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FINAL SITE CHARACTERIZATION REPORT AT BUILDING 710 NWS YORKTOWN VA
9/29/1993
BAKER ENVIRONMENTAL, INC.

FINAL
SITE CHARACTERIZATION REPORT

BUILDING 710
NAVAL WEAPONS STATION
YORKTOWN, VIRGINIA

CONTRACT TASK ORDER 0195

Prepared For:

DEPARTMENT OF THE NAVY
ATLANTIC DIVISION
NAVAL FACILITIES
ENGINEERING COMMAND
Norfolk, Virginia

Under the:

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SEPTEMBER 29, 1993

SITE CHARACTERIZATION REPORT CHECKLIST

Site: Building 710, Yorktown Naval Weapons Station PC# _____ Region Tidewater

The following checklist must be filled out by the Responsible Party (RP) and/or the RP's Consultant and included in the Site Characterization Report. **Indicated on the checklist the page and section number where each item is addressed in the attached report.** Also indicate on the checklist the section and page number where justification is given for items omitted from the attached report. The contents of the report should reflect and be commensurate with the nature of the release, degree of contamination and complexity of the site investigation.

A copy of the Initial Abatement Measures Report must be attached to or included in the Site Characterization Report.

Items marked with an * are required as part of the CAP Permit Application.

1. SITE ASSESSMENT

PAGE / SECTION

- 1-33 / 1.5 Nature and quantity of release
- 1-33 / 1.5 *Physical and chemical properties of released product
- ___ / ___ Free Product Removal Report
- 1-1 / 1.2 Tank information (capacity, location, contents)
- 1-3 / 1.2 Geologic/hydrogeologic site information
 - 1-3 / 1.2 Site geology
 - 1-3 / 1.2 Subsurface conditions (fractures, solution cavities, lenses, depth to groundwater)
 - 1-8 / 1.2 Pumping/injection wells
 - ___ / A,B Drillers/geologic logs and construction details for all wells and boreholes
 - 1-6 / 1.2 Aquifer characteristics
 - 1-6 / 1.2 Name
 - 1-8 / 1.2 Thickness
 - 1-8 / 1.2 Conductivity
 - ___ / ___ Transmissivity
 - 1-25 / 1.4 Hydraulic gradient
 - 1-25 / 1.4 Flow velocity/direction
 - 1-17 / 1.4 Hydrogeologic cross section
- 1-8 / 1.2 Information as to water resources within 1000 ft of site (wells, springs, surface water)
- 1-8 / 1.2 Information as to adjacent property owners and potentially affected ground and surface water users (names, addresses, telephone numbers)
- 1-2 / 1.1 Information on historical releases at the site as well as historical releases from USTs located on adjacent property
- 1-5 / 1.2 Construction information on potentially affected wells
- 1-8 / 1.2 Current and projected groundwater/land use
- 1-34 / 1.5 Description of vertical and lateral extent of contamination
 - ___ / ___ Free product phase
 - 1-33 / 1.5 Dissolved phase
 - 1-33 / 1.5 Residual phase
 - 1-33 / 1.5 Vapor phase

/ Plume migration direction and rate
 / **E** *Sampling / monitoring results

NOTE: All lab sheets and tables submitted in the SCR must have sample media, analytical method used, detection limit method, unit of measure, sample depths, and sample locations. Sampling results from BTEX analysis must be reported individually and totaled.

Site maps/sketches (combine when appropriate and to scale when possible)

1-2 / 1.1 *Locus map on 7.5 min. quad. or county highway map

1-4 / 1.1 *Base map with property lines and physical features (buildings, roads, etc.)

1-4 / 1.1 *Location of source(s) of contamination at site

1-12 / 1.3 Sample locations (water, vapor, and/or soil)

 / Excavation pits

 / Surficial soils

 / Surface waters

 / Basements/conduits (and/or soil vapor surveys)

1-12 / 1.3 Monitoring wells

 / Domestic wells

 / Public supply wells

 / Springs

1-12 / 1.3 Boring locations

1-12 / 1.3 Observation well locations

1-24 / 1.4 Groundwater flow direction map

1-4 / 1.1 Subsurface conduits (telephone, water, sewer, power, dispenser piping)

 / *Potentially affected wells/streams/springs

 / *Flood plain designation

 / Isoconcentration or plume delineation map for each affected aquifer and/or soil zone for all phases present (cross-sectional and map view)

 / Free product

1-33 / 1.5 Dissolved

1-33 / 1.5 Residual

 / Vapor

FOR OFFICE USE ONLY

COMMENTS:

DEFICIENCIES:

3. REMEDIATION ASSESSMENT

3-1 / 3.2 Remediation feasibility

3-2 / 3.2 Projected remediation endpoints based on site, risk, and remediation assessments

3-2 / 3.2 Free product

3-2 / 3.2 Dissolved

3-2 / 3.2 Residual

3-3 / 3.2 Vapor

 / Description & evaluation of applicable technologies

 / Design for each applicable technology

 / Timeframe for implementation and duration for each applicable technology to achieve projected remediation endpoints

 / Projected costs for each applicable technology to achieve projected remediation endpoints

 / Achievable endpoints for each applicable technology

 / Free product

 / 3-2 / 3.2 Dissolved

 / 3-2 / 3.2 Residual

 / Vapor

 / Estimated timeframe for achieving endpoints for each applicable technology

 / Free product

 / Dissolved

 / Residual

 / Vapor

 / Immediate/future beneficial results for each applicable technology

3-2 / 3.3 Recommendation of most appropriate technologies with costs

 / Site Characterization Report submitted within 45 days of release confirmation or extension granted

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COMMENTS: _____

DEFICIENCIES: _____

REVIEWED BY: _____ DATE: _____

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EXECUTIVE SUMMARY

A Site Characterization Study was performed in accordance with the Code of Federal Regulation (40 CFR) 280.63 and the Virginia State Water Control Board (SWCB) regulation VR 680-13-02. The study was performed to investigate suspected subsurface petroleum contamination related to the vehicle maintenance racks and the underground storage tank (UST) system located at the hobby shop, Building 710, Yorktown Naval Weapons Station.

Site characterization investigation activities included a background information review, installation of 11 soil borings, field screening of subsurface soils, soil sampling and analysis, installation of seven groundwater monitoring wells, groundwater sampling and analysis, and performing hydraulic conductivity tests.

Review of the background information indicated that prior to the installation of the UST system in 1982, waste oil from vehicle maintenance activities was contained in drums within the concrete service pits. Spilled waste oil and rain water would accumulate within the service pits and overflow into the adjacent drainage ditch.

Based on the results of the field activities conducted during this site characterization in June 1993, the site has not been impacted by operations associated with the UST located at Building 710. Any detected concentrations of petroleum constituents in the vicinity of the site were low and were obtained from sampling locations upgradient from the vehicle maintenance racks. Total lead concentrations detected in groundwater could be attributed to natural-occurring lead concentrations present in sediments. Sediments were observed in the groundwater samples collected.

Hydrogeologic conditions at the site indicate groundwater flow within the shallow water-bearing zone is generally to the north. The estimated hydraulic conductivity value, determined from the slug tests, is 3.0 feet/day. The average groundwater flow velocity is 66 feet/year.

Although minor concentrations of contaminants in soil and groundwater were identified, the results of the risk assessment indicate that these contaminants do not pose a public health risk. Concentrations of these contaminants are low and there are limited opportunities for exposure.

Based on the investigation results, the risk assessment and regulatory requirements, “no action” remediation of soil and groundwater is recommended at this time.

1.0 SITE ASSESSMENT

The site assessment portion of the Site Characterization Report consists of five sections. The first section (Section 1.1) presents the objectives of the site assessment. The second section (Section 1.2) provides information regarding site structures, regional geologic and hydrologic conditions, climate, background information, and local land and water uses. In Sections 1.3 and 1.4, the investigative methods and field/analytical results are respectively discussed. Section 1.5 presents the nature and extent of contamination.

1.1 Objectives of Site Assessment

Baker Environmental, Inc., (Baker) conducted a site assessment of the vehicle maintenance racks and the associated underground storage tank (UST) at Building 710, the hobby shop, located at Naval Weapons Station, Yorktown (WPNSTA Yorktown), Virginia. The location of the site is shown on Figure 1-1. The specific objectives of the site assessment were to: (1) investigate the geologic and hydrogeologic conditions in the area of concern; and, (2) define the extent and severity the suspected subsurface fuel contamination resulting from the vehicle maintenance activities, the UST system and/or its associated piping.

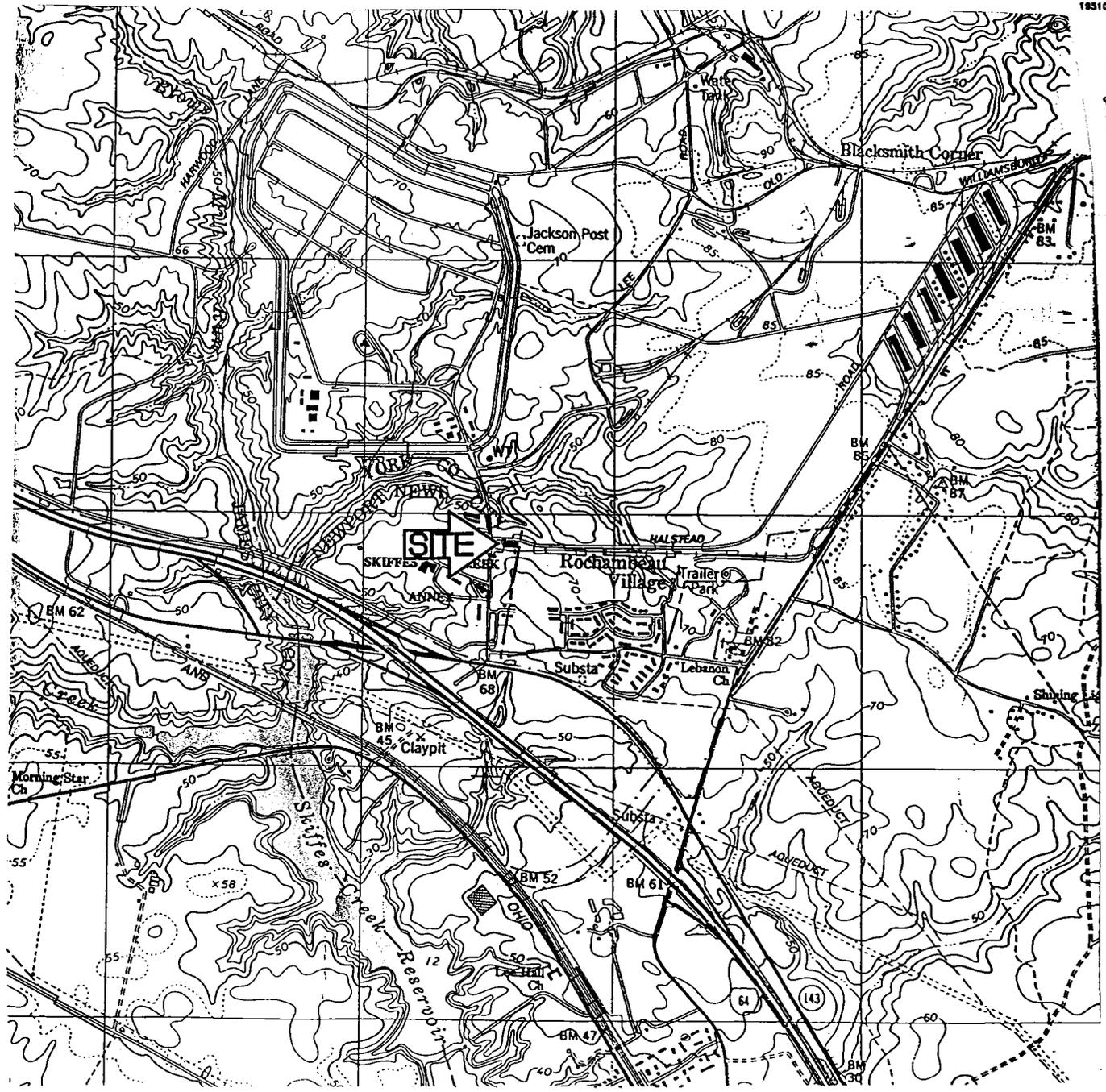
1.2 Site Characteristics and History

This section provides a general description of the site and of the regional setting of the study area. Information regarding site structures, regional geologic and hydrologic conditions, climate, site history, and local land and water uses are included to characterize the study area.

1.2.1 Site Description and History

Building 710 is located at the junction of Halstead Road and Longfellow Road approximately 1,400 feet north of Gate 3 at WPNSTA Yorktown (Figure 1-1). The building serves as an automotive hobby shop, special service issue office and an ordinance operation building. UST System 710 is located on the west side of Building 710. The UST is associated with two vehicle maintenance racks where base personnel formerly changed the motor oil from their car engines.

Before the UST was installed, waste oil from vehicle maintenance drained into metal containment drums which were within concrete service pits beneath the maintenance racks.



1 inch = 2000 ft.

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SOURCE: USGS TOPOGRAPHIC MAP
YORKTOWN, VIRGINIA 1984.

FIGURE 1-1
SITE LOCATION MAP
BUILDING 710

NAVAL WEAPONS STATION
YORKTOWN, VIRGINIA

Waste oil would occasionally spill into these service pits and with the accumulation of rainwater and sediment, the service pit drains would become clogged causing the waste oil and rainwater to overflow into the adjacent open drainage ditch.

The Activity contracted SCS Engineers, Inc.(SCS) in 1977 to perform an oil pollution survey on the effects of spills associated with the vehicle maintenance racks. SCS recommended cleaning and permanently closing the drainage pipes, constructing a canopy over the two maintenance racks and installing a 1,000-gallon UST for temporary waste oil storage.

The UST was installed in 1982 and consists of a single, steel 1,000-gallon capacity tank which contained and collected waste oils and rain water from the service pits. The vehicle maintenance racks and the associated UST were taken out of service in 1991, on recommendations of the Base Environmental Office. The vehicle maintenance racks and service pits are scheduled to be removed in October of 1993.

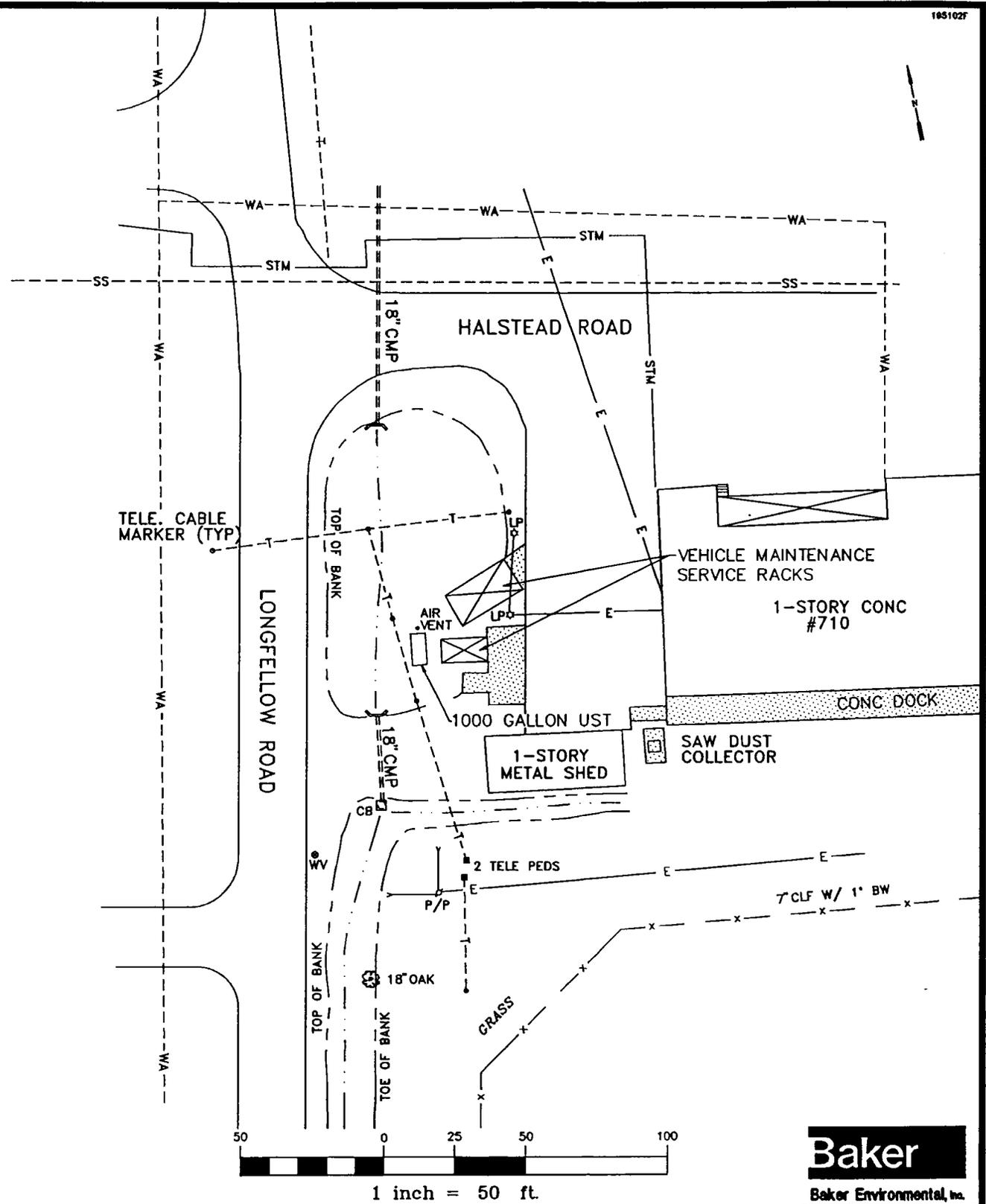
Figure 1-2 depicts a site plan for Building 710, showing the location of the vehicle maintenance racks, the UST system, the surrounding structures and utilities.

1.2.2 Regional Geology

The Atlantic Coastal Plain physiographic province is underlain by unconsolidated sediments of Cretaceous, Tertiary, and Quaternary ages that dip gently to the southeast and have a combined thickness of approximately 1,900 feet in the vicinity of WPNSTA Yorktown (Teifke, 1973). These sediments rest on a basement of pre-Cretaceous age igneous and metamorphic rocks, and in some places, on Triassic age sedimentary rocks that occur in isolated basins.

Most of the surficial unconsolidated sediments at WPNSTA Yorktown have been mapped as the Windwor Formation of the Pleistocene series (Johnson, 1972; Mixon et al., 1989). This formation is composed of a series of sand and silts deposited in marine and estuarine environments. Its thickness is estimated to vary from 0 to 40 feet at WPNSTA Yorktown.

In the easternmost portions of WPNSTA Yorktown, the Chuckatuck and Lower Shirley Formations have been mapped (Mixon et al., 1989). The Chuckatuck Formation consists of light- to medium-gray, yellowish-orange, and reddish-brown sandy silt and clay and minor amounts of brownish-black peat. Surficial deposits of river terraces and relict baymouth



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LEGEND

- ===== UNDERGROUND DRAINAGE LINE
- SS--- UNDERGROUND SEWER LINE
- WA--- UNDERGROUND WATER LINE
- T--- UNDERGROUND TELEPHONE LINE
- E— ABOVE GROUND ELECTRIC LINE
- STM— ABOVE GROUND STEAM LINE
- - - - - DITCH
- [Stippled Box] CONCRETE

SOURCE: MILLER-STEPHENSON & ASSOC., P.C., JUNE 1993

FIGURE 1-2
SITE PLAN
BUILDING 710
VEHICLE MAINTENANCE
RACKS AND UST SYSTEM
NAVAL WEAPONS STATION
YORKTOWN, VIRGINIA

barriers and bay floorplains constitute the Shirley Formation. This formation consists of gray and brown sand, gravel, silt, clay, and organics with some mollusk fossils.

The Bacons Castle Formation of Pliocene age underlies the Windsor Formation and is described as a clayey silt and silty fine-grained sand. The unit rests unconformably on the weathered top of the Upper Yorktown Formation, also of Pliocene age. Much of the lower half of the Yorktown Formation in the Virginia Coastal Plain has been reassigned to the Eastover Formation of Late Miocene age as defined by Ward and Blackwelder (1980). The Miocene deposits include the Yorktown, Eastover, St. Mary's, and Calvert Formations. The Miocene deposits range in thickness from approximately 200 feet in western James City County to slightly more than 300 feet in the Hampton area south-southeast of Yorktown. The top portion of the Yorktown Formation consists of shells and shell fragments cemented with calcium carbonate in a sandy silt matrix. The Yorktown/Eastover Formations grade downward into the St. Mary's Formation, which is composed of fine-grained, subround-to-round quartz-grained sand, with a decrease in shell fragment content. The St. Mary's Formation is a darker color that is often called blue sand or blue clay in drilling logs. Underlying the St. Mary's Formation is the Calvert Formation. The base of the Calvert Formation is marked by a marl or coquina (Johnson, 1972).

The Eocene deposits underlying the Miocene deposits, consist of the Chickahominy, Piney Point, and Nanjemoy (Claiborne age) Formations. These formations consist of fine to medium-grained sand, with varying concentrations of glauconite. The thickness of the Eocene deposits in the vicinity of WPNSTA Yorktown varies from approximately 80 to 120 feet (Teifke, 1973, Plate 9).

Paleocene deposits, underlying the Eocene deposits, consist of the Nanjemoy (Wilcox age), Aquia, and Mattaponi (Glaucinitic Member) Formations. In the central part of the York-James Peninsula, these formations consist of fine-grained quartz sand, with 10 to 25 percent glauconite and numerous relatively thin, silty clay stringers. These formations are approximately 100 feet thick in the central part of the York-James Peninsula (Teifke, 1973).

Cretaceous age deposits include the Lower Member of the Mattaponi Formation and the basal Potomac Group. Cretaceous deposits are characterized by discontinuous sand bodies interbedded with silts and clays. In the York-James Peninsula, these deposits originated in a fluvial-deltaic environment. The fluvial deposits are characteristically channel sand bodies that are coarse-grained at the base and fine upward. The deltaic deposits are

medium-grained, moderately sorted sands. The Cretaceous deposits in the vicinity of WPNSTA Yorktown are approximately 1,450 feet thick (C.C. Johnson, 1984).

1.2.3 Regional Hydrology

This section provides regional information on groundwater and surface waters. Principle aquifers and surface water features in the study area are discussed.

1.2.3.1 Regional Groundwater

Groundwater occurs in three major aquifer systems in the York-James Peninsula: the water table aquifer, the upper artesian aquifer, and the principal artesian aquifer. The water table aquifer, the uppermost of the three, consists of deposits of the Windsor and Yorktown Formations and ranges in thickness from 20 feet at the western end of the peninsula to approximately 150 feet at the seaward end of the vicinity of WPNSTA Yorktown. This aquifer is the dominant source of domestic (individual home) water supplies in many parts of Charles City, New Kent, James City, and York Counties.

At areas of NWS Yorktown that are located close to surface water bodies, the depth to the water table is frequently less than 10 feet. The groundwater flow direction within the water table aquifer is generally toward groundwater discharge zones coincident with surface streams. Therefore, the water table elevations roughly parallel surface topography.

The upper artesian aquifer underlies the water table aquifer and consists of the Calvert, Chickahominy, and Nanjemoy Formations. The bluish clayey St. Mary's Formation, which is approximately 100 feet thick, functions as an aquitard between the upper artesian aquifer and the water table aquifer. The upper artesian aquifer is generally 50 to 80 feet thick and consists of medium-grained sand, moderately to poorly sorted with glauconite, usually called green sand or black sand. The depth to the upper artesian aquifer is approximately 250 feet below mean sea level (MSL) and in the vicinity of WPNSTA Yorktown. The aquifer is a reliable source of domestic water supply. Much of the recharge to the aquifer is probably derived from silts and clays of the St. Mary's Formation. Specific capacities of wells completed in this system range from 1 to 10 gallon/minute/foot (gpm/ft) (Johnson, 1972).

The principal artesian aquifer (the deepest of the three aquifers) consists of deposits of the Mattaponi (lower) and Potomac Group Formations of the Lower Cretaceous Series and Several

discontinuous sand bodies interbedded with silt and clay. The top of the aquifer is approximately 450 feet below MSL in the vicinity of WPNSTA Yorktown. Recharge to the aquifer occurs through the outcrop in Henrico, Hanover, and western King William Counties. However, substantial recharge also occurs east of these areas from vertical leakage between the adjacent aquifers through the confining layers; it has been estimated at 30,500 gallons/day/square mile (gpd/mi²) of area. Transmissivities in the central and eastern parts of the aquifer (including WPNSTA Yorktown) vary from 15,000 to 50,000 gallons/day/foot (gpd/ft). Flow direction is generally eastward toward the Chesapeake Bay (Hamilton et al., 1983). The most extensive development of the aquifer has occurred in the Richmond metropolitan area, near West Point, Virginia, and in Franklin, Virginia. Dissolved solids in the water increase with depth in an easterly direction and result in limited use of the aquifer east of Williamsburg, where total dissolved solids range from 1,500 to 9,000 parts per million (ppm) and chlorides may exceed 1,000 ppm (Johnson, 1972). The deep aquifer is unusable as a potable water source at WPNSTA Yorktown because of its naturally poor quality (high hardness, elevated amounts of both total dissolved solids and fluorides).

1.2.3.2 Surface Water

WPNSTA Yorktown is situated within two major drainage basins, the York River Basin to the north and the James River Basin to the south. Approximately 80 percent of the Station lies within the York River Basin. Building 710 is located in the south-central portion of the Station in the James River Basin.

The vehicle maintenance racks extend from an asphalt parking area that slopes towards a grass-covered drainage ditch. Generally, some surface water would infiltrate into the surficial water-bearing layer, however the majority of the surface water would migrate overland towards the drainage ditch which conveys the water north towards an intermittent creek.

The intermittent creek is a tributary of Blows Mill Run, which empties into Skiffes Creek Reservoir. Skiffes Creek Reservoir is located approximately 2,500-feet west of the site and is the closest body of surface water.

1.2.3.3 Floodplain

Building 710 is approximately 2.5 miles northeast of the James River, at an elevation of approximately 55 feet above MSL. In this geographic location the 100-year water mark is

approximately 10 feet above MSL which approximates the maximum lateral extent of the James River floodplain. Building 710 is approximately 55 feet above MSL and based on location and elevation of the study area is not located within the James River System flood plain.

1.2.4 Climate

The climate of the Virginia Peninsula is maritime and is influenced by the moderating effects of the Atlantic Ocean. This results in long warm summers and mild winters. High humidity occurs frequently along the coast and less frequently inland. The average monthly temperatures in the area range from 40° F in January to 78° F in July.

Precipitation is well distributed throughout the year, with the heaviest rains in July and August. The average annual precipitation is 45 inches. Winds are highly variable in the area of the Weapons Station. Prevailing winds are usually from the south-southwest, but north-northwest winds are common in winter months (Weston, 1993).

1.2.5 Topography

The local terrain is gently rolling, and dissected by ravines and stream valleys. The area surrounding Building 710 is characterized by moderate relief sloping moderately to the north. Surface elevation at the site range from 53 to 62 feet MSL.

1.2.6 Local Land Use

The local land use in the study area is related to base operations, including light industrial and recreational (i.e. woodworking) activities. The site is bordered to the north by the motor pool and a wooded area. A central heating plant is located west of the site, and grass areas encompass the regions to the south, both inside and outside the base boundaries.

1.2.7 Well Survey

As required by the Virginia State Water Control Board (SWCB), pumping and injection wells within a one-mile radius of the site were identified. This search was accomplished by contacting the SWCB. There were no water supply wells within a 1-mile radius of Building 710. The closest wells identified to the site were 216-009, and 216-018 through

216-023. Well 216-009 is approximately 6,500 feet south of the site and is used as a potable water supply. Wells 216-018 through 216-023 are approximately 6,400 feet southeast of the site. These wells are a series of nested observation wells completed at various depths from 60 feet to 1,500 feet used by state and federal agencies to monitor groundwater quality in the area.

