REPORT OF
PHASE IIA REMEDIAL INVESTIGATION

MILLS GAP ROAD SITE
SKYLAND, NORTH CAROLINA
NCD NUMBER 003149556

Prepared for:

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NOVEMBER 19, 2010

MACTEC PROJECT 6686-08-1744

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engineering and constructing a better tomorrow

November 19, 2010

Ms. Bonnie Ware
North Carolina Department of Environment and Natural Resources
DWM, Superfund Section, Inactive Hazardous Sites Branch
585 Waughtown Street
Winston-Salem, North Carolina 27107

Subject: **Report of Phase IIA Remedial Investigation**
Mills Gap Road Site
Skyland, North Carolina
NCD Number 003149556
MACTEC Project 6686-08-1744

Dear Ms. Ware:

On behalf of CTS Corporation (CTS), MACTEC Engineering and Consulting, Inc. (MACTEC) is pleased to provide this Report of Phase IIA Remedial Investigation for the above-referenced site.

This report is intended for the use of CTS and for review by the North Carolina Department of Environment and Natural Resources (NCDENR). Reliance on this document by any other party is prohibited without the express written consent of MACTEC.

If there are any questions regarding the information contained herein, please contact us at (828) 252-8130.

Sincerely,

MACTEC ENGINEERING AND CONSULTING, INC.

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1.0 BACKGROUND

MACTEC Engineering and Consulting, Inc. (MACTEC) has prepared this Report of Phase IIA Remedial Investigation (RI) for the Mills Gap Road Site (Site) on behalf of CTS Corporation (CTS) pursuant to the requirements outlined in the North Carolina Department of Environment and Natural Resources (NCDENR) Inactive Hazardous Sites Branch (IHSB) *Guidelines for Assessment and Cleanup*, dated August 2010 (*Guidelines*). The "Site" is considered the approximate 8.7-acre property containing a former manufacturing facility on Mills Gap Road in Skyland, Buncombe County, North Carolina. However, it is understood that the Site also includes adjacent land containing soil or groundwater that has become adversely impacted by processes/operations conducted at the former manufacturing facility.

1.1 SITE OPERATIONAL HISTORY

International Resistance Company owned and operated a manufacturing facility at the Site from 1952 until 1959, when CTS of Asheville, Inc. purchased the real property, building, and equipment. CTS of Asheville, Inc. manufactured electronic components at the facility from 1959 until April 1986. Arden Electroplating, Inc. leased a portion of the building from approximately December 1, 1985 until November 30, 1986, and the Site was conveyed to Mills Gap Road Associates (MGRA) on December 23, 1987. MGRA reportedly leased portions of the facility to various tenants, and otherwise utilized the building for business interests. The Site has been vacant/unoccupied since the mid-1990s.

1.2 DESCRIPTION OF SITE AND SURROUNDING AREAS

The Site is located on Mills Gap Road in Skyland, Buncombe County, North Carolina (Buncombe County tax parcel 9655625706). The approximate center of the Site is located at north latitude 35°29'36" and west longitude 82°30'25". The property is owned by MGRA and is unoccupied.

The area surrounding the Site is considered rural and contains residential and light commercial properties. The Site is situated on a topographic "saddle" between two prominent mountains, Busbee Mountain to the north and Brown Mountain to the south and southwest. Properties northwest and southeast are topographically downgradient of the Site. The majority of the Site is relatively flat and natural surface drainage at the Site is to the northwest. The surrounding area contains mountains and rolling hills, typical of the eastern flank of the Appalachian Mountain range (Figure 1).

An approximate 95,000-square foot, single-story brick and metal structure is located in the southern portion of the Site (Figure 2). The northeastern portion of the Site contains an asphalt-paved parking area and asphalt-paved driveways are located parallel to the north (front) of the building and southeast (rear) of the building. A six-foot high chain-link fence surrounds the Site and a locked gate at the north end of the Site controls access to the Site from Mills Gap Road.

2.0 METHODS OF INVESTIGATION

The objectives and methods/procedures for implementation of the Phase IIA RI are described in the following sections.

2.1 IMPLEMENTATION OF THE PHASE II REMEDIAL INVESTIGATION

MACTEC submitted a Phase II Remedial Investigation Work Plan (Work Plan), dated June 18, 2010, to NCDENR IHSB on behalf of CTS. The Work Plan addressed requirements presented in letters dated January 6, March 1, and May 20, 2010, from the IHSB to CTS; the IHSB *Guidelines*; and discussions with the IHSB personnel. In a letter dated July 26, 2010, the IHSB indicated approval of the Work Plan with an additional requirement for collection of groundwater samples from monitoring wells MW-3 and MW-3A for analysis of 1,4-dioxane.

As indicated in the Work Plan, the first task of the Phase II RI includes additional investigation of three potential source areas associated with former Site operations (Phase IIA RI). Based on the results of the Phase IIA RI source area assessment, and in consideration of the results of the Phase I RI, a list of Site-specific contaminants of concern (COCs) has been proposed herein, in accordance with provisions outlined in the *Guidelines*. The next phase of the Phase II RI includes a non-aqueous phase liquid (NAPL) assessment to assess the distribution of NAPL. Additionally, the downgradient extent of the dissolved phase contaminant plume in the overburden will be determined by iteratively installing groundwater monitoring wells. Additional information regarding the NAPL assessment and delineation of the dissolved phase plume in overburden is included in Section 6.3. Bedrock wells will be installed in the third phase of investigation. The locations of the bedrock wells will be based on available Site data and will be proposed to the IHSB prior to installation. The bedrock wells will be installed using iterative testing procedures to determine the vertical extent of contamination. Phase II RI Reports will be submitted to NCDENR after each phase of assessment, and will be consecutively named for ease of reference (e.g., Phase IIA, IIB, IIC, and so on).

2.2 INVESTIGATION METHODS/PROCEDURES

The following three potential source areas were investigated in the Phase IIA RI: 1) the former waste water pretreatment system (WWPS), including a potential gravel filter reportedly located at the same location as the WWPS, and the Site's sanitary sewer lines, 2) the former contingency basin, and 3) the area located south of the Site building and north of the gravel road.

An access agreement was obtained for the collection of soil samples on the Southside Village property, which contains the former contingency basin. A copy of the signed access agreement is included in Appendix A.

Procedures and methods implemented during the Phase IIA RI are described in the following sections. A summary of soil samples collected during the Phase IIA RI is presented in Table 1 and soil sample locations are depicted in Figure 3.

2.2.1 Sewer Line Investigation

On August 24, 2010, AET Robotic Inspection Services, Inc. (AET) mobilized to the Site to locate the Site's sewer lines. Prior to AET's arrival, MACTEC personnel attempted to locate the Site's sewer manholes that were indicated on historical drawings of the Site. MACTEC utilized a magnetic detector and probe rods to locate four of the manholes. MACTEC was unable to locate two of the six manholes indicated on the historical drawings. AET entered the accessible manholes, and used a video camera mounted on a "snake" or self-propelled "robot" to view the interior of the sewer lines. Due to obstructions (e.g., roots, soil, collapsed piping), the video camera was unable to advance through the entire length of some of the sewer lines between manholes. Where possible, the horizontal locations of the sewer lines were identified at ground surface via a metal detector capable of locating the position of the video camera inside the sewer lines. The depths of the sewer lines were estimated based on the measured depth of the sewer line inverts in the manholes, as well as the elevation along the sewer line at ground surface. The approximate locations and depths of the Site's sewer lines and manholes are indicated on Figure 2.

2.2.2 Soil Sampling

Soil sampling activities were conducted from August 30 to September 8, 2010. Prior to advancing the soil borings, the depth to groundwater was measured in monitoring wells MW-1 and MW-2 to approximate the elevation of the water table in the areas of the proposed soil boring locations. The depth to water on August 25, 2010, was approximately 24.9 feet below ground surface (bgs) in MW-1 and 12.2 feet bgs in MW-2. Soil samples were collected with direct-push technology (DPT) drilling equipment (Geoprobe® 8040) or a stainless steel hand auger. Soil cores/cuttings were described by a North Carolina Licensed Geologist. Lithologic logs containing descriptions of the subsurface materials encountered are included in Appendix B. Soil borings were backfilled with hydrated bentonite chips and marked with a labeled wooden stake after completion.

2.2.2.1 WWPS and Sanitary Sewer

Five soil borings were advanced adjacent to the WWPS -- three borings were advanced with a hand auger and two borings were advanced with DPT equipment. The soil cores retrieved from the DPT equipment, or soil cuttings from the hand auger borings, were scanned at an approximate one-foot interval with a photoionization detector (PID) for the presence of organic vapors. The soil sample with the highest PID reading was collected from each five-foot interval of unsaturated soil. If elevated PID readings were not indicated (i.e., not above background levels), a soil sample was collected from the bottom one-foot of the five-foot interval. The soil borings were advanced to a depth of approximately ten feet bgs; however, shallow hand auger refusal (i.e., three to five feet bgs) was encountered at numerous soil borings advanced adjacent to the south wall of the WWPS. A soil boring was advanced to auger refusal adjacent to the south wall of the WWPS for collection of a soil sample from the zero to five foot interval (SS-115A), and , a fifth soil boring (SS-135B) was advanced adjacent to the northwest corner of the WWPS so that a fourth soil sample could be collected from the five to ten foot interval in the vicinity of the WWPS. The soil samples collected adjacent to the WWPS were submitted for the "full suite" of analyses, as described in Section 2.2.4.

Soil borings were collected at 14 locations adjacent to the sanitary sewer line. Two of the borings, which were located inside the building in an area inaccessible to DPT equipment, were advanced with a hand auger, and 12 of the borings were advanced using DPT equipment. The borings were advanced within one to five horizontal feet of the estimated location of the sewer line. The borings were advanced to a depth of within two to three feet below the approximate bottom of the sewer line and a soil sample was collected. The Work Plan stated that a soil sample would be collected within two feet of the approximate bottom of the sewer line; however, due to the inability to locate portions of the sewer line due to obstructions, the vertical distance between the interpolated sewer line location and sample interval was increased in some borings in order to account for the minor uncertainty in location. The soil cores retrieved from the DPT equipment, or soil cuttings from the hand auger borings, were scanned at an approximate one-foot interval with a PID. The soil samples collected adjacent to the sewer line were submitted for the full suite of analyses, as described in Section 2.2.4.

2.2.2.2 Former Contingency Basin and Background Samples

Two soil borings were advanced within the former contingency basin using a decontaminated stainless steel hand auger. The borings were advanced to a depth of approximately one foot bgs. Two background soil samples were collected from areas of the Site where former operations have not been conducted. The former contingency basin and background soil samples were submitted for analysis of hazardous substance list (HSL) metals and hexavalent chromium, as described in Section 2.2.4.

2.2.2.3 Area South of On-Site Building

Twelve soil borings were advanced using DPT equipment in the area south of the Site building and north of the Site's gravel service drive, as depicted in Figure 3. Soil borings SS-101, SS-102, and SS-103 were advanced to a depth of approximately 20 feet bgs, and the remaining nine soil borings were advanced to a depth of approximately 25 feet bgs. The soil cores retrieved from the DPT equipment were scanned at an approximate one-foot interval with a PID for the presence of organic vapors. A soil sample with the highest PID reading was collected from each five-foot interval of unsaturated soil. If elevated PID readings were not indicated, a soil sample was collected from the bottom one-foot of the five-foot interval. The soil samples collected in this area were submitted for the full suite of analyses, as described in Section 2.2.4.

2.2.3 Groundwater Sampling

Groundwater samples were collected from monitoring wells MW-3 and MW-3A. The monitoring wells were purged using low-flow purging techniques, in accordance with ASTM D6771 (*Standard Practice for Low-Flow Purging and Sampling for Wells and Devices Used for Ground-Water Quality Investigations*). Polyethylene tubing attached to a peristaltic pump was lowered to within the screened interval of the monitoring well and groundwater was purged at a minimal rate to prevent excessive drawdown in the well. The water level was monitored during purging using an electronic water level indicator. Water quality parameters (i.e., dissolved oxygen, oxidation-reduction potential, temperature, pH and conductivity) were measured during purging using a "flow-through cell" and samples of groundwater were collected periodically to measure turbidity using a turbidity meter.

Groundwater samples were collected when the water quality parameters stabilized (as described in the ASTM Standard Practice) and/or the turbidity was less than 15 Nephelometric Turbidity Units. Measurements collected during purging and sampling monitoring wells were recorded on Field Data Record forms. Copies of the forms are included in Appendix C.

2.2.4 Laboratory Analyses and Data Validation

Soil samples and associated quality assurance/quality control (QA/QC) samples collected during the Phase IIA RI were submitted to Pace Analytical Services, Inc. (Pace) a North Carolina-accredited laboratory. Samples were analyzed for one or more of the following:

- Volatile organic compounds (VOCs), according to EPA Method 8260B (plus tentatively identified compounds);
- Semi-volatile organic compounds (SVOCs), according to EPA Method 8270D (plus tentatively identified compounds);
- Hazardous Substance List metals, according to EPA Methods 6010C and 7471B/7470A (mercury, soil/water);
- Hexavalent chromium (extractable), according to EPA Method 7196 and,
- Cyanide, according to Standard Method 4500-CN-E.

Groundwater samples collected from monitoring wells MW-3 and MW-3A, as well as an associated QA/QC sample, were submitted to Columbia Analytical Services (CAS) for analysis of 1,4-dioxane according to EPA Method 8270C with liquid-liquid extraction and isotope dilution by gas chromatograph-mass spectrometer optimized for 1,4-dioxane as a single analyte.

MACTEC conducted a Level II Data Quality Evaluation of the laboratory data to evaluate the usability of the reported data. The Level II validation consisted of a review of sample integrity and receipt, laboratory method blank samples, surrogate and laboratory control sample recoveries, matrix spike/matrix spike duplicate recoveries and relative percent differences, field duplicate precision and field blank results.

2.3 QUALITY CONTROL/QUALITY ASSURANCE PROCEDURES

Field and laboratory procedures were performed in accordance with the QA/QC procedures described in the Phase II RI Work Plan. Documentation of field activities was completed using a combination of logbooks, field data records and sample custody records. Quality of the analytical results was controlled by submitting field QC samples and evaluating the analytical quality of the reported data. Field QC samples included field blanks, equipment blanks, field duplicates, a material blank, and trip blanks, as described below. A summary of the field QC samples is presented in Table 2.

Field Blank – A field blank is used to demonstrate the presence or absence of ambient contamination during sampling activities (i.e., in the atmosphere in the vicinity of the sample collection area). It is comprised of contaminant-free water brought to the field by sampling personnel, and transferred to the proper sample container at the sample collection area for shipment along with the other samples collected. Field blank sample containers were filled with deionized water and left open during collection of soil samples at SS-120 and SS-123. Field blank samples were submitted to the laboratory for analysis of VOCs.

Equipment Blank – An equipment blank is used to demonstrate the effectiveness of field cleaning/decontamination procedures. Contaminant-free water is poured over the equipment that has been decontaminated in the field and is collected in the appropriate sample containers. Three equipment blanks were collected during the Phase IIA RI -- two blanks from DPT equipment that came in contact with soil, and one blank from the hand auger equipment. Deionized water was poured on/through the equipment and collected in the appropriate containers. Equipment blank samples were submitted for analysis of VOCs, SVOCs, HSL metals, and cyanide.

Field Duplicate – Field duplicates are two samples collected from the same location and depth/interval, but submitted to the laboratory under blind identification protocol, and analyzed separately. Field duplicates were collected at a frequency of ten percent per analytical method for each media sampled.

Material Blank – A material blank is collected from water used during drilling activities (e.g., water used to decontaminate drilling equipment) and is submitted for analyses that other samples are submitted for during the investigation. The water for the Phase IIA RI drilling/decontamination activities was obtained from the drilling contractor's office/shop, which is located in Greenville, South Carolina. The drilling water was containerized in a polyethylene tank and transported to the Site for use. A material blank was collected from a hose connected to the tank and submitted for analysis of VOCs, SVOCs, HSL metals and cyanide.

Trip Blank – A trip blank is utilized to detect possible VOC contamination of samples to be analyzed for VOCs. Samples being analyzed for VOCs are susceptible to contamination by introduction or migration of contaminants through the septum of the sample container. Trip blanks that accompany aqueous samples are prepared by filling sample vials with purged organic-free water. Trip blanks that accompany soil samples are prepared by filling sample vials with preservatives used to collect soil samples for VOC analysis. Trip blanks were prepared by the laboratory and accompanied the sample collection vials during shipment and transportation to the Site and back to the laboratory. Trip blanks were shipped with each cooler containing field samples collected for VOC analysis.

2.4 MANAGEMENT AND DISPOSAL OF INVESTIGATION-DERIVED WASTE

Investigation-derived waste (IDW) generated during the Phase IIA RI included soil cuttings, decontamination water, monitoring well purge water, and debris/plastic from the decontamination pad. IDW was promptly transferred to Department of Transportation (DOT)-approved 55-gallon drums at the time of accumulation or after use (e.g., plastic). Drums were labeled at the time of filling.

IDW generated during the Phase IIA RI has been removed from the Site by an environmental waste disposal company, and, of as of the date of this report, the waste manifests are being processed. Waste manifests associated with the Phase IIA RI IDW will be forwarded to NCDENR upon receipt from the disposal facilities.

