the test results are presented in the table below along with the applicable North Carolina Ground Water Standards.

Owner	Hawks	
Address	810 Sixty Five Hwy	NC
Well Use	Potable	Ground Water
Laboratory Sample ID	Hawks	Standard
Inorganic Laboratory Analyses (µg/L)		
Iron	Not Detected	300
Manganese	5.2	50
Selenium	Not Detected	50
Barium	41	2,000
Cadmium	Not Detected	1.75
Chromium	Not Detected	50
Lead	1.4	15
Sulfates (mg/L)	4.3	250
Field Measurements		
pH (Standard Units)	7.53	6.5-8.5
Conductivity (mS/cm)	0.334	Not Established
Dissolved Oxygen (mg/l)	0.00	Not Established
Oxidation-Reduction Potential (millivolts)	87	Not Established
Turbidity (NTUs)	7.1	Not Established
Temperature (degrees Celsius)	16.8	Not Established

µg/L = Micrograms per Liter (equivalent to parts per billion)
mg/L = Milligrams per Liter (equivalent to parts per million)

The levels of manganese, barium, lead and sulfates detected in the water sample typical of their natural occurrence in ground water within the Piedmont region of North Carolina. Again, none of these levels were above the applicable North Carolina Ground Water Quality Standards.

These results will be submitted to the NCDENR and Forsyth County Health Department for their records.

If you have any questions, please contact me at 704-541-8345. Thank you for your assistance.

Sincerely,

Alan Martin
Project Manager

Attachment

cc: Jackie Drummond – NCDENR
Brock Turner – Forsyth County Health Department

Case Narrative

PRISM
LABORATORIES,INC.

Date: 07/29/09
Company: ERM NC, PC
Contact: Alan Martin
Address: Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Client Project ID: RJRT
Prism COC Group No: G0709617
Collection Date(s): 07/21/09
Lab Submittal Date(s): 07/22/09

This data package contains the analytical results for the project identified above and includes a Case Narrative, Laboratory Report and Quality Control Data totaling 4 pages. A chain-of-custody is also attached for the samples submitted to Prism for this project.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative. Quality control statements and/or sample specific remarks are included in the sample comments section of the laboratory report for each sample affected.

Semi Volatile Analysis

N/A

Volatile Analysis

N/A

Metals Analysis

No Anomalies Reported

Wet Lab and Micro Analysis

Analysis Note for Q43361 LCS Sulfate: No MS/MSD with this batch.

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

Data Reviewed by: Robbi A. Jones
Signature: Robbi A. Jones
Review Date: 07/29/09

Project Manager: Angela D. Overcash
Signature:
Approval Date: 07/29/09

Data Qualifiers Key Reference:

B: Compound also detected in the method blank.
#: Result outside of the QC limits.
DO: Compound diluted out.
E: Estimated concentration, calibration range exceeded.
J: The analyte was positively identified but the value is estimated below the reporting limit.
H: Estimated concentration with a high bias.
L: Estimated concentration with a low bias.
M: A matrix effect is present.

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NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Full Service Analytical & Environmental Solutions

Laboratory Report

07/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT
Sample Matrix: Water

Client Sample ID: Hawks
Prism Sample ID: 252787
COC Group: G0709617
Time Collected: 07/21/09 12:15
Time Submitted: 07/22/09 10:55

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Metals by ICP/MS									
Barium	**41**	µg/L	5.0	0.18	1	200.8	07/24/09 16:41	mcampbell	Q43293
Cadmium	**BRL**	µg/L	1.0	0.030	1	200.8	07/24/09 16:41	mcampbell	Q43293
Chromium	**BRL**	µg/L	1.0	0.12	1	200.8	07/24/09 16:41	mcampbell	Q43293
Iron	**BRL**	µg/L	50	1.0	1	200.8	07/24/09 16:41	mcampbell	Q43293
Lead	**1.4**	µg/L	1.0	0.054	1	200.8	07/24/09 16:41	mcampbell	Q43293
Manganese	**5.2**	µg/L	5.0	0.28	1	200.8	07/24/09 16:41	mcampbell	Q43293
Selenium	**BRL**	µg/L	1.0	0.58	1	200.8	07/24/09 16:41	mcampbell	Q43293
Sulfate by Ion Chromatography									
Sulfate	**4.3**	mg/L	1.0	0.098	1	300.0	07/28/09 3:53	celfaki	Q43361

Sample Comment(s):

BRL = Below Reporting Limit

Values are reported down to the reporting limits only. No J-flags applied.

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a wet-weight basis

Angela D. Overcash, V.P. Laboratory Services

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PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Level II QC Report

7/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT

COC Group Number: G0709617
Date/Time Submitted: 7/22/09 10:55

Metals by ICP/MS, method 200.8

Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
Barium	0.096	5	<2.5	µg/L	Q43293
Cadmium	0.063	1	<0.5	µg/L	Q43293
Chromium	0.036	1	<0.5	µg/L	Q43293
Iron	6.666	50	<25	µg/L	Q43293
Lead	0.076	1	<0.5	µg/L	Q43293
Manganese	0.094	5	<2.5	µg/L	Q43293
Selenium	0.063	1	<0.5	µg/L	Q43293

Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Barium	102.32	100	µg/L	102	85-115	Q43293
Cadmium	100.72	100	µg/L	101	85-115	Q43293
Chromium	100	100	µg/L	100	85-115	Q43293
Iron	99.25	100	µg/L	99	85-115	Q43293
Lead	98.61	100	µg/L	99	85-115	Q43293
Manganese	99.24	100	µg/L	99	85-115	Q43293
Selenium	103.15	100	µg/L	103	85-115	Q43293

Matrix Spike

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
252778	Barium	139.80	100	µg/L	101	70-130	Q43293
	Cadmium	99.740	100	µg/L	100	70-130	Q43293
	Chromium	93.540	100	µg/L	93	70-130	Q43293
	Iron	87.660	100	µg/L	92	70-130	Q43293
	Lead	96.060	100	µg/L	95	70-130	Q43293
	Manganese	93.960	100	µg/L	94	70-130	Q43293
	Selenium	105.600	100	µg/L	105	70-130	Q43293

Matrix Spike Duplicate

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Ranges %	RPD %	RPD Range %	QC Batch ID
252778	Barium	138.700	100	µg/L	100	70-130	1	0 - 10	Q43293
	Cadmium	98.660	100	µg/L	99	70-130	1	0 - 10	Q43293
	Chromium	93.010	100	µg/L	93	70-130	1	0 - 10	Q43293
	Iron	87.380	100	µg/L	92	70-130	0	0 - 10	Q43293
	Lead	95.80	100	µg/L	95	70-130	0	0 - 10	Q43293
	Manganese	93.850	100	µg/L	93	70-130	0	0 - 10	Q43293
	Selenium	105.100	100	µg/L	105	70-130	0	0 - 10	Q43293

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NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Level II QC Report

7/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT

COC Group Number: G0709617
Date/Time Submitted: 7/22/09 10:55

Sulfate by Ion Chromatography, method 300.0

Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
Sulfate	ND	1	<0.5	mg/L	Q43361

Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Sulfate	5.061	5	mg/L	101	90-110	Q43361

#-See Case Narrative

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CHAIN OF CUSTODY RECORD

PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING: ZH071009 ERM

Client Company Name: ERM NC, PC
Report To/Contact Name: A. Martin
Reporting Address: 8000 Corporate Center Dr #200
Charlotte NC 28226
Phone: (704)541-8345 Fax (Yes) (No):
Email (Yes) (No) Email Address alan.martin@erm.com
EDD Type: PDF X Excel X Other
Site Location Name: HAWKS (at florist shop)
Site Location Physical Address: 810 Sixty Five Hwy
Rural Hall

Project Name: RJRT
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:
Address: SAME

Purchase Order No./Billing Reference 103137
Requested Due Date ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days (5 Days)
"Working Days" ☐ 6-9 Days ☐ Standard 10 days ☐ Rush Work Must Be Pre-Approved
Samples received after 15:00 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

	YES	NO	N/A
Samples INTACT upon arrival?	✓		
Received ON WET ICE? Temp 3.6	✓		
PROPER PRESERVATIVES indicated?	✓		
Received WITHIN HOLDING TIMES?	✓		
CUSTODY SEALS INTACT?			✓
VOLATILES rec'd W/OUT HEADSPACE?			✓
PROPER CONTAINERS used?	✓		

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

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER *TYPE SEE BELOW	NO.	SIZE	PRESERVATIVES	Sulfates	Metals by 200.8					REMARKS	PRISM LAB ID NO.
Hawks	7/21/09	1215	W	P	2		None/HNO_3	X	X					Metals by 200.8 IRON, Manganese, Selenium, Barium, Chromium, Cadmium, Lead	252787

Sampler's Signature Alan D. Martin Sampled By (Print Name) A. Martin Affiliation ERM

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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)	Received By: (Signature)	Date	Military/Hours
Alan D. Martin			
Relinquished By: (Signature)	Received By: (Signature)	Date	
Relinquished By: (Signature)	Received For Prism Laboratories By:	Date	
		7/22/09	1055

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

COC Group No. G9709617

Additional Comments:

PRISM USE ONLY
Site Arrival Time:
Site Departure Time:
Field Tech Fee:
Mileage:

NPDES:	UST:	GROUNDWATER:	DRINKING WATER:	SOLID WASTE:	RCRA:	CERCLA	LANDFILL	OTHER:
☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☒ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ 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

ERM NC, PC

8000 Corporate Center Dr.
Suite 200
Charlotte, NC 28226
(704) 541-8345
(704) 541-8416 (fax)

August 7, 2009

Reference: Notification of Water Supply Well Sample Results
1234 Sixty Five Highway
Forsyth County Parcel ID #: 6921-40-6606
Rural Hall, NC

Ken Stewart
1234 Sixty Five Highway
Rural Hall, NC 27045

Dear Mr. Stewart:

On behalf of R.J. Reynolds Tobacco Company, ERM NC, PC (ERM) would like to thank you for your cooperation in allowing us to sample your water supply well on July 20, 2009. The water well sampling was conducted as part of a ground water quality assessment required by the North Carolina Department of Environment and Natural Resources (NCDENR).

The water sample obtained from your well was tested for the presence of a number of metals as well as sulfates. None of the analyzed compounds were detected above the applicable North Carolina Ground Water Quality Standards. The laboratory tests were conducted utilizing methods approved by the NCDENR. A copy of the laboratory report is enclosed and a summary of the test results are presented in the table below along with the applicable North Carolina Ground Water Standards.