1.2.8 Potential Off-Site Sources

Land usage throughout the Naval Weapons Station is primarily related to base operations and light industrial activities. A potential off-site source of contamination is a heating plant approximately 275 feet west of the site. Associated with the plant is a 15,000-gallon UST that contains No. 5 heating oil.

A motor pool was found approximately 400 feet northwest of Building 710. Three USTs were observed to be at this location. Two of the USTs contain gasoline and have a capacity of 8,000 gallons while one contains diesel fuel has a capacity of 1,000 gallons. However, the motor pool is downgradient of Building 710 and probably can be disregarded as an off-site source of contamination.

Underground utilities and conduits at the site, which could provide an avenue for off-site contaminant migration, include storm sewer, water and telephone lines. Figure 1-2, shows the location of these conduits.

1.3 Investigative Methods

Field activities were conducted from June 24 to July 1, 1993. These activities included soil boring advancement and monitoring well installation, soil and groundwater sampling, and hydraulic conductivity testing. The following sections discuss the methodologies for these activities.

1.3.1 Soil Boring Activities

Eleven soil borings (SB-1 through SB-4, and MW-1 through MW-7) were advanced in the vicinity of Building 710, the vehicle maintenance racks and the UST system (Figure 1-3). Rock-Ray Drilling of Virginia Beach, Virginia, provided the drilling services. Soil borings SB 1 through SB-4 were advanced approximately 14 to 22 feet below ground surface (bgs), and

terminated at the water table. Monitoring wells were not installed in these borings. The remaining soil borings, MW-1 through MW-7, were advanced approximately 20 to 35 bgs and converted into shallow groundwater monitoring wells. All borings were advanced using 4 1/4 inside diameter (ID) hollow-stem augers. Soil cuttings generated during drilling activities were contained in a roll-off box provided by EnviroTech Mid-Atlantic, and stored on-site pending final disposition.

During advancement of each soil boring, standard penetration tests (SPT) were conducted following ASTM D 1586 guidelines. Split-spoon samples were collected at continuous two-foot intervals to the approximate depths of 12 to 16 feet bgs and then at five foot intervals until the termination of the boring. Soil samples were visually classified by the project geologist and recorded on a Field Test Boring Record. The classification included characterization of soil type, color, moisture content, relative density (blow counts) and other pertinent information, such as indications of contamination. Copies of the Field Test Boring Records for each soil boring are provided in Appendix A.

In addition to soil classification, each soil sample was screened with an HNu photoionization detector (PID) to measure the presence or absence of total volatile organic vapors. These measurements were used to evaluate well location and the vertical extent of contamination. PID screening results are provided on the Field Test Boring Records in Appendix A.

Drilling equipment, including hollow-stem augers, drill rods and split-spoon samplers were decontaminated to minimize potential cross-contamination between boring locations. The hollow-stem augers and drill rods were decontaminated using high-pressure steam. Split-spoon samplers were decontaminated between each sampling event by washing with Alconox (non-phosphate soap) and potable water, and then rinsing with distilled water. Decontamination fluids were contained within a temporary decontamination pad/area to prevent spilling onto the ground surface. These fluids were transferred into labeled, 55-gallon, steel drums and stored at a temporary staging area on-site. C & M Waste Oil was contracted to extract the water from the 55-gallon drums and transport it to the proper disposal facility.

1.3.2 Soil Sampling and Analyses

Two grab soil samples were collected from each soil boring and submitted for chemical analysis. All of the soil samples were analyzed for total petroleum hydrocarbons (TPH) and

selected soil samples were analyzed for volatile organics. Additionally, one duplicate sample was submitted for chemical analyses of TPH. Two soil samples were collected from different wells at different depths and submitted for grain-size analysis.

Each of the samples were collected by SPT (Section 1.3.1.). The grab samples were obtained from intervals between the ground surface and the water-table. Each soil sample collected for chemical analyses was transferred into a laboratory-prepared bottle, properly labeled and placed on ice. The samples were transported to Microbac Laboratories, Inc., of Newport News, Virginia, for analysis according to the following methods: TPH - EPA Method (5030); Volatile Organics - EPA Method 8240; and grain size analysis - ASTM D22. Appropriate Chain-of-Custody documentation was completed and sent with the samples to the laboratory.

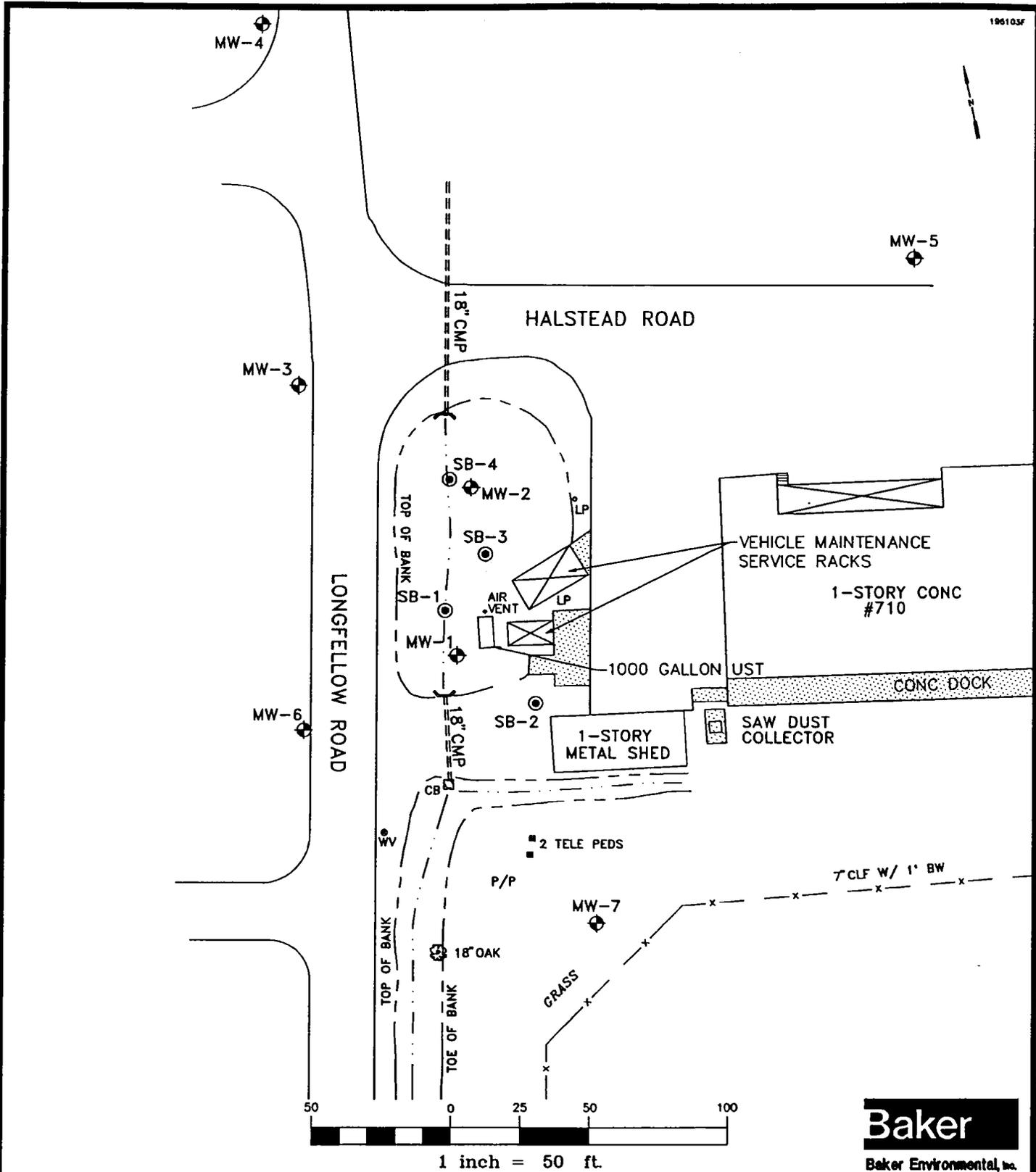
1.3.3 Soil Disposal

Soil cuttings generated during drilling activities were contained a roll-off box provided by EnviroTech Mid-Atlantic (ETMA), Inc., of Fredericksburg, Virginia. At the completion of the field program, the soil in the roll-off box will be transported to the ETMA plant in Chesapeake, Virginia, for incineration. ETMA uses a rotary kiln for thermal destruction of petroleum-contaminated soils. The stripped soils are then recycled for use as aggregate in asphalt, concrete, road subbase, or backfill. ETMA issues a certificate of destruction stating that all soil processed through their rotary kiln will have TPH levels below 50 ppm.

1.3.4 Monitoring Well Installation

Seven of the eleven soil borings (MW-1 through MW-7) were converted into shallow groundwater monitoring wells (Figure 1-3). MW-1 and MW-2 were advanced at locations adjacent to the vehicle maintenance racks and UST where petroleum contamination was suspected from spills. MW-3 through MW-6 were installed on the perimeter of the site to delineate the horizontal extent of contamination; MW-7 was installed upgradient as a background well. All wells were used to determine the groundwater flow direction.

The locations were selected based on historical site information and estimated groundwater flow patterns at the site. Total depths of the monitoring wells ranged from 19.9 feet to 34.4 feet bgs. Table 1-1 provides a summary of well construction details.



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LEGEND

- MW-1 MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., JUNE 1993
- SB-1 SOIL BORING ADVANCED BY BAKER ENVIRONMENTAL, INC., JUNE 1993
- DITCH
- CONCRETE

SOURCE: MILLER-STEPHENSON & ASSOC., P.C., JUNE 1993

FIGURE 1-3
MONITORING WELL AND SOIL BORING LOCATION MAP
BUILDING 710
VEHICLE MAINTENANCE RACKS AND UST SYSTEM
NAVAL WEAPONS STATION
YORKTOWN, VIRGINIA

TABLE 1-1

SUMMARY OF WELL CONSTRUCTION DETAILS
 BUILDING 710
 NAVAL WEAPONS STATION, YORKTOWN
 CONTRACT TASK ORDER 0195

Well No.	Date Installed	Top of Casing Elevation (1) (feet, above MSL)	Ground Surface Elevation (feet, above MSL)	Boring Depth (feet, below ground surface)	Well Depth (feet, below ground surface)	Screen Interval Depth (feet, below ground surface)	Depth to Sand Pack (feet, below ground surface)	Depth to Bentonite (feet, below ground surface)
MW-1	6-26-93	54.37	54.1	20.3	19.9	9.81 to 19.4	8.0	7.0
MW-2	6-26-93	53.47	53.1	28.0	27.8	12.7 to 27.5	10.0	9.0
MW-3	6-27-93	58.14	58.1	35.0	34.4	19.4 to 34.0	17.1	16.0
MW-4	6-28-93	54.92	55.2	30.0	28.5	13.5 to 28.1	11.0	9.0
MW-5	6-27-93	58.72	58.8	35.3	34.7	19.6 to 34.3	17.8	16.8
MW-6	6-28-93	60.33	60.3	35.0	33.4	18.4 to 33.1	17.0	16.0
MW-7	6-24-93	62.81	62.4	30.3	29.8	9.85 to 29.5	11.0	10.0

Note: (1) MSL - Mean Sea Level

Well and ground surface elevations were surveyed by the firm of Miller-Stephenson & Associates, P.C. on June 30, 1993.

The monitoring wells were constructed of two-inch nominal diameter, Schedule 40, flush-joint and threaded PVC casing with a 10-15 foot long 0.010-inch slotted screen. All wells have a medium-grained sand pack (i.e., approximate grain size of 0.25 millimeters) placed approximately two feet above the top of the screen in the annulus between the screen and the borehole wall. A bentonite seal was placed above the sand pack and hydrated with potable water. The remainder of the annulus was filled with a Portland cement/bentonite grout mixture to near ground surface. Monitoring wells were each installed with a steel, flush-mount, well cover to protect the PVC casing. PVC casing for each well was fitted with a watertight cap and secured by a padlock. Well construction logs are included in Appendix B, and typical well construction diagrams are depicted on Figure 1-4.

Each monitoring well was developed to remove sediment from the well and to establish hydraulic connection between the well and the water-bearing zone. The wells were developed using a Versa Matic double diaphragm pump. until the groundwater was visibly sediment-free. Approximately 15 to 20 gallons of water were removed from each well. The water recovered from each well was contained in labeled, 55-gallon, steel drums, and stored at a temporary staging area on site until off-site removal and disposal could be arranged.

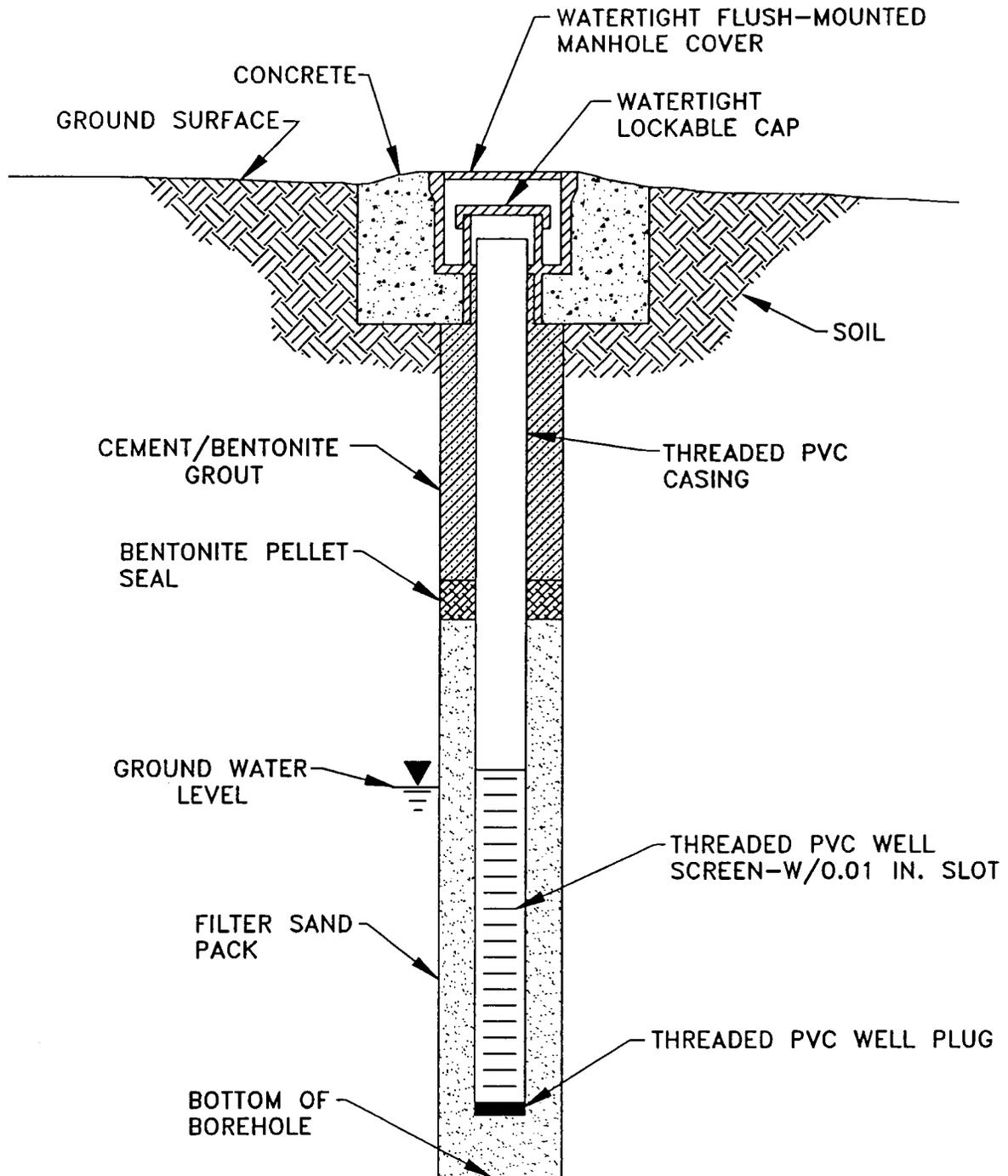
1.3.5 Fluid Level Measurements and Well Elevation Survey

Fluid level measurements for each monitoring well were recorded during the field investigation and prior to groundwater sampling. The depth to water was measured using an oil/water interface probe capable of detecting product layers as thin as 0.01 feet. The interface probe was decontaminated between readings by washing with a non-phosphate soap solution, and rinsing with alcohol and distilled water.

Following monitoring well installation, each newly installed monitoring wells were surveyed by a surveyor registered in the Commonwealth of Virginia using standard procedures. The firm of Miller-Stephenson & Associates, P.C., of Virginia Beach, Virginia, was retained to perform these services. The top of casing and ground surface elevations were measured to the nearest 0.01 and 0.1 feet, respectively, relative to mean sea level (MSL).

1.3.6 Groundwater Sampling and Analysis

Groundwater samples were collected on June 30 and July 1, 1993, from the seven monitoring wells. All the samples were analyzed for TPH (EPA Method 418.1), and selected samples were



N.T.S.

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FIGURE 1-4
 TYPICAL SHALLOW BELOW GRADE GROUNDWATER
 MONITORING WELL CONSTRUCTION DIAGRAM
 BUILDING 710
 VEHICLE MAINTENANCE RACKS AND UST SYSTEM
 NAVAL WEAPONS STATION
 YORKTOWN, VIRGINIA

analyzed for purgeable aromatics (EPA Method 624), polynuclear aromatic hydrocarbons (PAHs) using EPA Method 625 and lead SW-846 ICAP. Additionally, one duplicate sample for TPH, PAHs and lead was collected and analyzed. Equipment rinsates for all parameters were collected and analyzed. These rinsates were collected by pouring distilled water over decontaminated equipment (i.e. stainless steel trowel and spoon used for soil sampling and bailers used for groundwater sampling) and analyzing the samples. Also, two trip blanks were analyzed for TPH and purgeable aromatics.

Prior to groundwater sampling, three well volumes were purged from each well. A decontaminated, dedicated polyethylene bailer was used to purge the wells. Purge water was contained in labeled, 55 gallon, steel drums and stored at a temporary staging area on-site. Three measurements of pH, specific conductance and temperature were made prior to sampling to ensure that groundwater conditions had stabilized, within a 10 percent variance. The measurements were taken after the first, second and third well volumes had been removed.

Groundwater samples were collected from the wells using decontaminated, dedicated polyethylene bottom-loading bailers. The samples were transferred into laboratory-prepared sample containers and immediately placed on ice. Groundwater samples were collected by slowly pouring water from the bailer into the appropriate sample container to minimize volatilization. Samples were transported to Microbac for analysis. Appropriate Chain-of-Custody documentation, along with two trip blank samples, accompanied the samples to the laboratory.

1.3.7 Hydraulic Conductivity Tests

Hydraulic conductivity tests (also commonly referred to as slug tests) were conducted in two monitoring wells (MW-3 and MW-7) on June 30, 1993. The hydraulic conductivity test is performed by rapidly inserting or removing an object, a "slug", within a monitoring well. The slug displaces a volume of groundwater within the well. The resulting rise and/or fall of the water level is measured with respect to time.

For the hydraulic conductivity tests performed, a slug constructed of teflon, three feet in length and one inch in width, was used. Due to the rapid recovery rates anticipated for the site, the rise and/or fall of the groundwater levels were measured using an electric pressure transducer, and recorded with an In-Situ SE-1000C Environmental Data Logger. The teflon

slug and transducer were cleaned between wells using a non-phosphate soap solution, and rinsed with distilled water.

1.4 Investigation Results

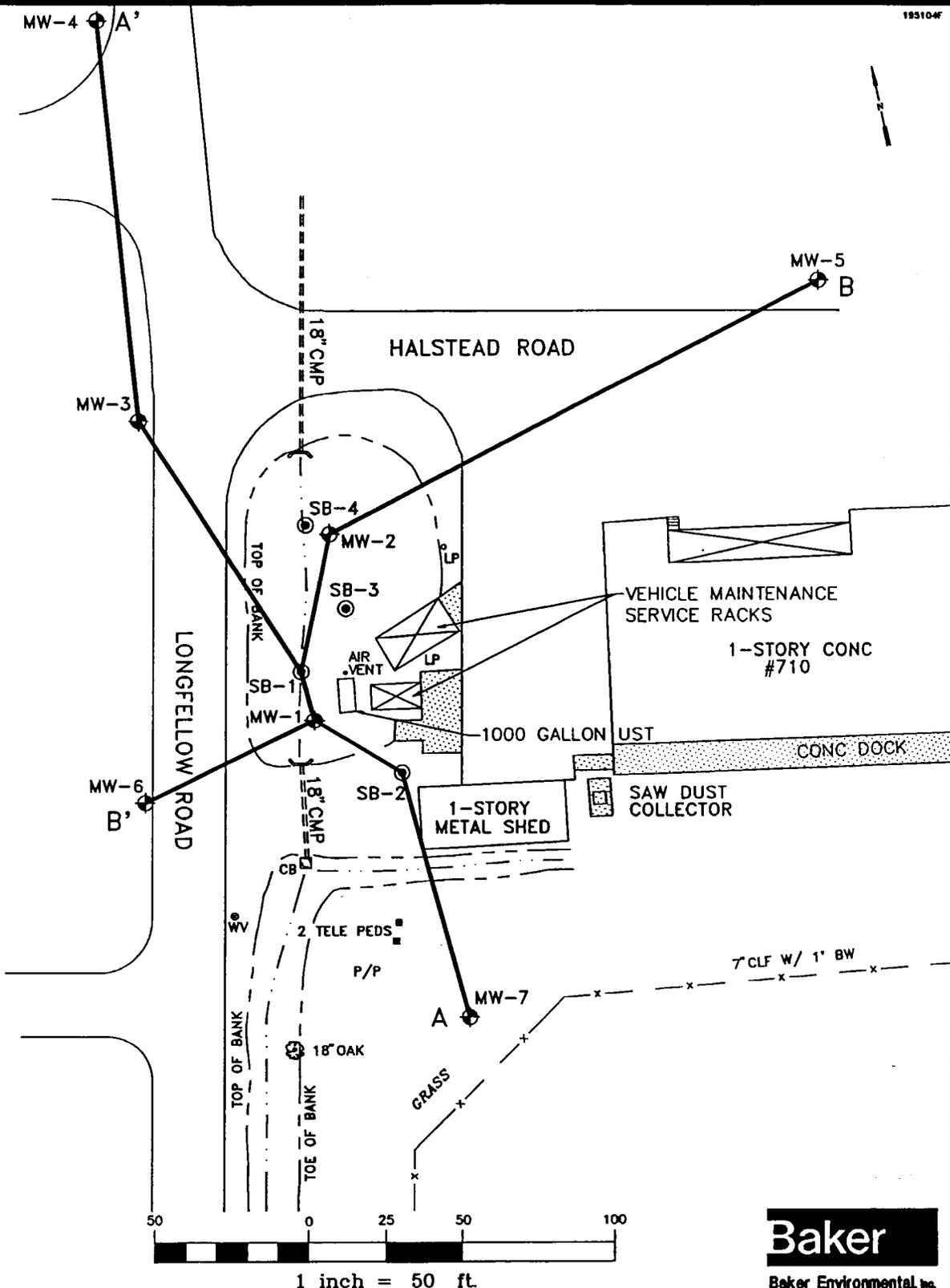
This section presents the results of site characterization activities. The subsurface conditions are discussed followed by a description of the nature and extent of petroleum hydrocarbon contamination as indicated by the analytical data.

1.4.1 Site Soils and Geology

The surficial geologic unit in the study area is the Windsor Formation which is of Pleistocene age (Weston, 1993). This formation is composed of sand and silts deposited in marine and estuarine environments and extend to depths of approximately 40 feet below ground surface (bgs). Underlying these are Pliocene deposits of the Bacons Castle and the Yorktown Formations.

Soil samples were obtained from each of the 11 borings to characterize the subsurface conditions. Two geologic cross sections were generated based on information obtained during advancement of the borings. As shown on Figure 1-5, two geologic cross sections, A-A' and B-B', were traversed to characterize horizontal and vertical subsurface soil conditions.

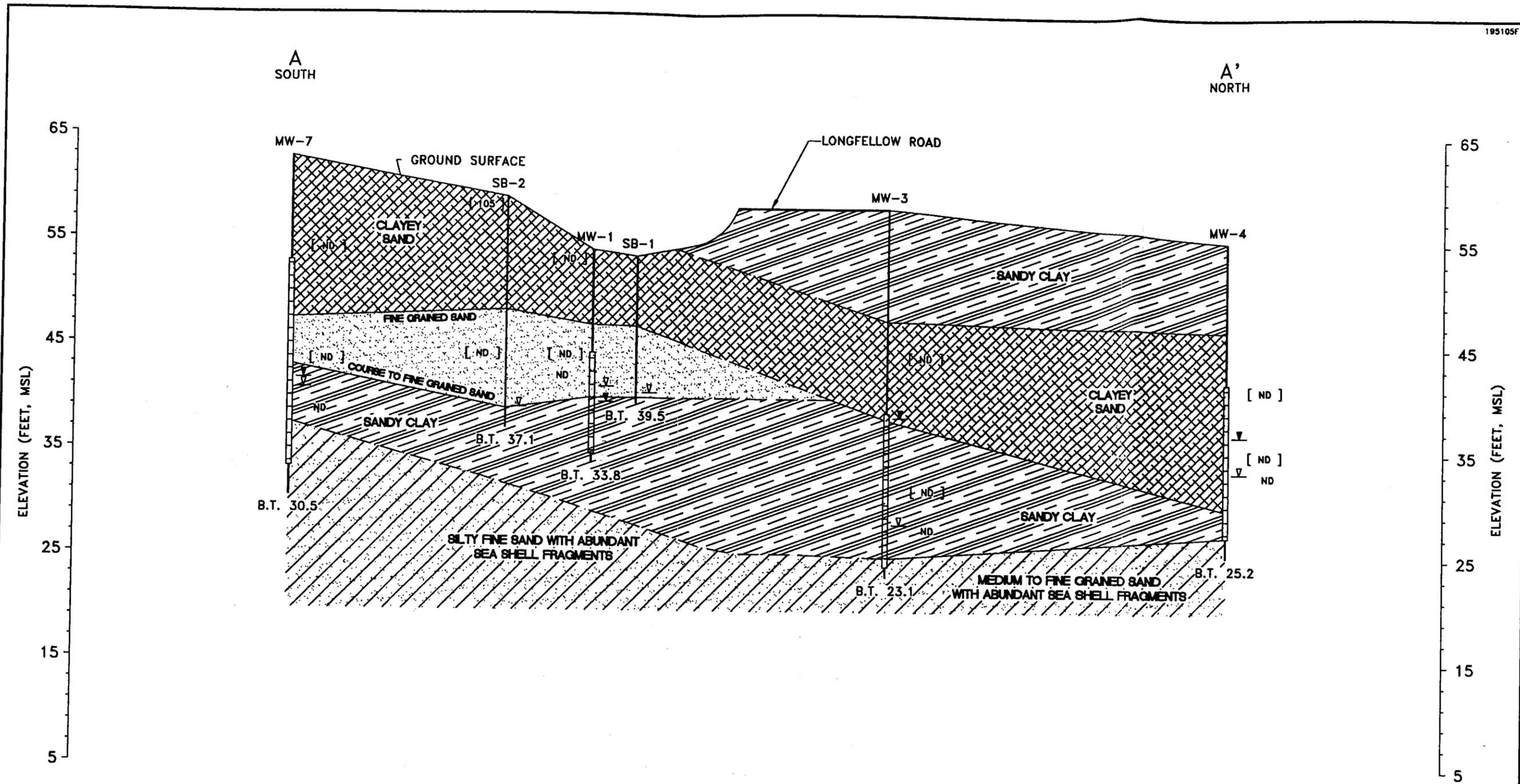
Cross section A to A', as shown on Figure 1-6, depicts geologic conditions encountered from borings MW-7 (south) to MW-4 (north). The site is generally underlain by surficial deposits of clayey sand and sandy clay, which overlies coarse to fine-grained sand deposits that vary in the percentage of silt. Below the sand are cohesive deposits of sandy clay which overly a silty fine grained sand with calcite cemented shell fragments. The clayey sand was noted as the surficial deposit while traversing south to north from MW-7 to SB-1. The top of this deposit was noted at approximately ten feet bgs in MW-3 and MW-4 where it underlies sandy clay deposits. Below the clayey fine sand deposits at MW-7 to SB-1 is a fine grained sand with little silt that increases in grain size with depth. These granular deposits decrease in thickness toward the north and are not encountered at MW-3 or MW-4. Sandy clay deposits were encountered below the sand and the clayey sand at approximate depths ranging from 21 to 35 feet bgs. A final change of lithology was noted at 28 to 38 feet bgs at MW-7, MW-3 and MW-4 where the sandy clay abruptly changes to silty fine sand with abundant fine gravel sized cemented sea shell fragments.