3.0 GEOLOGY AND HYDROGEOLOGY

A Conceptual Site Model was presented in the Phase II RI Work Plan. The sampling activities conducted at the Site during the Phase IIA RI did not significantly modify or enhance the geologic and hydrogeologic interpretations presented in the Work Plan. Information gathered during the Phase IIA provided additional information regarding contaminant types and source areas, as discussed in Section 4.4.

The North Carolina Geological Survey (NCGS) conducted geological mapping in the vicinity of the Site from January to May 2010, at the request of the following agencies: EPA Region 4, Superfund Section; the United States Geological Survey, North Carolina Water Science Center; and NCDENR Division of Waste Management, Superfund Section. The study methods and results are summarized in a Technical Memorandum entitled "Geology of the Mills Gap Area, Buncombe County, North Carolina," dated September 30, 2010. The Memorandum describes the NCGS's interpretation of a fault zone, informally designated as the Mills Gap Fault Zone (MGFZ), which trends west-northwest/east-southeast generally along a linear topographic low where Mills Gap Road is located. The MGFZ is described as a brittle, transtentional fault, interpreted to be Mesozoic or younger in age. The NCGS observed outcrops of strike-slip and normal-oblique faults with fault-related features such as slickenlines, breccias, gouge, and drag folding. In close proximity to the MGFZ, the NCGS observed that foliation and mylonitic foliation become incrementally realigned from the regional northeast/southwest trend to a west-northwest/east-southeast trend that is subparallel to the MGFZ. Mapped joints/fractures in the vicinity of the MGFZ were grouped into three broad groups, generally based on association with the MGFZ or regional faulting structures. The greatest frequency of joints/fractures were observed to have high dip angles (i.e., 61 to 90 degrees).

The NCGS's mapping and interpretation efforts provide a significant contribution to the geologic framework of the Conceptual Site Model. However, as noted in the Memorandum, the "internal geometry of the MGFZ is uncertain, owing primarily to limited outcrop and subsurface data in the vicinity of Mills Gap." Furthermore, the NCGS's study does not provide information regarding groundwater occurrence and flow. As additional subsurface data are collected in subsequent investigations associated with the Site, the geologic framework provided by the NCGS will be used to guide interpretations of observed subsurface features as they relate to groundwater and contaminant transport in the vicinity of the Site.

4.0 INVESTIGATION RESULTS

The laboratory analytical results for soil samples collected during the Phase IIA RI are summarized in Tables 3, 4, and 5. The laboratory analytical results for quality control samples collected during the Phase IIA RI are summarized in Table 6. Laboratory analytical reports and chain-of-custody records for samples collected during the Phase IIA RI are included in Appendix D.

4.1 DATA QUALITY

MACTEC conducted a Level II Data Quality Evaluation of the laboratory data to evaluate the usability of the reported data. The evaluation consisted of a review of sample integrity and receipt, laboratory method blank samples, surrogate and laboratory control sample recoveries, matrix spike/matrix spike duplicate recoveries and relative percent differences, field duplicate precision and field blank results. The data quality evaluation is included in Appendix E.

The results of the data quality evaluation indicate that the Phase IIA RI data set has a completeness of greater than 95 percent. The data are usable for the purpose of identifying the presence and chemical nature of constituents in soil and groundwater samples collected during the Phase IIA RI.

4.2 SOIL DATA

Soil samples were collected from the unsaturated zone at 35 locations at the Site, as described in Section 2.2.2. Constituents that were detected above the Method Detection Limit (MDL) were compared to the IHSB's Health-Based Preliminary Soil Remediation Goals, dated October 2010 (HBPSRG) and the Protection of Groundwater Preliminary Soil Remediation Goals, dated October 2010 (PGWPSRG).

4.2.1 EPA Method 8260 VOCs

Excluding methylene chloride and carbon disulfide, which were detected in the quality control samples, seven EPA Method 8260 VOCs were detected at concentrations above their associated MDL in the collected soil samples. Estimated concentrations of 18 EPA Method 8260 TICs, as well as several unknown TICs, were reported in the laboratory analytical results. Trichloroethene (TCE, also known as trichloroethylene) was detected in ten soil samples at concentrations above the PGWPSRG (0.018 milligrams per kilogram [mg/kg]) but less than the HBPSRG (2.8 mg/kg). The other detected VOCs were not detected above their respective PSRGs.

4.2.2 EPA Method 8270 SVOCs

The laboratory analytical report indicates that six EPA Method 8270 SVOCs were detected at concentrations above their associated MDL in the collected soil samples. Estimated concentrations of eight EPA Method 8270 TICs, as well as one unknown TIC, were reported in the laboratory analytical results. Three of the detected SVOCs were interpreted as containing laboratory blank contamination and the other three detected SVOCs were not detected above their respective PSRGs.

4.2.3 Inorganics

Cyanide was detected at concentrations above the MDL in four soil samples. The reported concentration of cyanide in the soil samples is greater than the PGWPSRG (0.28 mg/kg) but less than the HBPSRG (310 mg/kg).

The Hazardous Substance List includes fourteen metals, each of which was detected above the MDL in one or more of the collected soil samples. Hexavalent chromium was detected above the MDL in one soil sample (SS-121). The reported concentration of hexavalent chromium in sample SS-121 (4.9 mg/kg) is above the HBPSRG (0.29 mg/kg) and the PGWPSRG (3.8 mg/kg).

4.3 GROUNDWATER DATA

Groundwater samples collected from MW-3 and MW-3A, as well as one field duplicate, were analyzed for 1,4-dioxane. The constituent 1,4-dioxane was not detected above the reporting limit of 2.0 micrograms per liter (μg/L) in the three submitted groundwater samples.

4.4 DISCUSSION

As described in the Phase II RI Work Plan, electroplating operations were conducted in the central portion of the facility from the mid-1950s to the mid-1980s. Electroplating typically involves pretreatment (cleaning, degreasing, etc.), plating, rinsing, and drying. Components at the facility were plated using gold, silver, zinc, nickel, and tin during the time CTS operated the facility. Chemicals reportedly used in the plating process included solvent degreasers (primarily TCE), acetone, cyanide salts, chromic acid, as well as various acids and caustic cleaners. Prior to approximately 1980, rinse water from the electroplating process was discharged to the Site's sanitary sewer and process/plating sludge was drummed and disposed of at an off-site facility.

Spent acetone and TCE were drummed for off-site disposal or recovery/recycling. After approximately 1980, plating rinse water and other wastewater was pre-treated in the WWPS prior to permitted discharge into the sanitary sewer. Sludge generated from the wastewater pre-treatment process, as well as other process/plating sludge and spent solvents, were accumulated in drums prior to off-site disposal or recycling.

Although chemical spills have not been documented/reported, concentrations of constituents in soil in the southern portion of the Site building, and immediately south of the building, indicate that releases of chemicals used at the Site (chlorinated solvents and fuel oil) have occurred. Based on soil samples collected in 2004, specific/distinct source areas were not apparent; however the area of constituent concentrations in soil was generally delineated (MACTEC, 2004) and subsequently removed using soil vapor extraction (SVE). Additional potential source areas were evaluated during the Phase IIA RI, at the request of NCDENR.

4.4.1 EPA Method 8260 VOCs

As described in the Work Plan, the SVE system, consisting of 15 vapor extraction wells and blower equipment, began operation at the Site in July of 2006. The SVE system is located in the southern portion of the Site building, and in the area south of the building, and removed previously detected organic compounds from the unsaturated soil. Based on air discharge samples collected from the system, an estimated 6,473 pounds of VOCs were removed from the unsaturated soil by the SVE system. Less than one pound of VOCs was removed each month by the SVE system from January 2010 to July 2010 indicating that the system removal efficiency had reached asymptotic conditions. Operation of the SVE system was terminated in early August 2010 because of damage to the system, but after achieving the asymptotic recovery conditions.

Soil samples collected during the Phase IIA RI within the influence of the SVE system (i.e., soil samples SS-119, SS-120, and SS-121, which were collected adjacent to the southern portion of the sewer line) did not indicate significant concentrations of TCE. Furthermore, elevated TCE concentrations were not indicated in soil samples SS-122 through SS-130, which were collected adjacent to the eastern and northern portions of the sanitary sewer line. Therefore, the lack of elevated TCE readings adjacent to the Site's sewer lines indicate the following: 1) there has not been a significant release of TCE from the sewer lines, and/or, 2) operation of the SVE system has largely removed TCE that might have been released from the southern portion of the sewer lines.

Regardless, a significant source of TCE in unsaturated soil adjacent to the sewer lines was not identified during the Phase IIA RI.

Four soil samples collected adjacent to the WWPS, including the piping from the former plating room to the WWPS, contain concentrations of TCE above the PGWPSRG. With the exception of SS-117, which was collected adjacent to the sump that formerly collected wastewater from the plating room, the soil samples with elevated TCE concentrations (SS-114B, SS-115A, and SS-116B) are located adjacent to the WWPS building. Soil samples SS-114B, SS-115A, and SS-116B were collected from borings located adjacent to another potential source area (described below) and in an area potentially influenced by the SVE system.

Depth-discrete soil samples were collected from borings SS-101 through SS-112 in the area south of the Site building and north of the gravel service road. Concentrations of TCE were detected above the PGWPSRG in one or two of the soil samples collected from each of the soil borings SS-102, SS-104, SS-107, and SS-109. One soil sample collected from boring SS-107 contained a concentration of TCE above the MDL, and boring SS-107 is relatively isolated from SS-102, SS-104 and SS-109. Therefore, the TCE detection in boring SS-107 is considered to be from a minor incidental release near SS-107. Soil borings SS-102, SS-104, and SS-109 are located within approximately 60 feet of each other. The reported TCE concentrations in the soil samples collected from these borings increases with depth, indicating a likely source of TCE in this area of the Site. The soil sorption value of chlorinated solvents such as TCE is low. Therefore, when released into a sandy, low-organic unsaturated soil, similar to the soil identified in this area of the Site, the solvent material would be expected to migrate downward, leaving residual/lower concentrations near the source (ground surface) of the release. Soil samples collected in adjacent borings SS-101, SS-103, SS-105, and SS-110 contained minor concentrations of TCE (i.e., less than 20 μg/kg) providing an approximate delineation of a potential source area in the vicinity of the SS-102/104/109 soil samples.

4.4.2 EPA Method 8270 SVOCs

One EPA Method 8270D SVOC, dibenzo[a,h]anthracene, was detected at estimated concentrations in three soil samples. The three soil samples in which dibenzo[a,h]anthracene was detected (SS-104E, SS-112D, and SS-125) are not located in close proximity to each other. Benzo(g,h,i)perylene and indeno(1,2,3-cd)pyrene were detected in two of the soil samples containing dibenzo[a,h]anthracene, and indeno(1,2,3-cd) was detected in one of the soil samples containing dibenzo[a,h]anthracene. Benzo(g,h,i)perylene, dibenzo[a,h]anthracene, and indeno(1,2,3-cd)pyrene were detected in equipment blank EB-02, and with the exception of one soil sample collected in 1999, these SVOCs have not been detected in numerous historical soil samples collected from the Site. Therefore, the presence of benzo(g,h,i)perylene, dibenzo[a,h]anthracene, and indeno(1,2,3-cd)pyrene identified in soil samples SS-104E, SS-112D, and SS-125 are considered to be the result of laboratory contamination and not considered to be from a "source area" with respect to the Site.

4.4.3 Cyanide

Concentrations of cyanide were detected in soil samples collected from borings advanced to the former WWPS (SS-115A, SS-116A, SS-116B, and SS-117). The reported concentrations of cyanide are above the HBPSRG and the PGWPSRG. Groundwater samples collected from on-site overburden wells (with the exception of MW-7 and MW-7A) during the Phase I RI were analyzed for cyanide. Cyanide was detected at estimated concentrations of 3.4 μg/L and 4.6 μg/L in monitoring wells MW-3 and MW-3A, which are well below the North Carolina Groundwater Standard of 70 μg/L. Cyanide was not detected above the MDL in MW-2, which is located approximately 35 feet from the WWPS, nor downgradient monitoring wells MW-4 and MW-4A. Based on these results, it appears that a minor localized release(s) of cyanide has occurred in the area of the Site's WWPS; however, concentrations of cyanide in groundwater, where detected, are well below the North Carolina Groundwater Standard.

4.4.4 HSL Metals

Concentrations of HSL metals were detected in the Phase I and IIA RI soil samples. Metals are naturally occurring in soil/rock and used in numerous industrial applications. The United States Geological Survey (USGS) began a sampling program in the 1960s designed to provide estimates of the abundance of elements in soil and surficial materials in the conterminous United States (Boerngen and Shacklette, 1981). The USGS collected four soil samples in western North Carolina from soil derived from gneissic parent rock material, similar to that found at the Site. With the exception of antimony, beryllium, silver, and thallium, which were either not analyzed or not detected, the HSL metals were detected in the four soil samples collected from western North Carolina. In the EPA's Engineering Forum Issue, "Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites," a compilation of national and global soil data indicates similar results (Breckenridge and Crockett, 1995). Concentrations of the HSL metals that were detected in the USGS soil samples, as well as those presented in the EPA document, are presented in Table 7.

EPA-developed statistical analysis software ProUCL (USEPA, 2010) was used to estimate concentrations of HSL metals in background soil at the Site. The software can be used to determine the statistical distribution (e.g., normal, lognormal) of a parameter (metal constituent) based on reported concentrations above the MDL. The software also allows for the inclusion of MDL concentrations when a parameter is not detected above the MDL. The selected distribution is based upon "goodness-of-fit", as well as other variables such as percentage of non-detect values. Using the appropriate distribution for a particular parameter, a background value based on an upper prediction limit (UPL) is determined using the upper "tail" of the distributed data. An UPL is a value for which a future observation will not exceed, with a certain confidence, given what has already been observed. For example, if there is a 95 percent UPL of 50 mg/kg then one would not expect a future sample to exceed 50 mg/kg and one would have 95 percent confidence this would be true. Higher confidence (99 percent) increases the value of the prediction limit, while decreased confidence (90 percent) decreases the value of the prediction limit. The UPL values can be used to compare background soil data to other site soil data to determine the presence of potential contamination from site operations.

Analytical results of background soil samples were used in the analysis and included soil samples that were collected from areas not considered to be affected by Site operations and/or did not contain elevated concentrations of VOCs/SVOCs (i.e., primarily soil samples collected adjacent to the northern portion of the sewer line and samples collected in the area south of the building and north of the gravel service drive). Prior to performing the analysis, statistical outliers as determined by ProUCL were removed from the data set. The UPL values, as well as other relevant statistics, are presented in Table 7. The Guidelines indicate that remediation below practical quantitation limits is not required; therefore the maximum MDLs from the data set are also reported in Table 7. The HBPSRG and PGWPSRG are also presented in Table 7 for comparison to the UPL and MDL concentrations.

For comparison to off-Site data, the mean background concentrations, as well as the mean values from the USGS and EPA data, are presented in Table 7. Comparison of the mean values from the

Site background soil samples to the USGS and EPA values indicate that the concentrations of HSL metals in Site samples are, on average, less than or similar to the USGS and EPA background values, and are therefore considered representative of residual soil in similar geologic settings.

Comparison of the UPL values to the HBPSRGs indicates that, with the exception of total chromium (total chromium does not have an established HBPSRG), manganese, and thallium, the concentrations of background HSL metals are less than their respective HBPSRG. Total chromium was detected above the laboratory reporting limit in 100 percent of the background soil samples; therefore the UPL value of 25 mg/kg can reliably be used to represent a background threshold value (BTV) for total chromium. Manganese was detected above the laboratory reporting limit in 100 percent of the background soil samples, and 21 of 45 the reported manganese concentrations are greater than the HBPSRG of 370 mg/kg. Based on the high percentage of detected manganese concentrations, the UPL value of 2,405 mg/kg can be reliably used to represent a BTV for manganese. The maximum reported MDL for thallium is 4.1 mg/kg, which is above the HBPRSG of 1.0 mg/kg. Thallium was reported as an estimated concentration (i.e., above the MDL but below the laboratory reporting limit) in 20 percent of the background samples, and above the laboratory reporting limit in one background sample. Based on the low percentage of detected thallium concentrations, the derived UPL of 1.9 mg/kg is not statistically reliable, and the MDL of 4.1 mg/kg should be used to represent the compliance health-based concentration.

Comparison of the UPL values to the PGWPSRGs indicates that the UPL values for eight HSL metals (arsenic, cadmium, copper, lead, nickel, selenium, silver, and zinc) are below their respective PGWSRGs. Beryllium, total chromium, and mercury, which were detected above the MDL in more than 70 percent of the background soil samples, do not have established PGWSRGs. Based on the high percentage of detected values of beryllium, total chromium, and mercury, the UPL values of 1.9 mg/kg, 25 mg/kg and 0.03 mg/kg, respectively, can be reliably used to represent BTVs. Manganese was detected above the PGWPSRG of 65 mg/kg in 100 percent of the background soil samples, so the BTV value of 2,405 mg/kg should be used as a compliance concentration. The maximum reported MDL for thallium is 4.1 mg/kg, which is greater than the PGWPRSG of 0.28 mg/kg. As previously described, the derived UPL of 1.9 mg/kg is not statistically reliable, and the MDL of 4.1 mg/kg should be used to represent the compliance concentration. Similar to thallium, the maximum reported MDL for antimony is 4.1 mg/kg, which is greater than the PGWPSRG of 0.9 mg/kg. Antimony was reported as an estimated concentration (i.e., above the MDL but below the laboratory reporting limit) in 18 percent of the background samples, and above the laboratory reporting limit in three background samples. Based on the low percentage of detected antimony concentrations, the derived UPL of 0.9 mg/kg is not statistically reliable, and the MDL of 4.4 mg/kg should be used to represent the compliance concentration.