Owner Address Well Use Laboratory Sample ID	Ken Stewart 1234 Sixty Five Hwy Potable 1234 Sixty Five Hwy	NC Ground Water Standard
Inorganic Laboratory Analyses (µg/L)		
Iron	Not Detected	300
Manganese	Not Detected	50
Selenium	Not Detected	50
Barium	85	2,000
Cadmium	Not Detected	1.75
Chromium	1.3	50
Lead	1.3	15
Sulfates (mg/L)	1.2	250
Field Measurements		
pH (Standard Units)	6.45	6.5-8.5
Conductivity (mS/cm)	1.46	Not Established
Dissolved Oxygen (mg/l)	4.95	Not Established
Oxidation-Reduction Potential (millivolts)	214	Not Established
Turbidity (NTUs)	2.1	Not Established
Temperature (degrees Celsius)	15.3	Not Established

µg/L = Micrograms per Liter (equivalent to parts per billion)
mg/L = Milligrams per Liter (equivalent to parts per million)

The levels of barium, chromium, lead and sulfates detected in the water sample are typical of their natural occurrence in ground water within the Piedmont region of North Carolina. The pH of the water sample was also within the natural range of pH for ground water in the Piedmont region. Again, none of these levels were above the applicable North Carolina Ground Water Quality Standards.

These results will be submitted to the NCDENR and Forsyth County Health Department for their records.

If you have any questions, please contact me at 704-541-8345. Thank you for your assistance.

Sincerely,

Alan Martin
Project Manager

Attachment

cc: Jackie Drummond – NCDENR
Brock Turner – Forsyth County Health Department

PRISM
LABORATORIES,INC.

Case Narrative

Date:	07/29/09	**Client Project ID:**	RJRT
Company:	ERM NC, PC	**Prism COC Group No:**	G0709612
Contact:	Alan Martin	**Collection Date(s):**	07/20/09
Address:	Suite 200 8000 Corporate Center Drive Charlotte, NC 28226	**Lab Submittal Date(s):**	07/22/09

This data package contains the analytical results for the project identified above and includes a Case Narrative, Laboratory Report and Quality Control Data totaling 4 pages. A chain-of-custody is also attached for the samples submitted to Prism for this project.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative. Quality control statements and/or sample specific remarks are included in the sample comments section of the laboratory report for each sample affected.

Semi Volatile Analysis

N/A

Volatile Analysis

N/A

Metals Analysis

No Anomalies Reported

Wet Lab and Micro Analysis

Analysis Note for Q43361 LCS Sulfate: No MS/MSD with this batch.

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

Data Reviewed by:	Robbi A. Jones	**Project Manager:**	Angela D. Overcash
Signature:	Robbi A. Jones	**Signature:**	
Review Date:	07/29/09	**Approval Date:**	07/29/09

Data Qualifiers Key Reference:

B: Compound also detected in the method blank.
#: Result outside of the QC limits.
DO: Compound diluted out.
E: Estimated concentration, calibration range exceeded.
J: The analyte was positively identified but the value is estimated below the reporting limit.
H: Estimated concentration with a high bias.
L: Estimated concentration with a low bias.
M: A matrix effect is present.

Notes: This report should not be reproduced, except in its entirety, without the writtten consent of Prism Laboratories, Inc. The results in this report relate only to the samples submitted for analysis.

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NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Full Service Analytical & Environmental Solutions

Laboratory Report

07/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT
Sample Matrix: Water

Client Sample ID: 1234 Sixty Five
Prism Sample ID: 252781
COC Group: G0709612
Time Collected: 07/20/09 12:00
Time Submitted: 07/22/09 10:55

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Metals by ICP/MS									
Barium	**85**	µg/L	5.0	0.18	1	200.8	07/24/09 15:43	mcampbell	Q43293
Cadmium	**BRL**	µg/L	1.0	0.030	1	200.8	07/24/09 15:43	mcampbell	Q43293
Chromium	**1.3**	µg/L	1.0	0.12	1	200.8	07/24/09 15:43	mcampbell	Q43293
Iron	**BRL**	µg/L	50	1.0	1	200.8	07/24/09 15:43	mcampbell	Q43293
Lead	**1.3**	µg/L	1.0	0.054	1	200.8	07/24/09 15:43	mcampbell	Q43293
Manganese	**BRL**	µg/L	5.0	0.28	1	200.8	07/24/09 15:43	mcampbell	Q43293
Selenium	**BRL**	µg/L	1.0	0.58	1	200.8	07/24/09 15:43	mcampbell	Q43293
Sulfate by Ion Chromatography									
Sulfate	**1.2**	mg/L	1.0	0.098	1	300.0	07/28/09 1:39	celfaki	Q43361

Sample Comment(s):

BRL = Below Reporting Limit

Values are reported down to the reporting limits only. No J-flags applied.

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a wet-weight basis

Angela D. Overcash, V.P. Laboratory Services

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PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Level II QC Report

7/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT

COC Group Number: G0709612
Date/Time Submitted: 7/22/09 10:55

Metals by ICP/MS, method 200.8

Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
Barium	0.096	5	<2.5	µg/L	Q43293
Cadmium	0.063	1	<0.5	µg/L	Q43293
Chromium	0.036	1	<0.5	µg/L	Q43293
Iron	6.666	50	<25	µg/L	Q43293
Lead	0.076	1	<0.5	µg/L	Q43293
Manganese	0.094	5	<2.5	µg/L	Q43293
Selenium	0.063	1	<0.5	µg/L	Q43293

Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Barium	102.32	100	µg/L	102	85-115	Q43293
Cadmium	100.72	100	µg/L	101	85-115	Q43293
Chromium	100	100	µg/L	100	85-115	Q43293
Iron	99.25	100	µg/L	99	85-115	Q43293
Lead	98.61	100	µg/L	99	85-115	Q43293
Manganese	99.24	100	µg/L	99	85-115	Q43293
Selenium	103.15	100	µg/L	103	85-115	Q43293

Matrix Spike

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
252778	Barium	139.80	100	µg/L	101	70-130	Q43293
	Cadmium	99.740	100	µg/L	100	70-130	Q43293
	Chromium	93.540	100	µg/L	93	70-130	Q43293
	Iron	87.660	100	µg/L	92	70-130	Q43293
	Lead	96.060	100	µg/L	95	70-130	Q43293
	Manganese	93.960	100	µg/L	94	70-130	Q43293
	Selenium	105.600	100	µg/L	105	70-130	Q43293

Matrix Spike Duplicate

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Ranges %	RPD %	RPD Range %	QC Batch ID
252778	Barium	138.700	100	µg/L	100	70-130	1	0 - 10	Q43293
	Cadmium	98.660	100	µg/L	99	70-130	1	0 - 10	Q43293
	Chromium	93.010	100	µg/L	93	70-130	1	0 - 10	Q43293
	Iron	87.380	100	µg/L	92	70-130	0	0 - 10	Q43293
	Lead	95.80	100	µg/L	95	70-130	0	0 - 10	Q43293
	Manganese	93.850	100	µg/L	93	70-130	0	0 - 10	Q43293
	Selenium	105.100	100	µg/L	105	70-130	0	0 - 10	Q43293

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NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Full Service Analytical & Environmental Solutions

Level II QC Report

7/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT

COC Group Number: G0709612
Date/Time Submitted: 7/22/09 10:55

Sulfate by Ion Chromatography, method 300.0

Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
Sulfate	ND	1	<0.5	mg/L	Q43361

Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Sulfate	5.061	5	mg/L	101	90-110	Q43361

#-See Case Narrative

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CHAIN OF CUSTODY RECORD

PRISM LABORATORIES, INC. | Full-Service Analytical & Environmental Solutions

449 Springbrook Road • P.O. Box 240543 • Charlotte, NC 28224-0543
Phone: 704/529-6364 • Fax: 704/525-0409

PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING: ZH07/009 ERM

Client Company Name: ERM NC, PC
Report To/Contact Name: A. Martin
Reporting Address: 8000 Corporate Center Dr #200 Charlotte NC 28226
Phone: (704)541-8345 Fax (Yes) (No)
Email (Yes) (No) Email Address alan.martin@erm.com
EDD Type: PDF X Excel X Other
Site Location Name: Ken Stewart
Site Location Physical Address: 1234 Sixty Five Hwy Rural Hall NC

Project Name: RJRT
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 103137
Requested Due Date ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days ☒ 5 Days
"Working Days" ☐ 6-9 Days ☐ Standard 10 days ☐ Rush Work Must Be Pre-Approved
Samples received after 15:00 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

	YES	NO	N/A
Samples INTACT upon arrival?	✓		
Received ON WET ICE? Temp 3.6	✓		
PROPER PRESERVATIVES indicated?	✓		
Received WITHIN HOLDING TIMES?	✓		
CUSTODY SEALS INTACT?			✓
VOLATILES rec'd W/OUT HEADSPACE?			✓
PROPER CONTAINERS used?	✓		

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

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER *TYPE SEE BELOW	NO.	SIZE	PRESERVATIVES	ANALYSES REQUESTED: Sulfates	Metals by 200.8					REMARKS	PRISM LAB ID NO.
1234 Sixty Five Hwy	7/20/09	1200	W	P	2		None/HNO3	X	X					Metals by 200.8 Iron, Manganese, Selenium, Barium, Chromium, Cadmium, Lead	2527781

Sampler's Signature [signature] Sampled By (Print Name) A. Martin Affiliation ERM

PRESS DOWN FIRMLY - 3 COPIES

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)	Received By: (Signature)	Date	Military/Hours
[signature]			
Relinquished By: (Signature)	Received By: (Signature)	Date	
Relinquished By: (Signature)	Received For Prism Laboratories By: [signature]	Date 7/22/09	1055

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
COC Group No. G0709612

Additional Comments:

PRISM USE ONLY
Site Arrival Time:
Site Departure Time:
Field Tech Fee:
Mileage:

NPDES:	UST:	GROUNDWATER:	DRINKING WATER:	SOLID WASTE:	RCRA:	CERCLA	LANDFILL	OTHER:
☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☒ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ 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

ERM NC, PC

8000 Corporate Center Dr.
Suite 200
Charlotte, NC 28226
(704) 541-8345
(704) 541-8416 (fax)

August 7, 2009

Reference: Notification of Water Supply Well Sample Results
1180 Sixty Five Highway
Forsyth County Parcel ID #: 6921-40-2442
Rural Hall, NC

Mozelle Stewart
1180 Sixty Five Highway
Rural Hall, NC 27045

Dear Property Owner:

On behalf of R.J. Reynolds Tobacco Company, ERM NC, PC (ERM) would like to thank you for your cooperation in allowing us to sample your water supply well on July 20, 2009. The water well sampling was conducted as part of a ground water quality assessment required by the North Carolina Department of Environment and Natural Resources (NCDENR).