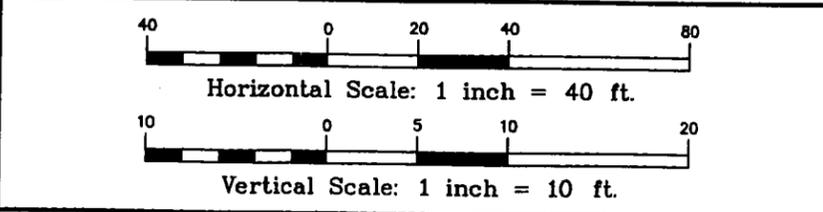
LEGEND

- MW-1 MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., JUNE 1993
 - SB-1 SOIL BORING ADVANCED BY BAKER ENVIRONMENTAL, INC., JUNE 1993
 - DITCH
 - CONCRETE
 - A—A' GEOLOGIC CROSS-SECTION TRAVERSE
- SOURCE: MILLER-STEPHENSON & ASSOC., P.C., JUNE 1993

**FIGURE 1-5
GEOLOGIC CROSS-SECTION
LOCATION MAP
BUILDING 710
VEHICLE MAINTENANCE
RACKS AND UST SYSTEM
NAVAL WEAPONS STATION
YORKTOWN, VIRGINIA**



LEGEND	
∇	GROUNDWATER ELEVATION (JULY 1, 1993)
∇	GROUNDWATER ENCOUNTERED DURING DRILLING
B.T. 30.5'	BORING TERMINATED, ELEVATION MSL
ND	TPH CONCENTRATIONS (mg/L) IN GROUNDWATER
[ND]	TPH CONCENTRATIONS (mg/kg) IN SOILS
\square	WELL SCREEN INTERVAL
ND	NOT DETECTED AT METHOD DETECTION LIMITS
—	ESTIMATED
- - -	PROJECTED
	SANDY CLAY
	CLAYEY SAND
	SAND
	SAND WITH SHELL FRAGMENTS



THE SOIL BORING INFORMATION IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. SUBSURFACE CONDITIONS INTERPOLATED BETWEEN BORINGS ARE ESTIMATED BASED ON ACCEPTED SOIL ENGINEERING PRINCIPLES AND GEOLOGIC JUDGEMENT.

FIGURE 1-6
GEOLOGIC CROSS-SECTION A-A'
WITH SOIL AND GROUNDWATER ANALYTICAL RESULTS
BUILDING 710
VEHICLE MAINTENANCE RACKS AND UST SYSTEM

NAVAL WEAPONS STATION
YORKTOWN, VIRGINIA

Figure 1-7, cross-section B to B', depicts geologic conditions encountered from MW-5 (northeast) to MW-6 (southwest). The soils encountered throughout this traverse are of the same lithology as encountered in the A to A' cross section. The surficial deposits consist of sandy clay and clayey sand. The sandy clay deposits were encountered at MW-5 with a thickness of approximately 6 feet. This unit grades into a clayey sand at MW-2 which increases in thickness to approximately 20 feet at the end of the traverse, MW-6. Underlying these surficial deposits is a more granular sand deposit which was described as silty fine grained at MW-5. At MW-2 the sand unit showed a gradual increase in the grain size and finally grades into a coarse to fine grained sand at SB-1. This unit is not present at MW-6. Sandy clay deposits were encountered below the sand at all the borings, except MW-6 where the silt content increases. This cohesive layer increases in thickness from approximately 11 feet at MW-5 to approximately 14 feet at MW-6. As noted above, this unit overlies a silty fine sand with abundant fine gravel sized cemented sea shell fragments.

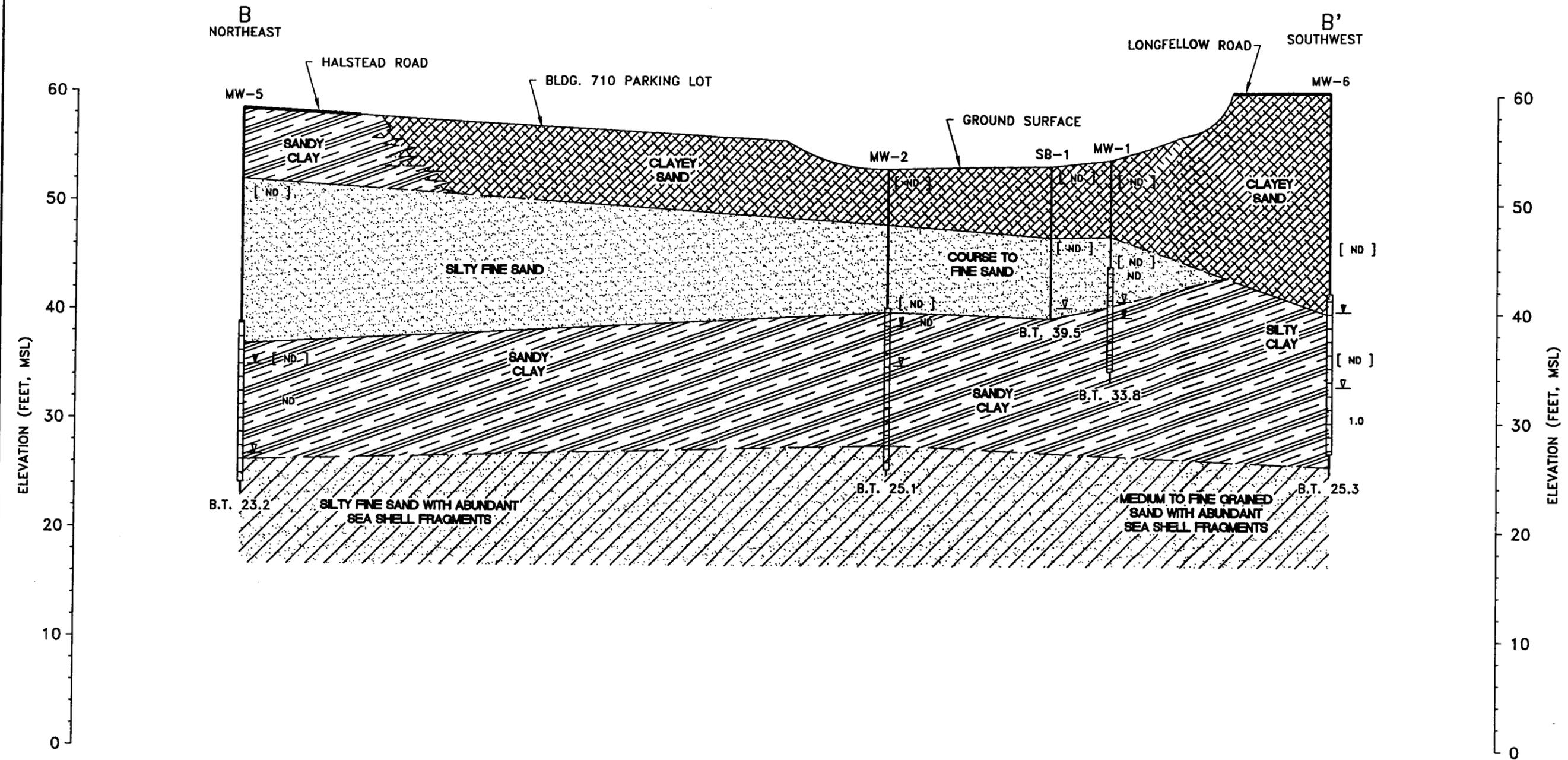
One soil sample was collected from MW-1 and MW-3 and were analyzed by ASTM D422 (grain size). The sample from MW-1 was a composite sample collected from the depths of 0 to 4 feet bgs and the second sample was collected at the 20 to 22 foot interval bgs. Both samples were classified by this method as clayey sands (SC). The grain distribution curves for these samples are included in Appendix E.

1.4.2 Site Hydrogeology

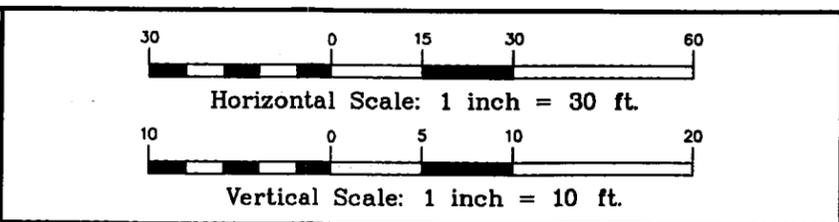
The hydrogeologic characteristics of the surficial water-bearing layer (Columbia Formation) are influenced by topographic relief, manmade drainage, surficial soils and pavement. Where the topographic relief across the site is low, surface water, not intercepted by storm drains, would generally seep into the subsurface. Downward movement of groundwater is hindered by the presence of low permeability, cohesive soils, and areas of asphalt.

Tables 1-2 and 1-3 summarizes fluid level measurements and groundwater elevations on June 30 and July 1, 1993. Free-phase petroleum hydrocarbons were not detected in any of the newly installed monitoring wells. Based on the groundwater elevation data, groundwater flows to the north, with an average groundwater gradient of 2.4×10^{-2} (Figure 1-8).

Hydraulic conductivity tests were performed on July 1, 1993, in monitoring wells MW-3 and MW-7. The data received from the test at MW-7 was questionable (possibly small movements



LEGEND	
	GROUNDWATER ELEVATION (JULY 1, 1993)
	GROUNDWATER ENCOUNTERED DURING DRILLING
B.T. 25.3'	BORING TERMINATED, ELEVATION MSL
ND	BENZENE CONCENTRATIONS (mg/L) IN GROUNDWATER
[ND]	TPH CONCENTRATIONS (mg/kg) IN SOILS
	WELL SCREEN INTERVAL
ND	NOT DETECTED AT METHOD DETECTION LIMITS
---	ESTIMATED
---	PROJECTED
	SANDY CLAY
	CLAYEY SAND
	SAND
	SAND WITH SHELL FRAGMENTS



THE SOIL BORING INFORMATION IS CONSIDERED TO BE REPRESENTATIVE OF SUBSURFACE CONDITIONS AT THE RESPECTIVE BORING LOCATIONS. SUBSURFACE CONDITIONS INTERPOLATED BETWEEN BORINGS ARE ESTIMATED BASED ON ACCEPTED SOIL ENGINEERING PRINCIPLES AND GEOLOGIC JUDGEMENT.

FIGURE 1-7
GEOLOGIC CROSS-SECTION B-B'
WITH SOIL AND GROUNDWATER ANALYTICAL RESULTS
BUILDING 710
VEHICLE MAINTENANCE RACKS AND UST SYSTEM

 NAVAL WEAPONS STATION
 YORKTOWN, VIRGINIA

TABLE 1-2

SUMMARY OF FLUID LEVEL MEASUREMENTS, JUNE 30, 1993
 BUILDING 710
 NAVAL WEAPONS STATION, YORKTOWN
 CONTRACT TASK ORDER 0195

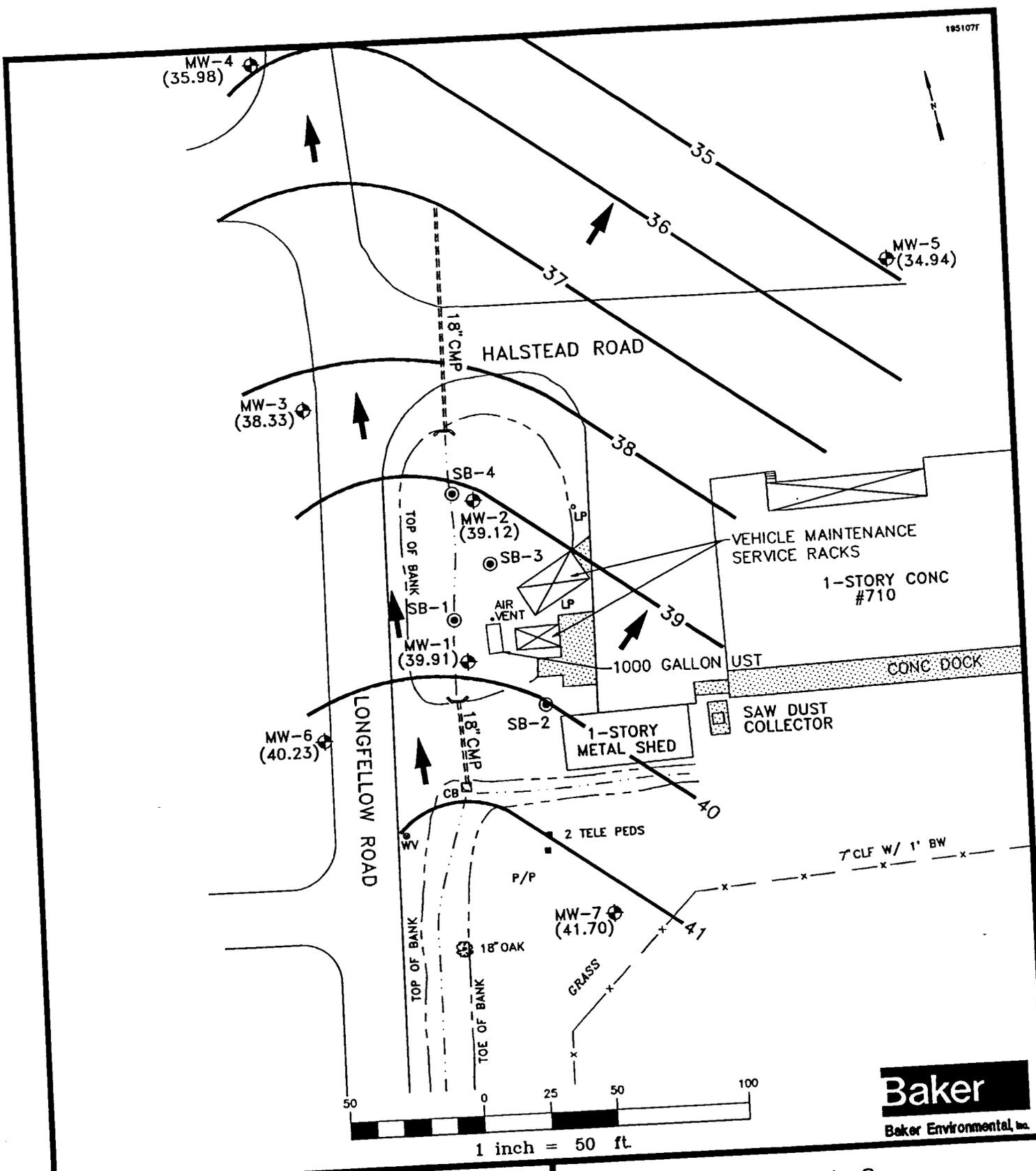
Well No.	Top of Casing Elevation (1) (feet, above MSL)	Depth to Product (feet, below top of casing)	Depth to Groundwater (feet, below top of casing)	Product Thickness	Product Elevation (feet, above MSL)	Groundwater Elevation (feet, above MSL)
MW-1	54.37	--	14.49	--	--	39.88
MW-2	53.47	--	14.31	--	--	39.16
MW-3	58.14	--	19.79	--	--	38.35
MW-4	54.92	--	18.82	--	--	36.10
MW-5	58.72	--	23.86	--	--	34.86
MW-6	60.33	--	20.08	--	--	40.25
MW-7	62.81	--	21.11	--	--	41.70

Note: (1) MSL - Mean Sea Level
 (2) -- = Not Detected

TABLE 1-3
SUMMARY OF FLUID LEVEL MEASUREMENTS
JULY 1, 1993
BUILDING 710
NAVAL WEAPONS STATION, YORKTOWN
CONTRACT TASK ORDER 0195

Well No.	Top of Casing Elevation (1) (feet, above MSL)	Depth to Product (feet, below top of casing)	Depth to Groundwater (feet, below top of casing)	Product Thickness	Product Elevation (feet, above MSL)	Groundwater Elevation (feet, above MSL)
MW-1	54.37	--	14.46	--	--	39.91
MW-2	53.47	--	14.35	--	--	39.12
MW-3	58.14	--	19.81	--	--	38.33
MW-4	54.92	--	18.94	--	--	35.98
MW-5	58.72	--	23.78	--	--	34.94
MW-6	60.33	--	20.10	--	--	40.23
MW-7	62.81	--	21.11	--	--	41.70

Note: (1) MSL - Mean Sea Level
(2) -- = Not Detected



Baker
Baker Environmental, Inc.

LEGEND

- MW-1 MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., JUNE 1993
- SB-1 SOIL BORING ADVANCED BY BAKER ENVIRONMENTAL, INC., JUNE 1993
- 35 GROUNDWATER ELEVATION, WELL SPECIFIC
- 35 GROUNDWATER ELEVATION, CONTOUR
- DITCH
- CONCRETE

SOURCE: MILLER-STEPHENSON & ASSOC., P.C., JUNE 1993

FIGURE 1-8
GROUNDWATER CONTOUR MAP
BUILDING 710
VEHICLE MAINTENANCE
RACKS AND UST SYSTEM
NAVAL WEAPONS STATION
YORKTOWN, VIRGINIA

of the transducer during the test), therefore the hydraulic conductivity calculated from the test at MW-3 is 3.0 ft/day (1.1×10^{-3} cm/sec). This value was calculated using the Geraghty and Miller aquifer test solver (AQTESOLV) program which uses the Bouwer and Rice (1976) method for unconfined aquifers. The results of the hydraulic conductivity tests are summarized on Table 1-4. A copy of the field data and AQTESOLV results are provided in Appendix C.

Using the estimated groundwater gradient and average hydraulic conductivity determined for the site, the average groundwater flow velocity can be estimated using a variation of Darcy's equation:

$$V = Ki/ne$$

where: V = estimated groundwater flow velocity
K = hydraulic conductivity
i = groundwater gradient
ne = average effective porosity, as a decimal fraction

Using an average K of 3.0 ft/day calculated from the hydraulic conductivity tests, a groundwater gradient of 2.4×10^{-2} , and an estimated effective porosity of 0.40 (Fetter, 1980), the average groundwater flow velocity is 0.18 ft/day (66 ft/year).

1.4.3 Field Screening of Soils

Soil samples collected during the soil boring activities were screened with a PID to measure for the presence or absence of volatile organic compounds (VOCs). Vapor concentrations ranged from not detectable to 29 ppm. The highest concentrations were observed at SB-1 at 0 to 2 feet bgs (25 ppm) and at SB-2 at 2 to 4 feet bgs (29 ppm). Generally, the remaining concentrations were less than 1 ppm. Background concentrations levels were measured at not detectable throughout the site. Results of the field screening are shown on Table 1-5 and on the Field Test Boring Records presented in Appendix A.

TABLE 1-4

SUMMARY OF HYDRAULIC CONDUCTIVITY TESTS
BUILDING 710
NAVAL WEAPONS STATION, YORKTOWN

Well No.	Hydraulic Conductivity Rising Test	
	ft/min	cm/sec
MW-3	2.1×10^{-3}	1.1×10^{-4}
MW-7 (1)	7.2×10^{-3}	3.7×10^{-3}

Hydraulic conductivity for site:

3.0 ft/day or 1.1×10^{-3} cm/sec

Notes: Hydraulic conductivity test results analyzed using Bouwer and Rice method as presented in the Geraghty & Miller "AQTESOLV" program, Version 1.10.

Hydraulic conductivity tests conducted on July 1, 1993 using an In-Situ Environmental Data Logger (Model SE-1000C) and pressure transducer.

(1) Hydraulic conductivity data from MW-7 was not used in calculating an average for the site due to irregularities of the field data.

TABLE 1-5

SUMMARY OF PID FIELD SCREENING OF SOIL SAMPLES
 BUILDING 710, NAVAL WEAPONS STATION YORKTOWN
 CONTRACT TASK ORDER 0195

Boring No.	Sample Depth (feet)/PID Readings (ppm) ⁽¹⁾															
	0.0-2.0	2.0-4.0	4.0-6.0	6.0-8.0	8.0-10.0	10.0-12.0	12.0-14.0	14.0-16.0	15.0-17.0	16.0-18.0	18.0-20.0	20.0-22.0	25.0-27.0	28.0-30.0	30.0-32.0	33/0-35.0
MW-1	2.2	0*	0	0	0	0*	0.2	0	NA ⁽³⁾	NA	0	-- ⁽²⁾	--	--	--	--
MW-2	0.2	0.4*	0	0	0	0	0*	0	NA	0	NA	0	0	--	--	--
MW-3	0	0.2	0	0.4	0.2	0.1	0.2	0.2*	NA	NA	NA	0	0*	NA	0	0
MW-4	0	0	0	0	0	0	NA	0*	NA	NA	NA	0*	0	0	--	--
MW-5	0.1	0	0	0.4	0*	0	NA	NA	0	NA	NA	0	0*	NA	0	0
MW-6	0	0	0	0	0	0	NA	0*	NA	NA	NA	0	0*	NA	0	0
MW-7	1.4	2.0	1.6	0.8	1.6*	0.6	NA	NA	0.4	NA	NA	0*	0	NA	0	--
SB-1	25*	9.9*	7.0	4.8	2.0	2.0*	1.6	--	--	--	--	--	--	--	--	--
SB-2	5.8	29*	4.8	4.0	2.8	3.0	NA	NA	2.0*	NA	NA	3.5	--	--	--	--
SB-3	0	0.7*	0*	0	0.8	0	0.8	0.9*	NA	0	--	--	--	--	--	--
SB-4	0.4*	0.8*	0	0.2	0	0	0	0	--	--	--	--	--	--	--	--

1-27

- Notes: (1) Result presented as a range of concentration.
 (2) -- = Below termination of boring
 (3) NA = Not Analyzed
 * Soil sample selected for chemical analysis.

Bold line represents approximate groundwater encountered at time of boring.

PID readings obtained using a HNu Model 101 organic vapor analyzer.

1.4.4 Soil Sampling

Subsurface soil samples were collected from 11 boring locations (SB-1 through SB-4, and MW-1 through MW-7; Figure 1-3). The samples were analyzed for TPH (EPA Method 5030) and volatile organics (EPA Method 8240). Laboratory results are summarized on Table 1-6, and in Appendix E. Chain-of-Custody records for the soil analyses are provided in Appendix D.

One of the 23 soil samples analyzed contained TPH concentrations above the DEQ "action level" of 100 mg/kg. This sample was located at SB-2 at 2 to 4 feet bgs and had TPH concentrations of 105 mg/kg.

One of the seven soil samples that were analyzed for volatile organics had concentrations above detection limits. This soil sample was obtained from SB-1 at 0 to 2 feet bgs. The sample was detected to have total volatile organic concentrations of 0.37 mg/kg. The compounds detected were ethylbenzene (0.32 mg/kg), tetrachloroethene (0.014 mg/kg), toluene (0.080 mg/kg) and total xylenes (0.294 mg/kg).

1.4.5 Groundwater Sampling

Groundwater samples were collected on June 30, 1993, from the seven newly installed monitoring wells. All the samples were analyzed for TPH and lead, and selected samples were analyzed for purgeable aromatics and polynuclear aromatic hydrocarbons. Results of the laboratory analyses are presented in Appendix E and on summarized Table 1-7.

Additionally, field parameters, including pH, temperature and specific conductance, were measured at the time of sampling. These parameters are included in Table 1-8. MW-2 exhibited elevated pH values during purging. This may indicate that bentonite has been introduced in the sand pack.

TPH was detected in one of the seven groundwater samples collected. The sample was obtained from monitoring well MW-6. The TPH concentration of the sample was equal to the DEQ's action level of 1.0 mg/L.

Five of the seven wells had detectable concentrations of total lead. The Federal treatment action level for dissolved lead of 0.015 mg/L was exceeded in monitoring wells MW-3, MW-4,

TABLE 1-6

**SUMMARY OF TOTAL PETROLEUM HYDROCARBONS AND VOLATILE ORGANICS FOR SOIL SAMPLES
BUILDING 710
NAVAL WEAPONS STATION, YORKTOWN
CONTRACT TASK ORDER 0195**

Boring No.	Field Sample No.	Parameter						Sample Depth (feet below ground surface)
		Total Petroleum Hydrocarbons (mg/kg) EPA Method 5030	Volatile (mg/kg) Organics* EPA Method 8240					
			Ethyl- benzene	Tetra- chloroethane	Toluene	Total Xylenes	Total Volatile Organics	
SB-1	710-SB1-01	NA	0.032	0.014	0.080	0.294	0.37	0 - 2
SB-1	710-SB1-02	--	NA	NA	NA	NA	NA	2 - 4
SB-1	710-SB1-06	--	NA	NA	NA	NA	NA	10 - 12
SB-2	710-SB2-02	105	NA	NA	NA	NA	NA	2 - 4
SB-2	710-SB2-07	--	NA	NA	NA	NA	NA	15 - 17
SB-3	710-SB3-03	NA	--	--	--	--	--	2 - 4
SB-3	710-SB3-03	--	NA	NA	NA	NA	NA	4 - 6
SB-3	710-SB3-08	--	NA	NA	NA	NA	NA	14 - 16
SB-4	710-SB4-01	--	NA	NA	NA	NA	NA	0 - 2
SB-4	710-SB4-02	NA	--	--	--	--	--	2 - 4
SB-4	710-SB4-03	--	NA	NA	NA	NA	NA	4 - 6
MW-1	710-MW1-02	--	NA	NA	NA	NA	NA	2 - 4
MW-1	710-MW1-02	NA	--	--	--	--	--	2 - 4
MW-1	710-MW1-06	--	NA	NA	NA	NA	NA	10 - 12

(1) -- = Not detected

(2) Duplicate sample

NA - Not Analyzed

* Only compounds with concentrations detected using EPA Method 8240.

TABLE 1-6 (Continued)

SUMMARY OF TOTAL PETROLEUM HYDROCARBONS AND VOLATILE ORGANICS FOR
SOIL SAMPLES
BUILDING 710
NAVAL WEAPONS STATION, YORKTOWN
CONTRACT TASK ORDER 0195

Boring No.	Field Sample No.	Parameter		Sample Depth (feet below ground surface)
		Total Petroleum Hydrocarbons (mg/kg) EPA Method 5030	Volatile Organics * (mg/kg) EPA Method 8240	
MW-2	710--MW2-02	NA	--	2 - 4
MW-2	710-MW-2-02	--	NA	2 - 4
MW-2	710-MW2-03 ⁽²⁾	--	NA	2 - 4
MW-2	710-MW2-07	--	NA	12 - 14
MW-3	710-MW3-08	NA	--	14 - 16
MW-3	710-MW3-08	--	NA	14 - 16
MW-3	710-MW3-10	--	NA	25 - 27
MW-4	710-MW4-07	--	NA	14 - 16
MW-4	710-MW4-08	--	NA	20 - 22
MW-5	710-MW5-05	--	NA	8 - 10
MW-5	710-MW5-09	--	NA	25 - 27
MW-6	710-MW6-07	--	NA	14 - 16
MW-6	710-MW6-09	--	NA	25 - 27
MW-7	710-MW7-05	--	NA	8 - 10
MW-7	710-MW7-05	--	NA	8 - 10
MW-7	710-MW7-08	NA	--	20 - 22

(1) -- = Not detected

(2) Duplicate sample

NA - Not Analyzed

* Only compounds with concentrations detected using EPA Method 8240.