Elevated concentrations of manganese (i.e., above 2,000 mg/kg) were detected in four background soil samples (SS-128, SS-105C, SS-105D, and SS-107B). The elevated concentrations were not removed from the data set as outliers, as the concentrations are not considered to be the result of contamination. Rather, the presence of elevated manganese in the soil samples is considered to be the result of manganese alteration/precipitation during metamorphism and weathering. "Dark mineral weathering" is noted in many of the soil boring lithologic descriptions, and is typically observed as "spots" or "veins" in the soil matrix and vary from dark orange/brown to brown/black. Furthermore, slickensides/slickenlines were observed in several borings (noted in SS-105 boring log) and appeared to be coated with a manganese-rich precipitate. The slickenside observed in boring SS-105 was at approximately 19.8 feet bgs, and the reported manganese concentration for the soil sample collected from 19 to 20 feet bgs was 2,030 mg/kg. Although manganese-coated slickensides were not specifically identified in the SS-128, SS-105C, and SS-107B sample intervals, the variable nature of manganese in residual soil at the Site and the lack of evidence that manganese was used at the facility indicates that manganese concentrations in soil samples collected at the Site are naturally-occurring.

Concentrations of HSL metals detected in non-background soil samples from four areas were compared to concentrations detected in background soil samples to determine if releases of inorganic/metal constituents have resulted in soil contamination (Table 8). Where a HBPSRG and/or PGWPSRG have not been established for a metal, the background UPL concentration is considered the compliance goal for screening purposes.

4.4.4.1 <u>Area 1: Adjacent to Northwestern Portion of Gravel Drive</u>

Soil samples collected from borings SS-101, SS-102, and SS-103 comprise Area 1, which is located adjacent to the northwestern portion of the gravel service drive (Figure 3). Elevated concentrations of several HSL metals were reported in soil sample SS-102A. A field duplicate (FD-34) of SS-102A was also collected, and, with the exception of total chromium, mercury, and zinc, the relative percent difference (RPD) between the reported concentrations exceeds the acceptable control limit of 50 percent. Concentrations of the elevated metals significantly decrease, or are not detected above the MDL, in the SS-102B sample, which was collected approximately five feet below SS-102A. Additional information is necessary to determine if the HSL metal detections in SS-102A represent an area where a potential release has occurred. Notwithstanding, if a release has occurred in the vicinity of SS-102A, the released material has not migrated vertically beyond approximately 9.5 feet bgs.

Silver was detected at a concentration of 6.4 mg/kg in soil sample SS-101A, which is greater than the PGWSRG of 3.4 mg/kg. SS-101A was collected at a depth of approximately two feet bgs. Silver was not detected above the MDL in underlying soil samples SS-101B, SS-101C, or SS-101D. The presence of silver near ground surface is likely attributable to air deposition from the facility's former operation, where cyclonic dust collectors discharged to the exterior of the building. Nonetheless, if a surficial release to ground surface has occurred in the vicinity of SS-101A, the released material has not migrated vertically beyond approximately six feet bgs (depth of SS-101B).

Concentrations of beryllium and total chromium were reported in multiple soil samples collected from borings SS-101, SS-102, and SS-103 above compliance goal concentrations (a PGWSRG has not been established for beryllium and a HBPSRG and PGWPSRG have not been established for total chromium). Hexavalent chromium was not detected above the MDL in soil samples collected from borings SS-101, SS-102, and SS-103. Nickel and zinc, which were reportedly used in the plating operation at the Site, were detected at concentrations that are greater than their respective background/UPL concentrations in multiple samples as well, although the reported nickel and zinc concentrations are less than their respective HBPSRG and PGWPSRG values. Based on these observations, it appears that a relatively isolated release of material containing metals might have occurred in the vicinity of borings SS-101/102/103. Elevated concentrations of beryllium, chromium, nickel, silver, and zinc were not detected in the groundwater sample collected from downgradient monitoring well MW-2 during the Phase I RI, indicating that the metal constituents have not significantly migrated to, or affected, groundwater.

4.4.4.2 Area 2: Adjacent to Western Portion of Gravel Drive

Soil samples collected from borings SS-104 and SS-109, as well as selected samples from SS-105, SS-107, and SS-110 (i.e., samples that contained concentrations of TCE) comprise Area 2, which is located adjacent to the western portion of the gravel service drive (Figure 3).

Concentrations of mercury were detected in soil samples SS-104A (0.097 mg/kg) and SS-109A (0.038 mg/kg) above the background UPL value of 0.03 mg/kg, which were collected at an approximate depth of 4.5 feet bgs. Deeper samples collected from the SS-104 and SS-107 borings were either non-detect for mercury, or the mercury concentration was estimated at a concentration above the MDL but below the laboratory reporting limit. Concentrations of mercury detected in soil samples collected from the upper five feet of borings advanced in "undisturbed" soil (i.e., not covered by a structure or road) during the Phase IIA RI (borings SS-101 through SS-112) were greatest in the upper interval and generally range from 0.01 to 0.1 mg/kg. The presence of low concentrations of mercury in "surficial" soils at the Site is likely attributable to air deposition from anthropogenic sources, such as emissions from coal-fired power plants, industrial operations and vehicles, rather than a spill/release of mercury-containing material at the Site.

Beryllium was detected in one soil sample (SS-104E) at a concentration of 2.1 mg/kg, which is slightly greater than the background/UPL concentration of 1.9 mg/kg. This concentration is considered to be naturally occurring, as elevated concentrations (above SRGs and UPL values) are not reported for the other HSL metals in the soils samples collected in Area 2. Hexavalent chromium was not detected above the MDL in soil samples collected from Area 2. As described in Section 4.4.1, there is an apparent source of TCE in unsaturated soil in the vicinity of Area 2; however, metal-contaminated soil is not present in the vicinity of Area 2.

4.4.4.3 Area 3: Building and WWPS

Soil samples collected from borings adjacent to the southern portion of the sewer line and adjacent to the WWPS (borings SS-113 through SS-122, and SS-135) comprise Area 3 (Figure 3).

Concentrations of beryllium and total chromium were reported in multiple soil samples collected from the Area 3 borings above compliance goal concentrations. Nickel and zinc, which were reportedly used in the plating operation at the Site, were detected at concentrations that are greater than their respective background/UPL concentrations in multiple samples as well, although the reported nickel and zinc concentrations are less than their respective HBPSRG and PGWPSRG values. Silver was detected at concentrations above the HBPSRG and PGWPSRG in soil samples SS-114A and SS-114B. Based on these observations, it appears that release(s) of metal-containing material might have impacted soils in the vicinity of the WWPS and adjacent to the former plating room (boring SS-117); however, the presence and variability of the detected metals concentrations indicates the release(s) were isolated.

Hexavalent chromium was detected in soil sample SS-122, which was collected adjacent to the sewer line. Historical maps of the facility indicate that hazardous waste was accumulated in the vicinity of the SS-122 location. Therefore, it is unclear if the hexavalent chromium was potentially released from the sewer line or from an isolated spill/release associated with the accumulation of hazardous waste in the vicinity of SS-122.

Elevated concentrations of beryllium, nickel, silver, and zinc were not detected in groundwater samples collected from adjacent monitoring well MW-2 and downgradient monitoring wells MW-3/3A and MW-4/4A during the Phase I RI. With the exception of MW-4A, total chromium was detected in the groundwater samples at concentrations similar to the background groundwater sample collected from MW-1. The concentration of total chromium in the groundwater sample collected from MW-4A (33 µg/L) is greater than the concentration in the MW-1 groundwater sample (estimated concentration of 1.9 µg/L); however, the type of chromium (i.e., trivalent or hexavalent) was not determined, so it is uncertain whether the elevated total chromium concentration in the MW-4A groundwater sample is naturally-occurring.

4.4.4.4 Area 4: Former Contingency Basin

Soil samples SS-131 and SS-132 were collected at depths of approximately 0.8 and 1.0 feet bgs, respectively, in the area of the former contingency basin. Mercury was detected at concentrations of 0.070 mg/kg and 0.040 mg/kg in soils samples SS-131 and SS-132, respectively. As previously discussed, the presence of mercury in these surficial soil samples is likely due to anthropogenic sources rather than a spill/release of mercury-containing material at the Site.

Total chromium was detected at a concentration of 33.1 mg/kg in SS-131, which is slightly greater than the background/UPL value of 25 mg/kg. However, the total chromium concentrations in SS-132 and a field duplicate of SS-132 (FD-33) are 24.6 mg/kg and 24.3 mg/kg, respectively. Hexavalent chromium was not detected above the MDL in the soil samples collected from the former contingency basin. Concentrations of associated Site metals (nickel, silver, and zinc) are similar to background/UPL concentrations, and were not detected above the HBPSRG or PGWPSRG. Based on these results, soil containing elevated concentrations of metals resulting from Site operations is not apparent in the area of the former contingency basin.

4.5 SUMMARY OF FINDINGS

The following items summarize the Phase IIA RI findings:

- 1,4-dioxane was not detected above the MDL in groundwater samples collected from MW-3 and MW-3A.
- A significant source of TCE in unsaturated soil adjacent to the sewer lines was not identified.
- An isolated area of TCE concentrations in unsaturated soil was identified in the vicinity of borings SS-102, SS-104, and SS-109. Elevated concentrations of HSL metals were not identified in this area.
- Concentrations of TCE were identified in soil borings advanced adjacent to the WWPS. The source of the TCE is considered to be from the adjacent source area (SS-102/104/109), spills/releases associated with former operations in the area of the WWPS, or a combination of both.
- Concentrations of cyanide were detected in soil samples in the area of the WWPS which indicate a minor localized release(s); however, concentrations of cyanide in groundwater, where detected, are well below the North Carolina Groundwater Standard.
- Isolated release(s) of metal-containing material might have impacted soils in the vicinity of the WWPS, adjacent to the former plating room (boring SS-117), and in the vicinity of soil borings SS-101, SS-102, and SS-103 (Area 1); however, with the exception of total chromium in two on-Site monitoring wells, concentrations of HSL metals detected in groundwater samples collected from Site monitoring wells are below the North Carolina Groundwater Standards.
- Hexavalent chromium was detected above the MDL in one soil sample (SS-122).
- Elevated concentrations of metals associated with former Site operations were not detected in soil samples collected from the area of the former contingency basin.

5.0 FIELD NOTES AND PHOTOGRAPHS

Field notes and Field Data Records from the Phase IIA RI are included in Appendix C.

6.0 OTHER INFORMATION

6.1 WATER SUPPLY INVENTORY

EPA Region 4 has been developing an inventory of water supply sources/wells within an approximate one-mile radius of the Site for the past several years. Samples have been collected from identified wells on a quarterly basis and the water samples are typically analyzed for VOCs, SVOCs, cyanide, and metals. The analytical results are tabulated and presented in reports that are available on the EPA ERRB On-Scene Coordinator (OSC) website. The most recent report available on the OSC website is dated February 1, 2010, and contains information from a water supply sampling event that occurred in October 2009. Based on information gathered from the report, five active water supply wells are located within a one-half mile of the center of the Site. The parcels containing the identified wells are depicted in Figure 5.

6.2 PROPOSED CONSTITUENTS OF CONCERN

According to the *Guidelines*, Phase II samples need only be analyzed for CERCLA hazardous substances (listed in CFR Title 40 Part 302) present above the method detection limit, unless the constituent is proven through sampling to be the result of a naturally occurring condition, or the constituent is a common laboratory contaminant.

Based on soil and groundwater samples collected during the Phase I and IIA RIs, the following constituents meet the criteria provided in the *Guidelines*:

- <u>VOCs:</u> acetone, benzene, ethylbenzene, isopropylbenzene, toluene, xylenes, methyl ethyl ketone, 1,1-dichloroethane, 1,1-dichloroethene, cis-1,2-dichloroethene, tetrachloroethene, 1,1,1-trichlorethane, trichloroethene, vinyl chloride.
- <u>SVOCs:</u> benzo(k)fluoranthene, bis(2-ethylhexyl)phthalate, dibenzofuran, 2,6-dinitrotoluene, fluoranthene, 2-methylnaphthalene, naphthalene, phenanthrene, pyrene.
- <u>Inorganics:</u> cyanide, hexavalent chromium, nickel, silver, zinc.

Of the constituents listed above, the following have been detected at concentrations above the current HBPSRG, PGWPSRG, and/or North Carolina Groundwater Standard, and are considered to be the Site-specific constituents of concern:

- Benzene (soil and groundwater)
- Ethylbenzene (soil)
- Isopropylbenzene (soil and groundwater)
- Xylenes (soil)
- 1,1-Dichloroethene (soil and groundwater)
- cis-1,2-Dichloroethene (soil and groundwater)
- Tetrachloroethene (soil and groundwater)
- 1,1,1-Trichloroethane (soil and groundwater)
- Trichloroethene (soil and groundwater)
- Naphthalene (soil and groundwater)
- 2-Methylnaphthalene (soil and groundwater)
- Cyanide (soil)
- Hexavalent chromium (soil)
- Silver (soil)

6.3 PHASE IIB RI

As described in the approved Phase II RI Work Plan, the next phase of work (Phase IIB RI) will include a NAPL investigation and delineation of the overburden groundwater plume. The NAPL investigation will be performed using direct and indirect methods in an attempt to determine the distribution of potential NAPL in overburden at the Site. Based on the findings of the Phase IIA RI results, modifications to the methodology described in the Work Plan are not necessary or proposed. The estimated horizontal extent of the NAPL investigation is depicted in Figure 6. Actual boring locations will be determined in the field, using an iterative process as described in the Work Plan, and in consideration of accessibility to the drilling equipment and private property access.

Modifications to the location and methodology for installing six monitoring well pairs to determine the downgradient extent of the overburden groundwater plume to the east and west of the Site are not proposed. With the exception of total chromium, groundwater samples collected from Site monitoring wells MW-2 through MW-6/6A during the Phase I RI did not indicate concentrations of HSL metals above the applicable North Carolina Groundwater Standards or reported concentrations in background monitoring well MW-1. Estimated concentrations of cyanide were reported for groundwater samples collected from two monitoring wells, MW-3/3A, indicating that the possible impact to groundwater from cyanide does not extend to downgradient monitoring wells. Similarly, concentrations of Site-specific SVOCs were limited to groundwater samples collected from monitoring wells MW-3/3A, as wells as the springs east of the Site, indicating the SVOC concentrations are generally situated between the Site building and the springs east of the Site. Therefore, groundwater samples collected from the proposed monitoring wells will be submitted for the following analyses:

- Site-specific VOCs, according to EPA Method 8260
- Total chromium, according to EPA Method 6010
- Hexavalent chromium, according to EPA Method 7196

7.0 REFERENCES

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8.0 CERTIFICATIONS

I certify that, to the best of my knowledge, after thorough investigation, the information contained in or accompanying this certification is true, accurate, and complete.

Matthew E. Wallace

NORTH CAROLINA PROFESSIONAL SEAL 24933 ENGINEER MATTHEW E. WALLACE 11/23/10

Matthew E. Wallace, P.E.
North Carolina P.E. #24933
Principal Engineer
MACTEC Engineering and Consulting, Inc.

Before me personally appeared Matthew Wallace to me known and known to me the person described in and who executed the foregoing instrument, and acknowledge to and before me that Matthew Wallace executed said instrument for the purposes therein expressed.

MICHELLE S. THOMAS NOTARY PUBLIC My Comm. Exp. June 7, 2014 BUNCOMBE COUNTY, N.C.

WITNESS my hand and official seal this 23 day of November A.D., 2010.
Notary Public Michelle S. Thomas
My commission expires 6/7/2014
STATE OF NC, COUNTY OF Buncombe.

I certify that, to the best of my knowledge, after thorough investigation, the information contained in or accompanying this certification is true, accurate, and complete.

CTS Corporation

Richard G. Cutter
Vice President, Secretary and General Counsel

Before me personally appeared Richard G. Cutter to me known and known to me the person described in and who executed the foregoing instrument, and acknowledge to and before me that Richard G. Cutter executed said instrument for the purposes therein expressed.

WITNESS my hand and official seal this 22nd day of November A.D., 2010.
Notary Public Lucinda Bullock
My commission expires August 25, 2012.
STATE OF Indiana, COUNTY OF Elkhart.