The water sample obtained from your well was tested for the presence of a number of metals as well as sulfates. None of the analyzed compounds were detected above the applicable North Carolina Ground Water Quality Standards. The laboratory tests were conducted utilizing methods approved by the NCDENR. A copy of the laboratory report is enclosed and a summary of the test results are presented in the table below along with the applicable North Carolina Ground Water Standards.

Owner	Mozelle Stewart	
Address	1180 Sixty Five Hwy	NC
Well Use	Potable	Ground Water
Laboratory Sample ID	M Stewart	Standard
Inorganic Laboratory Analyses (µg/L)		
Iron	110	300
Manganese	Not Detected	50
Selenium	Not Detected	50
Barium	170	2,000
Cadmium	Not Detected	1.75
Chromium	1.7	50
Lead	Not Detected	15
Sulfates (mg/L)	Not Detected	250
Field Measurements		
pH (Standard Units)	5.79	6.5-8.5
Conductivity (mS/cm)	3.35	Not Established
Dissolved Oxygen (mg/l)	5.93	Not Established
Oxidation-Reduction Potential (millivolts)	189	Not Established
Turbidity (NTUs)	4.9	Not Established
Temperature (degrees Celsius)	16.1	Not Established

µg/L = Micrograms per Liter (equivalent to parts per billion)
mg/L = Milligrams per Liter (equivalent to parts per million)

The levels of iron, barium and chromium detected in the water sample are typical of their natural occurrence in ground water within the Piedmont region of North Carolina. The pH of the water sample was also within the natural range of pH for ground water in the Piedmont region. Again, none of these levels were above the applicable North Carolina Ground Water Quality Standards.

These results will be submitted to the NCDENR and Forsyth County Health Department for their records.

If you have any questions, please contact me at 704-541-8345. Thank you for your assistance.

Sincerely,

Alan Martin
Project Manager

Attachment

cc: Jackie Drummond – NCDENR
Brock Turner – Forsyth County Health Department

Case Narrative

PRISM LABORATORIES, INC.

Date:	07/29/09	**Client Project ID:**	RJRT
Company:	ERM NC, PC	**Prism COC Group No:**	G0709614
Contact:	Alan Martin	**Collection Date(s):**	07/20/09
Address:	Suite 200 8000 Corporate Center Drive Charlotte, NC 28226	**Lab Submittal Date(s):**	07/22/09

This data package contains the analytical results for the project identified above and includes a Case Narrative, Laboratory Report and Quality Control Data totaling 4 pages. A chain-of-custody is also attached for the samples submitted to Prism for this project.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative. Quality control statements and/or sample specific remarks are included in the sample comments section of the laboratory report for each sample affected.

Semi Volatile Analysis

N/A

Volatile Analysis

N/A

Metals Analysis

No Anomalies Reported

Wet Lab and Micro Analysis

Analysis Note for Q43361 LCS Sulfate: No MS/MSD with this batch.

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

Data Reviewed by:	Robbi A. Jones	**Project Manager:**	Angela D. Overcash
Signature:	Robbi A. Jones	**Signature:**	
Review Date:	07/29/09	**Approval Date:**	07/29/09

Data Qualifiers Key Reference:

B: Compound also detected in the method blank.
#: Result outside of the QC limits.
DO: Compound diluted out.
E: Estimated concentration, calibration range exceeded.
J: The analyte was positively identified but the value is estimated below the reporting limit.
H: Estimated concentration with a high bias.
L: Estimated concentration with a low bias.
M: A matrix effect is present.

Notes: This report should not be reproduced, except in its entirety, without the writtten consent of Prism Laboratories, Inc. The results in this report relate only to the samples submitted for analysis.

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PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Laboratory Report

07/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT
Sample Matrix: Water

Client Sample ID: M. Stewart
Prism Sample ID: 252784
COC Group: G0709614
Time Collected: 07/20/09 11:00
Time Submitted: 07/22/09 10:55

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Metals by ICP/MS									
Barium	**170**	µg/L	5.0	0.18	1	200.8	07/24/09 16:05	mcampbell	Q43293
Cadmium	**BRL**	µg/L	1.0	0.030	1	200.8	07/24/09 16:05	mcampbell	Q43293
Chromium	**1.7**	µg/L	1.0	0.12	1	200.8	07/24/09 16:05	mcampbell	Q43293
Iron	**110**	µg/L	50	1.0	1	200.8	07/24/09 16:05	mcampbell	Q43293
Lead	**BRL**	µg/L	1.0	0.054	1	200.8	07/24/09 16:05	mcampbell	Q43293
Manganese	**BRL**	µg/L	5.0	0.28	1	200.8	07/24/09 16:05	mcampbell	Q43293
Selenium	**BRL**	µg/L	1.0	0.58	1	200.8	07/24/09 16:05	mcampbell	Q43293
Sulfate by Ion Chromatography									
Sulfate	**BRL**	mg/L	1.0	0.098	1	300.0	07/28/09 2:46	celfaki	Q43361

Sample Comment(s):

BRL = Below Reporting Limit

Values are reported down to the reporting limits only. No J-flags applied.

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a wet-weight basis

Angela D. Overcash, V.P. Laboratory Services

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PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Level II QC Report

7/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT

COC Group Number: G0709614
Date/Time Submitted: 7/22/09 10:55

Metals by ICP/MS, method 200.8

Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
Barium	0.096	5	<2.5	µg/L	Q43293
Cadmium	0.063	1	<0.5	µg/L	Q43293
Chromium	0.036	1	<0.5	µg/L	Q43293
Iron	6.666	50	<25	µg/L	Q43293
Lead	0.076	1	<0.5	µg/L	Q43293
Manganese	0.094	5	<2.5	µg/L	Q43293
Selenium	0.063	1	<0.5	µg/L	Q43293

Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Barium	102.32	100	µg/L	102	85-115	Q43293
Cadmium	100.72	100	µg/L	101	85-115	Q43293
Chromium	100	100	µg/L	100	85-115	Q43293
Iron	99.25	100	µg/L	99	85-115	Q43293
Lead	98.61	100	µg/L	99	85-115	Q43293
Manganese	99.24	100	µg/L	99	85-115	Q43293
Selenium	103.15	100	µg/L	103	85-115	Q43293

Matrix Spike

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
252778	Barium	139.80	100	µg/L	101	70-130	Q43293
	Cadmium	99.740	100	µg/L	100	70-130	Q43293
	Chromium	93.540	100	µg/L	93	70-130	Q43293
	Iron	87.660	100	µg/L	92	70-130	Q43293
	Lead	96.060	100	µg/L	95	70-130	Q43293
	Manganese	93.960	100	µg/L	94	70-130	Q43293
	Selenium	105.600	100	µg/L	105	70-130	Q43293

Matrix Spike Duplicate

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Ranges %	RPD %	RPD Range %	QC Batch ID
252778	Barium	138.700	100	µg/L	100	70-130	1	0 - 10	Q43293
	Cadmium	98.660	100	µg/L	99	70-130	1	0 - 10	Q43293
	Chromium	93.010	100	µg/L	93	70-130	1	0 - 10	Q43293
	Iron	87.380	100	µg/L	92	70-130	0	0 - 10	Q43293
	Lead	95.80	100	µg/L	95	70-130	0	0 - 10	Q43293
	Manganese	93.850	100	µg/L	93	70-130	0	0 - 10	Q43293
	Selenium	105.100	100	µg/L	105	70-130	0	0 - 10	Q43293

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PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Level II QC Report

7/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT

COC Group Number: G0709614
Date/Time Submitted: 7/22/09 10:55

Sulfate by Ion Chromatography, method 300.0

Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
Sulfate	ND	1	<0.5	mg/L	Q43361

Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Sulfate	5.061	5	mg/L	101	90-110	Q43361

#-See Case Narrative

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CHAIN OF CUSTODY RECORD

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Phone: 704/529-6364 • Fax: 704/525-0409

PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING: 2H071009 ERM

Client Company Name: ERM NC PC
Report To/Contact Name: A. Martin
Reporting Address: 8000 Corporate Center Dr. #200 Charlotte, NC 28226
Phone: 704 541 8341 Fax (Yes) (No)
Email (Yes) (No) Email Address Alan.martin@ERM.com
EDD Type: PDF ☒ Excel ☒ Other
Site Location Name: Mozelle Stewart
Site Location Physical Address: 1180 Sixty Five Hwy Rural Hall, NC

Project Name: RJRT
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 103137
Requested Due Date ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days ☒ 5 Days
"Working Days" ☐ 6-9 Days ☐ Standard 10 days ☐ Rush Work Must Be Pre-Approved
Samples received after 15:00 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

	YES	NO	N/A
Samples INTACT upon arrival?	✓		
Received ON WET ICE? Temp 3.6	✓		
PROPER PRESERVATIVES indicated?	✓		
Received WITHIN HOLDING TIMES?	✓		
CUSTODY SEALS INTACT?			✓
VOLATILES rec'd W/OUT HEADSPACE?	✓		✓
PROPER CONTAINERS used?	✓		

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

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER *TYPE SEE BELOW	NO.	SIZE	PRESERVATIVES	Sulfates	Metals by 200.8					REMARKS	PRISM LAB ID NO.
M. Stewart	7/20/09	1100	W	P	2		None / HNO3	X	X					Metals by 200.8 Iron, Manganese, Selenium, Barium Chromium, Cadmium Lead	252784

Sampler's Signature [signature] Sampled By (Print Name) A. Martin Affiliation ERM

PRESS DOWN FIRMLY - 3 COPIES

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)	Received By: (Signature)	Date	Military/Hours
[signature]			
Relinquished By: (Signature)	Received By: (Signature)	Date	
	[signature]		
Relinquished By: (Signature)	Received For Prism Laboratories By: [signature]	Date 7/22/09	1055

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
COC Group No. G0709614

Additional Comments:

PRISM USE ONLY
Site Arrival Time:
Site Departure Time:
Field Tech Fee:
Mileage:

NPDES:	UST:	GROUNDWATER:	DRINKING WATER:	SOLID WASTE:	RCRA:	CERCLA	LANDFILL	OTHER:
☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☒ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ 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

ERM NC, PC

8000 Corporate Center Dr.
Suite 200
Charlotte, NC 28226
(704) 541-8345
(704) 541-8416 (fax)

August 7, 2009

Reference: Notification of Water Supply Well Sample Results
8320 Crestbrook Road
Forsyth County Parcel ID #: 6921-41-5108
Rural Hall, NC

Mack Phipps
8320 Crestbrook Road
Rural Hall, NC 27045

Dear Mr. Phipps:

On behalf of R.J. Reynolds Tobacco Company, ERM NC, PC (ERM) would like to thank you for your cooperation in allowing us to sample your water supply well on July 20, 2009. The water well sampling was conducted as part of a ground water quality assessment required by the North Carolina Department of Environment and Natural Resources (NCDENR).