TABLE 1-7

**SUMMARY OF CHEMICAL ANALYSIS FOR GROUNDWATER SAMPLES COLLECTED FROM MONITORING WELLS
BUILDING 710
NAVAL WEAPONS STATION, YORKTOWN
CONTRACT TASK ORDER 0195**

Parameter/Method	710-W-MW1	710-W-MW2	710-W-MW2A ⁽¹⁾	710-W-MW3	710-W-MW4	710-W-MW4A ⁽²⁾	710-W-MW5	710-W-MW6
EPA Method - 418.1 - (mg/L) Total Petroleum Hydrocarbons	--	--	--	--	--	NA	--	1.0
EPA Method - 624 - (mg/L) Chloroethane 2-Chloroethylvinyl ether	--	--	NA	--	--	NA	NA	NA
EPA Method - 625 - (µg/L)	--	--	NA	--	--	--	NA	NA
Lead ICAP - (mg/L)	--	--	--	0.070	0.181	NA	0.025	0.064

Parameter/Method	710-W-MW7	710-Trip 1	710-Trip 2	710-ER-1	710-ER-2	710-ER-3	710-ER-4
EPA Method - 418.1 - (mg/L) Total Petroleum Hydrocarbons	--	--	NA	--	NA	NA	NA
EPA Method - 624 - (mg/L) Chloroethane 2-Chloroethylvinyl ether	NA	NA	0.010 0.010	NA	--	NA	NA
EPA Method - 625 - (µg/L)	NA	NA	NA	NA	NA	NA	--
Lead ICAP - (mg/L)	0.069	NA	NA	NA	NA	--	NA

(1) Sample 710-W-MW2A is a duplicate sample of 710-W-MW1

(2) 710-W-MW4A is a duplicate sample of 710-W-MW3

TABLE 1-8
SUMMARY OF GROUNDWATER FIELD PARAMETERS
JUNE 30, 1993
BUILDING 710
NAVAL WEAPONS STATION, YORKTOWN
CONTRACT TASK ORDER 0195

Well No.	Field Parameter			
	pH ⁽¹⁾	Specific Conductance ⁽²⁾ at 25° C (µmhos/cm)	Temperature ⁽²⁾ (°C)	Well Volumes/Gallons ⁽³⁾
MW-1	6.59	230	16.0	1 (1.05)
	6.86	210	16.0	2 (2.10)
	6.92	210	16.0	3 (3.15)
MW-2 ⁽⁴⁾	12.49	2020	20.0	1 (2.21)
	12.49	2000	20.0	2 (4.42)
				3 (6.63)
MW-3	7.61	470	19.0	1 (2.39)
	7.54	450	18.5	2 (4.76)
	7.62	445	19.0	3 (7.14)
MW-4	7.23	450	19.0	1 (1.58)
	7.34	450	18.0	2 (3.16)
	7.41	460	19.0	3 (4.74)
MW-5 ⁽⁵⁾	8.01	500	18.0	1 (1.77)
	8.13	470	18.0	2 (3.54)
MW-6				3 (5.31)
	7.26	490	18.0	1 (2.02)
	7.22	480	18.0	2 (4.04)
MW-7	7.18	480	18.0	3 (6.06)
	7.37	460	17.5	1 (1.43)
	7.45	500	17.0	2 (2.86)
	7.46	470	17.0	3 (4.29)

- Notes: (1) pH measured using an Orion pH meter, Model No. 290 and/or litmus paper.
(2) Specific conductance and temperature measured using YSI conductivity meter, Model No. 335 Ct.
(3) Total number of well volumes purged.
(4) Bailed dry after 4.75 gallons.
(5) Bailed dry after 5 gallons.

MW-5, MW-6 and MW-7. It was noted that sediment was contained within the groundwater samples when collected and total lead (both dissolved and suspended) concentrations were quantified by the analytical method. Therefore, these total lead concentrations cannot be compared with the Federal treatment action level for dissolved lead.

None of the groundwater samples from the monitoring wells contained concentrations of purgeable aromatics or PAHs. There was however, one trip blank (710-Trip 2) analyzed for purgeable aromatics contained 0.01 mg/L of both chloroethane and 2-chloroethylvinyl ether.

1.5 Nature and Extent of Contamination

Minor concentrations of TPH, VOCs, and lead were detected in the adsorbed-phase (soil) and dissolved-phase (groundwater). Discussions of the nature and extent of these concentrations are presented below.

1.5.1 Nature of Contamination

VOC concentrations were observed to be above detection limits in only one of the six soil samples analyzed (0.37 mg/kg). The sample was obtained from soil boring SB-1 at 0.0 to 2.0 foot below ground surface.

The TPH concentrations in soils observed at soil boring SB-2 (2.0 to 4.0 foot) is upgradient of the vehicle maintenance racks. The soil sample had a TPH concentration of 105 mg/kg. This concentration above the DEQs "action level" of 100 mg/kg may be due to the analytical error inherent in the method used. This is the only soil sample that had a detectable concentration of TPH.

Only one of the seven the groundwater samples analyzed contained detectable levels of TPH. The concentrations identified at monitoring well MW-6 met the DEQ standard of 1.0 mg/L for TPH in groundwater. The analytical method used, EPA Method 418.1, is not specific for hydrocarbons, but can also measure some other organics present in the groundwater from natural sources that are soluble in the solvent used for extraction. Therefore, a sample that has a value of 1.0 mg/L can contain petroleum hydrocarbons with a true value of less than 1.0 mg/L. Also, the location of the monitoring well is upgradient of the site, therefore is not related to the vehicle maintenance racks and UST system. Figure 1-11, shows TPH concentrations in groundwater.

Total lead concentrations were detected in monitoring wells MW-3, MW-4, MW-5, MW-6, and MW-7. The concentrations ranged from 0.025 mg/L to 0.181 mg/L. The Federal treatment action level for dissolved lead is 0.015 mg/L which was exceeded in all five groundwater samples. It was noted that sediment was contained within the groundwater samples when collected and total lead (both dissolved and suspended) concentrations were quantified by the analytical method. Therefore, these total lead concentrations cannot be compared with the Federal treatment action level for dissolved lead. Figure 1-11 includes the extent of total lead concentrations in groundwater.

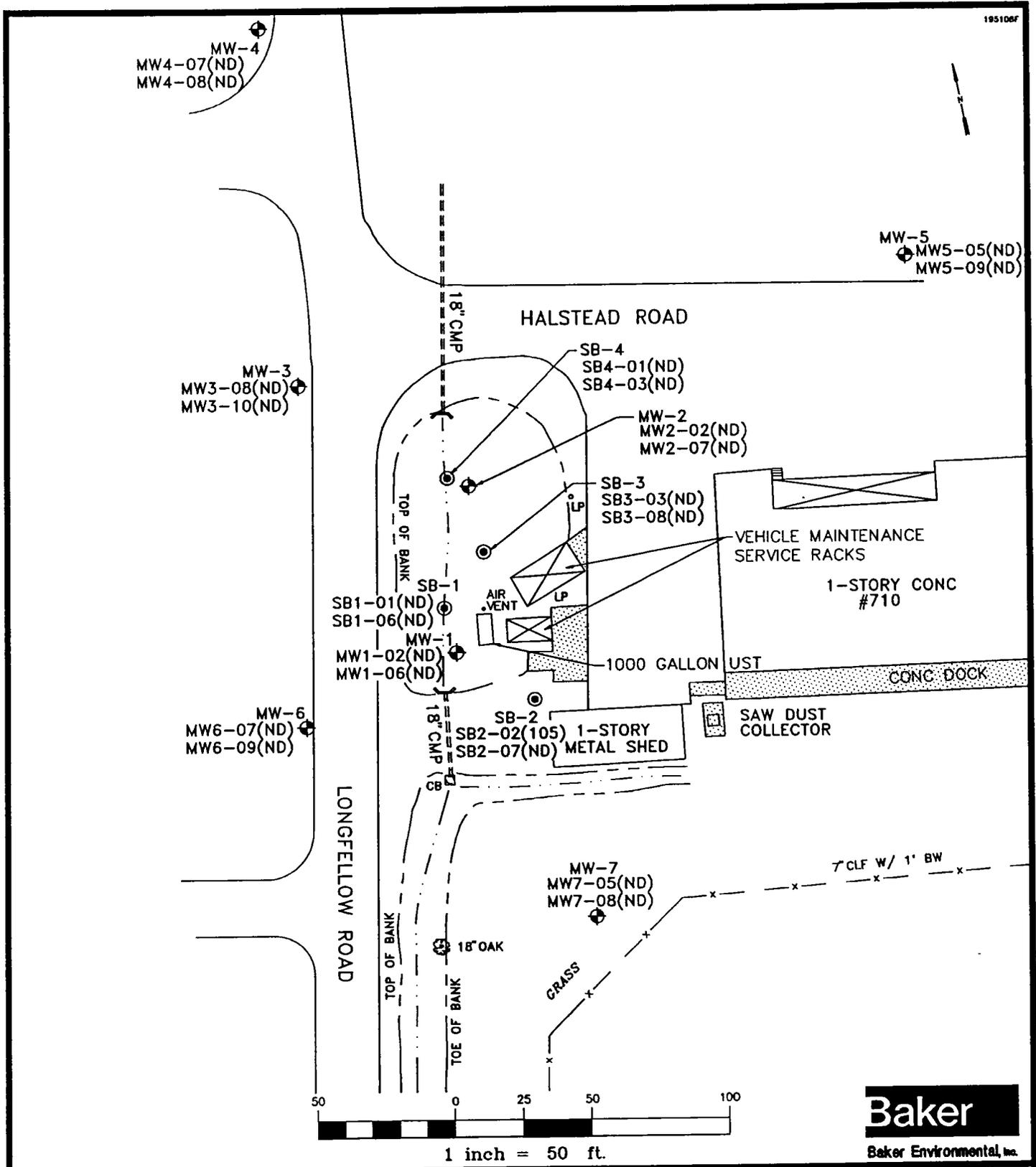
1.5.2 Extent of Contamination

The limited extent of TPH, VOC, and total lead concentrations detected in the soil and groundwater contamination in the vicinity of the site were evaluated by on-site observations and laboratory analytical data.

The soil analytical results for TPH showed that only 1 of the 23 soil samples analyzed had detectable amounts of TPH. This sample was collected at boring SB-2 (2.0 to 4.0 foot) and exhibited a TPH concentration of 105 ppm. The location of soil boring SB-2 is upgradient of the vehicle maintenance racks. Volatile organic concentrations were observed to be above detection limits in only one of six soil samples analyzed. The soil sample was collected from soil boring SB-1 (0.0 to 2.0 foot) with a concentration of 0.37 mg/kg. TPH and volatile organics concentrations in soils are shown in Figures 1-9 and 1-10, respectively.

Groundwater samples collected from the newly installed monitoring wells indicated that only one of the wells exhibited TPH concentrations above detection limits. Monitoring well MW-6 contained a TPH concentration of 1.0 mg/L. The location of this monitoring well is upgradient of the vehicle maintenance racks and UST system. Free product was not observed during this investigation. The TPH concentrations in groundwater are depicted on Figure 1-11.

Groundwater samples were also analyzed for total lead. Five of the seven wells had detectable concentrations of lead ranging from 0.025 mg/L to 0.181 mg/L. As noted above in Section 1.5.1, these total lead concentrations cannot be compared with the Federal treatment action level for dissolved lead, since they also contain suspended lead concentrations. Figure 1-11 shows total lead concentrations in groundwater.

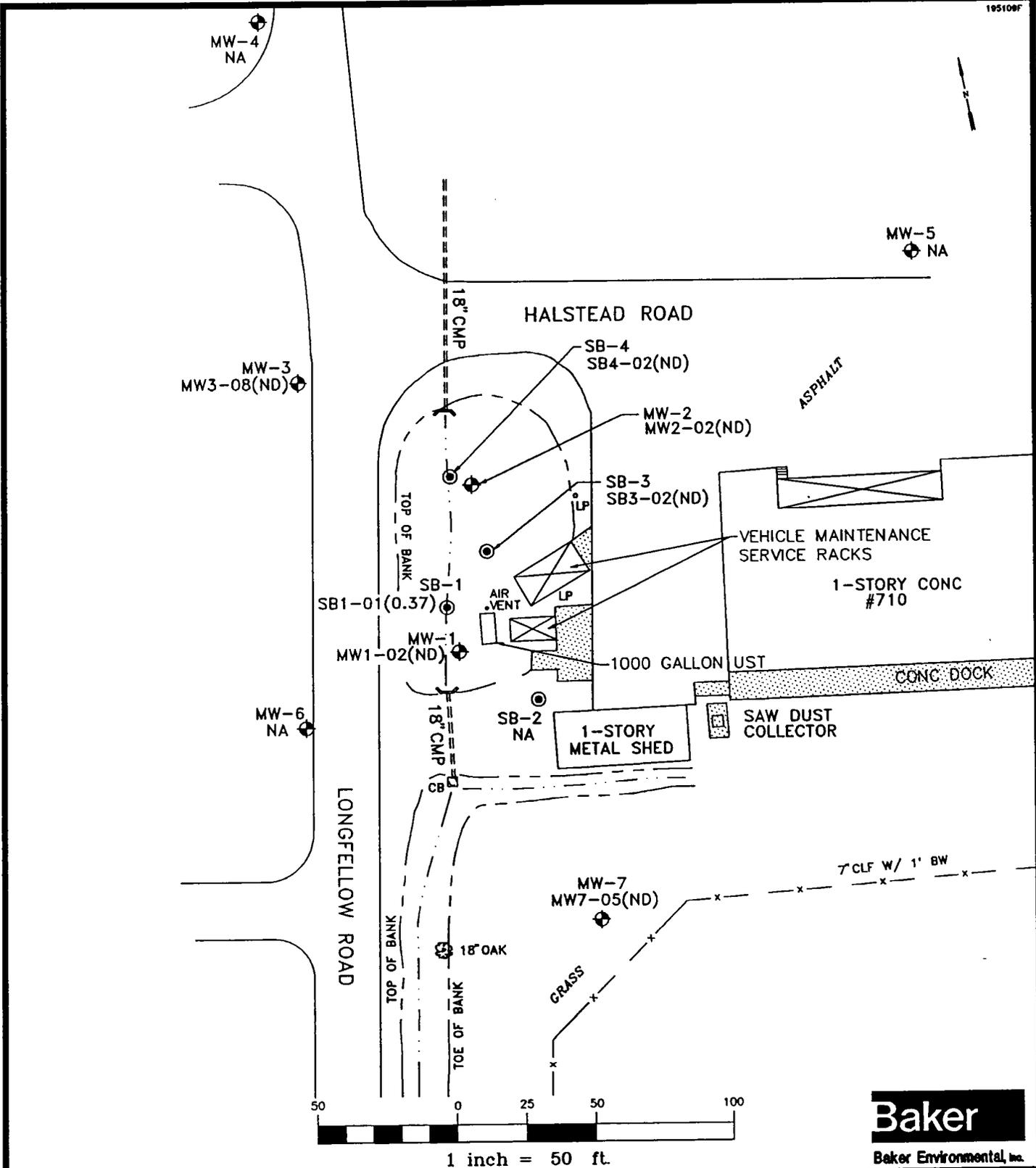


LEGEND

- MW-1 MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., JUNE 1993
- SB-1 SOIL BORING ADVANCED BY BAKER ENVIRONMENTAL, INC., JUNE 1993
- MW1-02(ND) SOIL SAMPLE NUMBER AND TPH CONCENTRATION (mg/kg)
- ND NON DETECT

SOURCE: MILLER-STEPHENSON & ASSOC., P.C., JUNE 1993

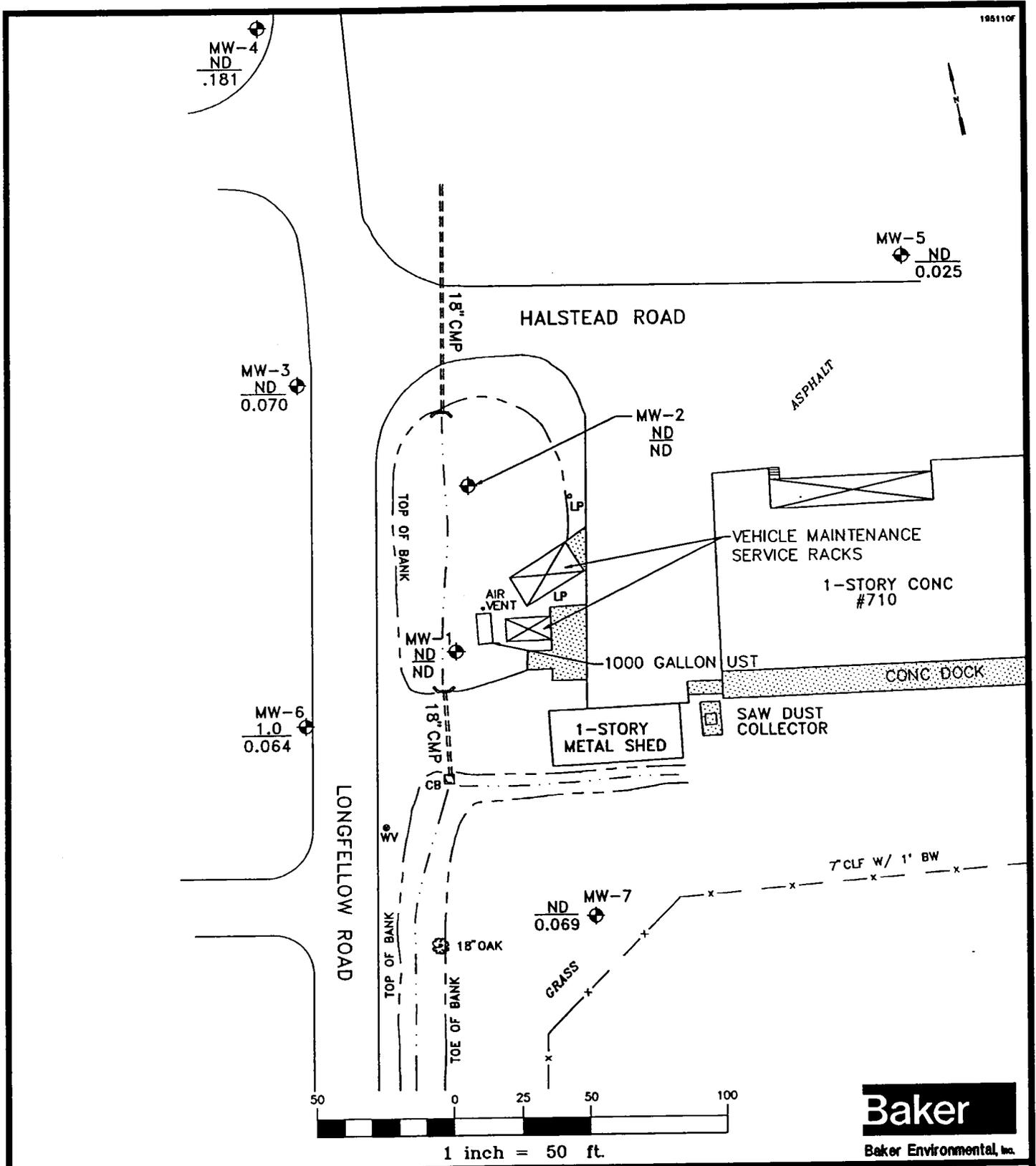
FIGURE 1-9
SOIL TPH CONCENTRATION MAP
BUILDING 710
VEHICLE MAINTENANCE
RACKS AND UST SYSTEM
NAVAL WEAPONS STATION
YORKTOWN, VIRGINIA



LEGEND

- MW-1 MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., JUNE 1993
 - SB-1 SOIL BORING ADVANCED BY BAKER ENVIRONMENTAL, INC., JUNE 1993
 - MW1-02(ND) SOIL SAMPLE NUMBER AND TOTAL VOC CONCENTRATIONS (mg/kg)
 - ND NON DETECT
 - NA NOT ANALYZED
- SOURCE: MILLER-STEPHENSON & ASSOC., P.C., JUNE 1993

FIGURE 1-10
VOLATILE ORGANIC CONCENTRATIONS
IN SOILS
BUILDING 710
VEHICLE MAINTENANCE
RACKS AND UST SYSTEM
NAVAL WEAPONS STATION
YORKTOWN, VIRGINIA



Baker
Baker Environmental, Inc.

LEGEND

- MW-1 MONITORING WELL INSTALLED BY BAKER ENVIRONMENTAL, INC., JUNE 1993
- $\frac{1.0}{0.064}$ TPH CONCENTRATIONS IN GROUNDWATER (mg/l)
LEAD CONCENTRATIONS IN GROUNDWATER (mg/l)
- ND NON DETECT

FIGURE 1-11
TPH AND LEAD CONCENTRATIONS
IN GROUNDWATER
BUILDING 710
VEHICLE MAINTENANCE
RACKS AND UST SYSTEM
NAVAL WEAPONS STATION
YORKTOWN, VIRGINIA

SOURCE: MILLER-STEPHENSON & ASSOC., P.C., JUNE 1993

1.5.3 Conclusions

Based on the conclusions noted above, the site has not been impacted by operations associated with the vehicle maintenance racks and the UST located at Building 710. Any detected concentrations of petroleum constituents in the vicinity of the site were low and obtained from sampling locations upgradient of the vehicle maintenance racks. The presence of total lead appears to be related to the sediment noted within the groundwater samples when collected. The following facts support this conclusion:

- - The direction of groundwater flow in the vicinity of Building 710 is to the north. The groundwater gradient at the site is estimated at 0.024.
- - The estimated hydraulic conductivity of the soils in the shallow water bearing zone is 3.0 ft/day based on slug test data. The estimated groundwater flow velocity is 66 ft/year.
- - Only one of the 23 soil samples analyzed contained TPH concentrations above detection limits. This sample was collected from soil boring SB-2 and had a concentration of 105 mg/kg. Though this concentration exceeded the DEQ's "action level" of 100 mg/kg, the amount of these concentrations above this level may be due to the analytical error inherent in the method used.
- - Total volatile organic concentrations were observed to be above detection limits in only one of the six soil samples analyzed. This sample was collected at soil boring SB-1 with a concentration of 0.37 mg/kg.
- - Free product was not observed during this investigation.
- - TPH in groundwater was detected in only one of the seven samples analyzed. This concentration met the DEQ standard of 1.0 mg/L for TPH in groundwater. The analytical method used, EPA Method 418.1, is not specific for hydrocarbons, but can also measure some other organics present in the groundwater from natural sources that are soluble in the solvent used for extraction. Therefore, a sample that has a value of 1.0 mg/L can contain petroleum hydrocarbons with a true value of less than 1.0 mg/L. Also, the location of the monitoring well is upgradient of the site.

- Five of the seven wells had detectable concentrations of total lead. The Federal treatment action level for dissolved lead of 0.015 mg/L was exceeded in monitoring wells MW-3, MW-4, MW-5, MW-6, and MW-7. It was noted that sediment was contained within the groundwater samples when collected and total lead (both dissolved and suspended) concentrations were quantified by the analytical method. Therefore, these total lead concentrations cannot be compared with the Federal treatment action level for dissolved lead.

2.0 RISK ASSESSMENT

The objectives of the risk assessment portion of the Site Characterization Report are to: (1) identify pathways of exposure; (2) identify the human or environmental receptors; (3) quantify the exposure levels; and (4) summarize the human and environmental risk.

The risk assessment section consists of five subsections. The first details the site demographics including land and water use. The second identifies the potential exposure pathways. The third identifies human or environmental receptors which may be affected. The fourth quantifies the exposure levels, and the fifth summarizes the potential risk.

2.1 Site Demographics

Building 710 is located at the junction of Halstead Road and Longfellow Road, approximately 1,400 feet north of Gate 3 at NWS, Yorktown, Virginia (Figure 1-1). The building serves as an automotive hobby shop, special service issue office and an ordinance operation building. UST System 710 is located on the west side of Building 710. The UST is associated with two vehicle maintenance racks where base personnel formerly changed the motor oil in their car engines.

The site is part of the Skiffes Creek Annex, WPNSTA Yorktown, Local land is primarily related to military activities. The local land use in the study area is related to base operations, including light industrial and recreational (i.e. woodworking) activities. The site is bordered to the north by the motor pool and a wooded area. A central heating plant is located west of the site, and grass areas encompass the regions to the south, both inside and outside the base boundaries. A residential housing development is located approximately 1,500 feet southeast of the site. The ground surface in the vicinity of the site is primarily covered by asphalt, concrete, or grass. Supply wells were not identified within a 1-mile radius of the site.

2.2 Identification of Exposure Pathways

The potential exposure pathways at this site may include groundwater ingestion and dermal contact with soil. Groundwater from the shallow aquifer is not reportedly used as a potable water source in this immediate area. Therefore, exposure pathways via groundwater do not currently exist. Also, the potential exposure from dermal contact with soil is unlikely because of the limited TPH and VOC concentrations detected.

2.3 Identification of Receptors

Based on the current data available and current conditions, there does not appear to be any human receptors in the immediate vicinity of the Building 710 UST system.

2.4 Quantification of Exposure Levels

In order to assess conditions at the site, analytical results from soil and groundwater samples were quantified. Soil samples were collected and analyzed for TPH and volatile organics. Groundwater samples, were analyzed for TPH, and selected samples were analyzed for purgeable aromatics, polynuclear aromatics and total lead. Additionally one duplicate sample, four equipment rinsate blanks and two trip blanks were collected.

Soil Contamination

The maximum TPH concentration detected in the soil samples was 105 mg/kg from SB-2 (2 to 4 bgs). None of the other soil samples collected during the investigation contained detectable concentrations of TPH. Only one of the six soil samples analyzed for volatile organics had concentrations above detection limits. The soil sample was from soil boring SB-1 and had concentrations of 0.37 mg/kg.

Groundwater Contamination

The following is a summary, by compound, of the groundwater contamination detected at this site:

- TPH were detected in only one of the seven groundwater samples and exhibited a concentration of 1.0 mg/L (MW-6).
- Concentrations of total lead were detected at MW-3 (0.070 mg/L), MW-4 (0.181 mg/L), MW-5 (0.025 mg/L), MW-6 (0.064 mg/L), and MW-7 (0.069 mg/L).

2.5 Potential Risks to Receptors

The current potential for exposure via ingestion or dermal contact of groundwater and/or dermal contact with soil at this site is unlikely. Drinking water for the area is supplied by

unrelated municipal source, and wells within a one-mile radius of the site are not used for domestic water supplies. In addition, the concentrations of TPH that were identified in soils and groundwater were minor.

Risk to the nearest receptors from the contaminants observed at the site is minimal. Volatile organics were not found to be present in the groundwater. The extent of TPH concentrations in soil and groundwater is defined and the impact of these concentrations are minimal.

The concentrations of total lead do not appear to be associated with the UST system (Section 1.5) and could be attributed to natural occurring lead concentrations present in sediments. These sediments were observed in the groundwater samples collected.

2.6 Risk Summary

As stated in Section 2.5, the potential risk of the present soil and groundwater contamination impacting a receptor is minimal. The contaminants identified at the site (as discussed previously in Section 1.0) do not pose a public health risk. Concentrations of these contaminants are low and there are limited opportunities for exposure.

3.0 REMEDIATION ASSESSMENT

The Remediation Assessment portion of the Site Characterization Report is presented in four sections. The first section (Section 3.1) discusses the objectives of the Remediation Assessment. Section 3.2 presents a discussion of the rationale for remediation at the site. Section 3.2 also presents the projected remediation endpoints based on the results of the site and risk assessments. Section 3.3 presents the remediation recommendations.

3.1 Objectives

The objectives of this Remediation Assessment are to: (1) evaluate whether the site requires remediation with respect to dissolved groundwater and/or soil contamination; (2) evaluate areas potentially requiring remediation; and (3) evaluate and identify potential technologies for site remediation.

3.2 Remediation Rationale

Based on current analytical data groundwater and soil have not been impacted by operations associated with the vehicle maintenance racks and the associate UST system.

Concentrations of TPH in soils, which exceeded the DEQ TPH action level of 100 ppm, were identified only at soil boring location SB-2 at 105 mg/kg, which is estimated to be upgradient of the vehicle maintenance racks. Also, the amount of this concentration above the action level may be due to analytical error inherent in the method used. None of the other soil samples collected during the investigation contained detectable amounts of TPH. Volatile organic compounds were detected at SB-1 (2.0 to 4.0 foot) at minor concentrations of 0.37 mg/kg.