NOTARY PUBLIC SEAL STATE OF INDIANA
LUCINDA A. BULLOCK
Elkhart County
My Commission Expires
August 25, 2012

TABLES

TABLE 1
Summary of Phase IIA RI Soil Samples
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

Sample ID	Location	Date	Depth (feet bgs)	Analyses				
				VOCs	SVOCs	Metals	Cr 6+	Cyanide
SS-101A	south area	9/1/2010	2.0	x	x	x	x	x
SS-101B	south area	9/1/2010	6.0	x	x	x	x	x
SS-101C	south area	9/1/2010	12.0	x	x	x	x	x
SS-101D	south area	9/1/2010	18.0	x	x	x	x	x
SS-102A	south area	9/2/2010	4.5	x	x	x	x	x
SS-102B	south area	9/2/2010	9.5	x	x	x	x	x
SS-102C	south area	9/2/2010	14.0	x	x	x	x	x
SS-102D	south area	9/2/2010	17.5	x	x	x	x	x
SS-103A	south area	9/2/2010	2.5	x	x	x	x	x
SS-103B	south area	9/2/2010	9.5	x	x	x	x	x
SS-103C	south area	9/2/2010	14.5	x	x	x	x	x
SS-103D	south area	9/2/2010	16.5	x	x	x	x	x
SS-104A	south area	9/1/2010	4.5	x	x	x	x	x
SS-104B	south area	9/1/2010	9.5	x	x	x	x	x
SS-104C	south area	9/1/2010	14.0	x	x	x	x	x
SS-104D	south area	9/1/2010	19.0	x	x	x	x	x
SS-104E	south area	9/1/2010	24.5	x	x	x	x	x
SS-105A	south area	9/1/2010	4.5	x	x	x	x	x
SS-105B	south area	9/1/2010	9.5	x	x	x	x	x
SS-105C	south area	9/1/2010	14.5	x	x	x	x	x
SS-105D	south area	9/1/2010	19.5	x	x	x	x	x
SS-105E	south area	9/1/2010	24.5	x	x	x	x	x
SS-106A	south area	9/1/2010	1.5	x	x	x	x	x
SS-106B	south area	9/1/2010	9.5	x	x	x	x	x
SS-106C	south area	9/1/2010	14.5	x	x	x	x	x
SS-106D	south area	9/1/2010	19.5	x	x	x	x	x
SS-106E	south area	9/1/2010	24.0	x	x	x	x	x
SS-107A	south area	9/2/2010	4.5	x	x	x	x	x
SS-107B	south area	9/2/2010	9.5	x	x	x	x	x
SS-107C	south area	9/2/2010	14.5	x	x	x	x	x
SS-107D	south area	9/2/2010	19.5	x	x	x	x	x
SS-107E	south area	9/2/2010	24.5	x	x	x	x	x

TABLE 1
Summary of Phase IIA RI Soil Samples
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

Sample ID	Location	Date	Depth (feet bgs)	Analyses				
				VOCs	SVOCs	Metals	Cr 6+	Cyanide
SS-108A	south area	9/2/2010	4.5	x	x	x	x	x
SS-108B	south area	9/2/2010	9.5	x	x	x	x	x
SS-108C	south area	9/2/2010	14.5	x	x	x	x	x
SS-108D	south area	9/2/2010	19.5	x	x	x	x	x
SS-108E	south area	9/2/2010	24.5	x	x	x	x	x
SS-109A	south area	8/31/2010	2.0	x	x	x	x	x
SS-109B	south area	8/31/2010	9.5	x	x	x	x	x
SS-109C	south area	8/31/2010	13.0	x	x	x	x	x
SS-109D	south area	8/31/2010	17.0	x	x	x	x	x
SS-109E	south area	8/31/2010	22.0	x	x	x	x	x
SS-110A	south area	9/1/2010	4.5	x	x	x	x	x
SS-110B	south area	9/1/2010	9.5	x	x	x	x	x
SS-110C	south area	9/1/2010	14.5	x	x	x	x	x
SS-110D	south area	9/1/2010	19.5	x	x	x	x	x
SS-110E	south area	9/1/2010	24.5	x	x	x	x	x
SS-111A	south area	9/1/2010	3.0	x	x	x	x	x
SS-111B	south area	9/1/2010	9.5	x	x	x	x	x
SS-111C	south area	9/1/2010	14.5	x	x	x	x	x
SS-111D	south area	9/1/2010	19.5	x	x	x	x	x
SS-111E	south area	9/1/2010	24.5	x	x	x	x	x
SS-112A	south area	9/2/2010	4.0	x	x	x	x	x
SS-112B	south area	9/2/2010	9.5	x	x	x	x	x
SS-112C	south area	9/2/2010	14.5	x	x	x	x	x
SS-112D	south area	9/2/2010	19.5	x	x	x	x	x
SS-112E	south area	9/2/2010	24.5	x	x	x	x	x
SS-113A	wwps	8/30/2010	2.0	x	x	x	x	x
SS-113B	wwps	8/30/2010	8.0	x	x	x	x	x
SS-114A	wwps	9/2/2010	5.0	x	x	x	x	x
SS-114B	wwps	9/2/2010	9.5	x	x	x	x	x
SS-115A	wwps	9/7/2010	3.5	x	x	x	x	x
SS-116A	wwps	8/31/2010	4.5	x	x	x	x	x
SS-116B	wwps	8/31/2010	9.5	x	x	x	x	x

TABLE 1
Summary of Phase IIA RI Soil Samples
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

Sample ID	Location	Date	Depth (feet bgs)	Analyses				
				VOCs	SVOCs	Metals	Cr 6+	Cyanide
SS-117	sewer	8/30/2010	4.5	x	x	x	x	x
SS-118	sewer	8/30/2010	4.5	x	x	x	x	x
SS-119	sewer	8/30/2010	6.0	x	x	x	x	x
SS-120	sewer	8/30/2010	5.5	x	x	x	x	x
SS-121	sewer	8/30/2010	8.0	x	x	x	x	x
SS-122	sewer	8/31/2010	7.5	x	x	x	x	x
SS-123	sewer	9/7/2010	9.5	x	x	x	x	x
SS-124	sewer	9/3/2010	9.5	x	x	x	x	x
SS-125	sewer	8/31/2010	9.5	x	x	x	x	x
SS-126	sewer	8/31/2010	11.5	x	x	x	x	x
SS-127	sewer	8/31/2010	10.5	x	x	x	x	x
SS-128	sewer	8/31/2010	10.5	x	x	x	x	x
SS-129	sewer	8/31/2010	10.5	x	x	x	x	x
SS-130	sewer	9/2/2010	11.0	x	x	x	x	x
SS-131	cont. basin	9/2/2010	0.8			x	x	
SS-132	cont. basin	9/2/2010	1.0			x	x	
SS-133	background	9/3/2010	0.5			x	x	
SS-134	background	9/3/2010	4.5			x	x	
SS-135B	wwps	9/8/2010	9.5	x	x	x	x	x

Notes:

1. bgs - below ground surface.
2. VOCs - volatile organic compounds according to EPA Method 8260B.
   SVOCs - semi-volatile organic compounds according to EPA Method 8270D.
   Metals - Hazardous Substance List metals according to EPA Methods 6010C and 7471B (mercury) .
   Cr 6+ - hexavalent chromium according to EPA Method 7196.
   CN - cyanide according to Standard Method 4500-CN-E.
3. "south area" - soil sample collected in area south of Site building and north of gravel road.
   "sewer" - soil sample collected adjacent to sanitary sewer line.
   "wwps" - soil sample collected adjacent to former wastewater pretreatment system.
   "cont. basin" - soil sample collected in area of former contingency basin.
   "background" - background soil sample.

Prepared By: LRD 10/06/2010
Checked By: SEK 10/13/2010

TABLE 2
Summary of Phase IIA RI Quality Control Samples
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

Sample ID	Associated Sample/Location	Date	Analyses				
			VOCs	SVOCs	Metals	Cr 6+	Cyanide
MB-01	Decon water	8/31/2010	x	x	x		x
FB-01	SS-120	8/30/2010	x				
FB-02	SS-123	9/3/2010	x				
EB-01	Geoprobe drill shoe	8/31/2010	x	x	x		x
EB-02	Geoprobe drill shoe	9/1/2010	x	x	x		x
EB-03	Hand Auger	9/3/2010	x	x	x		x
TB-01	VOCs (soil)	lab prep	x				
TB-02	VOCSs (water)	lab prep	x				
TB-03	VOCs (soil)	lab prep	x				
TB-04	VOCs (soil)	lab prep	x				
TB-05	VOCs (water)	lab prep	x				
TB-06	VOCs (soil)	lab prep	x				
TB-07	VOCs (soil)	lab prep	x				
TB-08	VOCs (water)	lab prep	x				
TB-09	VOCs (soil)	lab prep	x				
FD-01	SS-113B	8/30/2010					x
FD-02	SS-118	8/30/2010			x		
FD-03	SS-117	8/30/2010		x			
FD-04	SS-120	8/30/2010	x				
FD-05	SS-119	8/30/2010				x	
FD-06	SS-128	8/31/2010			x		
FD-07	SS-129	8/31/2010	x				
FD-08	SS-109A	8/31/2010		x			
FD-09	SS-109B	8/31/2010					x
FD-10	SS-109C	8/31/2010		x			
FD-11	SS-109D	8/31/2010				x	
FD-12	SS-104A	9/1/2010	x				
FD-13	SS-104B	9/1/2010			x		
FD-14	SS-104C	9/1/2010				x	
FD-15	SS-104D	9/1/2010					x
FD-16	SS-106A	9/1/2010		x			
FD-17	SS-106B	9/1/2010			x		
FD-18	SS-106C	9/1/2010				x	
FD-19	SS-106D	9/1/2010					x
FD-20	SS-105A	9/1/2010	x				
FD-21	SS-110A	9/1/2010		x			
FD-22	SS-110B	9/1/2010			x		
FD-23	SS-110C	9/1/2010	x				

TABLE 2
Summary of Phase IIA RI Quality Control Samples
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

Sample ID	Associated Sample/Location	Date	Analyses				
			VOCs	SVOCs	Metals	Cr 6+	Cyanide
FD-24	SS-110D	9/1/2010				x	
FD-25	SS-110E	9/1/2010					x
FD-26	SS-111A	9/1/2010		x			
FD-27	SS-112A	9/2/2010	x				
FD-28	SS-112B	9/2/2010			x		
FD-29	SS-112C	9/2/2010				x	
FD-30	SS-112D	9/2/2010					x
FD-31	SS-112E	9/2/2010		x			
FD-32	SS-131	9/2/2010				x	
FD-33	SS-132	9/2/2010			x		
FD-34	SS-102A	9/2/2010			x		
FD-35	SS-102B	9/2/2010				x	
FD-37	SS-102D	9/2/2010		x			
FD-38	SS-103A	9/2/2010	x				
FD-39	SS-103B	9/2/2010			x	x	
FD-40	SS-103C	9/2/2010					x
FD-41	SS-130	9/2/2010	x				
FD-42	SS-115A	9/7/2010					x

Notes:

1. VOCs - volatile organic compounds according to EPA Method 8260C.
   SVOCs - semi-volatile organic compounds according to EPA Method 8270D.
   Metals - Hazardous Substance List metals according to EPA Methods 6010C, 7471B/7470A (mercury, soil/aqueous).
   Cr 6+ - hexavalent chromium according to EPA Method 7196.
   CN - cyanide according to Standard Method 4500-CN-E.
2. Sample types: MB - material blank; FB - field blank; EB - equipment blank; TB - trip blank; FD - field duplicate.
3. lab prep - trip blank prepared in lab and shipped with sample containers.

Prepared By: LRD 10/06/2010
Checked By: SEK 10/13/2010

TABLE 3
Phase IIA RI Soil Analytical Results - VOCs
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

	VOCs (µg/kg)									TICS (µg/kg)																							
	Acetone	Carbon Disulfide	cis-1,2-Dichloroethene	2-Hexanone	Methyl Acetate	Methylene Chloride	Methyl Ethyl Ketone	Tetrachloroethene	Trichloroethene	1R-alpha-Pinene	Benzocycloheptatriene	Bicyclo(4.1.0)hept-3-ene, 3	Butanal	1,4-Dimethylnaphthalene	1,5-Dimethylnaphthalene	1,6-Dimethylnaphthalene	2,3-Dimethylnaphthalene	2,6-Dimethylnaphthalene	4,4-Dimethyl-2-pentanone	Hexamethylcyclotrisiloxane	Hexanal	Methylcyclobutane	Methylene Chloride	1-Methylnaphthalene	Octanal	Pentanal	Propene	Unknown Alkane	Unknown Amide	Unknown Amine	Unknown Hydrocarbon	Unknown Organic Acid	Unknown
IHSB HBPSRG	1.2E+7	1.6E+5	1.6E+5	4.2E+4	1.6E+7	1.1E+4	5.6E+6	550	2,800	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	1.1E+4	2.2E+4	NE	NE	8.5.E+11	NA	NA	NA	NA	NA	NA
IHSB PGWPSRG	2.4E+4	3,800	360	1,200	NE	23	1.6E+4	5.0	18	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	23	NE	NE	NE	NE	NA	NA	NA	NA	NA	NA
SS-101A	109					11.3 JQ			9.7			5.63 E									26.0 E												
SS-101B	44.0 JQ					11.5 JQ																											
SS-101C						13.6 JQ																											
SS-101D	30.0 JQ					19.0 JQ			3.1 JQ																								
SS-102A	17.5 JQ					7.6 JB																											
SS-102B	12.6 JQ					12.0 JB			2.3 JQ																					5.14 E			
SS-102C						4.1 JB			**85.6**																								
SS-102D						7.3 JQ			**1,110**																								
SS-103A	10.7 JQ					3.5 JQ																											
SS-103B	37.9 JQ					9.5 JQ			9.5																								
SS-103C	15.0 JQ					6.2 JQ																											
SS-103D						5.9 JQ			4.4 JQ																								
SS-104A	24.2 JQ					7.3 JQ																											
SS-104B						9.6 JQ																											
SS-104C						14.8 JQ			11.4																								
SS-104D						9.2 JQ			**20.4**																								
SS-104E						6.6 JQ			**258**																								
SS-105A	71.2 JQ		2.1 JQ		2.2 JQ				15.2					0.528 E						1.02 E	2.12 E		1.92 E					0.964 E					3.187 E
SS-105B														0.407 E			0.366 E						2.31 E					1.472 E	0.263 E	0.372 E			0.809 E
SS-105C											0.347 E						0.569 E	0.487 E		1.04 E										1.258 E			0.514 E
SS-105D	19.3 JQ																																
SS-105E									6.3																								
SS-106A	54.5 JQ																																
SS-106B																																	
SS-106C																	0.960 E	0.728 E		1.10 E			3.22 E	0.390 E				0.721 E					1.55 E
SS-106D															0.550 E	0.535 E				1.04 E								1.146 E		1.012 E	0.737 E		
SS-106E																	0.535 E	0.438 E	1.22 E	1.19 E				0.306 E				1.117 E	0.350 E	0.538 E		0.376 E	
SS-107A	90.7 JQ						2.9 JQ		**28.0**																		6.68 E						
SS-107B																																	
SS-107C																																	
SS-107D	18.1 JQ																										6.28 E						
SS-107E																																	
SS-108A	44.0 JQ																																

TABLE 3
Phase IIA RI Soil Analytical Results - VOCs
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

	VOCs (µg/kg)									TICS (µg/kg)																							
	Acetone	**Carbon Disulfide**	**cis-1,2-Dichloroethene**	**2-Hexanone**	**Methyl Acetate**	**Methylene Chloride**	**Methyl Ethyl Ketone**	**Tetrachloroethene**	**Trichloroethene**	**1R-alpha-Pinene**	**Benzocycloheptatriene**	**Bicyclo(4.1.0)hept-3-ene, 3**	**Butanal**	**1,4-Dimethylnaphthalene**	**1,5-Dimethylnaphthalene**	**1,6-Dimethylnaphthalene**	**2,3-Dimethylnaphthalene**	**2,6-Dimethylnaphthalene**	**4,4-Dimethyl-2-pentanone**	**Hexamethylcyclotrisiloxane**	**Hexanal**	**Methylcyclobutane**	**Methylene Chloride**	**1-Methylnaphthalene**	**Octanal**	**Pentanal**	**Propene**	**Unknown Alkane**	**Unknown Amide**	**Unknown Amine**	**Unknown Hydrocarbon**	**Unknown Organic Acid**	**Unknown**
IHSB HBPSRG	1.2E+7	1.6E+5	1.6E+5	4.2E+4	1.6E+7	1.1E+4	5.6E+6	550	2,800	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	1.1E+4	2.2E+4	NE	NE	8.5.E+11	NA	NA	NA	NA	NA	NA
IHSB PGWPSRG	2.4E+4	3,800	360	1,200	NE	23	1.6E+4	5.0	18	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	23	NE	NE	NE	NE	NA	NA	NA	NA	NA	NA
SS-108B																																	
SS-108C																																	
SS-108D																																	
SS-108E																																	
SS-109A	101					16.2 JQ			4.2 JQ																								
SS-109B						12.1 JQ																											
SS-109C						**23.9**			5.1																								
SS-109D						**25.8**			9.9																								
SS-109E						9.3 JQ			**35.5**																								
SS-110A	12.1 JQ				1.7 JQ																												
SS-110B																																	
SS-110C	13.4 JQ																																
SS-110D																																	
SS-110E									2.6 JQ																								
SS-111A	64.8 JQ																																
SS-111B																																	
SS-111C																																	
SS-111D																																	
SS-111E																																	
SS-112A	41.9 JQ					19.7 JB				7.70 E																							
SS-112B																																	
SS-112C	10.4 JQ																																
SS-112D																																	
SS-112E																																	
SS-113A	13.5 JQ																																
SS-113B						5.2 JQ																											
SS-114A	51.5 JQ				85.7		6.1 JQ		3.5 JQ												12.1 E												
SS-114B	153	5.2 JB					12.7 JQ		**28.9**												34.2 E					12.3 E							
SS-115A	219					20.4	43.4 JQ	2.5 JQ	**195**												7.23 E						9.02 E						
SS-116A	451			10.2 JQ		10.6 JQ	103		10.1				5.76 E															7.04 E					9.89 E
SS-116B	12.9 JQ					14.2 JQ			**476**																								
SS-117	59.5 JQ		1.8 JQ			3.7 JQ			**85.0**																								
SS-118	14.0 JQ								2.8 JQ																								