The water sample obtained from your well was tested for the presence of a number of metals as well as sulfates. None of the analyzed compounds were detected above the applicable North Carolina Ground Water Quality Standards. The tests were conducted utilizing methods approved by the NCDENR. A copy of the laboratory report is enclosed and a summary of the test results are presented in the table below along with the applicable North Carolina Ground Water Standards.

Owner Address Well Use Laboratory Sample ID	Phipps 8320 Crestbrook Potable 8320 Crestbrook	NC Ground Water Standard
Inorganic Laboratory Analyses (µg/L)		
Iron	Not Detected	300
Manganese	Not Detected	50
Selenium	Not Detected	50
Barium	39	2,000
Cadmium	Not Detected	1.75
Chromium	Not Detected	50
Lead	Not Detected	15
Sulfates (mg/L)	7.1	250
Field Measurements		
pH (Standard Units)	7.34	6.5-8.5
Conductivity (mS/cm)	0.99	Not Established
Dissolved Oxygen (mg/l)	3.50	Not Established
Oxidation-Reduction Potential (millivolts)	191	Not Established
Turbidity (NTUs)	6.1	Not Established
Temperature (degrees Celsius)	15.6	Not Established

µg/L = Micrograms per Liter (equivalent to parts per billion)
mg/L = Milligrams per Liter (equivalent to parts per million)

The levels of barium and sulfates detected in the water sample are typical of their natural occurrence in ground water within the Piedmont region of North Carolina. Again, none of these levels were above the applicable North Carolina Ground Water Quality Standards.

These results will be submitted to the NCDENR and Forsyth County Health Department for their records.

If you have any questions, please contact me at 704-541-8345. Thank you for your assistance.

Sincerely,

Alan Martin
Project Manager

Attachment

cc: Jackie Drummond – NCDENR
Brock Turner – Forsyth County Health Department

PRISM
LABORATORIES, INC.

Case Narrative

Date:	07/29/09	**Client Project ID:**	RJRT
Company:	ERM NC, PC	**Prism COC Group No:**	G0709610
Contact:	Alan Martin	**Collection Date(s):**	07/20/09
Address:	Suite 200 8000 Corporate Center Drive Charlotte, NC 28226	**Lab Submittal Date(s):**	07/22/09

This data package contains the analytical results for the project identified above and includes a Case Narrative, Laboratory Report and Quality Control Data totaling 4 pages. A chain-of-custody is also attached for the samples submitted to Prism for this project.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative. Quality control statements and/or sample specific remarks are included in the sample comments section of the laboratory report for each sample affected.

Semi Volatile Analysis

N/A

Volatile Analysis

N/A

Metals Analysis

No Anomalies Reported

Wet Lab and Micro Analysis

Analysis Note for Q43361 LCS Sulfate: No MS/MSD with this batch.

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

Data Reviewed by:	Robbi A. Jones	**Project Manager:**	Angela D. Overcash
Signature:	Robbi A. Jones	**Signature:**	
Review Date:	07/29/09	**Approval Date:**	07/29/09

Data Qualifiers Key Reference:

B: Compound also detected in the method blank.
#: Result outside of the QC limits.
DO: Compound diluted out.
E: Estimated concentration, calibration range exceeded.
J: The analyte was positively identified but the value is estimated below the reporting limit.
H: Estimated concentration with a high bias.
L: Estimated concentration with a low bias.
M: A matrix effect is present.

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Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Laboratory Report

07/29/09

ERM NC, PC
Attn Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT
Sample Matrix: Water

Client Sample ID 8320 Crestbrook
Prism Sample ID 252778
COC Group: G0709610
Time Collected: 07/20/09 8:45
Time Submitted: 07/22/09 10:55

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Metals by ICP/MS									
Barium	**39**	µg/L	5.0	0.18	1	200.8	07/24/09 15:07	mcampbell	Q43293
Cadmium	**BRL**	µg/L	1.0	0.030	1	200.8	07/24/09 15:07	mcampbell	Q43293
Chromium	**BRL**	µg/L	1.0	0.12	1	200.8	07/24/09 15:07	mcampbell	Q43293
Iron	**BRL**	µg/L	50	1.0	1	200.8	07/24/09 15:07	mcampbell	Q43293
Lead	**BRL**	µg/L	1.0	0.054	1	200.8	07/24/09 15:07	mcampbell	Q43293
Manganese	**BRL**	µg/L	5.0	0.28	1	200.8	07/24/09 15:07	mcampbell	Q43293
Selenium	**BRL**	µg/L	1.0	0.58	1	200.8	07/24/09 15:07	mcampbell	Q43293
Sulfate by Ion Chromatography									
Sulfate	**7.1**	mg/L	1.0	0.098	1	300.0	07/27/09 23:47	celfaki	Q43361

Sample Comment(s):

BRL = Below Reporting Limit
J = Estimated value between the Reporting Limit and the MDL
The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.
All results are reported on a wet-weight basis

Angela D. Overcash, V.P. Laboratory Services

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NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Level II QC Report

7/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT

COC Group Number: G0709610
Date/Time Submitted: 7/22/09 10:55

Metals by ICP/MS, method 200.8

Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
Barium	0.096	5	<2.5	µg/L	Q43293
Cadmium	0.063	1	<0.5	µg/L	Q43293
Chromium	0.036	1	<0.5	µg/L	Q43293
Iron	6.666	50	<25	µg/L	Q43293
Lead	0.076	1	<0.5	µg/L	Q43293
Manganese	0.094	5	<2.5	µg/L	Q43293
Selenium	0.063	1	<0.5	µg/L	Q43293

Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Barium	102.32	100	µg/L	102	85-115	Q43293
Cadmium	100.72	100	µg/L	101	85-115	Q43293
Chromium	100	100	µg/L	100	85-115	Q43293
Iron	99.25	100	µg/L	99	85-115	Q43293
Lead	98.61	100	µg/L	99	85-115	Q43293
Manganese	99.24	100	µg/L	99	85-115	Q43293
Selenium	103.15	100	µg/L	103	85-115	Q43293

Matrix Spike

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
252778	Barium	139.80	100	µg/L	101	70-130	Q43293
	Cadmium	99.740	100	µg/L	100	70-130	Q43293
	Chromium	93.540	100	µg/L	93	70-130	Q43293
	Iron	87.660	100	µg/L	92	70-130	Q43293
	Lead	96.060	100	µg/L	95	70-130	Q43293
	Manganese	93.960	100	µg/L	94	70-130	Q43293
	Selenium	105.600	100	µg/L	105	70-130	Q43293

Matrix Spike Duplicate

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Ranges %	RPD %	RPD Range %	QC Batch ID
252778	Barium	138.700	100	µg/L	100	70-130	1	0 - 10	Q43293
	Cadmium	98.660	100	µg/L	99	70-130	1	0 - 10	Q43293
	Chromium	93.010	100	µg/L	93	70-130	1	0 - 10	Q43293
	Iron	87.380	100	µg/L	92	70-130	0	0 - 10	Q43293
	Lead	95.80	100	µg/L	95	70-130	0	0 - 10	Q43293
	Manganese	93.850	100	µg/L	93	70-130	0	0 - 10	Q43293
	Selenium	105.100	100	µg/L	105	70-130	0	0 - 10	Q43293

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NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

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Level II QC Report

7/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT

COC Group Number: G0709610
Date/Time Submitted: 7/22/09 10:55

Sulfate by Ion Chromatography, method 300.0

Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
Sulfate	ND	1	<0.5	mg/L	Q43361

Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Sulfate	5.061	5	mg/L	101	90-110	Q43361

#-See Case Narrative

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CHAIN OF CUSTODY RECORD

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Phone: 704/529-6364 • Fax: 704/525-0409

PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING: ZH071009ERM

Client Company Name: ERM NC, PC
Report To/Contact Name: A. Martin
Reporting Address: 8000 Corporate Center Dr #200 Charlotte NC 28226
Phone: 704541-8345 Fax (Yes) (No):
Email (Yes) (No) Email Address alan.martin@erm.com
EDD Type: PDF X Excel X Other
Site Location Name: Phipps
Site Location Physical Address: 8320 Crestbrook Rural Hall

Project Name: RJRT
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:
Address: SAME

Purchase Order No./Billing Reference 103137
Requested Due Date ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days ☒ 5 Days
"Working Days" ☐ 6-9 Days ☐ Standard 10 days ☐ Rush Work Must Be Pre-Approved
Samples received after 15:00 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

	YES	NO	N/A
Samples INTACT upon arrival?	✓		
Received ON WET ICE? Temp 3.6	✓		
PROPER PRESERVATIVES indicated?	✓		
Received WITHIN HOLDING TIMES?	✓		
CUSTODY SEALS INTACT?			✓
VOLATILES rec'd W/OUT HEADSPACE?			✓
PROPER CONTAINERS used?	✓		

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

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER *TYPE SEE BELOW	SAMPLE CONTAINER NO.	SAMPLE CONTAINER SIZE	PRESERVATIVES	ANALYSES REQUESTED: Sulfates	ANALYSES REQUESTED: Metals by 200.8					REMARKS	PRISM LAB ID NO.
8320 Crestbrook	9/20/09	0845	W	P	2		None/HNO3	X	X					Metals by 200.8 Iron, Manganese, Selenium, Barium, Chromium, Cadmium, Lead	252778

Sampler's Signature: Alan D Martin
Sampled By (Print Name): A. Martin
Affiliation: ERM

PRESS DOWN FIRMLY - 3 COPIES

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)	Received By: (Signature)	Date	Military/Hours
Relinquished By: (Signature)	Received By: (Signature)	Date	
Relinquished By: (Signature)	Received for Prism Laboratories By:	Date 7/22/09	1055

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
COC Group No. GP709610

Additional Comments:

PRISM USE ONLY
Site Arrival Time:
Site Departure Time:
Field Tech Fee:
Mileage:

NPDES:	UST:	GROUNDWATER:	DRINKING WATER:	SOLID WASTE:	RCRA:	CERCLA	LANDFILL	OTHER:
☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☒ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ 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

ERM NC, PC

8000 Corporate Center Dr.
Suite 200
Charlotte, NC 28226
(704) 541-8345
(704) 541-8416 (fax)

October 27, 2009

Reference: Notification of Water Supply Well Sample Results
1160 Sixty Five Highway
Forsyth County Parcel ID #: 6921-40-1108 & 6921-30-9647
Rural Hall, NC

Mr. Don Stewart
1160 Sixty Five Highway
Rural Hall, NC 27045

Dear Mr. Stewart:

On behalf of R.J. Reynolds Tobacco Company, ERM NC, PC (ERM) would like to thank you for your cooperation in allowing us to sample your water supply wells on July 20 and August 3, 2009. The water well sampling was conducted as part of a ground water assessment required by the North Carolina Department of Environment and Natural Resources (NCDENR).