The analytical results from the site characterization indicated that only one of the seven monitoring wells sampled contained a detectable concentration of TPH (1mg/L). The analytical method used, EPA Method 418.1, is not specific for hydrocarbons, but can also measure some other organics present in the groundwater from natural sources that are soluble in the solvent used for extraction. Therefore, a sample that has a value of 1.0 mg/L can contain petroleum hydrocarbons with a true value of less than 1.0 mg/L. Also, this monitoring well (MW-6) is estimated to be upgradient of the vehicle maintenance racks and the UST system.

Total lead was also found to exist at the site, but these concentrations were probably resultant from the sediment that was noted within the groundwater sample when collected.

The results of the risk assessment conducted for this site identified that contamination at the site does not appear to have a current pathway to potential human or environmental receptors. Therefore, "no action" remediation of groundwater and soil at this site is recommended.

3.2.1 Projected Remediation Endpoints

Direct remediation of soils is not recommended at this time. TPH concentrations were detected only in one soil sample and were determined to be unrelated to the vehicle maintenance racks and UST system.

At present, active groundwater remediation is not recommended. Although the TPH concentration met the DEQ's standard for TPH in groundwater. The analytical method used, EPA Method 418.1, is not specific for hydrocarbons, but can also measure other organics present in the groundwater from natural sources that are soluble in the solvent used for extraction. Therefore, a sample that has a value of 1.0 mg/L can contain petroleum hydrocarbons with a true value of less than 1.0 mg/L.

3.3 Recommendations

Based on the results of the site characterization/risk assessment, "no action" remediation of soils and groundwater is recommended.

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Appendix A
Field Test Boring Records

Baker

FIELD TEST BORING RECORD

Baker Environmental, Inc.

PROJECT: YorkTown WEAPONS STATION

S.O. NO.: 19195

BORING NO.: SB-1

COORDINATES: EAST:

NORTH:

ELEVATION: SURFACE: 53.5'

TOP OF PVC CASING: NA

RIG: Mobile B-47

	SPLIT SPOON	CASING	AUGERS	CORE BARREL	DATE	PROGRESS (FT)	WEATHER	TOP OF CASING WATER DEPTH (FT)	TIME
SIZE (DIAM.)	2"		4.25"		6/25/93				
LENGTH	2 ft		5 ft.						
TYPE	std.		H. S. A.						
HAMMER WT.	140 lb								
FALL	30 in								
STICK UP									

REMARKS: _____

DRILL RECORD							VISUAL DESCRIPTION				
DEPTH	SOIL ROCK	Sample ID Type- No. (N = No Samp.	Samp. Rec. (Ft & %)	SPT Blows Per 0.5'	Lab. Class.	Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL ROCK	ELEVATION
				RQD (Ft & %)	Pen. Rate						
1		S-1	1.1 2.0 55%	5 6 5 4		Fine Sand some clay	Brown Gray	Med. Dense	Dry - Petroleum odor		
2											
3		S-2	1.8 2.0 90%	4 7 6 4		Fine Sand little clay	Brown Gray	med. Dense	Damp - Slt. Petroleum odor		
4											
5		S-3	2.0 2.0 100%	2 4 5 6		Fine Sand, trace clay	light Brown	Loose	Damp - moist		
6											
7		S-4	1.9 2.0 95%	4 4 5 7		Fine Sand trace clay Fine Sand	Brown Lt. gray	Loose	moist Dry		
8											
9		S-5	1.7 2.0 85%	3 6 6 7		Med. to fine Sand	lt. gray lt. Brown	Med. Dense	Damp - moist		
10											

DRILLING CO.: Rock Ray
 DRILLER: Robert Schman

BAKER REP.: Dave Martin
 BORING NO.: SB-1 SHEET 1 OF 2

FIELD TEST BORING RECORD

Baker Environmental, Inc.

PROJECT: YORKTOWN WEAPONS STATION

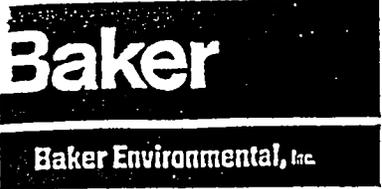
S.O. NO.: 19195

BORING NO.: SB-1

DRILL RECORD						VISUAL DESCRIPTION					
DEPTH	SOIL	Sample ID	Samp. Rec.	SPT Blows Per 0.5'	Lab. Class.	Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL	ELEVATION
	ROCK	Type- No. (N = No Samp.)	(Ft. & %)	RQD (Ft. & %)	Pen. Rate	PID (ppm)	Color	Hardness	Weathering, Bedding, Fracturing, and Other Observations	ROCK	
11		S-6	1.0 2.0	3 6		Coarse to Fine Sand	Orange Brown	Med. Dense	Moist		
12			50%	5							
13		S-7	2.0 2.0	5 6		Coarse to Fine Sand	Orange Brown	Med. Dense	Water at 13'		
14			100%	7 8	1.6				Moist - wet		37.5
14						END OF BORING = 14.0 FEET					
15											
16											
17											
18											
19											
20											
21											
22											
23											
24											
25											
26											
27											
28											
29											
30											

DRILLING CO.: Rock Ray
 DRILLER: Robert Schmon

BAKER REP.: Dave Martin
 BORING NO.: SB-1



FIELD TEST BORING RECORD

PROJECT: YORKTOWN WEAPONS STATION
 S.O. NO.: 19195 BORING NO.: SB-2
 COORDINATES: EAST: _____ NORTH: _____
 ELEVATION: SURFACE: 59.1' TOP OF PVC CASING: NA

RIG:	<u>Mobile B-47</u>							TOP OF CASING WATER DEPTH (FT)	
	SPLIT SPOON	CASING	AUGERS	CORE BARREL	DATE	PROGRESS (FT)	WEATHER		TIME
SIZE (DIAM.)	<u>2"</u>		<u>4.25"</u>		<u>6/25/93</u>				
LENGTH	<u>2 Ft.</u>		<u>5 ft</u>						
TYPE	<u>Std.</u>		<u>H.S.A.</u>						
HAMMER WT.	<u>140 lb.</u>								
FALL	<u>30 in</u>								
STICK UP									

REMARKS: AN = Auger - No Sample collected

DRILL RECORD							VISUAL DESCRIPTION					
DEPTH	SOIL	Sample ID	Samp. Rec. (Ft & %)	SPT Blows Per 0.5'	Lab. Class.		Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL ROCK	ELEVATION
					Type No. (N = No Samp.)	RQD (Ft & %)	Pen. Rate	PID (ppm)	Classification (Name, Grain Size, Principal Constituents, Etc.)	Color		
1		S-1	<u>1.3</u> <u>2.0</u> <u>65%</u>	<u>10</u> <u>9</u> <u>6</u> <u>5</u>			<u>Sand some gravel</u>	<u>Gray</u>	<u>med. Dense</u>	<u>Dry</u>		
2							<u>mottled med. Sand some clay</u>	<u>yellowish gray</u>	<u>med. Dense</u>	<u>Dry</u>		
3		S-2	<u>1.0</u> <u>2.0</u> <u>50%</u>	<u>8</u> <u>6</u> <u>8</u> <u>8</u>		<u>29</u>	<u>med. Sand some cby</u>	<u>med. Gray Brn. Mottled</u>	<u>med. Dense</u>	<u>Dry Pet. odor 3.5'-4.0'</u>		
4												
5		S-3	<u>1.0</u> <u>2.0</u> <u>50%</u>	<u>8</u> <u>6</u> <u>4</u> <u>4</u>		<u>4.8</u>	<u>Fine sand and clay</u>	<u>Orange Brown</u>	<u>med. Dense</u>	<u>moist</u>		
6												
7		S-4	<u>1.7</u> <u>2.0</u> <u>85%</u>	<u>5</u> <u>6</u> <u>8</u> <u>8</u>		<u>4.0</u>	<u>Fine sand and clay</u>	<u>Orange Brown</u>	<u>med. Dense</u>	<u>moist</u>		
8							<u>Fine sand, some clay</u>					
9		S-5	<u>1.9</u> <u>2.0</u> <u>95%</u>	<u>6</u> <u>5</u> <u>4</u> <u>5</u>		<u>2.8</u>	<u>Fine sand and clay</u>	<u>Orange Brown</u>	<u>Loose</u>	<u>moist</u>		
10												

DRILLING CO.: Rock RAY
 DRILLER: Robert Schman

BAKER REP.: DAVE MARTIN
 BORING NO.: SB-2 SHEET 1 OF 2

FIELD TEST BORING RECORD

Baker Environmental, Inc.

PROJECT: YORKTOWN WEAPONS STATION

S.O. NO.: 19195

BORING NO.: SB-2

DRILL RECORD							VISUAL DESCRIPTION					
DEPTH	SOIL	Sample ID	Samp. Rec.	SPT Blows Per 0.5'	Lab. Class.	Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL	ELEVATION	
	ROCK	Type-No. (N = No Samp.)	(Ft. & %)	RQD (Ft. & %)	Pen. Rate		PID (ppm)	Color	Hardness			Weathering, Bedding, Fracturing, and Other Observations
11		S-6	1.8 2.0 90%	5 5 9		3.0	med-fine Sand Trace clay	orange Brown	Loose	Moist		
12												
13		AN										
14												
15			2.0	5			med - fine Sand	orange Brown	Loose	Damp		
16		S-7	2.0 100%	5 4 4		2.0	1" clay seam @ 15.3'					
17												
18												
19												
20			2.0	6			clay, little fine Sand	Brown		moist-wet		20.39.1
21		S-8	2.0	6 5 4		3.5			stiff	water @ 20'		
22			100%	4			END OF BORING	22.0 FEET				37.1
23												
24												
25												
26												
27												
28												
29												
30												

DRILLING CO.: Rock Ray

DRILLER: Robert Schmon

BAKER REP.: DAVE MARTIN

BORING NO.: SB-2

SHEET 2 OF 2

Baker

Baker Environmental, Inc.

FIELD TEST BORING RECORD

PROJECT: YORKTOWN WEAPONS STATION
 S.O. NO.: 19195 BORING NO.: SB-3
 COORDINATES: EAST: _____ NORTH: _____
 ELEVATION: SURFACE: 54.2 TOP OF PVC CASING: NA

RIG: <u>Mobile-B 47</u>					DATE	PROGRESS (FT)	WEATHER	TOP OF CASING WATER DEPTH (FT)	TIME
SIZE (DIAM.)	SPLIT SPOON	CASING	AUGERS	CORE BARREL					
LENGTH	<u>2 in.</u>		<u>4.25 in.</u>		<u>6/26/93</u>				
TYPE	<u>2 Ft.</u>		<u>5 ft.</u>						
HAMMER WT.	<u>std.</u>		<u>H.S.A.</u>						
FALL	<u>140 lb.</u>								
STICK UP	<u>30 in</u>								

REMARKS: _____

DRILL RECORD							VISUAL DESCRIPTION				
DEPTH	SOIL ROCK	Sample ID Type No. (N = No Samp.)	Samp. Rec. (Ft & %)	SPT Blows Per 0.5'	Lab. Class.	Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL ROCK	ELEVATION
				RQD (Ft & %)	Pen. Rate						
1		S-1	1.2 2.0 60%	10 12 6 9		sand some clay	Orange Brown	Med Dense	Topsoil 1" Dry laminated orange, red, gray		
2						Sand	Orange Gray mottled	Med. Dense	Dry - damp		
3		S-2	1.2 2.0 60%	8 9 6 7							
4					0.7	Fine sand trace silt	Gray Brown	Loose	Damp blk. mottled staining throughout		
5		S-3	1.8 2.0 90%	2 2 2							
6						Fine sand, little silt	grayish tan	Med. Dense	Damp - moist		
7		S-4	2.0 2.0 100%	5 6 5 6							
8						Fine Sand, some clay	grayish tan to brown Brn.	Med. Dense	Moist		
9		S-5	1.7 2.0 85%	4 6 7 10							
10					0.8						



FIELD TEST BORING RECORD

Baker Environmental, Inc.

PROJECT: YORKTOWN WEAPONS STATION
 S.O. NO.: 19195 BORING NO.: SB-3

DRILL RECORD						VISUAL DESCRIPTION					
DEPTH	SOIL	Sample ID	Samp. Rec.	SPT Blows Per 0.5'	Lab. Class.	Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL	ELEVATION
	ROCK	Type-No. (N = No Samp.)	(Ft. & %)	RQD (Ft. & %)	Pen. Rate	PID (ppm)	Classification (Name, Grain Size, Principal Constituents, Etc.)	Color	Hardness	Weathering, Bedding, Fracturing, and Other Observations	
11		S-6	1.8 2.0 90%	8 9 11		Fine sand some clay	lt. orange Brn. to orange	Med. Dense	Moist		
12											
13		S-7	2.0 2.0 100%	11 7 4 4		Fine sand some clay clay some sand	orange Brn.	med. Dense	moist organics traces		13.41
14					0.8						
15		S-8	1.8 2.0 90%	11 9 4 3		Fine sand some clay clay little fine sand	orange Brn. orange Brn. red Black	med. Dense	moist mottled		14.5 39.7
16											
17		S-9	2.0 2.0 100%	3 4 4 5		clay little fine sand	orange Brn. red Blk mottled	Loose	Water at 16'		36.2
18	END OF BORING = 180 FEET										
19											
20											
1											
2											
3											
4											
5											
6											
7											
8											
9											
0											

DRILLING CO.: Rock PAV
 DRILLER: Robert Schmev

BAKER REP.: DAVE MARTIN
 BORING NO.: SB-3 SHEET 2 OF 2

Baker

FIELD TEST BORING RECORD

Baker Environmental, Inc.

PROJECT: YORKTOWN WEAPONS STATION

S.O. NO.: 19195

BORING NO.: SB-4

COORDINATES: EAST: _____

NORTH: _____

ELEVATION: SURFACE: 52.9

TOP OF PVC CASING: NA

RIG: Mobile B-47

	SPLIT SPOON	CASING	AUGERS	CORE BARREL	DATE	PROGRESS (FT)	WEATHER	TOP OF CASING WATER DEPTH (FT)	TIME
SIZE (DIAM.)	2 in.		4.25 in		6/27/93				
LENGTH	2 Ft.		5 Ft						
TYPE	Std.		H.S.A.						
HAMMER WT.	140 lb								
FALL	30 in								
STICK UP									

REMARKS: _____

DRILL RECORD

VISUAL DESCRIPTION

DEPTH	SOIL	Sample ID	Samp. Rec. (Ft & %)	SPT Blows Per 0.5'	Lab. Class.		Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL ELEVATION
					RQD (Ft & %)	Per. Rate					
1		S-1	1.2 2.0 60%	4 7 3 3		0.4	med. - Fine Sand little silt	Blk	Loose	Top Soil 2" Dry - moist	
2							Fine Sand and clay	lt. Brn.	med. Dense	Moist 3" at tip gray Blk. organics / Wood Fragments	
3		S-2	1.2 2.0 60%	3 4 7 5		0.8					
4							Fine sand and clay some silt	lt. Brn. lt. gray Brn.	Loose	moist little blk. staining ~ 5.25'	
5		S-3	2.0 2.0 100%	5 6 3 6		0					
6							Fine sand and clay some silt	lt. Brn. lt. gray Brn.	med. Dense	moist Blk. staining ~ 7'	
7		S-4	1.7 2.0 85%	8 7 7 8		0.2					
8							med. - Fine Sand	lt. Brn.	med. Dense	Damp	
9		S-5	1.8 2.0 90%	6 6 10 10		0					
10											

DRILLING CO.: Rock RAY

BAKER REP.: Dave MARTIN

DRILLER: Robert Schman

BORING NO.: SB-4

SHEET 1 OF 2

FIELD TEST BORING RECORD

Baker Environmental, Inc.

PROJECT: YORKTOWN WEAPONS STATION

S.O. NO.: 19195

BORING NO.: SB-4

DRILL RECORD							VISUAL DESCRIPTION					
DEPTH	SOIL	Sample ID	Samp. Rec.	SPT Blows Per 0.5'	Lab. Class.		Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL	ELEVATION
	ROCK	Type-No. (N = No Samp.)	(Ft. & %)	RQD (Ft. & %)	Pen. Rate	PID (ppm)	Classification (Name, Grain Size, Principal Constituents, Etc.)	Color	Hardness	Weathering, Bedding, Fracturing, and Other Observations	ROCK	
11		S-6	1.7 2.0	3 4			med. to fine sand	Lt. Brn	Loose	Damp		
12			85%	5 12		0						12
13		S-7	2.0 2.0	3 2			Clay and fine sand	lt. Brn orange Brn.	Loose	Damp 1" coarse red Brn. sand at 12.75' (iron like deposits)		
14			100%	3 4								
15		S-8	2.0 2.0	2 2			clay - some fine sand	yellow Brn. red Brn. orange	Loose	moist - Tip of sample saturated		
16			100%	3 2						Water at 15.8		36.9'
16							End of Boring at 16'					
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												

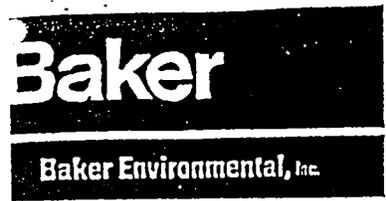
DRILLING CO.: Rock Ray

DRILLER: ROBERT SCHMON

BAKER REP.: DAVE MARTIN

BORING NO.: SB-4

SHEET 2 OF 2



FIELD TEST BORING RECORD

PROJECT: YORKTOWN WEAPONS STATION
 S.O. NO.: 19175 BORING NO.: MW-1
 COORDINATES: EAST: _____ NORTH: _____
 ELEVATION: SURFACE: 54.1 TOP OF PVC CASING: 54.37

RIG: <u>Mobile B 47</u>					DATE	PROGRESS (FT)	WEATHER	TOP OF CASING WATER DEPTH (FT)	TIME
SPLIT SPOON	CASING	AUGERS	CORE BARREL						
SIZE (DIAM.)	<u>2 in</u>		<u>4.25"</u>		<u>6/26/98</u>				
LENGTH	<u>2 Ft</u>		<u>5 ft.</u>						
TYPE	<u>std.</u>		<u>H.S.A.</u>						
HAMMER WT.	<u>140 lbs</u>								
CALL	<u>30 in</u>								
TICK UP									

REMARKS: AN = Auger No Sample Collected

DRILL RECORD							VISUAL DESCRIPTION				
DEPTH	SOIL ROCK	Sample ID Type-No. (N = No Samp.)	Samp. Rec. (Ft & %)	SPT Blows Per 0.5'	Lab. Class.	Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL	ELEVATION
				RQD (Ft & %)							
1		S-1	<u>1.0</u> <u>2.0</u> <u>50%</u>	<u>5</u> <u>10</u> <u>8</u> <u>5</u>		<u>Fine Sand some clay & silt</u>	<u>gray</u> <u>orange</u> <u>Brown</u>	<u>med. Dense</u>	<u>Dry Top 2" top soil</u>		
2						<u>Fine sand and clay</u>	<u>Brown</u> <u>Gray</u>	<u>Loose</u>	<u>Damp - moist</u>		
3		S-2	<u>1.5</u> <u>2.0</u> <u>75%</u>	<u>3</u> <u>3</u> <u>3</u>							
4						<u>Fine Sand some clay</u>	<u>lt. Brn</u> <u>gray</u> <u>Brown</u>	<u>very Loose</u>	<u>Moist - Damp</u>		
5		S-3	<u>1.5</u> <u>2.0</u> <u>75%</u>	<u>2</u> <u>1</u> <u>2</u> <u>3</u>							
6						<u>Fine Sand some clay</u>	<u>lt. gray</u>	<u>loose</u>			
7		S-4	<u>1.5</u> <u>2.0</u> <u>75%</u>	<u>3</u> <u>4</u> <u>5</u> <u>4</u>		<u>Fine Sand trace clay & silt</u>					
8											
9		S-5	<u>1.6</u> <u>2.0</u> <u>80%</u>	<u>4</u> <u>7</u> <u>10</u> <u>11</u>		<u>Fine Sand</u>	<u>lt. gray</u> <u>orange</u> <u>Brown</u>	<u>med. Dense</u>	<u>moist</u>		
10											

FIELD TEST BORING RECORD

Baker Environmental, Inc.

PROJECT: YONETOWN NAVAL WEAPONS STATION

S.O. NO.: 19195

BORING NO.: MW-1

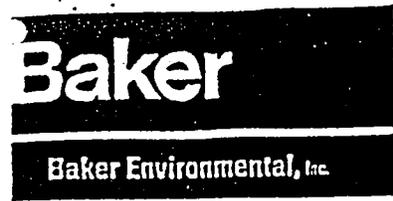
DRILL RECORD						VISUAL DESCRIPTION					
DEPTH	SOIL	Sample ID	Samp. Rec.	SPT Blows Per 0.5'	Lab. Class.	Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL	ELEVATION
	ROCK	Type-No. (N = No Samp.)	(Ft. & %)	RQD (Ft. & %)	Pen. Rate	PID (ppm)	Color	Hardness	Weathering, Bedding, Fracturing, and Other Observations	ROCK	
11		S-6	1.3 2.0 65%	7 9 10		Fine Sand trace clay silt	orange Brown	Med. Dense	Moist		
12			2.0	9		Fine Sand some clay	orange Brown	med Dense			
13		S-7	2.0 2.0 100%	10 2 2		Clay some clayey Fine Sand	orange		Water at 13'		13' 91.1
14											
15		S-8	2.0 2.0 100%	3 3 4		Clay some silt	orange Lt. gray	Loose	wet		
16											
17		AN									
18			2.0	3		Fine Sand and clay	orange Brn.	Loose			18.3 35.8
19		S-9	2.0 100%	3 3 3		Clay some fine Sand	orange				33.8'
20						END OF BORING 20.3 FEET					
1											
2											
3											
4											
5											
6											
7											
8											
9											
0											

BY: Robert Schman

BAKER REP.: DAVE MARTIN

BORING NO.: MW-1

SHEET 2 OF 2



FIELD TEST BORING RECORD

PROJECT: YORKTOWN WEAPONS STATION
 S.O. NO.: 19195 BORING NO.: MW-2
 COORDINATES: EAST: _____ NORTH: _____
 ELEVATION: SURFACE: 53.1 TOP OF PVC CASING: 53.47 53.4

RIG:	<u>Mobile B 47</u>				DATE	PROGRESS (FT)	WEATHER	TOP OF CASING WATER DEPTH (FT)	TIME
SIZE (DIAM.)	<u>2 in.</u>	CASING	<u>4.25 in</u>	CORE BARREL					
LENGTH	<u>2 Ft.</u>		<u>5 Ft.</u>						
TYPE	<u>Std.</u>		<u>H. S. A.</u>						
HAMMER WT.	<u>140 lb.</u>								
FALL	<u>30 in.</u>								
STICK UP									

REMARKS: AN: Auger No Sample Collected

DRILL RECORD							VISUAL DESCRIPTION					
DEPTH	SOIL ROCK	Sample ID	Samp. Rec. (Ft & %)	SPT Blows Per 0.5'	Lab. Class.	PID (ppm)	Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL ROCK	ELEVATION
				RQD (Ft & %)			Pen. Rate	Classification (Name, Grain Size, Principal Constituents, Etc.)	Color	Hardness		
1		S-1	<u>1.5</u> <u>2.0</u>	<u>2</u> <u>5</u> <u>3</u>		<u>0.2</u>	<u>Fine sand little clay trace fine gravel</u>	<u>Lt. Brn. Lt. gray mottled</u>	<u>Loose</u>	<u>Dry</u>		
2			<u>75%</u>	<u>6</u>								
3		S-2	<u>1.0</u> <u>2.0</u>	<u>6</u> <u>5</u>		<u>0.4</u>	<u>Fine sand little clay</u>	<u>Lt. Brn. Lt. gray mottled</u>	<u>Med. Dense</u>	<u>Damp</u>		
4			<u>50%</u>	<u>5</u> <u>6</u>								
5		S-3	<u>2.0</u> <u>2.0</u>	<u>3</u> <u>4</u> <u>6</u>		<u>0</u>	<u>Fine sand some clay Fine sand little silt</u>	<u>Lt. Brn. Lt. gray mottled Lt. gray</u>	<u>Med Dense</u>	<u>Damp</u>		
6			<u>100%</u>	<u>4</u>								
7		S-4	<u>1.7</u> <u>2.0</u>	<u>4</u> <u>4</u> <u>8</u>		<u>0</u>	<u>Fine sand some silt</u>	<u>Lt. gray</u>	<u>Med. Dense</u>	<u>moist</u>		
8			<u>85%</u>	<u>9</u>								
9		S-5	<u>1.7</u> <u>2.0</u>	<u>5</u> <u>6</u> <u>9</u>		<u>0</u>	<u>Fine sand little silt</u>	<u>Lt. gray</u>	<u>Med. Dense</u>	<u>Moist-Damp</u>		
10			<u>85%</u>	<u>12</u>								

FIELD TEST BORING RECORD

Baker Environmental, Inc.

PROJECT: YORKTOWN WEAPONS STATION

S.O. NO.: 19195

BORING NO.: MW-2

DRILL RECORD						VISUAL DESCRIPTION					
DEPTH	SOIL	Sample ID	Samp. Rec.	SPT Blows Per 0.5'	Lab. Class..	Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL	ELEVATION
	ROCK	Type-No. (N = No Samp.)	(Ft. & %)	RQD (Ft. & %)	Pen. Rate	PID (ppm)	Classification (Name, Grain Size, Principal Constituents, Etc.)	Color	Hardness		
11		S-6	1.7 2.0	5 14 12		Fine Sand - med. Fine Sand Trace coarse Sand/ Fine gravel	lt. gray	med. Dense	Damp		
12			85%	17		med. Fine Sand little clay	orange Brn.		Moist	12.25	40.85
13		S-7	2.0 2.0	3 3		clay little Fine Sand	orange yellow B/K mottled	Loose	Damp		
14			100%	4							
15		S-8	2.0 2.0	2 2		clay little fine Sand	orange	Loose	Moist		
16			100%	3							
17		S-9	2.0 2.0	2 2		clay	orange	Loose	moist wet at tip of sample		
18			100%	3					water at 18'		
19		AN									
20											
21		S-10	1.4 2.0	1 1		clay little fine Sand	orange red	Very Loose	wet		
22			70%	2							
23											
24		AN									
25											
26		S-11	1.5 2.0	3 2		clay and silt some fine sand 50% shell fragments	red Brown lt. gray	Very Loose	wet		
27			75%	1							
28		A-N									25.1
29						End of Boring at 28'					
30											

DRILLING CO.: Rock Ray
 DRILLER: Robert Schman

BAKER REP.: DAVE MARTIN
 BORING NO.: MW-2

SHEET 2 OF 2

Baker

Baker Environmental, Inc.