TABLE 3
Phase IIA RI Soil Analytical Results - VOCs
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

	VOCs (µg/kg)									TICS (µg/kg)																							
	Acetone	Carbon Disulfide	cis-1,2-Dichloroethene	2-Hexanone	Methyl Acetate	Methylene Chloride	Methyl Ethyl Ketone	Tetrachloroethene	Trichloroethene	1R-alpha-Pinene	Benzocycloheptatriene	Bicyclo(4.1.0)hept-3-ene, 3	Butanal	1,4-Dimethylnaphthalene	1,5-Dimethylnaphthalene	1,6-Dimethylnaphthalene	2,3-Dimethylnaphthalene	2,6-Dimethylnaphthalene	4,4-Dimethyl-2-pentanone	Hexamethylcyclotrisiloxane	Hexanal	Methylcyclobutane	Methylene Chloride	1-Methylnaphthalene	Octanal	Pentanal	Propene	Unknown Alkane	Unknown Amide	Unknown Amine	Unknown Hydrocarbon	Unknown Organic Acid	Unknown
IHSB HBPSRG	1.2E+7	1.6E+5	1.6E+5	4.2E+4	1.6E+7	1.1E+4	5.6E+6	550	2,800	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	1.1E+4	2.2E+4	NE	NE	8.5.E+11	NA	NA	NA	NA	NA	NA
IHSB PGWPSRG	2.4E+4	3,800	360	1,200	NE	23	1.6E+4	5.0	18	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	23	NE	NE	NE	NE	NA	NA	NA	NA	NA	NA
SS-119	45.1 JQ					9.5 JQ			3.2 JQ																								
SS-120	28.2 JQ								5.3																								
SS-121	10.6 JQ								8.5																								
SS-122						4.1 JQ			3.2 JQ																								
SS-123	19.6 JQ																					5.39 E			7.88 E								
SS-124	21.4 JQ					3.4 JQ																											
SS-125	20.9 JQ					10.1 JQ																											
SS-126						6.9 JQ																											5.07 E
SS-127	11.1 JQ					10.9 JQ			5.4																								
SS-128	19.9 JQ					7.9 JQ			8.1																								
SS-129	47.7 JQ				7.4 JQ	10.1 JQ																											
SS-130	11.4 JQ					5.5 JQ																											
SS-131																																	
SS-132																																	
SS-133																																	
SS-134																																	
SS-135B	12.9 JQ					11.5 JQ			7.2																								

Notes:

Prepared By: SEK 10/14/2010
Checked By: LRD 10/15/2010

1. IHSB HBPSRG - Inactive Hazardous Sites Branch Health-Based Preliminary Soil Remediation Goal, dated October 2010.
2. IHSB PGWPSRG - Inactive Hazardous Sites Branch Protection of Groundwater Preliminary Soil Remediation Goal, dated October 2010.
3. VOCs - volatile organic compounds according to EPA Method 8260B.
4. TICs - tentatively identified compounds, according to EPA Method 8260B; where more than one "unknown" TIC is reported for a sample, the sum of the concentrations is reported.
5. µg/kg - micrograms per kilogram.
6. NE - A Preliminary Soil Remediation Goal has not been established for constituent; NA - not applicable due to non-specific constituent.
7. Analytes detected in one or more samples above Method Detection Limit (MDL) are shown; refer to laboratory report for the list of analytes.
8. Blank cells indicate analyte not detected above MDL; refer to laboratory report for associated MDLs.
9. JB - Constituent concentration is estimated based on the detection of the same constituent above the laboratory reporting limit in a laboratory blank or field blank.
10. JQ - Constituent concentration is estimated. Reported concentration is between the laboratory MDL and the reporting limit.
11. E - Constituent concentration is estimated, as method standards are not performed for TICs.
12. Bold concentrations indicate exceedance of the HBPSRG and/or PGWPSRG.

TABLE 4
Phase IIA RI Soil Analytical Results - SVOCs
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

	SVOCs (µg/kg)						TICS (µg/kg)								
	Benzo(g,h,i)perylene	**bis(2-Ethylhexyl)-phthalate**	**Dibenz[a,h]anthracene**	**2,6-Dinitrotoluene**	**Fluoranthene**	**Indeno(1,2,3-cd)pyrene**	**Benzo(k)fluoranthene**	**Decahydro-4,4,8,9,10-pentamethylnaphthalene**	**Decamethylcyclo-pentasiloxane**	**1-Docosene**	**Hexadecane**	**Hexatriacontane**	**1-Octadecene**	**5-(1-propenyl)-1,3-Benzodioxole**	**Unknown**
IHSB HBPSRG	NE	3.5E+4	15	1.2E+4	4.6E+5	150	1,500	NE	NE	NE	NE	NE	NE	NE	NA
IHSB PGWPSRG	3.6E+5	7,200	190	NE	3.3E+5	2,000	5,900	NE	NE	NE	NE	NE	NE	NE	NA
SS-101A															
SS-101B															23,000 E
SS-101C												216 E			
SS-101D															
SS-102A															
SS-102B															19,600 E
SS-102C															15,232 E
SS-102D															
SS-103A														200 E	19,500 E
SS-103B															
SS-103C															
SS-103D															
SS-104A				305 JQ											
SS-104B															28,634 E
SS-104C										1,560 E					
SS-104D															
SS-104E	154 JB		**159 JB**			146 JB	279 E								55.3 E
SS-105A															
SS-105B															

TABLE 4
Phase IIA RI Soil Analytical Results - SVOCs
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

	SVOCs (µg/kg)						TICS (µg/kg)								
	Benzo(g,h,i)perylene	bis(2-Ethylhexyl)-phthalate	Dibenz[a,h]anthracene	2,6-Dinitrotoluene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Benzo(k)fluoranthene	Decahydro-4,4,8,9,10-pentamethylnaphthalene	Decamethylcyclo-pentasiloxane	1-Docosene	Hexadecane	Hexatriacontane	1-Octadecene	5-(1-propenyl)-1,3-Benzodioxole	Unknown
IHSB HBPSRG	NE	3.5E+4	15	1.2E+4	4.6E+5	150	1,500	NE	NE	NE	NE	NE	NE	NE	NA
IHSB PGWPSRG	3.6E+5	7,200	190	NE	3.3E+5	2,000	5,900	NE	NE	NE	NE	NE	NE	NE	NA
SS-105C															
SS-105D															
SS-105E															
SS-106A															
SS-106B															
SS-106C											237 E				
SS-106D															
SS-106E															
SS-107A															
SS-107B															
SS-107C															
SS-107D															
SS-107E															
SS-108A															14,383 E
SS-108B															
SS-108C															
SS-108D															
SS-108E															
SS-109A													1,060 E		

TABLE 4
Phase IIA RI Soil Analytical Results - SVOCs
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

	SVOCs (µg/kg)						TICS (µg/kg)								
	Benzo(g,h,i)perylene	**bis(2-Ethylhexyl)-phthalate**	**Dibenz[a,h]anthracene**	**2,6-Dinitrotoluene**	**Fluoranthene**	**Indeno(1,2,3-cd)pyrene**	**Benzo(k)fluoranthene**	**Decahydro-4,4,8,9,10-pentamethylnaphthalene**	**Decamethylcyclo-pentasiloxane**	**1-Docosene**	**Hexadecane**	**Hexatriacontane**	**1-Octadecene**	**5-(1-propenyl)-1,3-Benzodioxole**	**Unknown**
IHSB HBPSRG	NE	3.5E+4	15	1.2E+4	4.6E+5	150	1,500	NE	NE	NE	NE	NE	NE	NE	NA
IHSB PGWPSRG	3.6E+5	7,200	190	NE	3.3E+5	2,000	5,900	NE	NE	NE	NE	NE	NE	NE	NA
SS-109B															873 E
SS-109C															
SS-109D															1,580 E
SS-109E															
SS-110A															
SS-110B															2,750 E
SS-110C															
SS-110D															
SS-110E															
SS-111A															
SS-111B									108 E						
SS-111C															
SS-111D															
SS-111E															
SS-112A															
SS-112B															
SS-112C															
SS-112D			**78.2 JB**			72.6 JB									
SS-112E															19,400 E

TABLE 4
Phase IIA RI Soil Analytical Results - SVOCs
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

	SVOCs (µg/kg)						TICS (µg/kg)								
	Benzo(g,h,i)perylene	**bis(2-Ethylhexyl)-phthalate**	**Dibenz[a,h]anthracene**	**2,6-Dinitrotoluene**	**Fluoranthene**	**Indeno(1,2,3-cd)pyrene**	**Benzo(k)fluoranthene**	**Decahydro-4,4,8,9,10-pentamethylnaphthalene**	**Decamethylcyclo-pentasiloxane**	**1-Docosene**	**Hexadecane**	**Hexatriacontane**	**1-Octadecene**	**5-(1-propenyl)-1,3-Benzodioxole**	**Unknown**
IHSB HBPSRG	NE	3.5E+4	15	1.2E+4	4.6E+5	150	1,500	NE	NE	NE	NE	NE	NE	NE	NA
IHSB PGWPSRG	3.6E+5	7,200	190	NE	3.3E+5	2,000	5,900	NE	NE	NE	NE	NE	NE	NE	NA
SS-113A															
SS-113B															424 E
SS-114A															
SS-114B		144 JQ			75.9 JQ										19.9 E
SS-115A								1,409 E							547 E
SS-116A															676 E
SS-116B															212 E
SS-117															
SS-118															
SS-119															2,240 E
SS-120															3,240 E
SS-121															
SS-122															
SS-123															
SS-124															292 E
SS-125	101 JB		**94.0 JB**			87.8 JB									
SS-126															1,080 E
SS-127															1,510 E
SS-128															

TABLE 4
Phase IIA RI Soil Analytical Results - SVOCs
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

	SVOCs (μg/kg)						TICS (μg/kg)								
	Benzo(g,h,i)perylene	**bis(2-Ethylhexyl)-phthalate**	**Dibenz[a,h]anthracene**	**2,6-Dinitrotoluene**	**Fluoranthene**	**Indeno(1,2,3-cd)pyrene**	**Benzo(k)fluoranthene**	**Decahydro-4,4,8,9,10-pentamethylnaphthalene**	**Decamethylcyclo-pentasiloxane**	**1-Docosene**	**Hexadecane**	**Hexatriacontane**	**1-Octadecene**	**5-(1-propenyl)-1,3-Benzodioxole**	**Unknown**
IHSB HBPSRG	NE	3.5E+4	15	1.2E+4	4.6E+5	150	1,500	NE	NE	NE	NE	NE	NE	NE	NA
IHSB PGWPSRG	3.6E+5	7,200	190	NE	3.3E+5	2,000	5,900	NE	NE	NE	NE	NE	NE	NE	NA
SS-129															1,170 E
SS-130															
SS-131															
SS-132															
SS-133															
SS-134															
SS-135B															418 E

Notes:

1. IHSB HBPSRG - Inactive Hazardous Sites Branch Health-Based Preliminary Soil Remediation Goal, dated October 2010.
2. IHSB PGWPSRG - Inactive Hazardous Sites Branch Protection of Groundwater Preliminary Soil Remediation Goal, dated October 2010.
3. SVOCs - semi-volatile organic compounds according to EPA Method 8270D.
4. TICs - tentatively identified compounds, according to EPA Method 8270D; where more than one "unknown" TIC is reported for a sample, the sum of the concentrations is reported.
5. μg/kg - micrograms per kilogram.
6. NE - A Preliminary Soil Remediation Goal has not been established for constituent; NA - not applicable due to non-specific constituent.
7. Analytes detected in one or more samples above Method Detection Limit (MDL) are shown; refer to laboratory report for the list of analytes.
8. Blank cells indicate analyte not detected above MDL; refer to laboratory report for associated MDLs.
9. JB - Constituent concentration is estimated based on the detection of the same constituent above the laboratory reporting limit in a laboratory blank or field blank.
10. JQ - Constituent concentration is estimated. Reported concentration is between the laboratory MDL and the reporting limit.
11. E - Constituent concentration is estimated, as method standards are not performed for TICs.
12. Bold concentrations indicate exceedance of the HBPSRG and/or PGWPSRG.

Prepared By: SEK 10/14/2010
Checked By: LRD 10/15/2010

TABLE 5
Phase IIA RI Soil Analytical Results - Inorganic Constituents
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

			Hazardous Substance List Metals													
	Cyanide	**Chromium VI***	**Antimony**	**Arsenic**	**Beryllium**	**Cadmium**	**Chromium (total)**	**Copper**	**Lead**	**Manganese**	**Mercury**	**Nickel**	**Selenium**	**Silver**	**Thallium**	**Zinc**
SS-101A					1.7		23.7	19.6	10.2	537	0.018	14.0		6.4		73.7
SS-101B					1.5		19.1	16.0	9.4	692	0.00043 JQ	16.8				48.9
SS-101C					4.2		56.0	36.3	14.0	371		30.6				157
SS-101D					5.2		26.0	48.7	8.7	632	0.00093 JQ	8.9				107
SS-102A			27.2 J	33.3 J	45.8 J	41.4 J	71.6	69.8 J	62.8 J	795 J	0.0063	63.4 J	30.7 J	18.8 J	38.3 J	115
SS-102B					1.7		30.5	13.6	12.6	670	0.0033 JQ	31.7			2.8 JQ	100
SS-102C					4.1		41.5	59.0	14.2	1,330	0.0025 JQ	43.7				136
SS-102D				4.0 JQ	3.6		49.9	11.9	13.3	400	0.0022 JQ	26.7				133
SS-103A					1.0		12.2	8.3	3.5	564	0.0025 JQ	7.3				47.0
SS-103B					1.8 J		27.3	24.1	12.7	1,030	0.0018 JQ	20.1				76.5 J
SS-103C				2.8 JQ	2.2		23.9	16.8	16.2	1,240	0.0027 JQ	16.7				82.4
SS-103D					2.1		28.2	18.3	10.1	325	0.0025 JQ	18.0				97.1
SS-104A					0.84		22.5	8.4	9.4	160	0.097	8.3	2.0 JQ			36.9
SS-104B				3.2 JQ	1.1		14.9	5.9		200 J	0.00092 JQ	6.9				46.6
SS-104C					1.1		16.0	1.4 JQ	3.6 JQ	278		10.1				51.7
SS-104D					1.3		13.6	3.9 JQ		256	0.00015 JQ	7.6				45.4
SS-104E					2.1		12.9	30.6	6.8	342		2.8 JQ				54.3
SS-105A				1.9 JQ	0.86	0.43	14.7	9.4	10.9	370	0.024	8.6				47.4
SS-105B					1.1		14.8	3.3	3.3	266	0.010	12.1				52.7
SS-105C				6.1	2.5		30.1	8.9	15.9	3,130	0.0016 JQ	24.6				128
SS-105D					1.4		12.8	7.1		2,030		8.7			2.4 JQ	45.5
SS-105E					1.5 JQ		14.3			194		6.8 JQ				45.9
SS-106A				1.4 JQ	0.95		16.7	12.4	7.8	306	0.022	9.1		0.14 JQ		47.8
SS-106B					1.4		20.2	8.5 J	5.3	546	0.0074	10.9			2.4 JQ	85.8
SS-106C					1.4		16.3	3.5 JQ	5.2	354	0.00073 JQ	9.8				75.4

TABLE 5
Phase IIA RI Soil Analytical Results - Inorganic Constituents
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