The water samples obtained from your residential well and livestock well on July 20 were tested for the presence of certain metals and sulfates. The laboratory analyses utilized methods approved by the NCDENR. Copies of laboratory reports for your water samples are enclosed and a summary of the results is presented in the table below along with the applicable North Carolina Ground Water Standards.

Owner	D. Stewart – 1160 Sixty Five Highway		
Sample Date	July 20	July 20	NC
Sample Location	Residence – Front Spigot	Barn – Well Head	Ground Water
Laboratory Sample ID	Residence	Livestock	Standard
Inorganic Laboratory Analyses (ug/L)			
Iron	Not Detected	Not Detected	300
Manganese	Not Detected	Not Detected	50
Selenium	Not Detected	Not Detected	50
Barium	150	39	2,000
Cadmium	Not Detected	Not Detected	1.75
Chromium	1.3	Not Detected	50
Lead	**28**	Not Detected	15
Sulfates (mg/L)	Not Detected	10	250
Field Measurements			
pH (Standard Units)	5.70	6.95	6.5 - 8.5
Conductivity (mS/cm)	1.62	0.90	Not Established
Dissolved Oxygen (mg/l)	7.38	1.84	Not Established
Oxidation-Reduction Potential (millivolts)	218	38	Not Established
Turbidity (NTUs)	0.8	4.4	Not Established
Temperature (degrees Celsius)	16.7	15.5	Not Established

ug/l = Micrograms per Liter (equivalent to parts per billion)
Mg/l = Milligrams per Liter (equivalent to parts per million)

LIVESTOCK WELL RESULTS

The levels of barium and sulfates detected in the water sample from the livestock well are below the applicable North Carolina Ground Water Quality Standards and typical of their natural occurrence in ground water within the Piedmont Region of North Carolina. The pH of the water sample was also within the natural range of pH for ground water in the Piedmont Region. No lead was detected in the sample from the livestock well.

RESIDENTIAL WELL RESULTS

As noted in the chart above, lead was detected in the water sample from the residential well at 28 micrograms per liter (ug/L) which is above the applicable North Carolina Ground Water Quality Standard of 15 ug/L.

The levels of barium and chromium are below the North Carolina Ground Water Quality Standards and are typical of their natural occurrence in ground water within the Piedmont Region of North Carolina. Although the pH of the water sample was outside the range of the North Carolina Ground Water Quality Standard of 6.5 to 8.5 standard units, the measured pH is considered to be within the natural range of pH for ground water in the Piedmont Region.

On July 31, 2009, we contacted you by telephone to inform you that the lead concentration detected in the water sample collected from the residential well on July 20 was above the applicable North Carolina Ground Water Quality Standard (NCGWS) of 15 ug/L. We alerted you to the recommendation by the Forsyth County Health Department to immediately discontinue the use of your well water for drinking and cooking, since the lead concentration in the water sample is above the North Carolina Ground Water Quality Standard. You indicated to me during our conversation on July 20 and again on July 31 that you have not been drinking water from your well for several years.

In accordance with guidance by the Forsyth County Health Department, your residential well water was re-sampled on August 3, 2009 for the presence of lead. Samples were also collected by Forsyth County Health Department personnel that same day for comparison purposes. The water sample collected by ERM from your plumbing system was obtained from the spigot located immediately "upstream" of the pressure tank for the well after allowing the water to run for approximately 20 minutes. Copies of the laboratory report from the re-sampling are enclosed and the results are summarized below.

Owner Sample Date Sample Location Laboratory Sample ID	D. Stewart – 1160 Sixty-Five Highway August 3 Spigot at Pressure Tank Residence	NC Ground Water Standard
Inorganic Laboratory Analyses (ug/L)		
Lead	**39**	15
Field Measurements		
pH (Standard Units)	5.99	6.5 - 8.5
Conductivity (mS/cm)	0.166	Not Established
Dissolved Oxygen (mg/l)	7.61	Not Established
Oxidation-Reduction Potential (millivolts)	255	Not Established
Turbidity (NTUs)	58.0	Not Established
Temperature (degrees Celsius)	17.8	Not Established

ug/l = Micrograms per Liter (equivalent to parts per billion)
Mg/l = Milligrams per Liter (equivalent to parts per million)

The results from this re-sampling indicate that lead level is above the North Carolina Ground Water Quality Standard and is comparable to the lead results for the sample collected on July 20. ERM understands that the results from the Forsyth County Health Department's re-sampling indicated that one of the samples slightly exceeded the NC Ground Water Quality Standard and it has provided copies of these results to you directly. The source of the lead in your water is currently undetermined.

On August 24 after your return from your three week vacation, we contacted you to inform you of the re-sampling results and inform you that a representative of Le Bleu Water Corporation would be contacting you regarding delivery of bottled water to your home for drinking and cooking purposes. In addition, we informed you that additional ground water assessment activities were being conducted by ERM under a plan approved by the NCDENR.

On September 16, 2009, it is also our understanding that the Forsyth County Health Department collected three additional samples for lead analysis to further evaluate lead levels in the plumbing of your structure and the ground water. According to Mr. Brock Turner of the Forsyth County Health Department, three samples were collected from your kitchen sink at different intervals and included a "first draw" sample and then at five and 15 minute intervals. No lead was detected in each of the three samples collected and analyzed by the Forsyth County Health Department in September 2009.

ERM will submit our analytical results to the NCDENR and the Forsyth County Health Department for their records. The Forsyth County Health Department can provide information concerning the drinking water standards and recommendations for water use limitations and/or treatment options for your well. Further information may be obtained by contacting Brock Turner with the Forsyth County Health Department at 336-703-3225.

If you have any questions, please contact me at 704-541-8345. Thank you for your assistance.

Sincerely,

Alan Martin
Project Manager

Attachment

cc: Jackie Drummond – NCDENR
Brock Turner – Forsyth County Health Department

Case Narrative

PRISM
LABORATORIES, INC.

Date:	07/29/09	**Client Project ID:**	RJRT
Company:	ERM NC, PC	**Prism COC Group No:**	G0709611
Contact:	Alan Martin	**Collection Date(s):**	07/20/09
Address:	Suite 200 8000 Corporate Center Drive Charlotte, NC 28226	**Lab Submittal Date(s):**	07/22/09

This data package contains the analytical results for the project identified above and includes a Case Narrative, Laboratory Report and Quality Control Data totaling 4 pages. A chain-of-custody is also attached for the samples submitted to Prism for this project.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative. Quality control statements and/or sample specific remarks are included in the sample comments section of the laboratory report for each sample affected.

Semi Volatile Analysis

N/A

Volatile Analysis

N/A

Metals Analysis

No Anomalies Reported

Wet Lab and Micro Analysis

Analysis Note for Q43361 LCS Sulfate: No MS/MSD with this batch.

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

Data Reviewed by:	Robbi A. Jones	**Project Manager:**	Angela D. Overcash
Signature:	Robbi A. Jones	**Signature:**	
Review Date:	07/29/09	**Approval Date:**	07/29/09

Data Qualifiers Key Reference:

B: Compound also detected in the method blank.
#: Result outside of the QC limits.
DO: Compound diluted out.
E: Estimated concentration, calibration range exceeded.
J: The analyte was positively identified but the value is estimated below the reporting limit.
H: Estimated concentration with a high bias.
L: Estimated concentration with a low bias.
M: A matrix effect is present.

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NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Laboratory Report

07/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT
Sample Matrix: Water

Client Sample ID: D. Stewart - Residence
Prism Sample ID: 252779
COC Group: G0709611
Time Collected: 07/20/09 9:45
Time Submitted: 07/22/09 10:55

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Metals by ICP/MS									
Barium	**150**	µg/L	5.0	0.18	1	200.8	07/24/09 15:29	mcampbell	Q43293
Cadmium	**BRL**	µg/L	1.0	0.030	1	200.8	07/24/09 15:29	mcampbell	Q43293
Chromium	**1.3**	µg/L	1.0	0.12	1	200.8	07/24/09 15:29	mcampbell	Q43293
Iron	**BRL**	µg/L	50	1.0	1	200.8	07/24/09 15:29	mcampbell	Q43293
Lead	**28**	µg/L	1.0	0.054	1	200.8	07/24/09 15:29	mcampbell	Q43293
Manganese	**BRL**	µg/L	5.0	0.28	1	200.8	07/24/09 15:29	mcampbell	Q43293
Selenium	**BRL**	µg/L	1.0	0.58	1	200.8	07/24/09 15:29	mcampbell	Q43293
Sulfate by Ion Chromatography									
Sulfate	**BRL**	mg/L	1.0	0.098	1	300.0	07/28/09 0:09	celfaki	Q43361

Sample Comment(s):

BRL = Below Reporting Limit

Values are reported down to the reporting limits only. No J-flags applied.

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a wet-weight basis

Angela D. Overcash, V.P. Laboratory Services

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Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Full Service Analytical & Environmental Solutions

Laboratory Report

07/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT
Sample Matrix: Water

Client Sample ID: D. Stewart - Livestock
Prism Sample ID: 252780
COC Group: G0709611
Time Collected: 07/20/09 10:30
Time Submitted: 07/22/09 10:55

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Metals by ICP/MS									
Barium	**39**	µg/L	5.0	0.18	1	200.8	07/24/09 15:36	mcampbell	Q43293
Cadmium	**BRL**	µg/L	1.0	0.030	1	200.8	07/24/09 15:36	mcampbell	Q43293
Chromium	**BRL**	µg/L	1.0	0.12	1	200.8	07/24/09 15:36	mcampbell	Q43293
Iron	**BRL**	µg/L	50	1.0	1	200.8	07/24/09 15:36	mcampbell	Q43293
Lead	**BRL**	µg/L	1.0	0.054	1	200.8	07/24/09 15:36	mcampbell	Q43293
Manganese	**BRL**	µg/L	5.0	0.28	1	200.8	07/24/09 15:36	mcampbell	Q43293
Selenium	**BRL**	µg/L	1.0	0.58	1	200.8	07/24/09 15:36	mcampbell	Q43293
Sulfate by Ion Chromatography									
Sulfate	**10**	mg/L	1.0	0.098	1	300.0	07/28/09 0:31	celfaki	Q43361

Sample Comment(s):

BRL = Below Reporting Limit

Values are reported down to the reporting limits only. No J-flags applied.