FIELD TEST BORING RECORD

PROJECT: Yorktown Weapons Station - Bldg 710
 S.O. NO.: 19195 BORING NO.: MW-3
 COORDINATES: EAST: _____ NORTH: _____
 ELEVATION: SURFACE: 58.1' TOP OF PVC CASING: 58.14'

RIG: <u>Mobile B-97</u>					DATE	PROGRESS (FT)	WEATHER	TOP OF CASING WATER DEPTH (FT)	TIME
SIZE (DIAM.)	SPLIT SPOON	CASING	AUGERS	CORE BARREL					
2.0"			4.25"		6-27-73	35	Sunny humid 90°		
LENGTH	2.0'		5.0'						
TYPE	STD		HSA						
HAMMER WT.	140 lb								
FALL	30"								
STICK UP									

REMARKS: _____

DRILL RECORD							VISUAL DESCRIPTION				
DEPTH	SOIL ROCK	Sample ID Type-No. (N = No Samp.)	Samp. Rec. (Ft. & %)	SPT Blows Per 0.5'	Lab. Class.	Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL	ELEVATION
				RQD (Ft. & %)							
1			1.2 / 2.0	7 18 10 8		0.25' topsoil Clay and coarse to fine sand, some silt, trace fine gravel	gray-orange brown	Very stiff	Dry		
2		S1	60%	5 4 6 5		0.2	orange brown &	Stiff	Damp		
3		S2	50%	3 3 7 17		0	light orange brown	Stiff	Damp		
4		S3	35%	7 7 10 9		0.4	orange brown to gray brn	Very stiff	Damp		
5		S4	65%	3 4 7 7		0.2	orange-brn with red and gray mottling	Stiff	Damp, fine sand also in partings		
6		S5	65%	7							

DRILLING CO.: Rock-Ray Drilling
 DRILLER: Robert Schuman

BAKER REP.: David Martin
 BORING NO.: MW-3 SHEET 1 OF 3

FIELD TEST BORING RECORD

PROJECT: Yorktown Weapons Station - Bldg 710
 S.O. NO.: 19195 BORING NO.: MW 3

DRILL RECORD						VISUAL DESCRIPTION						
DEPTH	SOIL	Sample ID	Samp. Rec.	SPT Blows Per 0.5'	Lab. Class.	Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL	ELEVATION	
	ROCK	Type-No. (N = No Samp.)	(Ft. & %)	RQD (Ft. & %)	Pen. Rate	PID (ppm)	Classification (Name, Grain Size, Principal Constituents, Etc.)	Color	Hardness			Weathering, Bedding, Fracturing, and Other Observations
11		S6	1.7 2.0	3 5 5		0.1	0.25' clay and fine sand Fine sand, and clay	orange-brn red gray	medium Dense	Damp		10.5 / 17.9
12			2.0 2.0	5 7 6 8		0.2	Medium to Fine Sand, some clay	light orange brn	medium Dense	Damp		
13		S7										
14			2.0 2.0	5 7 8 8		0.2	Fine Sand, some clay	orange brn.	medium Dense	Damp		
15		S8	100%									
16												
17												
18		A-N										
19												
20			2.0 2.0	4 2 4 3		0	Clay, some fine sand, trace black organics	orange brown with red yellow mottling	medium stiff	Damp		
21		S9	100%									
22												
23												
24		A-N										
25			2.0 2.0	WOR 2.0		0	Clay and silt, little fine sand	Tan	Very soft	Moist		
26		S10	100%									
27												
28												
29		A-N										
30												

DRILLING CO.: Rock-Ray Drilling
 DRILLER: Robert Schman

BAKER REP.: David Martin
 BORING NO.: MW3 SHEET 2 OF 3

FIELD TEST BORING RECORD

PROJECT: Yorktown Weapons Station - Bldg 710
 S.O. NO.: 19195 BORING NO.: MW-3

DRILL RECORD						VISUAL DESCRIPTION					
DEPTH	SOIL	Sample ID	Samp. Rec.	SPT Blows Per 0.5'	Lab. Class.	Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL	ELEVATION
	ROCK	Type-No. (N = No Samp.)	(Ft. & %)	RQD (FL & %)	Pen. Rate	PID (ppm)	Classification (Name, Grain Size, Principal Constituents, Etc.)	Color	Hardness	Weathering, Bedding, Fracturing, and Other Observations	
31		S11		<u>WOR</u> 2.0		0	Clay and silt, little fine Sand also in partings	tan	very soft	Wet, laminated	
32		A-N									
33				13			Silt and clay, little fine Sand	brn			33.5
34		S12		7 9 16		0	med-fine Sand, some silt trace clay, 80% sea shell coquina	light gray	medium dense	Wet	24.6'
35							End of Boring at 35'				23.1'
6											
7											
8											
9											
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
0											

DRILLING CO.: Rock-Ray Drilling
 DRILLER: Robert Schman

BAKER REP.: David Martin
 BORING NO.: MW-3 SHEET 3 OF 3

Baker

Baker Environmental, Inc.

FIELD TEST BORING RECORD

PROJECT: Yorktown Weapons Station - Bldg 710
 S.O. NO.: 19195 BORING NO.: MW-4
 COORDINATES: EAST: _____ NORTH: _____
 ELEVATION: SURFACE: 55.2 TOP OF PVC CASING: 54.92

RIG: <u>Mobile B-97</u>								TOP OF CASING WATER DEPTH (FT)	
	SPLIT SPOON	CASING	AUGERS	CORE BARREL	DATE	PROGRESS (FT)	WEATHER		TIME
SIZE (DIAM.)	<u>2.0"</u>		<u>4.25"</u>		<u>6-28-93</u>	<u>30</u>	<u>90° sunny</u>		
LENGTH	<u>2.0'</u>		<u>5.0'</u>						
TYPE	<u>STD</u>		<u>HSA</u>						
HAMMER WT.	<u>140 lb</u>								
FALL	<u>30"</u>								
STICK UP									

REMARKS: _____

DRILL RECORD							VISUAL DESCRIPTION					
DEPTH	SOIL ROCK	Sample ID Type- No. (N = No Samp.)	Samp. Rec. (Ft. & %)	SPT Blows Per 0.5'	Lab. Class.	PID (ppm)	Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL ROCK	ELEVATION
				RQD (Ft. & %)	Pen. Rate		Classification (Name, Grain Size, Principal Constituents, Etc.)	Color	Hardness	Weathering, Bedding, Fracturing, and Other Observations		
1		S1	1.0 2.0	12 14 11			<u>.25' TOPSOIL</u> Clay, some coarse to fine sand, trace roots	orange brown	Very stiff	Dry		
2			50%	7			Clay, little fine sand	orange brown	stiff	damp		
3		S2	0.8 2.0	7 4 7 8			DO.					
4			40%	8								
5		S3	0.8 2.0	1 2					soft	Damp to wet, perched water table		
6			40%	3								
7		S4	1.3 2.0	4 7 5 4			Clay, little fine sand trace roots.	lt. brown to lt. gray	stiff	Damp, color gray, red black mottled.		
8			65%	4			Clay, trace fine sand					
9		S5	1.3 2.0	3 2 6 11			Fine Sand, some silt, trace clay	medium gray	medium dense	Damp		8.5 46.7
10			65%	11								

DRILLING CO.: Rock-Ray Drilling
 DRILLER: Robert Schmon

BAKER REP.: David Martin
 BORING NO.: MW-4 SHEET 1 OF 2

Baker Environmental, Inc.

PROJECT: Yorktown Weapons Station - Bldg 710
 S.O. NO.: 19195 BORING NO.: MW-4

DRILL RECORD							VISUAL DESCRIPTION					
DEPTH	SOIL	Sample ID	Samp. Rec.	SPT Blows Per 0.5'	Lab. Class.		Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL	ELEVATION
	ROCK	Type-No. (N = No Samp.)	(Ft. & %)	RQD (FL & %)	Pen. Rate	PID (ppm)	Classification (Name, Grain Size, Principal Constituents, Etc.)	Color	Hardness	Weathering, Bedding, Fracturing, and Other Observations	ROCK	
11		S ₆	1.5 / 2.0	3 6 2		0	Fine Sand and silt, trace Clay, organic silt	light gray	medium dense	Damp		
12			75%									
13		A-N										
14												
15		S ₇	1.7 / 2.0	3 3 3		0	Fine sand, some silt	light brn gry	loose	Damp		
16			85%									
17												
18		A-N										
19												
20										moist		
21		S ₈	2.0 / 2.0	WOH / 24"		0	Fine sand and clay	orange brown	very loose			
22			100%							wet water @ 21.75'		
23		A-N										
24												
25											25	30.2
26		S ₉	1.8 / 2.0	WOH / 24"		0	Clay and silt, some fine sand	light brn w/lt grey mottling	very soft	wet		
27			90%									
28		A-N										
29		S ₁₀	1.8 / 2.0	WOH / 12"		0	Clay, some silt, little fine sand	light brn to brown				
30			90%	1			Fine sand and silt, trace clay 50% fegonia	light gray			29.7	25.5
							END OF BORING AT 30					

DRILLING CO.: Rock-Ray Drilling
 DRILLER: Robert Schman

BAKER REP.: David Martin
 BORING NO.: MW-4 SHEET 2 OF 2

FIELD TEST BORING RECORD

PROJECT: Yorktown Weapons Station - Bldg 710
 S.O. NO.: 19195 BORING NO.: MW-5
 COORDINATES: EAST: _____ NORTH: _____
 ELEVATION: SURFACE: 58.8' TOP OF PVC CASING: 58.72'

RIG: <u>Mobile B-97</u>					DATE	PROGRESS (FT)	WEATHER	TOP OF CASING WATER DEPTH (FT)	TIME
SPLIT SPOON	CASING	AUGERS	CORE BARREL						
SIZE (DIAM.)	<u>2.0"</u>		<u>4.25"</u>		<u>6-27-93</u>	<u>35'</u>	<u>Humid, 90° Overcast - Sunny</u>		
LENGTH	<u>2.0'</u>		<u>5.0'</u>						
TYPE	<u>STD</u>		<u>HSA</u>						
HAMMER WT.	<u>140 lb</u>								
FALL	<u>30"</u>								
STICK UP									

REMARKS: _____

DRILL RECORD							VISUAL DESCRIPTION					
DEPTH	SOIL	Sample ID	Samp. Rec.	SPT Blows Per 0.5'	Lab. Class.		Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL	ELEVATION
	ROCK	Type- No. (N = No Samp.)	(Ft. & %)	RQD (Ft. & %)	Pen. Rate	PID (ppm)	Classification (Name, Grain Size, Principal Constituents, Etc.)	Color	Hardness	Weathering, Bedding, Fracturing, and Other Observations		
1		S1	<u>1.6 / 2.0</u> <u>80%</u>	<u>7</u> <u>13</u> <u>8</u> <u>8</u>		<u>0.1</u>	<u>0.5' TOP SOIL</u> <u>Clay, some sand</u>	<u>tan w/orange brn mottling</u>	<u>Very stiff</u>	<u>Dry</u>	<u>0.5</u>	<u>58.3</u>
2			<u>1.5 / 2.0</u> <u>75%</u>	<u>5</u> <u>6</u> <u>8</u> <u>8</u>		<u>0</u>	<u>DO.</u>	<u>tan w/red & gray mottling</u>	<u>stiff</u>	<u>Damp</u>		
3		S2	<u>1.0 / 2.0</u> <u>50%</u>	<u>4</u> <u>3</u> <u>4</u> <u>4</u>		<u>0</u>	<u>DO.</u>		<u>medium stiff</u>			
4		S3	<u>1.2 / 2.0</u> <u>60%</u>	<u>2</u> <u>2</u> <u>5</u> <u>6</u>		<u>0.4</u>	<u>DO.</u> <u>Fine Sand, some silt</u>	<u>tan</u>	<u>Loose</u>	<u>Damp</u>	<u>6.45</u>	<u>52.4'</u>
5			<u>1.8 / 2.0</u> <u>90%</u>	<u>3</u> <u>5</u> <u>5</u> <u>8</u>		<u>0</u>	<u>Fine Sand, little silt, clay</u>	<u>Tan</u>	<u>medium dense</u>	<u>Damp, black organic silt noted @ 9ft.</u>		
6		S4										
7		S5										
8												
9												
10												

DRILLING CO.: Rock-Ray Drilling
 DRILLER: Robert Schmon

BAKER REP.: David Martin
 BORING NO.: MW 5 SHEET OF 3

DRILL RECORD							VISUAL DESCRIPTION					
DEPTH	SOIL	Sample ID	Samp. Rec.	SPT Blows Per 0.5'	Lab. Class.		Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL	ELEVATION
	ROCK	Type-No. (N = No Samp.)	(Ft. & %)	RQD (Ft. & %)	Pen. Rate	PID (ppm)	Classification (Name, Grain Size, Principal Constituents, Etc.)	Color	Hardness	Weathering, Bedding, Fracturing, and Other Observations	ROCK	
11		S ₆	1.9 2.0	6 10 11		0	Fine Sand, some clay, little silt	Tan	medium dense	Damp		
12												
13		A-N										
14												
15			2.0 2.0	4 5 6 7		0	Fine Sand, little silt, trace clay in stringers	tan - orange brown	medium dense	Damp		
16		S ₇	100%									
17												
18		A-N										
19												
20			1.8 2.0	2 4 4 3		0	Fine Sand, little silt trace clay, 1 1/2" m. fine sand lense at 22.6'	orange brown to	Loose	damp		
21		S ₈						orange to red brn		damp moist	21.9'	36.9'
22							Clay with some fine sand trace black organic particulates.					
23		A-N										
24												
25			2.0 2.0	3 3 4 5		0	Clay, fine sand, trace black organic particulates m-f sand partings at 25.75' & 26'	Brown	medium stiff	moist		
26		S ₉	100%									
27												
28		A-N										
29												
30												

Baker Environmental, Inc.

PROJECT: Yorktown Weapons Station - Bldg 710
 S.O. NO.: 19195 BORING NO.: MW-5

DRILL RECORD						VISUAL DESCRIPTION					
DEPTH	SOIL	Sample ID	Samp. Rec.	SPT Blows Per 0.5'	Lab. Class.	Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL	ELEVATION
	ROCK	Type-No. (N = No Samp.)	(Ft. & %)	RQD (Ft. & %)	Pen. Rate	PID (ppm)	Classification (Name, Grain Size, Principal Constituents, Etc.)	Color	Hardness	Weathering, Bedding, Fracturing, and Other Observations	
31		S10	2.0 2.0	WOR		Silt, some clay, little fine sand	orange brn to yellow brn to yellow gray	Very soft	moist		
32		A-N	100%						Wet		
33						DO.		medium			
34		S11	2.0 2.0	6 6 9 10		Fine sand and silt, little clay	light gray	dense	Wet - 75% coarse sand to gravel sized COQUINA fragments	33.7	25.1
35			100%			End of Boring at 35.3'					23.5
6											
7											
8											
9											
0											
1											
2											
3											
4											
5											
6											
7											
8											
9											
0											

DRILLING CO.: Rock-Ray Drilling
 DRILLER: Robert Schmon

BAKER REP.: David Martin
 BORING NO.: MW-5 SHEET 3 OF 3

Baker

Baker Environmental, Inc.

FIELD TEST BORING RECORD

PROJECT: Yorktown Weapons Station - Bldg 710
 S.O. NO.: 19195 BORING NO.: MW-6
 COORDINATES: EAST: _____ NORTH: _____
 ELEVATION: SURFACE: 60.3 TOP OF PVC CASING: 60.33

RIG: <u>Mobile B-97</u>					DATE	PROGRESS (FT)	WEATHER	TOP OF CASING WATER DEPTH (FT)	TIME
SPLIT SPOON	CASING	AUGERS	CORE BARREL						
SIZE (DIAM.)	<u>2.0"</u>		<u>4.25"</u>		<u>6-28-93</u>	<u>35</u>	<u>90° Sunny</u>		
LENGTH	<u>2.0'</u>		<u>5.0'</u>						
TYPE	<u>STD</u>		<u>HSA</u>						
HAMMER WT.	<u>140 lb</u>								
FALL	<u>30"</u>								
STICK UP									

REMARKS: _____

DRILL RECORD							VISUAL DESCRIPTION				
DEPTH	SOIL	Sample ID	Samp. Rec.	SPT Blows Per 0.5'	Lab. Class.	Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL	ELEVATION
				RQD (Ft. & %)							
1			<u>1.0</u> <u>2.0</u>	<u>14</u> <u>15</u> <u>8</u> <u>7</u>		<u>Gravel - ridx rock</u> Clay, little medium to fine sand	<u>orange brown</u>	<u>very stiff</u>	<u>Dry</u>		
2		<u>S1</u>	<u>50%</u>	<u>6</u> <u>7</u>		Clay and silt, little fine sand	<u>light gray</u>	<u>very stiff</u>	<u>Dry</u>		
3		<u>S2</u>	<u>0.7</u> <u>2.0</u>	<u>6</u> <u>7</u> <u>16</u> <u>6</u>							
4			<u>1.8</u> <u>2.0</u>	<u>5</u> <u>5</u>		<u>Fine Sand and clay</u>	<u>orange brn - brn gry</u>	<u>loose</u>	<u>Damp</u>	<u>4.0</u>	<u>58.3'</u>
5		<u>S3</u>		<u>14</u> <u>11</u>	<u>0</u>	Clay and fine sand, trace black organics	<u>brn gray</u>	<u>very stiff</u>	<u>Damp</u>	<u>5.0</u>	<u>58.3'</u>
6			<u>2.0</u> <u>2.0</u>	<u>9</u> <u>11</u> <u>9</u>	<u>0</u>	Fine sand, some silt	<u>orange brown</u>	<u>medium Dense</u>		<u>6.3</u>	<u>54'</u>
7		<u>S4</u>		<u>11</u> <u>9</u>	<u>0</u>						
8			<u>100%</u> <u>2.0</u> <u>2.0</u>	<u>7</u> <u>8</u> <u>10</u> <u>9</u>	<u>0</u>	Fine sand, some silt, little clay	<u>orange brown</u>	<u>Medium Dense</u>	<u>Damp</u>		
9		<u>S5</u>									
10			<u>100%</u>								

DRILLING CO.: Rock-Ray Drilling
 DRILLER: Robert Schmon

BAKER REP.: David Martin
 BORING NO.: MW-6 SHEET 1 OF 3

FIELD TEST BORING RECORD

PROJECT: Yorktown Weapons Station - Bldg 710
 S.O. NO.: 19195 BORING NO.: MW-6

DRILL RECORD							VISUAL DESCRIPTION					
DEPTH	SOIL	Sample ID	Samp. Rec.	SPT Blows Per 0.5'	Lab. Class.		Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL	ELEVATION
	ROCK	Type-No. (N = No Samp.)	(Ft. & %)	RQD (FL & %)	Pen. Rate	PID (ppm)	Classification (Name, Grain Size, Principal Constituents, Etc.)	Color	Hardness	Weathering, Bedding, Fracturing, and Other Observations	ROCK	
11		S ₆	2.0 2.0 100%	5 7 10 7		0	Fine Sand, little silt, trace clay	orange to orange brown	medium dense	Damp		
12												
13		A-N										
14												
15		S ₇	2.0 2.0 100%	6 6 5 7		0	DO. except little clay 1.5" lense of coarse to fine sand at 14.75'	orange	medium dense	Damp		
16												
17												
18												
19												
20							Fine Sand, little clay	orange brn		moist		20.5
21		S ₈	2.0 2.0 100%	4 4 4 5		0	Clay and silt trace fine sand, black organic silt	orange brn	stiff	moist		
22												
23												
24												
25												
26		S ₉	2.0 2.0 100%	1 4 4 6		0	Clay, some silt, trace fine sand, blk organic silt.	brown	medium stiff	moist to wet		
27												
28												
29												
30												

DRILLING CO.: Rock-Ray Drilling
 DRILLER: Robert Schman

BAKER REP.: David Martin
 BORING NO.: MW-6 SHEET 2 OF 3

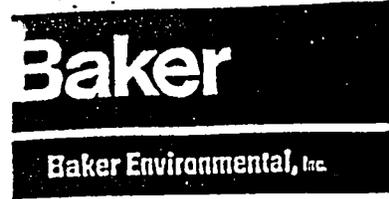
FIELD TEST BORING RECORD

PROJECT: Yorktown Weapons Station - Bldg 710
 S.O. NO.: 19195 BORING NO.: MW-4

DRILL RECORD							VISUAL DESCRIPTION					
DEPTH	SOIL	Sample ID	Samp. Rec.	SPT Blows Per 0.5'	Lab. Class.		Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL	ELEVATION
	ROCK	Type-No. (N = No Samp.)	(Ft. & %)	RQD (Ft. & %)	Pen. Rate	PID (ppm)	Classification (Name, Grain Size, Principal Constituents, Etc.)	Color	Hardness	Weathering, Bedding, Fracturing, and Other Observations	ROCK	
31		S10		WOR 12" 1/2"		0	Clay and silt, little fine sand	light Brown	Very Soft	Wet		
32		A-N										
33		S11		7 7 10 9		0	Change to fine sand and silt little clay. 80% sea shell fragments (argonia)	light gray	Medium Dense	Wet		
35							End of Boring at 35'					35 25.3
6												
7												
8												
9												
0												
1												
2												
3												
4												
5												
6												
7												
8												
9												
0												

DRILLING CO.: Rock-Ray Drilling
 DRILLER: Robert Schman

BAKER REP.: David Martin
 BORING NO.: MW-4 SHEET 3 OF 3



FIELD TEST BORING RECORD

PROJECT: YORKTOWN WEAPONS STATION
 S.O. NO.: 19195 BORING NO.: MW-7
 COORDINATES: EAST: _____ NORTH: _____
 ELEVATION: SURFACE: 62.4 TOP OF PVC CASING: 62.81

RIG:	<u>Mobile-B 47</u>				DATE	PROGRESS (FT)	WEATHER	TOP OF CASING WATER DEPTH (FT)	TIME
	SPLIT SPOON	CASING	AUGERS	CORE BARREL					
SIZE (DIAM.)	<u>2"</u>		<u>4.25"</u>		<u>6/24/93</u>				
LENGTH	<u>2 ft.</u>		<u>5 ft.</u>						
TYPE	<u>std.</u>		<u>H. S. A.</u>						
HAMMER WT.	<u>140 lb.</u>								
FALL	<u>30in</u>								
STICK UP									

REMARKS: _____

DRILL RECORD						VISUAL DESCRIPTION					
DEPTH	SOIL	Sample ID	SPT Blows Per 0.5'	Lab. Class.		Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL	ELEVATION
				RQD (Ft. & %)	Pen. Rate	PID (ppm)	Classification (Name, Grain Size, Principal Constituents, Etc.)	Color	Hardness		
1		S-1	<u>1.3</u>	9		Fine Sand some clay	Orange Brown gray mottled	Med. Dense	Dry		
2			<u>2.0</u>	12							
3		S-2	<u>65%</u>	5		Fine Sand some clay	orange Brown	Med. Dense	Dry moist 3.5'-4.0'		
4			<u>1.0</u>	4							
5		S-3	<u>2.0</u>	5		Med. to Fine Sand little clay	orange Brown	Med. Dense	Dry - damp		
6			<u>50%</u>	7							
7		S-4	<u>1.8</u>	6		Fine Sand Trace clay	orange Brown	Med. Dense	Damp		
8			<u>2.0</u>	7							
9		S-5	<u>90%</u>	6		Fine Sand little clay	Orange Brown	Loose	Damp		
10			<u>1.7</u>	4							

FIELD TEST BORING RECORD

Baker Environmental, Inc.

PROJECT: YORKTOWN WEAPONS STATION

S.O. NO.: 19195

BORING NO.: MW-7

DRILL RECORD							VISUAL DESCRIPTION					
DEPTH	SOIL	Sample ID	Samp. Rec.	SPT Blows Per 0.5'	Lab. Class.		Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL	ELEVATION
	ROCK	Type-No. (N = No Samp.)	(Ft. & %)	RQD (Ft. & %)	Pen. Rate	PID (ppm)	Classification (Name, Grain Size, Principal Constituents, Etc.)	Color	Hardness	Weathering, Bedding, Fracturing, and Other Observations	ROCK	
11		S-6	1.7 2.0 85%	4 3 3 3		0.6	Fine sand little clay Fine sand Trace clay	orange Brown	Loose			
12												
13												
14												
15												
16		S-7	2.0 2.0 100%	3 4 6 6		0.4	Coarse-mod. - Fine Sand	orange Brown Gray white	Loose	Dry		
17												
18												
19												
20							Fine Sand and clay	orange Brown		Moist		20.3 (42)
21		S-8	2.0 2.0 100%	3 3 4 3		0	clay Some fine sand	laminated orange Red. Blk Brown.	Loose	Water at 22'		
22												
23												
24												
25												25 35.3
26		S-9	1.0 2.0 50%	3 3 2 3			Clay little fine sand 30% Shell Fragments	Brown	Loose	very wet		
27												
28												
29												
30												

DRILLING CO.: Rock Ray
 DRILLER: Robert Schman

BAKER REP.: Dave Martin
 BORING NO.: MW-7

SHEET 2 OF 3



FIELD TEST BORING RECORD

Baker Environmental, Inc.

PROJECT: YORKTOWN WEAPONS STATION
S.O. NO.: 19195 BORING NO.: Mw-7

DRILL RECORD							VISUAL DESCRIPTION					
DEPTH	SOIL	Sample ID	Samp. Rec.	SPT Blows Per 0.5'	Lab. Class.		Classification (Grain Size, Principal Constituents, Etc.)	Color	Consist. or Density	Moisture Content, Organic Content, Plasticity, and Other Observations	SOIL	ELEVATION
	ROCK	Type-No. (N = No Samp.)	(Ft. & %)	RQD (Ft. & %)	Pen. Rate	PID (ppm)	Classification (Name, Grain Size, Principal Constituents, Etc.)	Color	Hardness	Weathering, Bedding, Fracturing, and Other Observations	ROCK	
31		S-10	2.0 2.0	4 4 5 5		0	Clay and silt, little Sand 60% shell fragments	Gray Brown	Very Loose	Very wet		
32			100%				END OF BORING = 32.3 FEET					28
33												
34												
35												
36												
37												
38												
39												
40												
41												
42												
43												
44												
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46												
47												
48												
49												
50												

DRILLING CO.: Rock Ray
DRILLER: Robert Schman

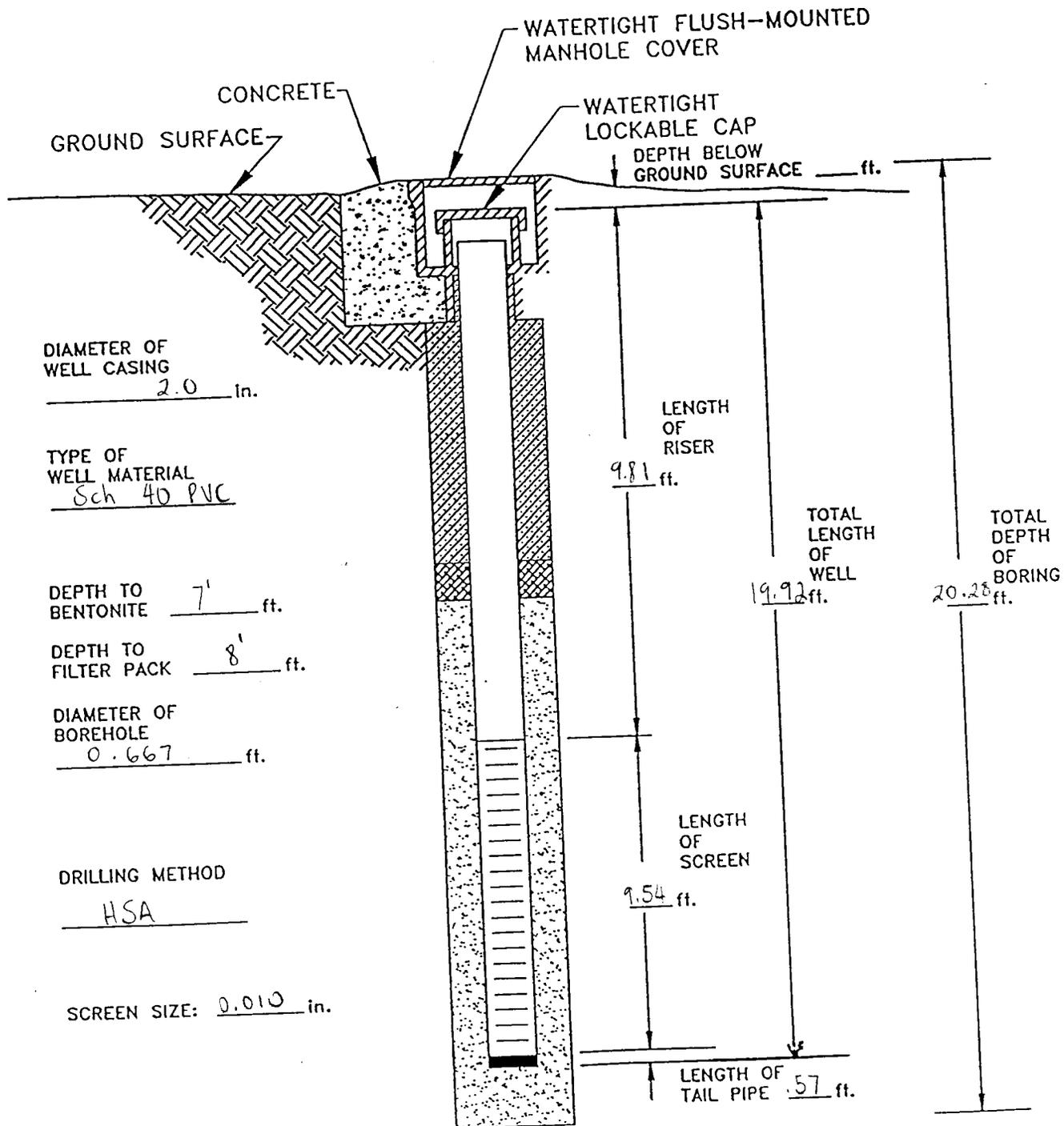
BAKER REP.: Dave Martin
BORING NO.: Mw-7 SHEET 3 OF 3