			Hazardous Substance List Metals													
	Cyanide	Chromium VI*	Antimony	Arsenic	Beryllium	Cadmium	Chromium (total)	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
SS-106D					1.2		17.3	10.7	5.1	813		9.1				46.0
SS-106E					1.5		14.3	4.2 JQ		426	0.00014 JQ	9.5				66.4
SS-107A					0.91		18.1 JQ	10.5	10.9	290	0.019	8.7		1.3 JQ		40.8
SS-107B				1.4 JQ	1.2		13.3	2.7	11.3	2,510	0.010	10.4			2.1 JQ	59.2
SS-107C				3.7 JQ	1.3		21.0	8.5	5.4	284	0.00018 JQ	20.6				81.7
SS-107D					1.8		19.5	7.3		257		11.8				77.1
SS-107E					1.3		21.4	1.7 JQ		294		15.5				74.5
SS-108A					0.79		17.5	11.2	6.7	116	0.051	8.5				59.2
SS-108B					1.5		20.2	9.7	9.5	393	0.0075	17.6				115
SS-108C				4.6 JQ	1.8		27.3	4.3 JQ	9.5	664	0.0046	17.5				93.5
SS-108D				2.9 JQ	1.8		23.6	7.0	4.1	509		16.0	3.5 JQ		17.5 J	88.0
SS-108E				4.0 JQ	1.5		17.5	2.4 JQ	7.4	502		15.5				61.4
SS-109A					0.94		16.8	4.5	5.1	133	0.038	7.5				38.9
SS-109B					1.5		19.0	0.62 JQ		355	0.00080 JQ	11.6				61.3
SS-109C					1.5		16.2	8.1		264	0.00041 JQ	7.0				49.1
SS-109D					1.9		17.6	6.8	6.2	480		14.2				74.5
SS-109E					0.86		11.9	3.4	4.2	552		6.1				35.0
SS-110A					0.81		23.0	4.2	8.0	228	0.041	10.6				49.1
SS-110B					1.3		18.4	0.51 JQ		221	0.0031 JQ	14.6				84.1
SS-110C					1.6		23.1	10.9	6.3	599	0.00047 JQ	13.8				90.0
SS-110D					1.5		24.7	5.8 JQ		380	0.00037 JQ	11.1				67.5
SS-110E					1.4		22.6	0.68 JQ		304	0.0021 JQ	11.3				53.7
SS-111A					0.58	0.26	19.9	5.3	11.8	134	0.069	6.1				25.1
SS-111B				1.5 JQ	0.89		15.3	2.5	9.1	586	0.0031 JQ	11.7				77.0
SS-111C				1.8 JQ	0.86		16.8	2.5	6.4	269	0.0011 JQ	12.2				78.9

TABLE 5
Phase IIA RI Soil Analytical Results - Inorganic Constituents
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

			Hazardous Substance List Metals													
	Cyanide	**Chromium VI***	**Antimony**	**Arsenic**	**Beryllium**	**Cadmium**	**Chromium (total)**	**Copper**	**Lead**	**Manganese**	**Mercury**	**Nickel**	**Selenium**	**Silver**	**Thallium**	**Zinc**
SS-111D				4.4 JQ	1.2		13.6	5.9	7.3	552		8.5				56.7
SS-111E				4.0	1.2		16.4	13.5		304	0.00066 JQ	12.3			2.4 JQ	88.8
SS-112A				1.7 JQ	0.70		15.2	3.3	3.7	150	0.0096	14.4				53.2
SS-112B					0.74		15.7	11.4	6.3	230 J		10.1			2.0 JQ	73.6
SS-112C				2.0 JQ	1.4		16.1	7.7	5.1	368	0.00063 JQ	10.1				61.5
SS-112D				1.5 JQ	0.88		17.1	20.2	6.2	240		10.6				63.1
SS-112E				1.9 JQ	0.87		18.3	11.6	5.5	209		9.8				60.1
SS-113A				0.34 JQ	0.35		2.4	5.1	5.3	290	0.011	3.6				6.1
SS-113B				7.2 JQ	2.6		35.1	21.5	15.7	514	0.00050 JQ	25.4				120
SS-114A				5.3 J	4.0	1.4	34.3	44.1	31.5	739	0.010	82.5		101		515
SS-114B				2.7	3.0		42.1	25.6	8.8	446	0.0061	25.9		72.1	1.7 JQ	106
SS-115A	0.40				4.7		33.5	35.2	24.1	426	0.0064	14.7		2.7 JQ		140
SS-116A	4.4				5.1		35.8 J	51.6 J	17.8 J	833	0.0022 JQ	18.6		1.5 JQ		181
SS-116B	17.8		3.3 JQ		11.9	4.0	36.9	87.5	9.4	4,010	0.00017 JQ	31.4			7.3 JQ	193
SS-117	0.44		2.1		1.3	2.2	70.8	34.7	10.1	332	0.0093	17.8	1.2 JQ	0.27 JQ		94.1
SS-118				5.3 J	1.6		18.9 J	12.0 J	14.1	328 J	0.00018 JQ	9.2 J				57.2 J
SS-119				6.7	2.5		34.2	22.7	16.0	775	0.0012 JQ	30.4	3.9 JQ			137
SS-120				3.4 JQ	1.6		25.4	21.1	18.3	1,630	0.0060	24.2				81.9
SS-121		4.9		4.1 JQ	2.1		37.3	31.5	10.4	714	0.0011 JQ	14.5				88.7
SS-122			1.5		1.6	1.7	33.8	27.0	3.4	71.1	0.0053	5.3	0.39 JQ	0.035 JQ	0.36 JQ	52.7
SS-123			0.32 JQ		0.87	0.20	16.0	26.4	8.3	458	0.0034 JQ	7.6	0.87 JQ			19.3
SS-124			0.25 JQ	0.35 JQ	0.54		15.4	13.3	6.7	394	0.0051	9.2				45.8
SS-125			0.71		0.56	1.0	18.3	20.7	10.8	564	0.0032 JQ	15.8	0.60 JQ	0.082 JQ	0.80	50.0
SS-126			0.80		0.55	0.82	19.2	6.6	12.6	384	0.015	10.2	0.36 JQ		0.40 JQ	47.6
SS-127			0.66		0.60	0.40	9.6	7.2	16.1	232	0.025	5.7	0.46 JQ		0.58 JQ	21.9

TABLE 5
Phase IIA RI Soil Analytical Results - Inorganic Constituents
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

			Hazardous Substance List Metals													
	Cyanide	Chromium VI*	Antimony	Arsenic	Beryllium	Cadmium	Chromium (total)	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
SS-128					0.93 J	0.16 J	6.4 J	4.5	5.9	2,160	0.025 J	8.1	0.41 JQ			19.1
SS-129					0.61	0.21	16.8	15.6	19.2	307	0.028	7.4	0.74 JQ			23.8
SS-130			0.39 JQ		0.67	0.79	14.8	20.6	6.2	244	0.013	9.7	0.63 JQ			51.5
SS-131				2.7	1.7		33.1	27.3	12.6	433	0.070	16.4		0.22 JQ		65.7
SS-132					1.2		24.6	18.9	9.9	150	0.040	11.9				45.4
SS-133					0.33	0.064 JQ	8.8	5.8	11.4	104	0.021	4.1				16.8
SS-134			1.2 JQ		0.82		18.2	3.5	6.6	210	0.0041	10.5	2.6 JQ			49.5
SS-135B					8.8		32.0	56.2		822	0.00046 JQ					173

Notes:

1. Cyanide analyzed according to Standard Method 4500-CN-E; Chromium VI analyzed according to EPA Method 7196; Hazardous Substance List metals analyzed according to EPA Methods 6010C and 7471B (mercury).
2. Concentrations reported in milligrams per kilogram (mg/kg).
3. Blank cells indicate analyte not detected above MDL; refer to laboratory report for associated MDLs.
4. J - Constituent concentration is estimated based on non-compliant QA/QC data.
5. JQ - Constituent concentration is estimated. Reported concentration is between the laboratory MDL and the reporting limit.
6. * - Leachable/extractable hexavalent chromium.

Prepared By: SEK 10/14/2010
Checked By: LRD 10/15/2010

TABLE 6
Phase IIA RI Analytical Results - Quality Control Samples
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

Analyte	MB-01	FB-01	FB-02	EB-01	EB-02	EB-03	TB-01*	TB-02	TB-03*	TB-04*	TB-05	TB-06*	TB-07*	TB-08	TB-09*
EPA Method 8260B VOCs															
Acetone	2.5 JQ				6.3 JQ			2.5 JQ							
Carbon Disulfide	50.4														
Chloromethane								0.16 JQ							
1,4-Dichlorobenzene									3.3 J						
Methylene Chloride		8.7		6.3							1.9 J			2.3	
EPA Method 8270D SVOCs															
Benzo(g,h,i)perylene		--	--		4.1 JQ		--	--	--	--	--	--	--	--	--
Dibenz(a,h)anthracene		--	--		3.7 JQ		--	--	--	--	--	--	--	--	--
Indeno(1,2,3-cd)pyrene		--	--		3.5 JQ		--	--	--	--	--	--	--	--	--
TICs by EPA Method 8270D															
Cyclopentene, 1,2,3,4,5-pen	5.06 E	--	--				--	--	--	--	--	--	--	--	--
Unknown	41.69 E	--	--	57.6 E	3.484 E	32.06 E	--	--	--	--	--	--	--	--	--
Cyanide and HSL Metals															
Cyanide		--	--				--	--	--	--	--	--	--	--	--
Arsenic		--	--		5.4	3.7 JQ	--	--	--	--	--	--	--	--	--
Antimony		--	--				--	--	--	--	--	--	--	--	--
Beryllium	0.11 JQ	--	--	0.11 JQ			--	--	--	--	--	--	--	--	--
Cadmium		--	--				--	--	--	--	--	--	--	--	--
Chromium	0.58 JQ	--	--	1.1 JQ	0.53 JQ	0.67 JQ	--	--	--	--	--	--	--	--	--
Copper	2.3 JQ	--	--	0.89 JQ			--	--	--	--	--	--	--	--	--
Lead		--	--				--	--	--	--	--	--	--	--	--
Manganese	90.6	--	--	2.0 JQ			--	--	--	--	--	--	--	--	--
Mercury		--	--		0.11 JQ		--	--	--	--	--	--	--	--	--

TABLE 6
Phase IIA RI Analytical Results - Quality Control Samples
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

Analyte	MB-01	FB-01	FB-02	EB-01	EB-02	EB-03	TB-01*	TB-02	TB-03*	TB-04*	TB-05	TB-06*	TB-07*	TB-08	TB-09*
Nickel		--	--				--	--	--	--	--	--	--	--	--
Selenium		--	--		11.9		--	--	--	--	--	--	--	--	--
Silver		--	--				--	--	--	--	--	--	--	--	--
Thallium	3.2 JQ	--	--	3.7 JQ		4.0 JQ	--	--	--	--	--	--	--	--	--
Zinc	116 JQ	--	--	24.5 JQ	1.9 JQ	18.8	--	--	--	--	--	--	--	--	--

Notes:

1. VOCs - volatile organic compounds, according to EPA Method 8260B; SVOCs - semi-volatile organic compounds according to EPA Method 8270D; Cyanide according to Standard Method CN-4500-CN-E; HSL Metals - Hazardous Substance List Metals according to EPA Methods 6010C and 7470A (mercury); TICs - tenatively identified compounds.
2. MB - material blank; FB - field blank; EB - equipment blank; TB - trip blank (refer to Table 2 for associated quality control information).
3. Concentrations are reported as micrograms per liter (µg/L), unless otherwise indicated.
4. * TB soil (concentrations reported as micrograms per kilogram (µg/kg).
5. EPA Method 8260B and 8270D analytes detected in one or more samples above the Method Detection Limit (MDL) are shown; refer to laboratory report for the list of analytes
6. Blank cells indicate analyte not detected above MDL; refer to laboratory report for associated MDLs.
7. "--" - constituent not analyzed.
8. JQ - Constituent concentration is estimated. Reported concentration is between the laboratory MDL and the reporting limit.
9. E - Constituent concentration is estimated, as method standards are not performed for TICs.

Prepared By: SEK 10/14/2010
Checked By: LRD 10/15/2010

TABLE 7
Evaluation of HSL Metals in Site Background Soils
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

	Antimony	Arsenic	Beryllium	Cadmium	Chromium (total)	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium*	Zinc
USGS														
Lake Chatuge, NC	NR	2.5	NR	0.20	70	100	15	150	0.25	30	0.8	NR	NR	100
Asheville, NC	NR	1.0	NR	0.75	50	30	15	500	0.03	30	0.4	NR	NR	100
Waynesville, NC	NR	1.5	NR	0.20	70	50	30	500	0.03	20	0.2	NR	NR	95
Boone, NC	NR	3.8	NR	0.55	200	50	15	700	0.16	50	0.8	NR	NR	60
Mean USGS	NA	2.2	NA	0.43	98	58	19	463	0.12	33	0.6	NA	NA	89
EPA														
Range	NR	0.7 - 15.0	NR	0.01 - 7	10 - 100	7 - 70	10 - 50	150 - 1,000	0.01 - 0.14	<5 - 50	<0.1 - 1.2	0.01 - 5	NR	30 - 125
Mean	NR	3.6	NR	0.06	45	24	21	540	0.06	18.5	0.4	0.05	NR	73.5
SITE														
Background Range	0.25 - 1.2	0.35 - 6.1	0.33 - 2.5	0.064 - 1.0	6.4 - 30.1	0.51 - 26.4	3.3 - 19.2	104 - 3,130	0.00014 - 0.069	4.1 - 24.6	0.36 - 3.5	0.082 - 0.84	0.4 - 17.5	16.8 - 128
Background Mean	0.58	2.7	1.1	0.43	17	8.1	7.8	551	0.012	12	1.1	0.35	1.6	63
Percentage Above MDL	18%	38%	100%	22%	100%	100%	84%	100%	73%	100%	20%	7%	20%	100%
Minimum MDL	0.22	0.23	NA	0.051	NA	NA	3.8	NA	0.000056	NA	0.1	0.023	0.094	NA
Maximum MDL	4.4	5.1	NA	0.95	NA	NA	7.6	NA	0.0025	NA	6.0	0.47	4.1	NA
Background UPL	0.9	3.8	1.9	0.6	25	24	13	2,405	0.03	19	1.8	0.3	1.9	105
IHSB PSRGs														
Health-Based	6.3	4.4	31	14	NE	630	400	360	1.1	300	78	78	1.0	4,600
Protection of Groundwater	0.9	5.8	NE	3.0	NE	700	270	65	NE	130	2.1	3.4	0.28	1,200

Notes:

1. USGS - values from "Chemical Analyses of Soils and Other Surficial Materials of the Conterminous United States," dated 1991 (Open File Report 81-197).
2. EPA - values from "Determination of Background Concentrations of Inorganics in Soils and Sediments at Hazardous Waste Sites," dated 1995 (EPA/540/S-96/500).
3. Concentrations are in milligrams per kilogram (mg/kg), except where indicated otherwise; NR - not reported; "<" = less than; NA - not applicable.
4. EPA values for arsenic, chromium, copper, lead, manganese, mercury, nickel, selenium, and zinc represent concentrations in "soils over granites and gneisses."
5. PSRG - Preliminary Soil Remediation Goal (PSRGs from Inactive Hazardous Sites Branch's "Soil Remediation Goals" Table, dated October 2010).
6. MDL - Method Detection Limit; UPL - Upper Prediction Limit (95 percent confidence).
7. NE- PSRG not established.
8. * - outlier of 17.5 mg/kg removed from data set for mean and UPL values.

Prepared By: SEK 11/4/2010
Checked By: MEW 11/17/2010

TABLE 8
Evaluation of HSL Metals in Soil Collected from Potential Source Areas
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

	Antimony	**Arsenic**	**Beryllium**	**Cadmium**	**Chromium (total)**	**Copper**	**Lead**	**Manganese**	**Mercury**	**Nickel**	**Selenium**	**Silver**	**Thallium**	**Zinc**
Health-Based Goal	6.3	4.4	31	14	NE/25*	630	400	360/2,405*	1.1	300	78	78	1.0/4.1*	4,600
Protection of Groundwater Goal	0.9/4.4*	5.8	NE/1.9*	3.0	NE/25*	700	270	65/2,405*	NE/0.03*	130	2.1	3.4	0.28/4.1*	1,200
AREA 1: ADJACENT TO NORTHWEST PORTION OF GRAVEL DRIVE														
SS-101A			1.7		23.7	19.6	10.2	537	0.018	14.0		**6.4**		73.7
SS-101B			1.5		19.1	16.0	9.4	692	0.00043 JQ	16.8				48.9
SS-101C			**4.2**		**56.0**	36.3	14.0	371		30.6				157
SS-101D			**5.2**		**26.0**	48.7	8.7	632	0.00093 JQ	8.9				107
SS-102A	**27.2 J**	**33.3 J**	**45.8 J**	**41.4 J**	**71.6**	69.8 J	62.8 J	795 J	0.0063	63.4 J	**30.7 J**	**18.8 J**	**38.3 J**	115
FD-34 (SS-102A)			**3.2 J**		**73.4**	16.9 J	23.0 J	1,360 J	0.0070	33.8 J				91.9
SS-102B			1.7		**30.5**	13.6	12.6	670	0.0033 JQ	31.7			2.8 JQ	100
SS-102C			**4.1**		**41.5**	59.0	14.2	1,330	0.0025 JQ	43.7				136
SS-102D		4.0 JQ	**3.6**		**49.9**	11.9	13.3	400	0.0022 JQ	26.7				133
SS-103A			1.0		12.2	8.3	3.5	564	0.0025 JQ	7.3				47.0
SS-103B			1.8 J		**27.3**	24.1	12.7	1,030	0.0018 JQ	20.1				76.5 J
FD-39 (SS-103B)			**3.2 J**		**40.9**	15.5	18.6	1,530	0.0038 JQ	31.6				133 J
SS-103C		2.8 JQ	**2.2**		23.9	16.8	16.2	1,240	0.0027 JQ	16.7				82.4
SS-103D			**2.1**		**28.2**	18.3	10.1	325	0.0025 JQ	18.0				97.1

TABLE 8
Evaluation of HSL Metals in Soil Collected from Potential Source Areas
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