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a wet-weight basis

Angela D. Overcash, V.P. Laboratory Services

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PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Level II QC Report

7/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT

COC Group Number: G0709611
Date/Time Submitted: 7/22/09 10:55

Metals by ICP/MS, method 200.8

Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
Barium	0.096	5	<2.5	µg/L	Q43293
Cadmium	0.063	1	<0.5	µg/L	Q43293
Chromium	0.036	1	<0.5	µg/L	Q43293
Iron	6.666	50	<25	µg/L	Q43293
Lead	0.076	1	<0.5	µg/L	Q43293
Manganese	0.094	5	<2.5	µg/L	Q43293
Selenium	0.063	1	<0.5	µg/L	Q43293

Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Barium	102.32	100	µg/L	102	85-115	Q43293
Cadmium	100.72	100	µg/L	101	85-115	Q43293
Chromium	100	100	µg/L	100	85-115	Q43293
Iron	99.25	100	µg/L	99	85-115	Q43293
Lead	98.61	100	µg/L	99	85-115	Q43293
Manganese	99.24	100	µg/L	99	85-115	Q43293
Selenium	103.15	100	µg/L	103	85-115	Q43293

Matrix Spike

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
252778	Barium	139.80	100	µg/L	101	70-130	Q43293
	Cadmium	99.740	100	µg/L	100	70-130	Q43293
	Chromium	93.540	100	µg/L	93	70-130	Q43293
	Iron	87.660	100	µg/L	92	70-130	Q43293
	Lead	96.060	100	µg/L	95	70-130	Q43293
	Manganese	93.960	100	µg/L	94	70-130	Q43293
	Selenium	105.600	100	µg/L	105	70-130	Q43293

Matrix Spike Duplicate

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Ranges %	RPD %	RPD Range %	QC Batch ID
252778	Barium	138.700	100	µg/L	100	70-130	1	0 - 10	Q43293
	Cadmium	98.660	100	µg/L	99	70-130	1	0 - 10	Q43293
	Chromium	93.010	100	µg/L	93	70-130	1	0 - 10	Q43293
	Iron	87.380	100	µg/L	92	70-130	0	0 - 10	Q43293
	Lead	95.80	100	µg/L	95	70-130	0	0 - 10	Q43293
	Manganese	93.850	100	µg/L	93	70-130	0	0 - 10	Q43293
	Selenium	105.100	100	µg/L	105	70-130	0	0 - 10	Q43293

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NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Full Service Analytical & Environmental Solutions

Level II QC Report

7/29/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT

COC Group Number: G0709611
Date/Time Submitted: 7/22/09 10:55

Sulfate by Ion Chromatography, method 300.0

Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
Sulfate	ND	1	<0.5	mg/L	Q43361

Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Sulfate	5.061	5	mg/L	101	90-110	Q43361

#-See Case Narrative

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PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING: ZH071009ERA

Project Name: RJRT

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:

Address: SAME

Purchase Order No./Billing Reference 103137

Requested Due Date ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days ☒ 5 Days

"Working Days" ☐ 6-9 Days ☐ Standard 10 days ☐ Rush Work Must Be Pre-Approved

Samples received after 15:00 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)

Client Company Name: ERM NC, PC

Report To/Contact Name: A. Martin

Reporting Address: 8000 Corporate Center Dr #200 Charlotte NC 28226

Phone: (704) 541-8345 Fax (Yes) (No):

Email (Yes) (No) Email Address alan.martin@erm.com

EDD Type: PDF ✓ Excel ✓ Other

Site Location Name: DON Stewart

Site Location Physical Address: 1160 Sixty Five Hwy Rural Hall

LAB USE ONLY

	YES	NO	N/A
Samples INTACT upon arrival?	✓		
Received ON WET ICE? Temp 3.6	✓		
PROPER PRESERVATIVES indicated?	✓		
Received WITHIN HOLDING TIMES?	✓		
CUSTODY SEALS INTACT?			✓
VOLATILES rec'd W/OUT HEADSPACE?			✓
PROPER CONTAINERS used?	✓		

TO BE FILLED IN BY CLIENT/SAMPLING PERSONNEL

Certification: NELAC ____ USACE ____ FL ____ NC ✓ SC ____ OTHER ____ N/A ____

Water Chlorinated: YES ____ NO ✓

Sample Iced Upon Collection: YES ✓ NO ____

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER *TYPE SEE BELOW	NO.	SIZE	PRESERVATIVES	Sulfates	Metals by 200.8					REMARKS	PRISM LAB ID NO.
1160 Sixty Five	7/20/09	0945	W	P	2		None/HNO3	X	X					Metals by 200.8	252779
1160 Sixty Five	7/20/09	1030	W	P	2		" "	X	X					IRON, Manganese, Selenium, Barium, Chromium, Cadmium, Lead	252780
														0945=Don Stewart	
														1030=Don Stewart Livestock	

Sampler's Signature [signature] Sampled By (Print Name) A. Martin Affiliation ERM

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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)	Received By: (Signature)	Date	Military/Hours
Relinquished By: (Signature)	Received By: (Signature)	Date	
Relinquished By: (Signature)	Received For Prism Laboratories By: [signature]	Date 7/22/09	1055

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

COC Group No. G0709611

Additional Comments:

PRISM USE ONLY

Site Arrival Time:

Site Departure Time:

Field Tech Fee:

Mileage:

NPDES:	UST:	GROUNDWATER:	DRINKING WATER:	SOLID WASTE:	RCRA:	CERCLA	LANDFILL	OTHER:
☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☒ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ 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

PRISM
LABORATORIES, INC.

Case Narrative

Date:	08/07/09	**Client Project ID:**	RJRT
Company:	ERM NC, PC	**Prism COC Group No:**	G0809043
Contact:	Alan Martin	**Collection Date(s):**	08/03/09
Address:	Suite 200 8000 Corporate Center Drive Charlotte, NC 28226	**Lab Submittal Date(s):**	08/04/09

This data package contains the analytical results for the project identified above and includes a Case Narrative, Laboratory Report and Quality Control Data totaling 3 pages. A chain-of-custody is also attached for the samples submitted to Prism for this project.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative. Quality control statements and/or sample specific remarks are included in the sample comments section of the laboratory report for each sample affected.

Semi Volatile Analysis

N/A

Volatile Analysis

N/A

Metals Analysis

No Anomalies Reported

Wet Lab and Micro Analysis

N/A

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

Data Reviewed by:	Robbi A. Jones	**Project Manager:**	Angela D. Overcash
Signature:	Robbi A. Jones	**Signature:**	
Review Date:	08/07/09	**Approval Date:**	08/07/09

Data Qualifiers Key Reference:

B: Compound also detected in the method blank.
#: Result outside of the QC limits.
DO: Compound diluted out.
E: Estimated concentration, calibration range exceeded.
J: The analyte was positively identified but the value is estimated below the reporting limit.
H: Estimated concentration with a high bias.
L: Estimated concentration with a low bias.
M: A matrix effect is present.

Notes: This report should not be reproduced, except in its entirety, without the writtten consent of Prism Laboratories, Inc. The results in this report relate only to the samples submitted for analysis.

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PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Laboratory Report

08/07/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT
Sample Matrix: Water

Client Sample ID: Residence
Prism Sample ID: 253877
COC Group: G0809043
Time Collected: 08/03/09 15:40
Time Submitted: 08/04/09 9:13

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Metals by ICP/MS									
Lead	**39**	µg/L	1.0	0.054	1	200.8	08/05/09 17:32	mcampbell	Q43548

Sample Comment(s):

BRL = Below Reporting Limit

Values are reported down to the reporting limits only. No J-flags applied.

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a wet-weight basis

Angela D. Overcash, V.P. Laboratory Services

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SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Level II QC Report

8/7/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT

COC Group Number: G0809043
Date/Time Submitted: 8/4/09 9:13

Metals by ICP/MS, method 200.8

Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
Lead	0.110	1	<0.5	µg/L	Q43548

Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Lead	102.14	100	µg/L	102	85-115	Q43548

Matrix Spike

Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
253875 Lead	113.00	100	µg/L	102	70-130	Q43548

Matrix Spike Duplicate

Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	RPD %	RPD Range %	QC Batch ID
253875 Lead	113.300	100	µg/L	102	70-130	0	0 - 10	Q43548

#-See Case Narrative

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Phone: 704/529-6364 • Fax: 704/525-0409

PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING:

Client Company Name: ERM
Report To/Contact Name: A. Martin
Reporting Address: 8000 Corp. Center Dr. #200 Charlotte NC 28211 28226
Phone: 704 541 8345 Fax ~~(Yes) (No)~~:
Email (Yes) (No) Email Address: Alan.Martin@erm.com
EDD Type: PDF X Excel X Other
Site Location Name: Don Stewart
Site Location Physical Address: 1160 Sixty Five Hwy Rural Hall NC

Project Name: RSRT
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 103137
Requested Due Date ☐ 1 Day ☐ 2 Days ☐ 3 Days ☐ 4 Days ☐ 5 Days
"Working Days" ☐ 6-9 Days ☐ Standard 10 days ☐ Rush Work Must Be Pre-Approved
Samples received after 15:00 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

	YES	NO	N/A
Samples INTACT upon arrival?	✓		
Received ON WET ICE? Temp 3.7°	✓		
PROPER PRESERVATIVES indicated?	✓		
Received WITHIN HOLDING TIMES?	✓		
CUSTODY SEALS INTACT?			✓
VOLATILES rec'd W/OUT HEADSPACE?			✓
PROPER CONTAINERS used?	✓		

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

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER *TYPE SEE BELOW	NO.	SIZE	PRESERVATIVES	ANALYSES REQUESTED: Lead	Dylan					REMARKS	PRISM LAB ID NO.
Residence	8/3/09	1540	W	P	1	250ml	HNO3	X							253877

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Sampler's Signature: Alan D. Martin Sampled By (Print Name): A. Martin Affiliation: ERM

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)	Received By: (Signature)	Date	Military/Hours
Alan D. Martin		8/4/09	09:13
Relinquished By: (Signature)	Received By: (Signature)	Date	
Relinquished By: (Signature)	Received For Prism Laboratories By:	Date 8/4/09	09:13

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
COC Group No. G0809043

Additional Comments: Sample collected @ spigot immediately upstream of pressure tank

PRISM USE ONLY
Site Arrival Time:
Site Departure Time:
Field Tech Fee:
Mileage:

NPDES:	UST:	GROUNDWATER:	DRINKING WATER:	SOLID WASTE:	RCRA:	CERCLA	LANDFILL	OTHER:
☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ 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

ERM NC, PC

8000 Corporate Center Dr.
Suite 200
Charlotte, NC 28226
(704) 541-8345
(704) 541-8416 (fax)

August 20, 2009

Reference: Notification of Water Supply Well Sample Results
8390 Crestbrook Road
Forsyth County Parcel ID #: 6921-41-4516
Rural Hall, NC

Michael & Susan Sprinkle
8390 Crestbrook Road
Rural Hall, NC 27045

Dear Mr. & Mrs. Sprinkle:

On behalf of R.J. Reynolds Tobacco Company, ERM NC, PC (ERM) would like to thank you for your cooperation in allowing us to sample your water supply well on July 28 and August 3. The water well sampling was conducted as part of a ground water quality assessment required by the North Carolina Department of Environment and Natural Resources (NCDENR).