Appendix B
Well Construction Logs

BELOW GRADE TYPE II MONITORING WELL

PROJECT No.: 19195
PROJECT NAME: Yorktown Weapons Sta.-Bldg 71D
WELL No.: MW-1
DRILLING CO.: Rock-Ray Drilling

DATE STARTED: 6-26-93
DATE COMPLETED: 6-26-93
DATE DEVELOPED: 6-29-93
DEVELOPMENT METHOD: PUMP

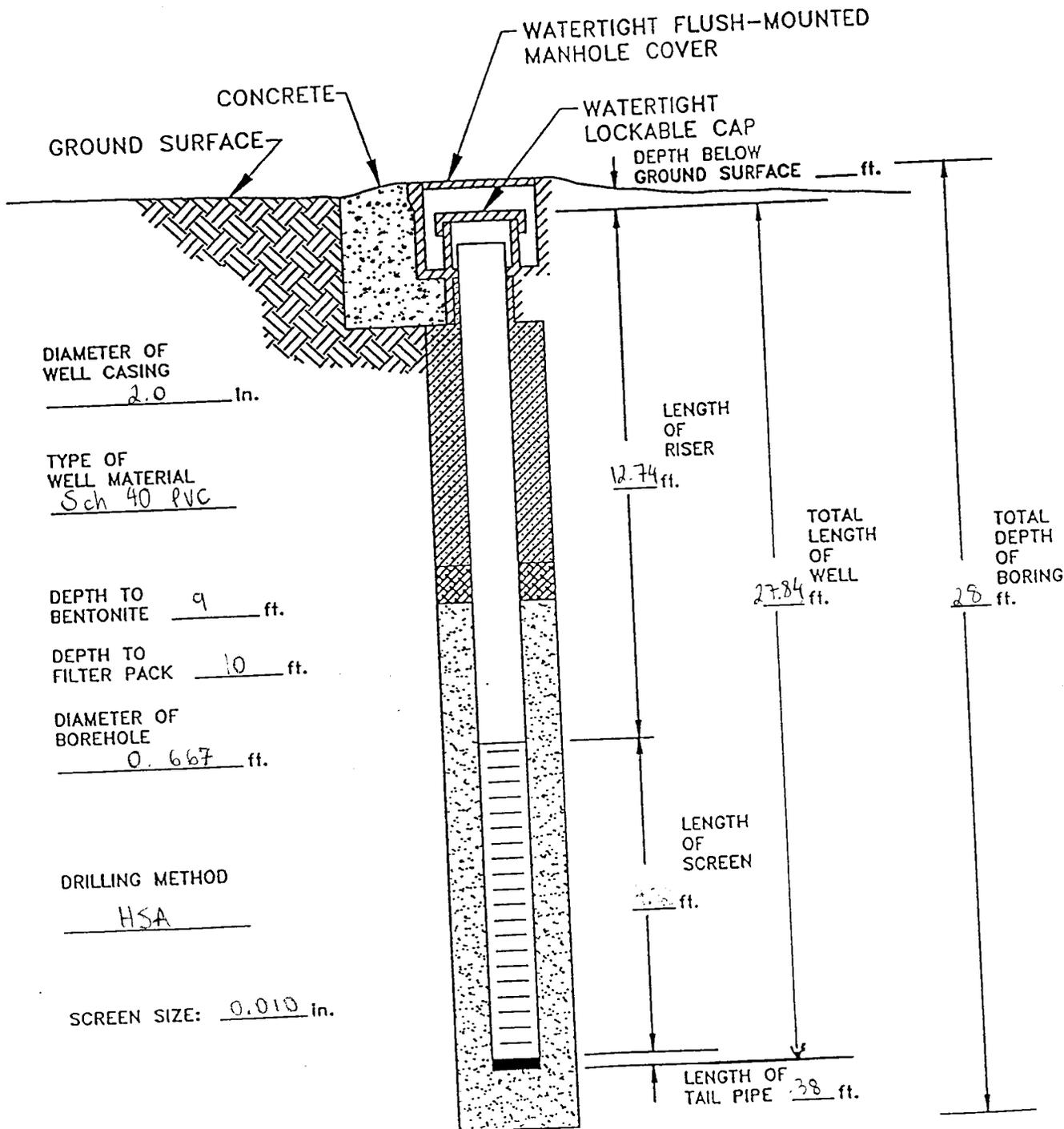


BAKER ENVIRONMENTAL REPRESENTATIVE: DAVID MARTIN

BELOW GRADE TYPE II MONITORING WELL

PROJECT No.: 19195
PROJECT NAME: Yorktown Weapons Sta. - Bldg 710
WELL No.: MW - 2
DRILLING CO.: Rock-Ray Drilling

DATE STARTED: 6-26-93
DATE COMPLETED: 6-26-93
DATE DEVELOPED: 6-29-93
DEVELOPMENT METHOD: PUMP

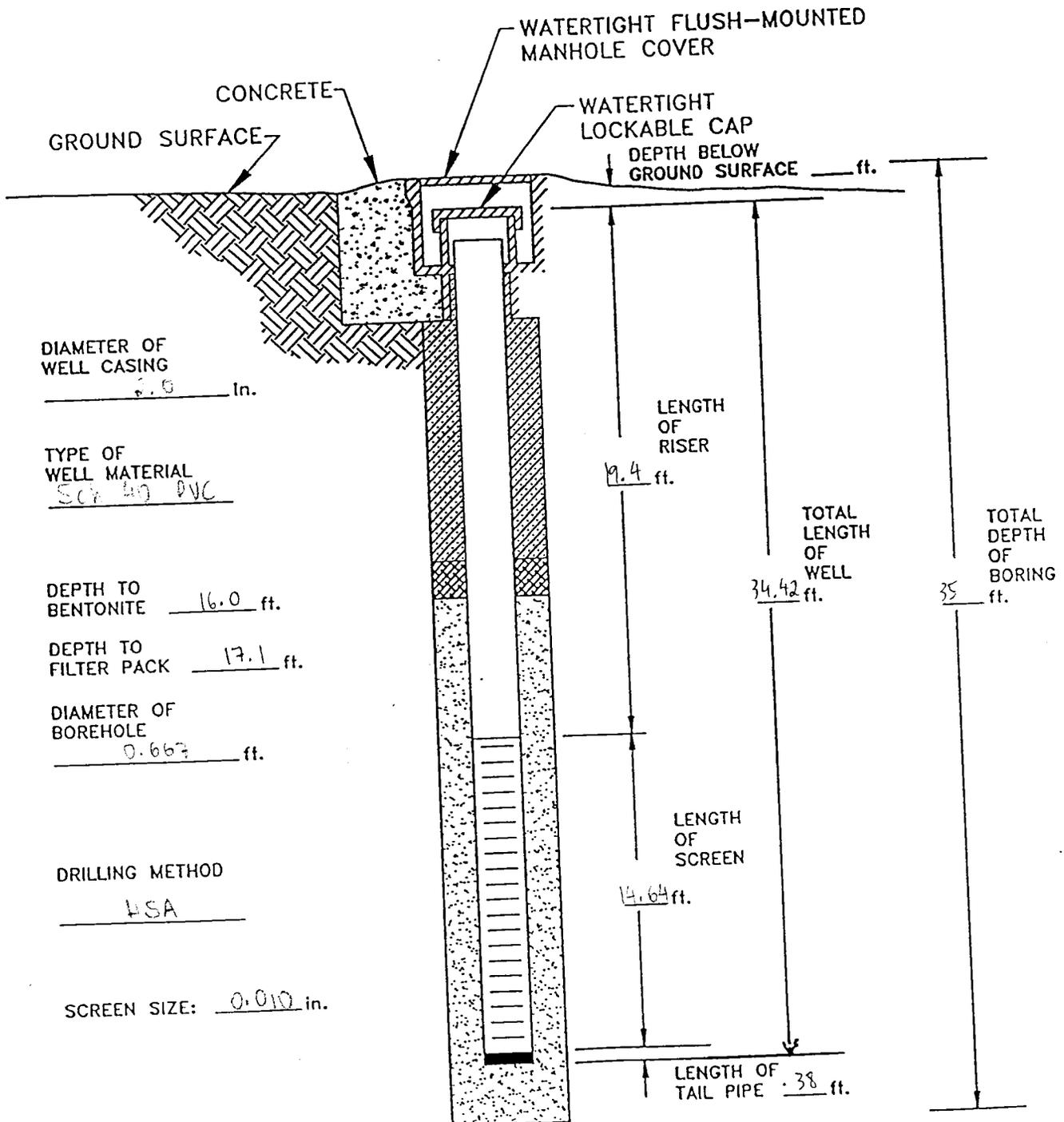


BAKER ENVIRONMENTAL REPRESENTATIVE: DAVID MARTIN

BELOW GRADE TYPE II MONITORING WELL

PROJECT No.: 19195
PROJECT NAME: Yorktown Weapons Sta. - Bldg 710
WELL No.: MW-3
DRILLING CO.: Rock-Ray Drilling

DATE STARTED: 6-27-93
DATE COMPLETED: 6-27-93
DATE DEVELOPED: 6-29-93
DEVELOPMENT METHOD: LVML

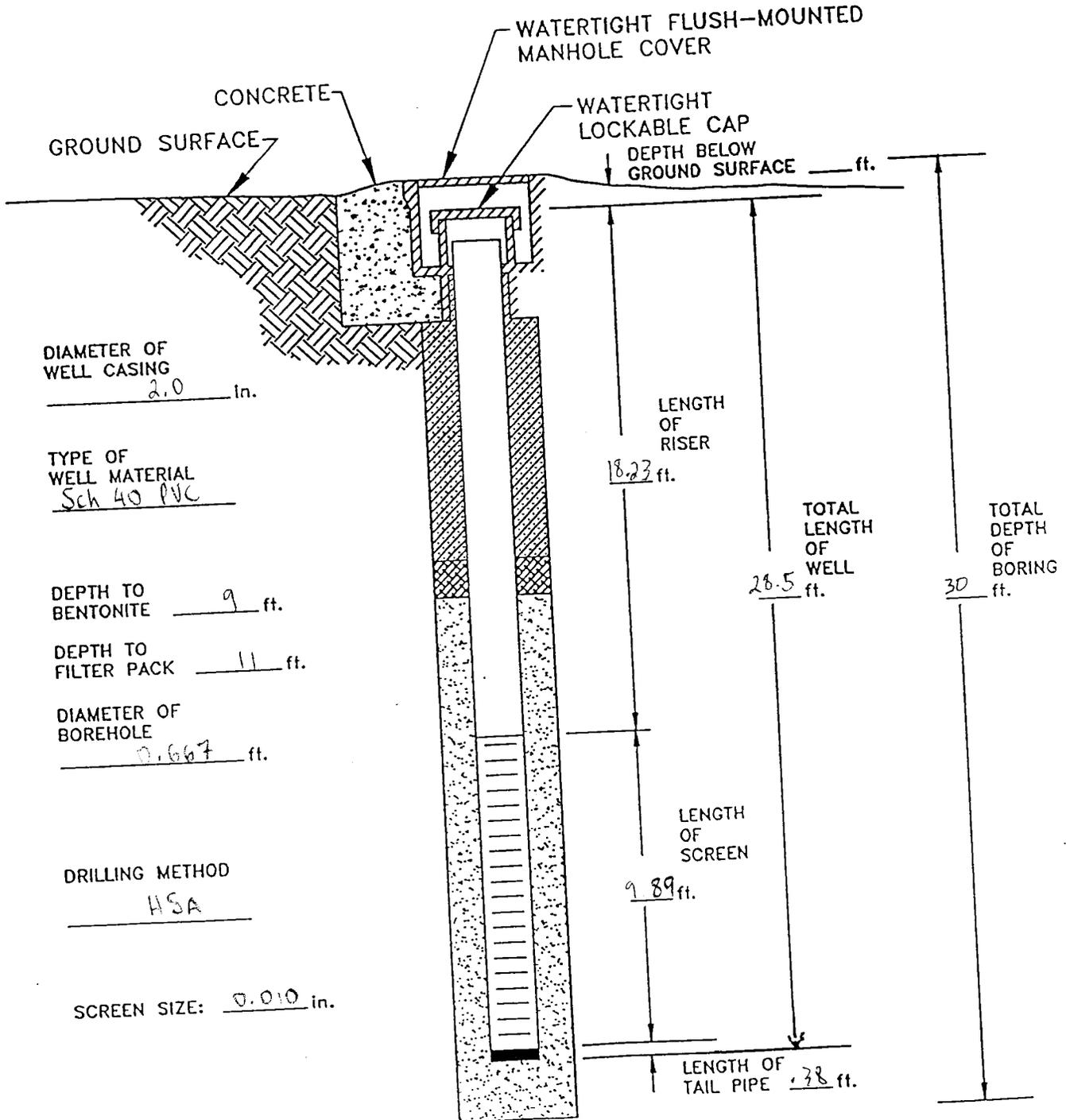


BAKER ENVIRONMENTAL REPRESENTATIVE: DAVID MARTIN

BELOW GRADE TYPE II MONITORING WELL

PROJECT No.: 19195
PROJECT NAME: Yorktown Weapons Sta-Bldg 710
WELL No.: MW-4
DRILLING CO.: Rock-Ray Drilling

DATE STARTED: 6-28-93
DATE COMPLETED: 6-28-93
DATE DEVELOPED: 6-29-93
DEVELOPMENT METHOD: PUMP

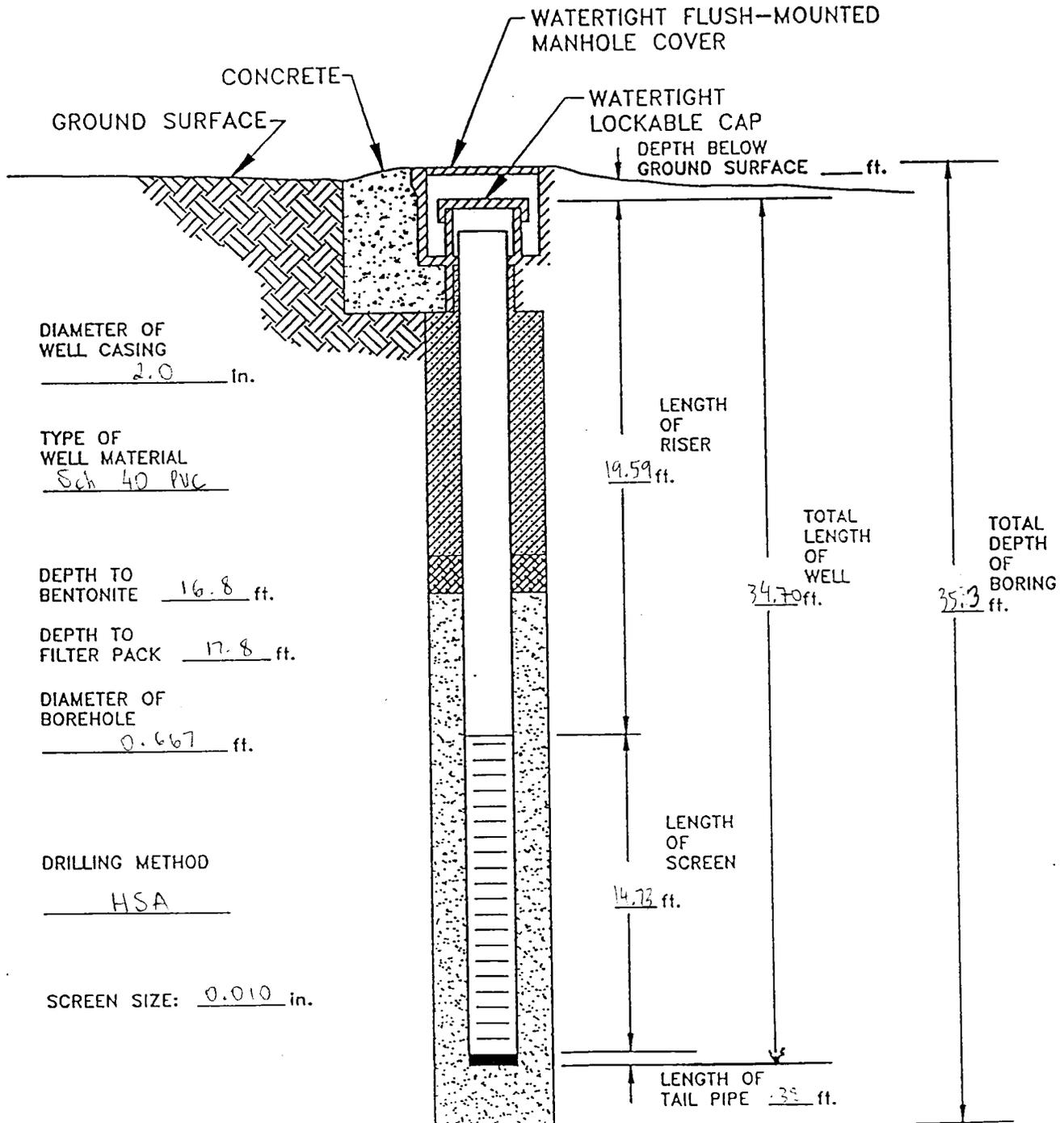


BAKER ENVIRONMENTAL REPRESENTATIVE: DAVID MARTIN

BELOW GRADE TYPE II MONITORING WELL

PROJECT No.: 19195
 PROJECT NAME: Yorktown Weapons Sta - Bldg 7ID
 WELL No.: MW-5
 DRILLING CO.: Rock-Ray Drilling

DATE STARTED: 6-27-93
 DATE COMPLETED: 6-27-93
 DATE DEVELOPED: 6-29-93
 DEVELOPMENT METHOD: PUMP



DIAMETER OF WELL CASING
2.0 in.

TYPE OF WELL MATERIAL
Sch 40 PVC

DEPTH TO BENTONITE 16.8 ft.

DEPTH TO FILTER PACK 17.8 ft.

DIAMETER OF BOREHOLE
0.667 ft.

DRILLING METHOD
HSA

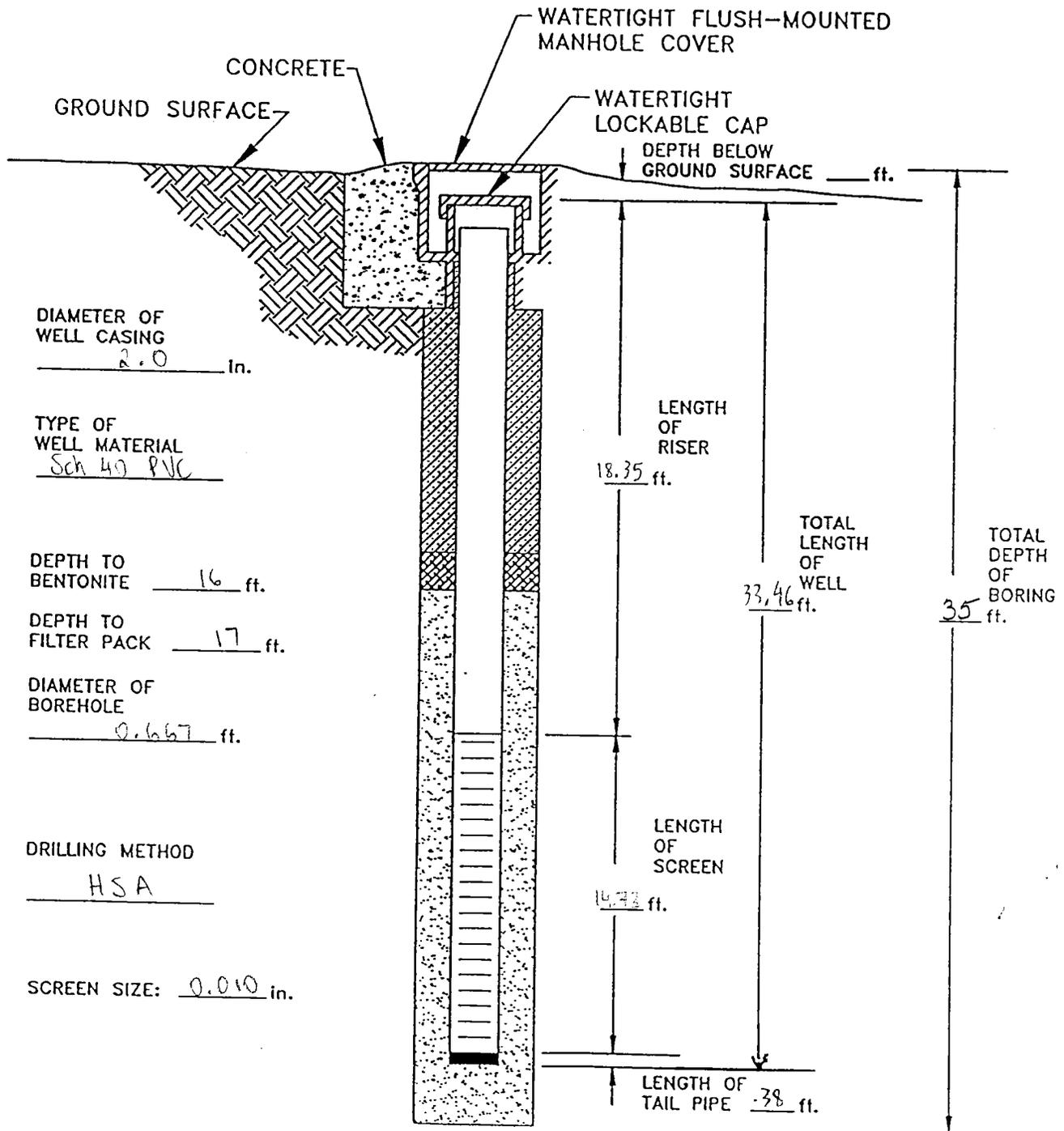
SCREEN SIZE: 0.010 in.

BAKER ENVIRONMENTAL REPRESENTATIVE: DAVID MARTIN

BELOW GRADE TYPE II MONITORING WELL

PROJECT No.: 19195
PROJECT NAME: Yorktown Weapons Sta. - Bldg 710
WELL No.: MW-6
DRILLING CO.: Rock-Ray Drilling

DATE STARTED: 6-28-93
DATE COMPLETED: 6-28-93
DATE DEVELOPED: 6-29-93
DEVELOPMENT METHOD: PUM



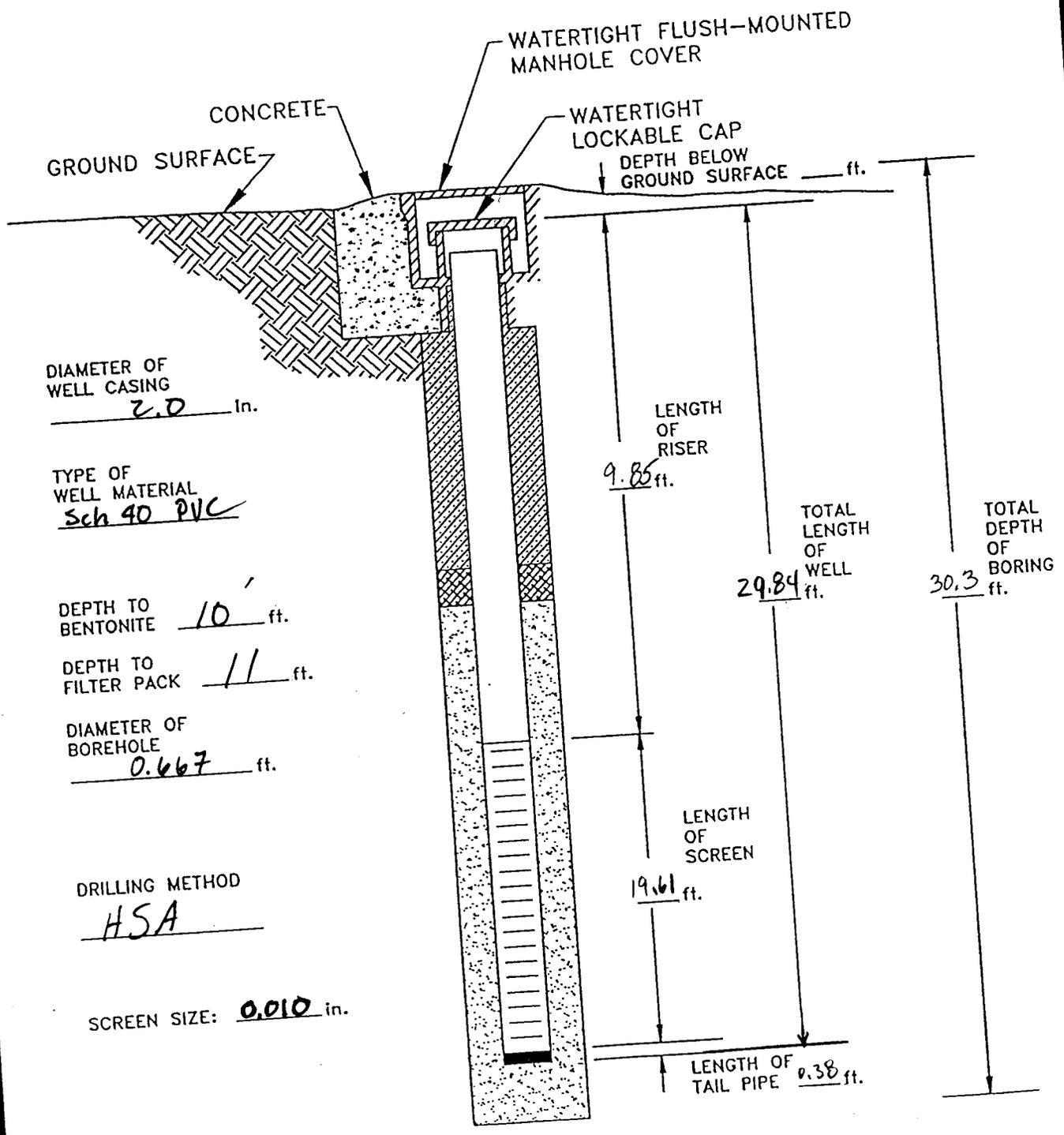
BAKER ENVIRONMENTAL REPRESENTATIVE: DAVID MARTIN

Baker

BELOW GRADE TYPE II MONITORING WELL

PROJECT No.: 19195
PROJECT NAME: Yorktown Weapons Sta - Bldg 710
WELL No.: MW 7
DRILLING CO.: Rock-Ray Drilling