	Antimony	**Arsenic**	**Beryllium**	**Cadmium**	**Chromium (total)**	**Copper**	**Lead**	**Manganese**	**Mercury**	**Nickel**	**Selenium**	**Silver**	**Thallium**	**Zinc**
Health-Based Goal	6.3	4.4	31	14	NE/25*	630	400	360/2,405*	1.1	300	78	78	1.0/4.1*	4,600
Protection of Groundwater Goal	0.9/4.4*	5.8	NE/1.9*	3.0	NE/25*	700	270	65/2,405*	NE/0.03*	130	2.1	3.4	0.28/4.1*	1,200
AREA 2: ADJACENT TO WESTERN PORTION GRAVEL DRIVE														
SS-104A			0.84		22.5	8.4	9.4	160	**0.097**	8.3	2.0 JQ			36.9
SS-104B		3.2 JQ	1.1		14.9	5.9		200 J	0.00092 JQ	6.9				46.6
FD-13 (SS-104B)			1.3		14.2	7.9	6.4 J	834 J	0.00087 J	9.2				42.3
SS-104C			1.1		16.0	1.4 JQ	3.6 JQ	278		10.1				51.7
SS-104D			1.3		13.6	3.9 JQ		256	0.00015 JQ	7.6				45.4
SS-104E			**2.1**		12.9	30.6	6.8	342		2.8 JQ				54.3
SS-105A		1.9 JQ	0.86	0.43	14.7	9.4	10.9	370	0.024	8.6				47.4
SS-105E			1.5 JQ		14.3			194		6.8 JQ				45.9
SS-107A			0.91		18.1 JQ	10.5	10.9	290	0.019	8.7		1.3 JQ		40.8
SS-109A			0.94		16.8	4.5	5.1	133	**0.038**	7.5				38.9
SS-109B			1.5		19.0	0.62 JQ		355	0.00080 JQ	11.6				61.3
SS-109C			1.5		16.2	8.1		264	0.00041 JQ	7.0				49.1
SS-109D			1.9		17.6	6.8	6.2	480		14.2				74.5
SS-109E			0.86		11.9	3.4	4.2	552		6.1				35.0
SS-110E			1.4		22.6	0.68 JQ		304	0.0021 JQ	11.3				53.7

TABLE 8
Evaluation of HSL Metals in Soil Collected from Potential Source Areas
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

	Antimony	Arsenic	Beryllium	Cadmium	Chromium (total)	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
Health-Based Goal	6.3	4.4	31	14	NE/25*	630	400	360/2,405*	1.1	300	78	78	1.0/4.1*	4,600
Protection of Groundwater Goal	0.9/4.4*	5.8	NE/1.9*	3.0	NE/25*	700	270	65/2,405*	NE/0.03*	130	2.1	3.4	0.28/4.1*	1,200
AREA 3: BUILDING and WWPS														
SS-113A		0.34 JQ	0.35		2.4	5.1	5.3	290	0.011	3.6				6.1
SS-113B		**7.2 JQ**	**2.6**		**35.1**	21.5	15.7	514	0.00050 JQ	25.4				120
SS-114A		5.3 JQ	**4.0**	1.4	**34.3**	44.1	31.5	739	0.010	82.5		**101**		515
SS-114B		2.7	**3.0**		**42.1**	25.6	8.8	446	0.0061	25.9		**72.1**	1.7 JQ	106
SS-115A			**4.7**		**33.5**	35.2	24.1	426	0.0064	14.7		2.7 JQ		140
SS-116A			**5.1**		**35.8 J**	51.6 J	17.8 J	833	0.0022 JQ	18.6		1.5 JQ		181
SS-116B	3.3 JQ		**11.9**	**4.0**	**36.9**	87.5	9.4	**4,010**	0.00017 JQ	31.4			**7.3 JQ**	193
SS-117	2.1		1.3	2.2	**70.8**	34.7	10.1	332	0.0093	17.8	1.2 JQ	0.27 JQ		94.1
SS-118		5.3 J	1.6		18.9 J	12.0 J	14.1	328 J	0.00018 JQ	9.2 J				57.2 J
FD-02 (SS-118)		2.2 J	1.2		3.4 J	20.8 J	14.4	786 J		4.7 J				15.6 J
SS-119		**6.7**	**2.5**		**34.2**	22.7	16.0	775	0.0012 JQ	30.4	**3.9 JQ**			137
SS-120		3.4 JQ	1.6		**25.4**	21.1	18.3	1,630	0.0060	24.2				81.9
SS-121		4.1 JQ	**2.1**		**37.3**	31.5	10.4	714	0.0011 JQ	14.5				88.7
SS-122	1.5		1.6	1.7	**33.8**	27.0	3.4	71.1	0.0053	5.3	0.39 JQ	0.035 JQ	0.36 JQ	52.7
SS-135B			**8.8**		**32.0**	56.2		822	0.00046 JQ					173

TABLE 8
Evaluation of HSL Metals in Soil Collected from Potential Source Areas
Mills Gap Road Site
Skyland, North Carolina
MACTEC Project 6686-08-1744

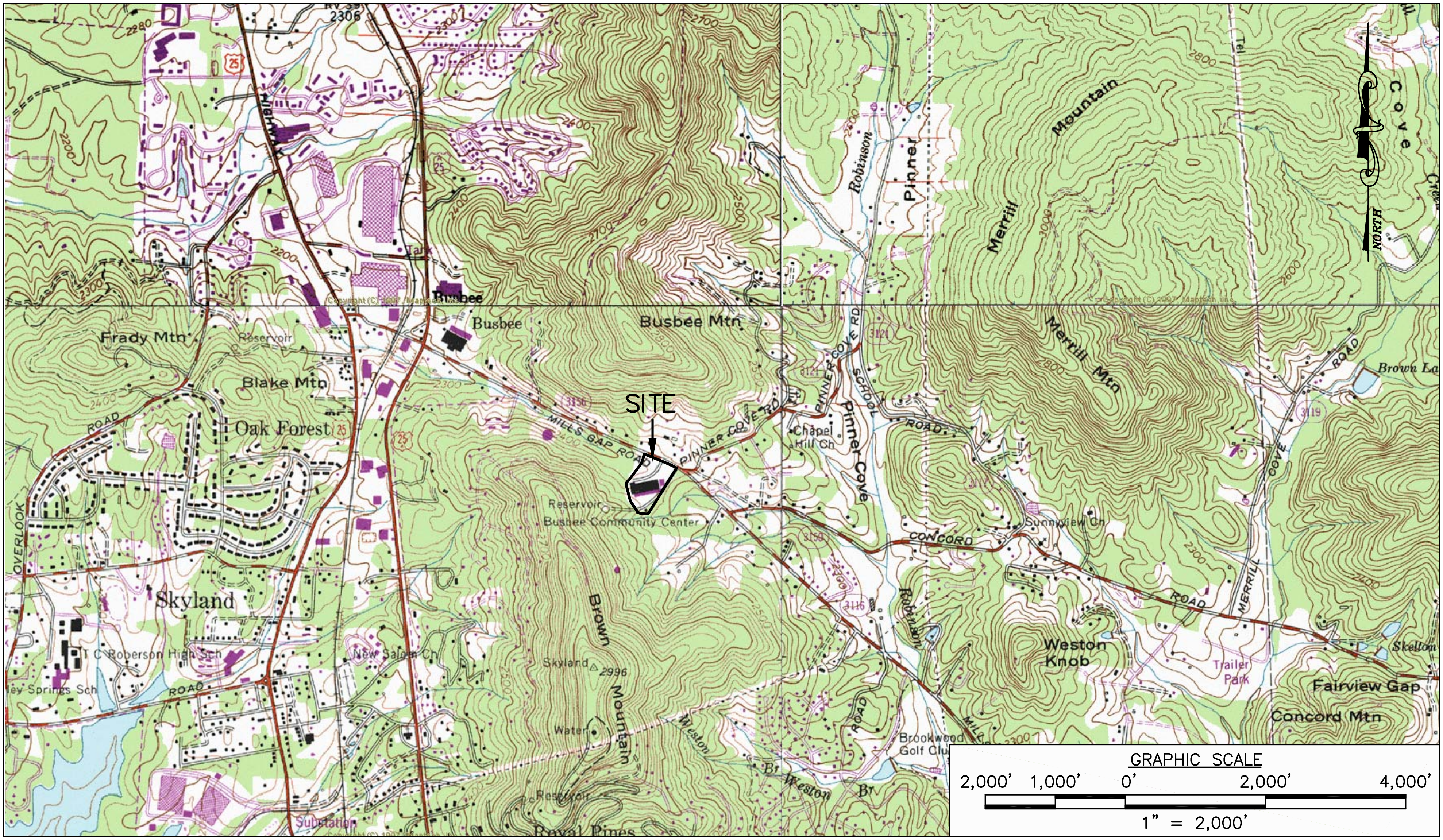
	Antimony	Arsenic	Beryllium	Cadmium	Chromium (total)	Copper	Lead	Manganese	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
Health-Based Goal	6.3	4.4	31	14	NE/25*	630	400	360/2,405*	1.1	300	78	78	1.0/4.1*	4,600
Protection of Groundwater Goal	0.9/4.4*	5.8	NE/1.9*	3.0	NE/25*	700	270	65/2,405*	NE/0.03*	130	2.1	3.4	0.28/4.1*	1,200
AREA 4: FORMER CONTINGENCY BASIN														
SS-131		2.7	1.7		**33.1**	27.3	12.6	433	**0.070**	16.4		0.22 JQ		65.7
SS-132			1.2		24.6	18.9	9.9	150	**0.040**	11.9				45.4
FD-33 (SS-132)	0.76 JQ	1.3	1.4	0.18 JQ	24.3	21.0	9.4	171	0.026	11.0				46.5

Notes:

1. Health-Based Goal: based on IHSB Health-Based Preliminary Soil Remediation Goals (PSRGs), dated October 2010, or Site-Specific value (denoted with *).
2. Protection of Groundwater Goal: based on IHSB Protection of Groundwater PSRGs, dated October 2010, or Site-Specific value (denoted with *).
3. NE - PSRG not established for compound.
4. Hazardous Substance List metals analyzed according to EPA Methods 6010C and7471B (mercury).
5. Concentrations reported in milligrams per kilogram (mg/kg).
6. Blank cells indicate analyte not detected above MDL; refer to laboratory report for associated MDLs.
7. J - Constituent concentration is estimated based on non-compliant QA/QC data.
8. JQ - Constituent concentration is estimated. Reported concentration is between the laboratory MDL and the reporting limit.
9. Bold concentrations indicate exceedance of the Protection of Groundwater Goal.
10. Shaded cells indicate concentration exceeds the Health-Based Goal.

Prepared By: SEK 11/4/2010
Checked By: LRD 11/17/2010

FIGURES

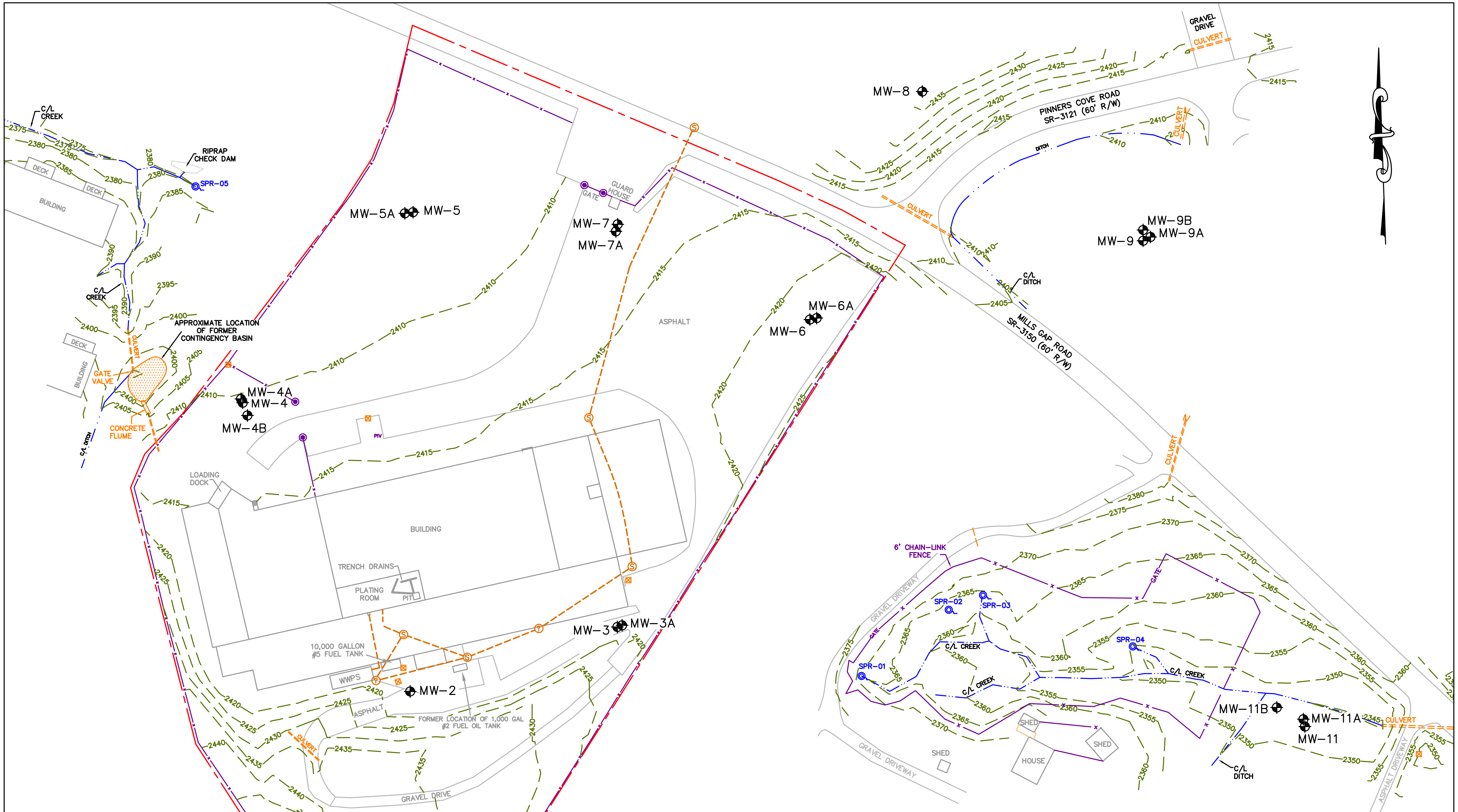


TOPOGRAPHIC SITE MAP
MILLS GAP ROAD SITE
SKYLAND, NORTH CAROLINA

MACTEC
ENGINEERING AND CONSULTING, INC.

DRAWN: SEK	ENG CHECK:	DATE: NOVEMBER 2010	PROJECT: 6686-08-1744
DFT CHECK: MEW	APPROVAL: MEW	SCALE: 1" = 2,000'	FIGURE: 1

REFERENCE: USGS QUADRANGLES: ASHEVILLE (1961), OTEEN (1962), FRUITLAND (1978) AND SKYLAND (1978)



LEGEND

- MW-1 MONITORING WELL
- SPR-01 SPRING
- CATCH BASIN DRAIN INLET
- SANITARY SEWER MANHOLE
- ESTIMATED SEWER MANHOLE LOCATION
- PROPERTY LINE
- SANITARY SEWER LINE
- STORMWATER CONDUIT
- FENCE
- 2445 TOPOGRAPHIC CONTOUR, 5-FT INTERVAL (Elevations are in feet above mean sea level)

NOTE: The locations of MW-9B and MW-11B are approximate.
The locations of the sanitary sewer lines and manholes are approximate.