The water sample obtained from your well on July 28 was tested for the presence of a number of metals and sulfates. The laboratory tests were conducted utilizing methods approved by the NCDENR. Copies of laboratory reports for your water samples are enclosed and a summary of the test results is presented in the table below along with the applicable North Carolina Ground Water Standards.

Owner	Sprinkle - 8390 Crestbrook	
Sample Date	July 28	NC
Sample Location	Well Head	Ground Water
Laboratory Sample ID	Sprinkle	Standard
Inorganic Laboratory Analyses (ug/L)		
Iron	Not Detected	300
Manganese	Not Detected	50
Selenium	Not Detected	50
Barium	99	2,000
Cadmium	Not Detected	1.75
Chromium	Not Detected	50
Lead	**30**	15
Sulfates (mg/L)	2.5	250
Field Measurements		
pH (Standard Units)	5.13	6.5-8.5
Conductivity (mS/cm)	0.12	Not Established
Dissolved Oxygen (mg/l)	meter error	Not Established
Oxidation-Reduction Potential (millivolts)	376	Not Established
Turbidity (NTUs)	4.9	Not Established
Temperature (degrees Celsius)	15.8	Not Established

ug/l = Micrograms per Liter (equivalent to parts per billion)
Mg/l = Milligrams per Liter (equivalent to parts per million)

As noted in the chart above, lead was detected in the water sample at 30 micrograms per liter (ug/L) which is above the applicable North Carolina Ground Water Quality Standard of 15 ug/L.

The levels of barium and sulfates detected in the water sample are typical of their natural occurrence in ground water within the Piedmont Region of North Carolina. These levels are not above the North Carolina Ground Water Quality Standards. The pH of the water sample was also within the natural range of pH for ground water in the Piedmont Region.

On July 31, 2009, we contacted you by telephone to inform you that the lead concentration detected in the water sample collected from your well on July 28 was above the applicable North Carolina Ground Water Quality Standard (NCGWS) of 15 ug/L. We alerted you to the recommendation by the Forsyth County Department of Public Health to immediately discontinue the use of your well water for drinking and cooking, since the lead concentration in the water sample is above the North Carolina Ground Water Quality Standard.

In accordance with guidance by the Forsyth County Health Department, your well water was re-sampled on August 3, 2009 for the presence of lead. Samples were also collected by Forsyth County Health Department personnel that same day for comparison purposes. Two water samples were collected by ERM from your plumbing system. One sample was collected from the spigot at the south side of your house near the carport. The second sample was collected from the spigot on the well head after allowing the water to run for approximately 35 minutes. Copies of the laboratory reports from the re-sampling are enclosed and the results are summarized below.

Owner	Sprinkle - 8390 Crestbrook		
Sample Date	August 3	August 3	NC
Sample Location	Spigot near carport	Well Head	Ground Water
Laboratory Sample ID	First Draw	Well Head	Standard
Inorganic Laboratory Analyses (ug/L)			
Lead	11	1.1	15
Field Measurements			
pH (Standard Units)	- -	5.99	6.5-8.5
Conductivity (mS/cm)	- -	0.15	Not Established
Dissolved Oxygen (mg/l)	- -	7.22	Not Established
Oxidation-Reduction Potential (millivolts)	- -	329	Not Established
Turbidity (NTUs)	- -	1.0	Not Established
Temperature (degrees Celsius)	- -	17.2	Not Established

ug/l = Micrograms per Liter (equivalent to parts per billion) "- -" = Not analyzed
Mg/l = Milligrams per Liter (equivalent to parts per million)

The results from this re-sampling indicate that lead levels are below the previous testing results and below the North Carolina Ground Water Quality Standard. The first draw of water from the spigot at the house contained 11 ug/L which is below the NCGWS of 15 ug/L. Subsequent sampling from the well head, after the water was flowing for approximately 35 minutes, indicated a lead level of 1.1 ug/L. As of August 19, 2009, the Health Department has not yet received the laboratory results from its samples.

On August 14, we contacted you to inform you of the re-sampling results and inform you that a representative of Le Bleu Water Corporation would be contacting you to deliver bottled water to your home for drinking and cooking purposes.

The results of the well sampling program indicated the presence of lead at levels above drinking water standards in one other water well sampled in the area. The source of the lead in your water and the other well is currently undetermined. Additional ground water assessment activities are being conducted by ERM under a plan approved by the NCDENR.

ERM will submit the results to the NCDENR Solid Waste Section and the Forsyth County Health Department for their records. Once the Health Department's sample results become available, we will work with the Health Department on the next steps for evaluating your ground water quality. The Health Department can provide information concerning the chemical constituents and the drinking water standards and recommendations for water use limitations, treatment options or future sampling. Since the concentrations of lead in the August 3 water samples are lower than the July 28 sample results and below the North Carolina Ground Water Quality Standard, additional testing may be necessary. Further information may be obtained by contacting Brock Turner with the Forsyth County Health Department at 336-703-3225.

If you have any questions, please contact me at 704-541-8345. Thank you for your assistance.

Sincerely,

Alan Martin
Project Manager

Attachment

cc: Jackie Drummond – NCDENR
Brock Turner – Forsyth County Health Department

PRISM
LABORATORIES, INC.

Case Narrative

Date:	07/30/09	**Client Project ID:**	RJRT
Company:	ERM NC, PC	**Prism COC Group No:**	G0709765
Contact:	Alan Martin	**Collection Date(s):**	07/28/09
Address:	Suite 200 8000 Corporate Center Drive Charlotte, NC 28226	**Lab Submittal Date(s):**	07/28/09

This data package contains the analytical results for the project identified above and includes a Case Narrative, Laboratory Report and Quality Control Data totaling 4 pages. A chain-of-custody is also attached for the samples submitted to Prism for this project.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative. Quality control statements and/or sample specific remarks are included in the sample comments section of the laboratory report for each sample affected.

Semi Volatile Analysis

N/A

Volatile Analysis

N/A

Metals Analysis

No Anomalies Reported

Wet Lab and Micro Analysis

Analysis Note for Q43374 LCS Sulfate: No MS/MSD with this batch.

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

Data Reviewed by:	Robbi A. Jones	**Project Manager:**	Angela D. Overcash
Signature:	Robbi A. Jones	**Signature:**	
Review Date:	07/30/09	**Approval Date:**	07/30/09

Data Qualifiers Key Reference:

B: Compound also detected in the method blank.
#: Result outside of the QC limits.
DO: Compound diluted out.
E: Estimated concentration, calibration range exceeded.
J: The analyte was positively identified but the value is estimated below the reporting limit.
H: Estimated concentration with a high bias.
L: Estimated concentration with a low bias.
M: A matrix effect is present.

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Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Laboratory Report

07/30/09

ERM NC, PC
Attn Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT
Sample Matrix: Water

Client Sample ID Sprinkle
Prism Sample ID 253306
COC Group: G0709765
Time Collected: 07/28/09 13:50
Time Submitted: 07/28/09 15:53

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Metals by ICP/MS									
Barium	**99**	µg/L	5.0	0.18	1	200.8	07/28/09 20:08	mcampbell	Q43385
Cadmium	**BRL**	µg/L	1.0	0.030	1	200.8	07/28/09 20:08	mcampbell	Q43385
Chromium	**BRL**	µg/L	1.0	0.12	1	200.8	07/28/09 20:08	mcampbell	Q43385
Iron	**BRL**	µg/L	50	1.0	1	200.8	07/28/09 20:08	mcampbell	Q43385
Lead	**30**	µg/L	1.0	0.054	1	200.8	07/28/09 20:08	mcampbell	Q43385
Manganese	**BRL**	µg/L	5.0	0.28	1	200.8	07/28/09 20:08	mcampbell	Q43385
Selenium	**BRL**	µg/L	1.0	0.58	1	200.8	07/28/09 20:08	mcampbell	Q43385
Sulfate by Ion Chromatography									
Sulfate	**2.5**	mg/L	1.0	0.098	1	300.0	07/29/09 1:09	celfaki	Q43374

Sample Comment(s):

BRL = Below Reporting Limit

J = Estimated value between the Reporting Limit and the MDL

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a wet-weight basis

Angela D. Overcash, V.P. Laboratory Services

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Phone: 704/529-6364 - Toll Free Number: 1-800/529-6364 - Fax: 704/525-0409

PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Level II QC Report

7/30/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT

COC Group Number: G0709765
Date/Time Submitted: 7/28/09 15:53

Sulfate by Ion Chromatography, method 300.0

Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
Sulfate	ND	1	<0.5	mg/L	Q43374

Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Sulfate	5.414	5	mg/L	108	90-110	Q43374

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NC Drinking Water Cert. No. 37735

Level II QC Report

7/30/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT

COC Group Number: G0709765
Date/Time Submitted: 7/28/09 15:53

Metals by ICP/MS, method 200.8

Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
Barium	0.074	5	<2.5	µg/L	Q43385
Cadmium	0.065	1	<0.5	µg/L	Q43385
Chromium	0.119	1	<0.5	µg/L	Q43385
Iron	8.037	50	<25	µg/L	Q43385
Lead	0.081	1	<0.5	µg/L	Q43385
Manganese	0.155	5	<2.5	µg/L	Q43385
Selenium	0.227	1	<0.5	µg/L	Q43385

Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Barium	98.27	100	µg/L	98	85-115	Q43385
Cadmium	98.78	100	µg/L	99	85-115	Q43385
Chromium	103.11	100	µg/L	103	85-115	Q43385
Iron	102.72	100	µg/L	103	85-115	Q43385
Lead	97.68	100	µg/L	98	85-115	Q43385
Manganese	99.78	100	µg/L	100	85-115	Q43385
Selenium	97.73	100	µg/L	98	85-115	Q43385

Matrix Spike

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
253306	Barium	207.100	100	µg/L	108	70-130	Q43385
	Cadmium	110.100	100	µg/L	110	70-130	Q43385
	Chromium	108.900	100	µg/L	108	70-130	Q43385
	Iron	111.70	100	µg/L	109	70-130	Q43385
	Lead	135.100	100	µg/L	106	70-130	Q43385
	Manganese	107.100	100	µg/L	106	70-130	Q43385
	Selenium	113.800	100	µg/L	114	70-130	Q43385

Matrix Spike Duplicate

Sample ID:		Result	Spike Amount	Units	Recovery %	Recovery Ranges %	RPD %	RPD Range %	QC Batch ID
253306	Barium	209.800	100	µg/L	110	70-130	1	0 - 10	Q43385
	Cadmium	110.200	100	µg/L	110	70-130	0	0 - 10	Q43385
	Chromium	110.100	100	µg/L	109	70-130	1	0 - 10	Q43385
	Iron	111.500	100	µg/L	109	70-130	0	0 - 10	Q43385
	Lead	135.900	100	µg/L	106	70-130	1	0 - 10	Q43385
	Manganese	107.500	100	µg/L	107	70-130	0	0 - 10	Q43385
	Selenium	112.200	100	µg/L	112	70-130	1	0 - 10	Q43385

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CHAIN OF CUSTODY RECORD

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Phone: 704/529-6364 • Fax: 704/525-0409

PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING: 2H071009 ERM

Project Name: RTRT

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 103137.02

Requested Due Date ☐ 1 Day ☐ 2 Days ☒ 3 Days ☐ 4 Days ~~☐ 5 Days~~

"Working Days" ☐ 6-9 Days ☐ Standard 10 days ☐ Rush Work Must Be Pre-Approved

Samples received after 15:00 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)

Client Company Name: ERM
Report To/Contact Name: A. Martin
Reporting Address: 8000 Corporate Center Dr #200
Charlotte NC 28226
Phone: (704) 541-8845 Fax (Yes) (No):
Email (Yes) (No) Email Address alan.martin@erm.com
EDD Type: PDF X Excel X Other
Site Location Name: Sprinkle
Site Location Physical Address: 8390 Crestbrook
Rural Hall, NC

LAB USE ONLY

	YES	NO	N/A
Samples INTACT upon arrival?	✓		
Received ON WET ICE? Temp 5.5	✓		
PROPER PRESERVATIVES indicated?	✓		
Received WITHIN HOLDING TIMES?	✓		
CUSTODY SEALS INTACT?			✓
VOLATILES rec'd W/OUT HEADSPACE?	✓		✓
PROPER CONTAINERS used?	✓		

TO BE FILLED IN BY CLIENT/SAMPLING PERSONNEL

Certification: NELAC ____ USACE ____ FL ____ NC X
SC ____ OTHER ____ N/A ____
Water Chlorinated: YES ____ NO X
Sample Iced Upon Collection: YES X NO ____

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER *TYPE SEE BELOW	NO.	SIZE	PRESERVATIVES	Sulfates	Metals by 200.8					REMARKS	PRISM LAB ID NO.
Sprinkle	7-28-09	1350	W	P	2		None/HNO_3	X	X					Metals by 200.8 Iron, Manganese, Selenium, Barium, Chromium, Cadmium Lead	253306

PRESS DOWN FIRMLY - 3 COPIES

Sampler's Signature Donald Hall Sampled By (Print Name) Donald Hall Affiliation ERM

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)	Received By: (Signature)	Date	Military/Hours
Donald Hall		7/28/09	1553
Relinquished By: (Signature)	Received By: (Signature)	Date	
Relinquished By: (Signature)	Received For Prism Laboratories By:	Date	
	[illegible]	7/28/09	1553

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

COC Group No. G0709765

Additional Comments: Results by Friday, 7/31/09

PRISM USE ONLY

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

NPDES:	UST:	GROUNDWATER:	DRINKING WATER:	SOLID WASTE:	RCRA:	CERCLA	LANDFILL	OTHER:
☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☒ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ 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

PRISM
LABORATORIES,INC.

Case Narrative

Date:	08/07/09	**Client Project ID:**	RJRT
Company:	ERM NC, PC	**Prism COC Group No:**	G0809042
Contact:	Alan Martin	**Collection Date(s):**	08/03/09
Address:	Suite 200 8000 Corporate Center Drive Charlotte, NC 28226	**Lab Submittal Date(s):**	08/04/09

This data package contains the analytical results for the project identified above and includes a Case Narrative, Laboratory Report and Quality Control Data totaling 4 pages. A chain-of-custody is also attached for the samples submitted to Prism for this project.

Data qualifiers are flagged individually on each sample. A key reference for the data qualifiers appears at the end of this case narrative. Quality control statements and/or sample specific remarks are included in the sample comments section of the laboratory report for each sample affected.

Semi Volatile Analysis

N/A

Volatile Analysis

N/A

Metals Analysis

No Anomalies Reported

Wet Lab and Micro Analysis

N/A

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

Data Reviewed by:	Robbi A. Jones	**Project Manager:**	Angela D. Overcash
Signature:	Robbi A. Jones	**Signature:**	
Review Date:	08/07/09	**Approval Date:**	08/07/09

Data Qualifiers Key Reference:

B: Compound also detected in the method blank.
#: Result outside of the QC limits.
DO: Compound diluted out.
E: Estimated concentration, calibration range exceeded.
J: The analyte was positively identified but the value is estimated below the reporting limit.
H: Estimated concentration with a high bias.
L: Estimated concentration with a low bias.
M: A matrix effect is present.

Notes: This report should not be reproduced, except in its entirety, without the writtten consent of Prism Laboratories, Inc. The results in this report relate only to the samples submitted for analysis.

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PRISM LABORATORIES, INC.
Full Service Analytical & Environmental Solutions

NC Certification No. 402
SC Certification No. 99012
NC Drinking Water Cert. No. 37735

Laboratory Report

08/07/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT
Sample Matrix: Water

Client Sample ID: First Draw
Prism Sample ID: 253875
COC Group: G0809042
Time Collected: 08/03/09 13:45
Time Submitted: 08/04/09 9:13

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Metals by ICP/MS									
Lead	**11**	µg/L	1.0	0.054	1	200.8	08/05/09 17:05	mcampbell	Q43548

Sample Comment(s):

BRL = Below Reporting Limit

Values are reported down to the reporting limits only. No J-flags applied.

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a wet-weight basis

Angela D. Overcash, V.P. Laboratory Services

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NC Certification No. 402
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NC Drinking Water Cert. No. 37735

Laboratory Report

08/07/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT
Sample Matrix: Water

Client Sample ID: Well Head
Prism Sample ID: 253876
COC Group: G0809042
Time Collected: 08/03/09 14:30
Time Submitted: 08/04/09 9:13

Parameter	Result	Units	Report Limit	MDL	Dilution Factor	Method	Analysis Date/Time	Analyst	Batch ID
Metals by ICP/MS									
Lead	**1.1**	µg/L	1.0	0.054	1	200.8	08/05/09 17:26	mcampbell	Q43548

Sample Comment(s):

BRL = Below Reporting Limit

Values are reported down to the reporting limits only. No J-flags applied.

The results in this report relate only to the samples submitted for analysis and meet state certification requirements other than NELAC certification except for those instances indicated in the case narrative and/or test comments.

All results are reported on a wet-weight basis

Angela D. Overcash, V.P. Laboratory Services

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NC Drinking Water Cert. No. 37735

Level II QC Report

8/7/09

ERM NC, PC
Attn: Alan Martin
Suite 200
8000 Corporate Center Drive
Charlotte, NC 28226

Project ID: RJRT

COC Group Number: G0809042
Date/Time Submitted: 8/4/09 9:13

Metals by ICP/MS, method 200.8

Method Blank

	Result	RL	Control Limit	Units	QC Batch ID
Lead	0.110	1	<0.5	µg/L	Q43548

Laboratory Control Sample

	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
Lead	102.14	100	µg/L	102	85-115	Q43548

Matrix Spike

Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	QC Batch ID
253875 Lead	113.00	100	µg/L	102	70-130	Q43548

Matrix Spike Duplicate

Sample ID:	Result	Spike Amount	Units	Recovery %	Recovery Ranges %	RPD %	RPD Range %	QC Batch ID
253875 Lead	113.300	100	µg/L	102	70-130	0	0 - 10	Q43548

#-See Case Narrative

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Phone: 704/529-6364 • Fax: 704/525-0409

PAGE 1 OF 1 QUOTE # TO ENSURE PROPER BILLING:

Client Company Name: ERM
Report To/Contact Name: 8000 Corp. Center Dr. #200
Reporting Address: Alan Martin
Charlotte NC 28226
Phone: 704 541 6345 Fax (Yes) (No)
Email (Yes) (No) Email Address: Alan.Martin@erm.com
EDD Type: PDF ✓ Excel Other
Site Location Name: Springle
Site Location Physical Address: 8390 Crestbrook Rd
Rural Hall NC

Project Name: RSRT
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 103177
Requested Due Date ☐ 1 Day ☑ 2 Days ☐ 3 Days ☐ 4 Days ☐ 5 Days
"Working Days" ☐ 6-9 Days ☐ Standard 10 days ☐ Rush Work Must Be Pre-Approved
Samples received after 15:00 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

	YES	NO	N/A
Samples INTACT upon arrival?	✓		
Received ON WET ICE? Temp 4°	✓		
PROPER PRESERVATIVES indicated?	✓		
Received WITHIN HOLDING TIMES?	✓		
CUSTODY SEALS INTACT?			✓
VOLATILES rec'd W/OUT HEADSPACE?	✓		✓
PROPER CONTAINERS used?	✓		

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

CLIENT SAMPLE DESCRIPTION	DATE COLLECTED	TIME COLLECTED MILITARY HOURS	MATRIX (SOIL, WATER OR SLUDGE)	SAMPLE CONTAINER *TYPE SEE BELOW	NO.	SIZE	PRESERVATIVES	ANALYSES REQUESTED: LAP for 200.8						REMARKS	PRISM LAB ID NO.
First Draw	8/3/09	1345	W	P	1	250	HNO_3							collected @ spigot on side of house	253875
Well head	8/3/09	1430	W	P	1	250	HNO_3							@ well head post-purge	253876

PRESS DOWN FIRMLY - 3 COPIES

Sampler's Signature [signature] Sampled By (Print Name) Alan Martin Affiliation ERM

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)	Received By: (Signature)	Date	Military/Hours
[signature]		8/4/09	0913
Relinquished By: (Signature)	Received By: (Signature)	Date	
Relinquished By: (Signature)	Received For Prism Laboratories By: [signature]	Date 8/4/09	0913

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
COC Group No. G080904 2

Additional Comments:

PRISM USE ONLY
Site Arrival Time:
Site Departure Time:
Field Tech Fee:
Mileage:

NPDES:	UST:	GROUNDWATER:	DRINKING WATER:	SOLID WASTE:	RCRA:	CERCLA	LANDFILL	OTHER:
☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☑ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC	☐ NC ☐ SC
☐ ____	☐ ____	☐ ____	☐ ____	☐ ____	☐ ____	☐ ____	☐ ____	☐ ____

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

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ORIGINAL

APPENDIX F
SOIL LABORATORY DATA SHEETS & HELP MODEL RESULTS

Included on Enclosed CD