GRAPHIC SCALE

100' 0 100' 200'

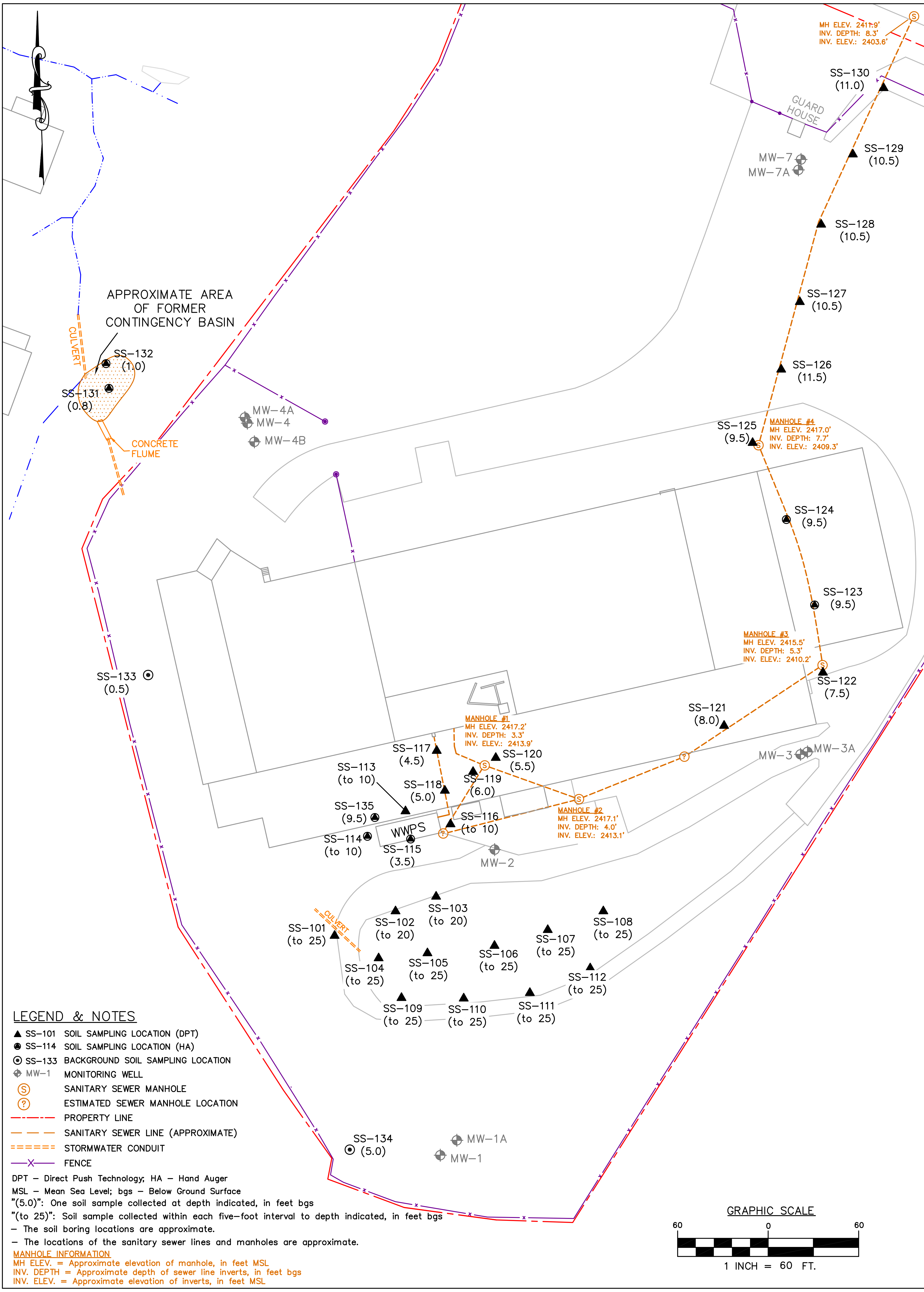
1 INCH = 100 FT.

MACTEC ENGINEERING AND CONSULTING, INC.

SITE MAP
MILLS GAP ROAD SITE
SKYLAND, NORTH CAROLINA

DRAWN: SEK	DFT CHECK: MEW
ENG CHECK:	APPROVAL: MEW
DATE: NOVEMBER 2010	SCALE: 1"=100'
JOB: 6686-08-1744	FIG: 2

REFERENCE: SURVEY PREPARED BY FREELAND & ASSOCIATES.

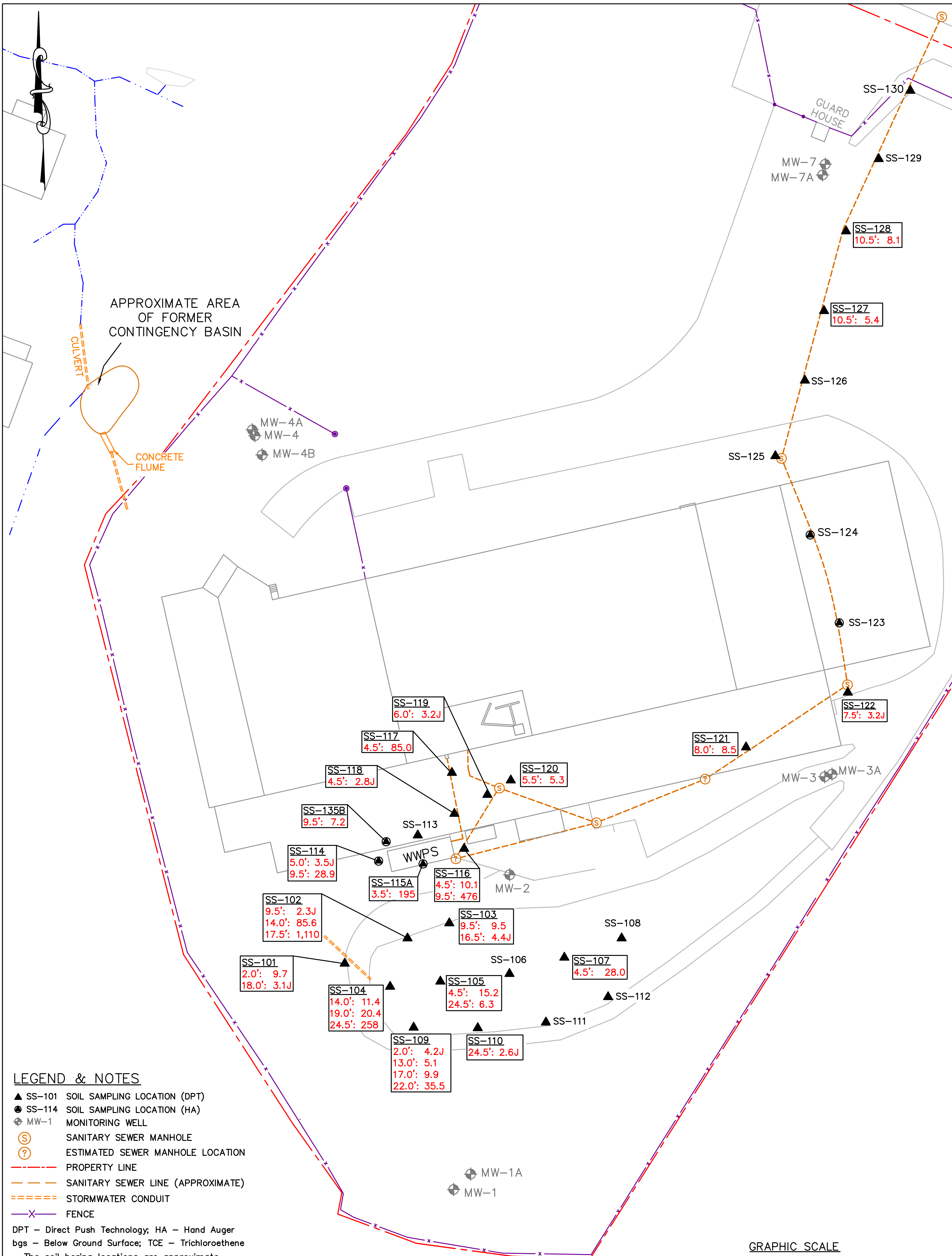


SOIL SAMPLE LOCATION MAP
MILLS GAP ROAD SITE
SKYLAND, NORTH CAROLINA

MACTEC
ENGINEERING AND CONSULTING, INC.

DRAWN: SEK	ENG CHECK:	DATE: NOVEMBER 2010	JOB: 6686-08-1744
DFT CHECK: MEW	APPROVAL: MEW	SCALE: 1"=60'	FIG: 3

REFERENCE: SURVEY PREPARED BY FREELAND & ASSOCIATES; MACTEC FIELD NOTES.



LEGEND & NOTES

- ▲ SS-101 SOIL SAMPLING LOCATION (DPT)
- ● SS-114 SOIL SAMPLING LOCATION (HA)
- MW-1 MONITORING WELL
- SANITARY SEWER MANHOLE
- ESTIMATED SEWER MANHOLE LOCATION
- PROPERTY LINE
- SANITARY SEWER LINE (APPROXIMATE)
- STORMWATER CONDUIT
- FENCE

DPT – Direct Push Technology; HA – Hand Auger
bgs – Below Ground Surface; TCE – Trichloroethene
– The soil boring locations are approximate.
– The locations of the sanitary sewer lines and manholes are approximate.

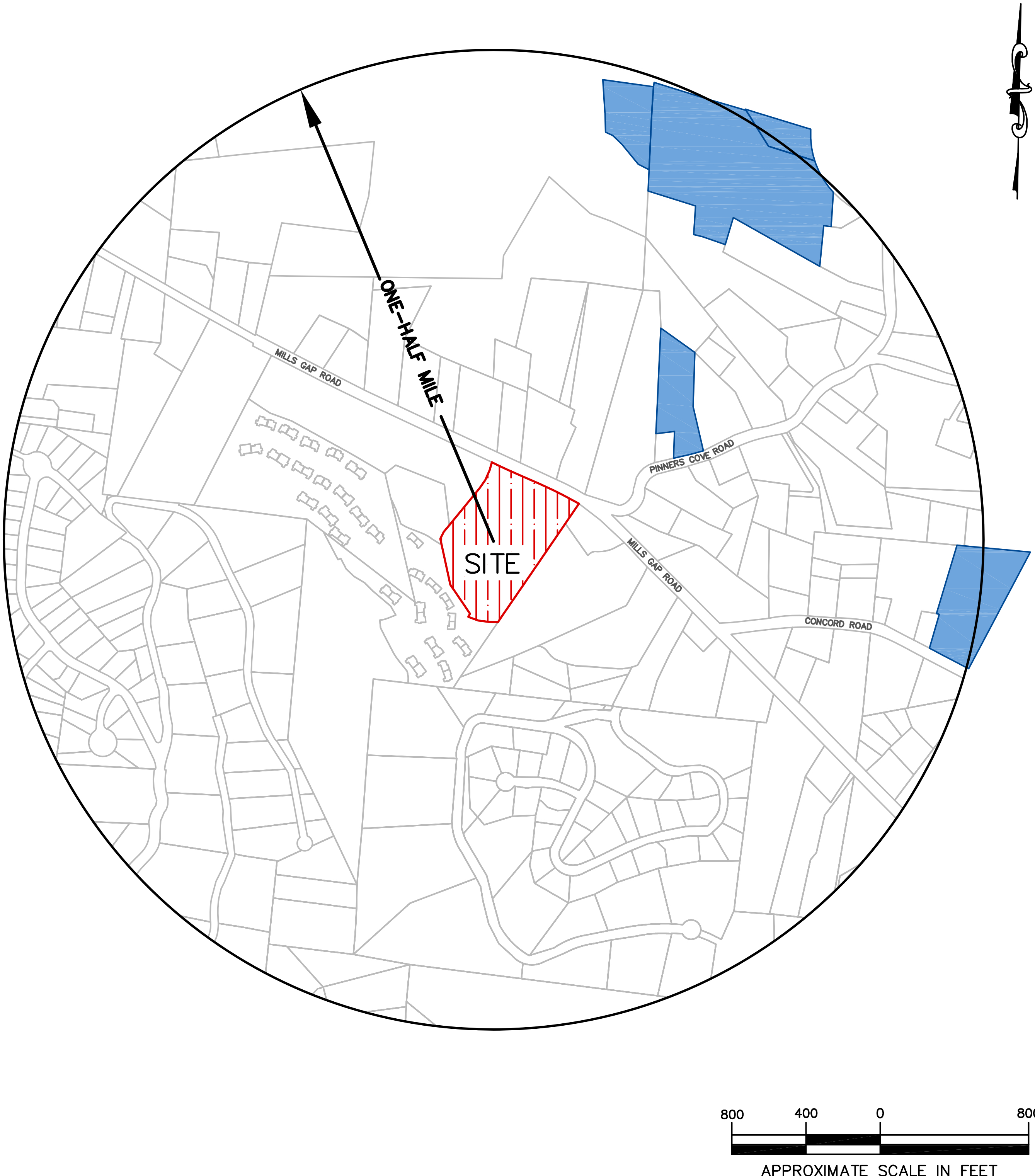
SS-110 (boring location)
24.5': 2.6J Sample depth, in feet bgs: Concentration of TCE, in micrograms per kilogram (ug/kg)
J – estimated concentration (above the Method Detection Limit but below the Laboratory Reporting Limit)

CONCENTRATIONS OF TCE IN PHASE IIA RI SOIL SAMPLES
MILLS GAP ROAD SITE
SKYLAND, NORTH CAROLINA

MACTEC ENGINEERING AND CONSULTING, INC.

DRAWN: SEK	ENG CHECK:	DATE: NOVEMBER 2010	JOB: 6686-08-1744
DFT CHECK: MEW	APPROVAL: MEW	SCALE: 1"=60'	FIG: 4

REFERENCE: SURVEY PREPARED BY FREELAND & ASSOCIATES; MACTEC FIELD NOTES.



LEGEND

PARCEL BOUNDARY

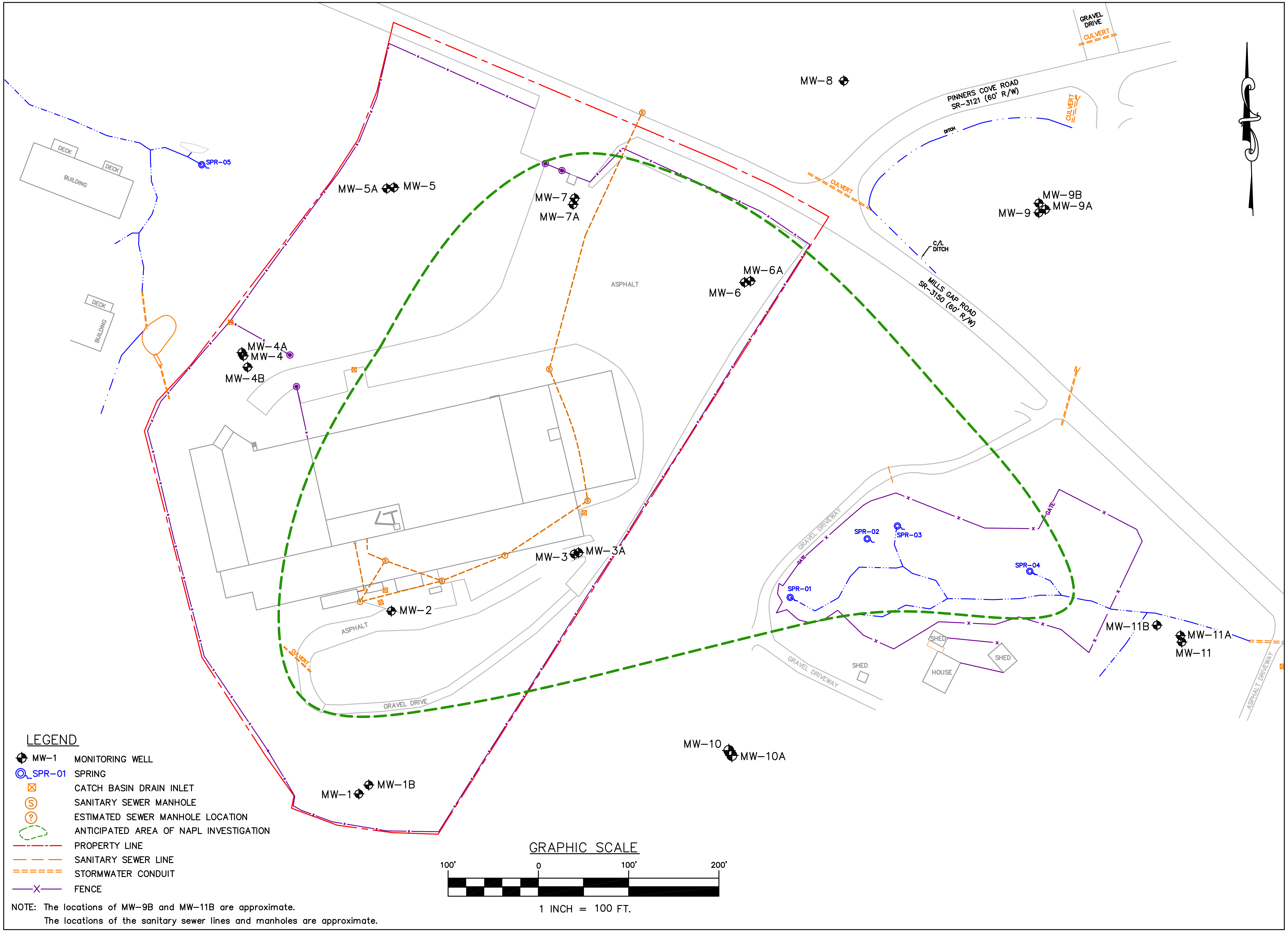
PARCEL CONTAINS ACTIVE WATER SUPPLY WELL

MACTEC
ENGINEERING AND CONSULTING, INC.

WATER SUPPLY WELL INVENTORY MAP
MILLS GAP ROAD SITE
SKYLAND, NORTH CAROLINA

DRAWN: SEK	DATE: NOV. 2010
DFT CHECK: MEW	SCALE: approx. 1"=800'
ENG CHECK:	JOB: 6686-08-1744
APPROVAL: MEW	FIG: 5

REFERENCE: BUNCOMBE COUNTY GEOGRAPHIC INFORMATION SYSTEMS WEBSITE.



MACTEC
ENGINEERING AND CONSULTING, INC.

ANTICIPATED AREA OF NAPL INVESTIGATION
MILLS GAP ROAD SITE
SKYLAND, NORTH CAROLINA

JOB: 6686-08-1744	FIG: 6
DATE: NOVEMBER 2010	SCALE: 1"=100'
ENG CHECK:	APPROVAL: MEW
DRAWN: SEK	DFT CHECK: MEW

REFERENCE: SURVEY PREPARED BY FREELAND & ASSOCIATES.