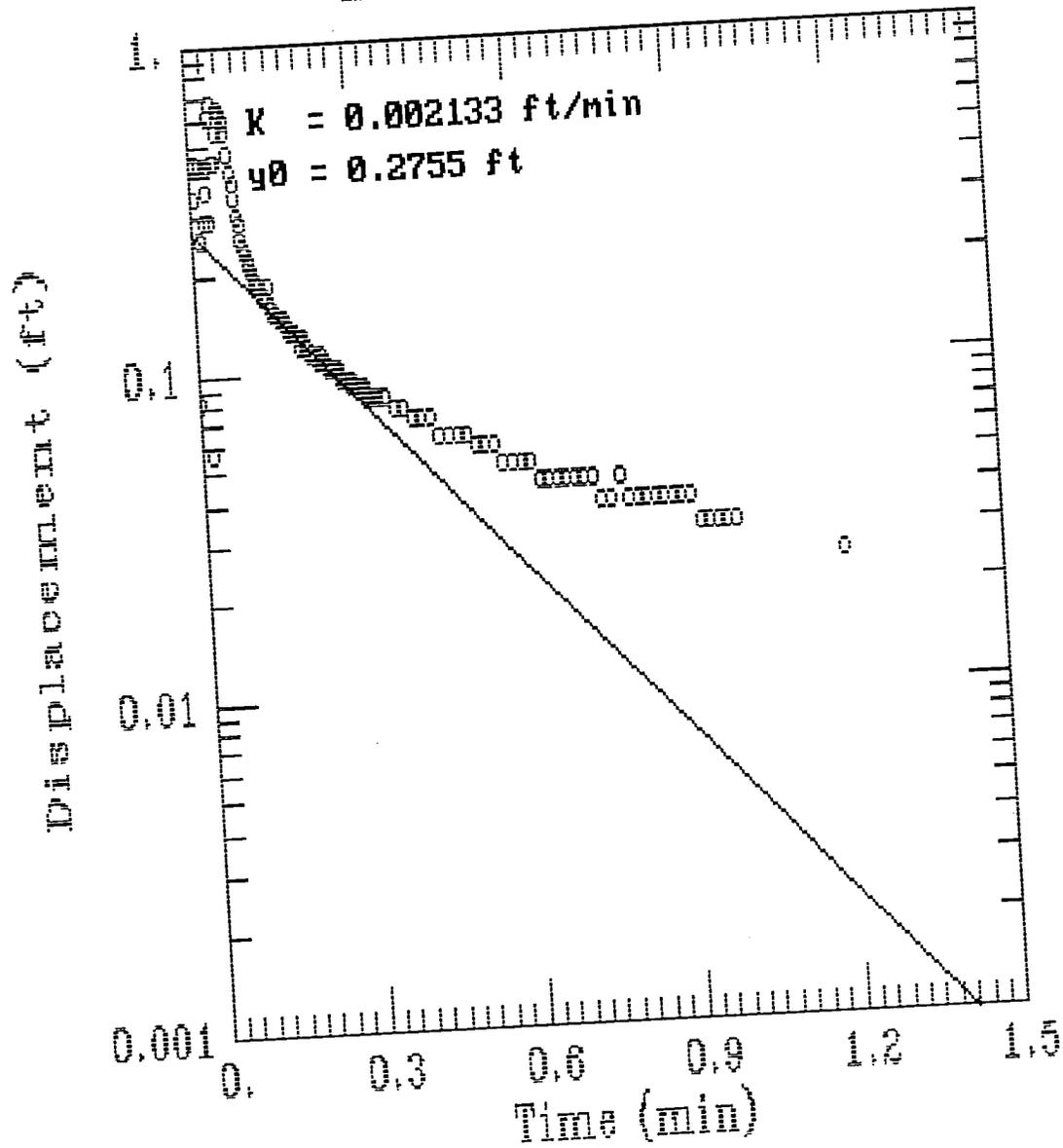
DATE STARTED: 6-24-93
DATE COMPLETED: 6-24-93
DATE DEVELOPED: 6-29-93
DEVELOPMENT METHOD: pump



BAKER ENVIRONMENTAL REPRESENTATIVE: David Martin

Appendix C
AQTESOLV Calculations

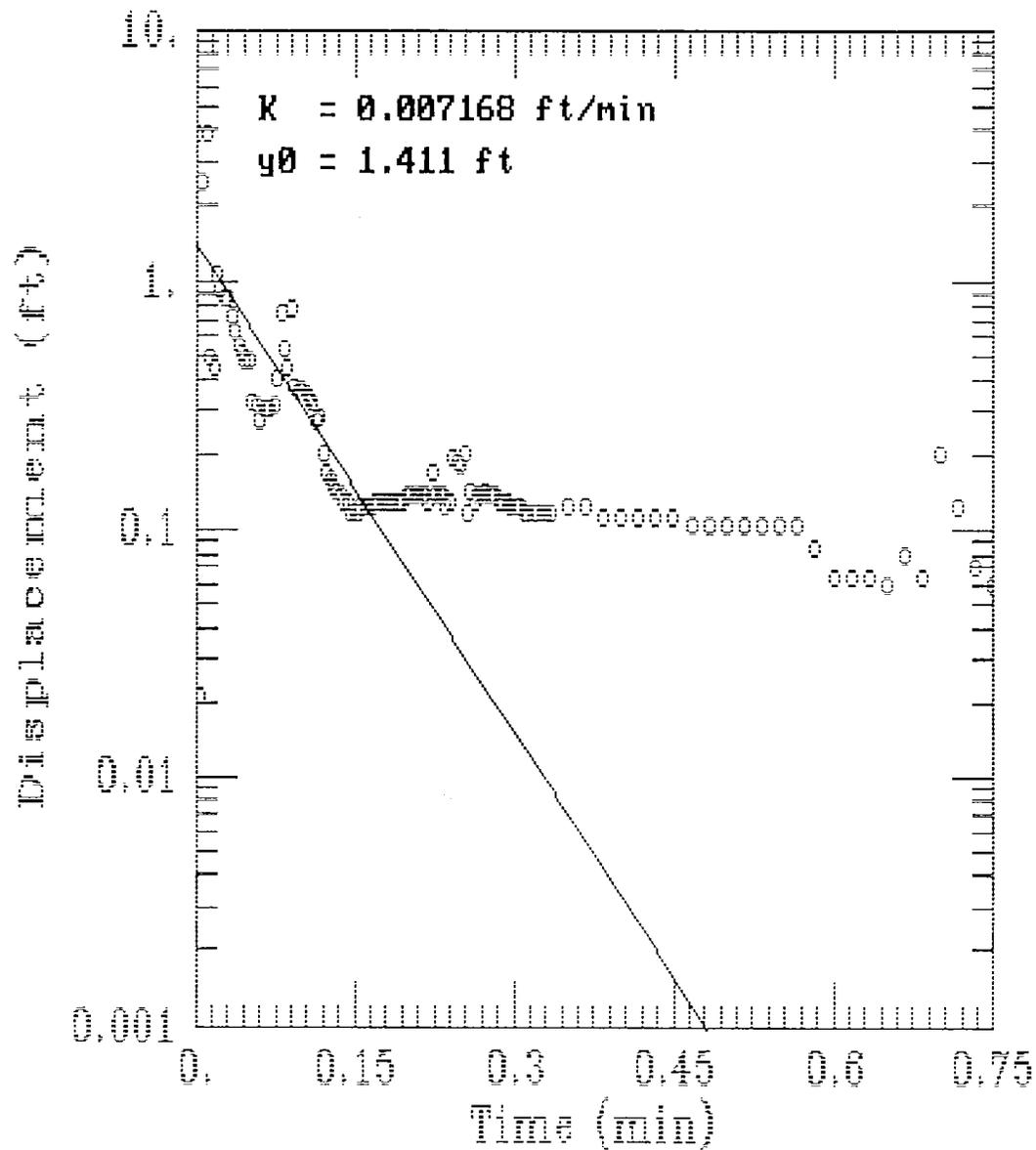
MW3 RISING HEAD TEST



AQTESOLV

 GERAGHTY
& MILLER, INC.
Modeling Group

MW7 RISING HEAD TEST



AQTESOLV
 GERAGHTY
& MILLER, INC.
 Modeling Group

Appendix D
Chain-of-Custody Documentation

Microbac

Microbac Laboratories, Inc.

Mid-Atlantic Division
604 Morris Drive, Newport News, VA 23605
804/825-1000 Fax: 804/825-1200
Air • Fuel • Water • Food • Wastes

CHAIN-OF-CUSTODY RECORD

Company	Baker
Contact	David J Martin
Mailing Address	420 Rowser Rd, AOP Bldg 3, Coopers Pa 15108
Phone & Fax	412-269-6000, 412-269-7002
Billing Address	
Job Number	19195
Purchase Order No.	19195-62-SVZ

193-001
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Sample ID	Sample Location	Date/Time Collected	Collectors Initials	Matrix	Preservative	Analysis
710-W-MW3	MW3	6-30-93, 1355	DJM	Water	HNO3	Lead ICAP
710-W-MW3	MW3	6-30-93, 1355	DJM		H2SO4	TPH 418.1
710-W-MW3	MW3	6-30-93, 1355				EPA 624
710-W-MW3	MW3	6-30-93, 1355				EPA 625
710-W-MW1	MW1	6-30-93, 1531			HNO3	Lead ICAP
710-W-MW1	MW1	6-30-93, 1531			H2SO4	TPH 418.1
710-W-MW1	MW1	6-30-93, 1531				EPA 624
710-W-MW1	MW1	6-30-93, 1531				EPA 625
710-W-MW6	MW6	6-30-93, 1432			H2SO4	TPH 418.1
710-W-MW6	MW6	6-30-93, 1432			HNO3	Lead ICAP

Special Instructions: FOR RESULTS WHEN READY

Possible Hazard Identification: (Please indicate if sample(s) are hazardous materials and/or suspected of containing levels of hazardous substances.)

Nonhazard Flammable Skin Irritant Highly Toxic Biological Other _____ Please Specify

Turnaround Time Required: (Rush must be approved by appropriate Manager and is subject to surcharge.)*

Normal *Rush _____

Sample Disposal: Return to Client _____ or Disposal by Lab (Laboratory reserves the right to return hazardous samples to client)

Relinquished By: Signature David J Martin Company Baker Env. Date/Time 7-1-93 1100

Received By: Signature [Signature] Company [Signature] Date/Time 7-1-93 1045

Relinquished By: Signature [Signature] Company MWA Date/Time 7-1-93 1045

Received By: Signature [Signature] Company MMH Date/Time 7-1-93 1045

Relinquished By: Signature _____ Company _____ Date/Time _____

Received By: Signature _____ Company _____ Date/Time _____



Microbac Laboratories, Inc.
 Mid-Atlantic Division
 604 Morris Drive, Newport News, VA 23605
 804/825-1000 Fax: 804/825-1200
 Air • Fuel • Water • Food • Wastes

CHAIN-OF-CUSTODY RECORD

Company	Baker Env
Contact	David Martin
Mailing Address	4120 Rouser Rd
Phone & Fax	412-269-6000, 412-269-2002 (Fax)
Billing Address	
Job Number	19195
Purchase Order No.	19195-62-SVZ

9306-001
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Sample ID	Sample Location	Date/Time Collected	Collectors	Matrix	Preservative	Analysis
			Initials			
710-W-MWZ	MWZ	6-30-93; 1545	DJM	Water	H ₂ SO ₄	TPH 418.1
710-W-MWZ	MWZ	6-30-93; 1545			HNO ₃	Lead ICAP
710-W-MWZ	MWZ	6-30-93; 1545			—	EPA 624
710-W-MWZ	MWZ	6-30-93; 1545			—	EPA 625
710-Trip 1	—	—	—	—	H ₂ SO ₄	TPH 418.1
710-W-MW5	MW5	06-30-93; 1303	*	Water	H ₂ SO ₄	TPH 418.1
710-W-MW5	MW5	06-30-93; 1303		Water	HNO ₃	LEAD ICAP

Special Instructions: Final results when ready

Possible Hazard Identification: (Please indicate if sample(s) are hazardous materials and/or suspected of containing levels of hazardous substances.)
 Nonhazard Flammable Skin Irritant Highly Toxic Biological Other _____ Please Specify _____

Turnaround Time Required: (Rush must be approved by appropriate Manager and is subject to surcharge.)*
 Normal _____ *Rush _____

Sample Disposal: Return to Client _____ or Disposal by Lab (Laboratory reserves the right to return hazardous samples to client)

Relinquished By: Signature David J. Martin Company Baker Env. Date/Time 7-1-93 1100

Received By: Signature [Signature] Company [Signature] Date/Time 7-1-93 1600

Relinquished By: Signature [Signature] Company MIMS Date/Time 7-1-93 1045

Received By: Signature [Signature] Company [Signature] Date/Time [Signature]

Relinquished By: Signature _____ Company _____ Date/Time _____

Received By: Signature _____ Company _____ Date/Time _____

CHAIN-OF-CUSTODY RECORD

Microbac Laboratories, Inc.
 Mid-Atlantic Division
 604 Morris Drive, Newport News, VA 23605
 804/825-1000 Fax: 804/825-1200
 Air • Fuel • Water • Food • Wastes

Company	Baker Environmental
Contact	David Martin
Mailing Address	420 Pousen Rd, AUP #3, Coopers Pa 15108
Phone & Fax	412-269-6000, 412-269-2002 (Fax)
Billing Address	
Job Number	19195
Purchase Order No.	19195-62-SVZ

7 DAY TAT

306-079

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Sample ID	Sample Location	Date/Time Collected	Collectors Initials	Matrix	Preservative	Analysis
710-MW7-05	MW7	6-25-93/1126	DJM	Soil	---	TPH 5030 Volatile Organics 8240
710-MW7-05	MW7	6-25-93/1126	DJM	Soil	---	TPH 5030 8240
710-MW7-08	MW7	6-25-93/1204	DJM	Soil	---	TPH 5030
710-SB2-02	SB2	6-25-93/912	↓	↓	---	TPH 5030
710-SB2-07	SB2	6-25-93/1002	↓	↓	---	TPH 5030
710-MW1-02	MW1	6-25-93/846	↓	↓	---	TPH 5030
710-MW1-02	MW1	6-25-93/846	↓	↓	---	Volatile Organics 8240
710-MW1-06	MW1	6-25-93/948	↓	↓	---	TPH 5030
710-SB1-01	SB1	6-25-93/1700	↓	↓	---	Volatile Organics 8240
710-SB1-02	SB1	6-25-93/1702	↓	↓	---	TPH 5030

Some auto

Special Instructions: Fax results when completed before hard copy is sent

Possible Hazard Identification: (Please indicate if sample(s) are hazardous materials and/or suspected of containing levels of hazardous substances.)

Nonhazard Flammable Skin Irritant Highly Toxic Biological Other _____ Please Specify

Turnaround Time Required: (Rush must be approved by appropriate Manager and is subject to surcharge.)*
 Normal *Rush _____

Sample Disposal: Return to Client _____ or Disposal by Lab (Laboratory reserves the right to return hazardous samples to client)

Relinquished By:	Signature: <u>David J Martin</u>	Company: <u>Baker</u>	Date/Time: <u>6-28-93 0800</u>
Received By:	Signature: <u>[Signature]</u>	Company: <u>MMA</u>	Date/Time: <u>6-28-93 1115</u>

Relinquished By:	Signature: <u>[Signature]</u>	Company: <u>MMA</u>	Date/Time: <u>6-28-93 1155</u>
Received By:	Signature: <u>[Signature]</u>	Company: <u>MMA</u>	Date/Time: <u>6-28-93 @ 1155</u>

Relinquished By:	Signature: _____	Company: _____	Date/Time: _____
Received By:	Signature: _____	Company: _____	Date/Time: _____



Microbac Laboratories, Inc.
 Mid-Atlantic Division
 604 Morris Drive, Newport News, VA 23605
 804/825-1000 Fax: 804/825-1200
 Air • Fuel • Water • Food • Wastes

CHAIN-OF-CUSTODY RECORD

Company	Baker Environmental
Contact	David J Martin
Mailing Address	420 Raven Rd, ADP Bldg 3, Coatesville, Pa 15108
Phone & Fax	412-269-6000, 412-269-2002
Billing Address	
Job Number	19195
Purchase Order No.	19195-62-SVZ

9306-079
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Sample ID	Sample Location	Date/Time Collected	Collectors Initials	Matrix	Preservative	Analysis
710-SB1-06	SB1	6-25-93/1730	DJM	soil	—	TPH 5030
710-MW2-02	MW2	6-26-93/1535				Volatile Organics 8240
710-MW2-02	MW2	6-26-93/1535				TPH 5030
710-MW2-03	MW2	6-26-93/1555				TPH 5030
710-MW2-07	MW2	6-26-93/1415				TPH 5030
710-SB3-02	SB3	6-26-93/1323				Volatile Organics 8240
710-SB3-03	SB3	6-26-93/1330				TPH 5030
710-SB3-08	SB3	6-26-93/1445				TPH 5030
710-SB4-01	SB4	6-27-93/925				TPH 5030
710-SB4-02	SB4	6-27-93/937	✓	✓		Volatile Organics 8240

Special Instructions: Fax results when completed before hand copy is sent

Possible Hazard Identification: (Please indicate if sample(s) are hazardous materials and/or suspected of containing levels of hazardous substances.)
 Nonhazard Flammable Skin Irritant Highly Toxic Biological Other _____ Please Specify

Turnaround Time Required: (Rush must be approved by appropriate Manager and is subject to surcharge.)*
 Normal *Rush _____

Sample Disposal: Return to Client _____ or Disposal by Lab (Laboratory reserves the right to return hazardous samples to client)

Relinquished By: David J Martin Signature Baker Company Date/Time 6-28-93 0800
 Received By: [Signature] Signature MMA Company Date/Time 6-28-93/115

Relinquished By: [Signature] Signature MMA Company Date/Time 6-28-93/115
 Received By: [Signature] Signature MMA Company Date/Time 6-28-93@155

Relinquished By: _____ Signature _____ Company _____ Date/Time _____
 Received By: _____ Signature _____ Company _____ Date/Time _____

CHAIN-OF-CUSTODY RECORD



Microbac Laboratories, Inc.

Mid-Atlantic Division
 604 Morris Drive, Newport News, VA 23605
 804/825-1000 Fax: 804/825-1200
 Air • Fuel • Water • Food • Wastes

Company	Baker Env.
Contact	David Martin
Mailing Address	420 Louisa Rd Carrollton Pa 15008
Phone & Fax	412-269-0000, 412-269-2002
Billing Address	
Job Number	19195
Purchase Order No.	19195-62-SVZ

7300-0799

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Sample ID	Sample Location	Date/Time Collected	Collectors Initials	Matrix	Preservative	Analysis
710-SB4-03	SB4	6-27-93/945	DJM	Soil	—	TPH 5030
710-MW5-05	MW5	6-27-93/1142	↓	↓	—	TPH 5030
710-MW5-09	MW5	6-27-93/1250	↓	↓	—	TPH 5030

Special Instructions: Fax results when completed before hard copy is sent

Possible Hazard Identification: (Please indicate if sample(s) are hazardous materials and/or suspected of containing levels of hazardous substances.)

Nonhazard Flammable Skin Irritant Highly Toxic Biological Other _____ Please Specify

Turnaround Time Required: (Rush must be approved by appropriate Manager and is subject to surcharge.)*

Normal *Rush _____

Sample Disposal: Return to Client _____ or Disposal by Lab (Laboratory reserves the right to return hazardous samples to client)

Relinquished By: Signature David J Martin Company Baker Date/Time 6-28-93 0800

Received By: Signature [Signature] Company MMA Date/Time 6-28-93 1155

Relinquished By: Signature [Signature] Company MMA Date/Time 6-28-93 1155

Received By: Signature [Signature] Company MMA Date/Time 6-28-93 @ 1155

Relinquished By: Signature _____ Company _____ Date/Time _____

Received By: Signature _____ Company _____ Date/Time _____

CHAIN-OF-CUSTODY RECORD



Microbac Laboratories, Inc.

Mid-Atlantic Division
604 Morris Drive, Newport News, VA 23605
804/825-1000 Fax: 804/825-1200
Air • Fuel • Water • Food • Wastes

*MCMH
TAT
Don Gaid
06/29/93
@ 8:30*

Company	Baker Env
Contact	Daniel Martin
Mailing Address	970 Keweenaw Rd AcP Bldg 3, Camp Springs PA 15106
Phone & Fax	412-261-6000, 412-264-2002
Billing Address	
Job Number	1995
Purchase Order No.	1995-62-SVZ

9306-085

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Sample ID	Sample Location	Date/Time Collected	Collectors Initials	Matrix	Preservative	Analysis
710-MW3-08	MW3	6/27-1825	DJM	Soil	None	TPH SD30
710-MW3-08	MW3	6/27-1825	↓	↓	↓	Vol. % Petroleum 82.40
710-MW3-10	MW3	6/28-0920	↓	↓	↓	TPH SD30
710-MW3-10-11-12	MW3	6/28-0945	↓	↓	↓	Grain size / Hydrometer
710-MW6-07	MW6	6/28-1242	↓	↓	↓	TPH SD30
710-MW6-09	MW6	6/28-1300	↓	↓	↓	TPH SD30
710-MW4-07	MW4	6/28-1812	↓	↓	↓	TPH SD30
710-MW4-08	MW4	6/28-1825	↓	↓	↓	TPH SD30

Special Instructions: Fax results when complete, send hard copy later

Possible Hazard Identification: (Please indicate if sample(s) are hazardous materials and/or suspected of containing levels of hazardous substances.)

Nonhazard Flammable Skin Irritant Highly Toxic Biological Other _____ Please Specify

Turnaround Time Required: (Rush must be approved by appropriate Manager and is subject to surcharge.)*

Normal *Rush _____

Sample Disposal: Return to Client _____ or Disposal by Lab (Laboratory reserves the right to return hazardous samples to client)

Relinquished By:	Signature: <u>Daniel J. Martin</u>	Company: _____	Date/Time: _____
Received By:	Signature: <u>Maria M. Moore</u>	Company: <u>MMA</u>	Date/Time: <u>6/29/93 @ 1345</u>

Relinquished By:	Signature: _____	Company: _____	Date/Time: _____
Received By:	Signature: _____	Company: _____	Date/Time: _____

Relinquished By:	Signature: _____	Company: _____	Date/Time: _____
Received By:	Signature: _____	Company: _____	Date/Time: _____

CHAIN-OF-CUSTODY RECORD



Microbac Laboratories, Inc.
 Mid-Atlantic Division
 604 Morris Drive, Newport News, VA 23605
 804/825-1000 Fax: 804/825-1200
 Air • Fuel • Water • Food • Wastes

Company	Baker Env.
Contact	David Martin
Mailing Address	412 Roanoke Rd, ACP Bldg 3, Cornopolis Pa 15708
Phone & Fax	412-264-2002 (FAX) 412-264-6000
Billing Address	
Job Number	19195
Purchase Order No.	19195-6Z-SVZ

307-002

Sample ID	Sample Location	Date/Time Collected	Collectors Initials	Matrix	Preservative	Analysis
1 710-MW1-1-Z	MW 1	6-26-93; 848	DJM	Soil	—	Grain Size / Hydrometer ASTM D 422
2 710-ER1	Equip. Rinsate	6-30-93; 1005	↓	Water	H ₂ SO ₄	TPH 418.1
3 710-ER-2	Equip. Rinsate	6-30-93; 1011		—	—	EPA 624 ✓
4 710-ER-3	Equip. Rinsate	6-30-93; 1020		HNO ₃	—	Lead ICAP
5 710-ER-4	Equip. Rinsate	6-30-93; 1027		—	—	EPA 625 ✓
6 710-W-MW 7	MW 7	6-30-93; 1122		H ₂ SO ₄	—	TPH 418.1
7 710-W-MW 7	MW 7	6-30-93; 1122		HNO ₃	—	Lead ICAP
8 710-W-MW 4	MW 4	6-30-93; 1201		H ₂ SO ₄	—	TPH 418.1
9 710-W-MW 4	MW 4	6-30-93; 1201		HNO ₃	—	Lead ICAP
10 710-W-MW 4	MW 4	6-30-93; 1201		—	—	EPA 624 ✓

Special Instructions: For results when ready

Possible Hazard Identification: (Please indicate if sample(s) are hazardous materials and/or suspected of containing levels of hazardous substances.)
 Nonhazard Flammable Skin Irritant Highly Toxic Biological Other _____ Please Specify

Turnaround Time Required: (Rush must be approved by appropriate Manager and is subject to surcharge.)*
 Normal *Rush _____

Sample Disposal: Return to Client _____ or Disposal by Lab (Laboratory reserves the right to return hazardous samples to client)

Relinquished By: Signature David J. Martin Company Baker Env. Date/Time 7-1-93, 1100
 Received By: Signature Robert J. Taylor Company HMMA Date/Time 7-1-93 10:30

Relinquished By: Signature Robert J. Taylor Company HMMA Date/Time 7-1-93 10:35
 Received By: _____

Relinquished By: _____
 Received By: _____



Microbac Laboratories, Inc.

Mid-Atlantic Division
604 Morris Drive, Newport News, VA 23605
804/825-1000 Fax: 804/825-1200
Air • Fuel • Water • Food • Wastes

CHAIN-OF-CUSTODY RECORD

Company	Baker
Contact	David Martin
Mailing Address	420 Rouse Rd, ACP Bldg 3, Coraopolis PA 15108
Phone & Fax	412-269-6000; 412-269-2002 Fax
Billing Address	
Job Number	19195
Purchase Order No.	19195-62-SVZ

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Sample ID	Sample Location	Date/Time Collected	Collectors Initials	Matrix	Preservative	Analysis
710-W-MW4	MW4	6-30-93; 1201	DJM	water	—	EPA 625'
710-Trip 2	—	—	+	water	—	EPA 624V
710-W-MWZA	MWZ	7-1-93; 730	+	↓	H ₂ SO ₄	TPH 918.1
710-W-MWZA	MWZ	7-1-93; 730	+	↓	HNO ₃	Lead 1CAP
710-W-MW4A	MW4	7-1-93; 745	+	↓	—	EPA 625V

Special Instructions: For results when ready

Possible Hazard Identification: (Please indicate if sample(s) are hazardous materials and/or suspected of containing levels of hazardous substances.)

Nonhazard Flammable Skin Irritant Highly Toxic Biological Other _____ Please Specify

Turnaround Time Required: (Rush must be approved by appropriate Manager and is subject to surcharge.)*

Normal *Rush _____

Sample Disposal: Return to Client _____ or Disposal by Lab (Laboratory reserves the right to return hazardous samples to client)

Relinquished By:	Signature	David J. Martin	Company	Baker Env.	Date/Time	7-1-93 1100
Received By:	Signature	[Signature]	Company	MMHA	Date/Time	7-1-93 1005

Relinquished By:	Signature	[Signature]	Company	MMHA	Date/Time	7-1-93 1045
Received By:	Signature	[Signature]	Company		Date/Time	

Relinquished By:	Signature	[Signature]	Company		Date/Time	
Received By:	Signature	[Signature]	Company		Date/Time	

Appendix E

Laboratory Data

AIR • FUEL • WATER • FOOD • WASTES

CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis PA 15108

Date Reported 7/07/93
Date Received 6/28/93
Order No 9306-00079
Invoice No 233

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : Project #: 19195 David Martin

HP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
1	710-MW7-05 MW7	SAMPLED: 06/25/93 @ 1126						
	TPH	8015M/5030	1.0	<1.00	mg/kg	7/01/93	19:20	ALR
2	710-MW7-05 MW7	SAMPLED: 06/25/93 @ 1126						
	VOLATILES	8240						
	Acetone		0.100	<0.100	mg/kg	7/01/93	14:46	ALR
	Benzene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Bromodichloromethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Bromomethane		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	Bromoform		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	2-Butanone		0.100	<0.100	mg/kg	7/01/93	14:46	ALR
	Carbon disulfide		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Carbon tetrachloride		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Chlorobenzene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Chloroethane		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	2-Chloroethylvinyl ether		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	Chloroform		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Chloromethane		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	Dibromochloromethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1-Dichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,2-Dichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1-Dichloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	trans-1,2-Dichloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,2-Dichloropropane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	cis-1,3-Dichloropropene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	trans-1,3-Dichloropropene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR

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Microbac Laboratories, Inc.
 Microbac Mid-Atlantic Division
 604 Morris Drive
 Newport News VA 23605
 (804)825-1000

AIR • FUEL • WATER • FOOD • WASTES

CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
 Airport Office Park, Bldg. 3
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 Coraopolis PA 15108

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Cust # 202200
 Cust P.O.# 19195-62-SVZ

Subject : Project #: 19195 David Martin

MP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
2	710-MW7-05 MW7	SAMPLED: 06/25/93 @ 1126						
	Ethylbenzene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	2-Hexanone		0.050	<0.050	mg/kg	7/01/93	14:46	ALR
	4-Methyl-2-pentanone		0.050	<0.050	mg/kg	7/01/93	14:46	ALR
	Methylene chloride		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Styrene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Tetrachloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Toluene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Total Xylenes		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1,2,2-Tetrachloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1,1-Trichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1,2-Trichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Trichloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Vinyl acetate		0.050	<0.050	mg/kg	7/01/93	14:46	ALR
	Vinyl chloride		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
3	710-MW7-08 MW7	SAMPLED: 06/25/93 @ 1204						
	TPH	8015M/5030	1.0	<1.00	mg/kg	7/01/93	19:20	ALR
4	710-SB2-02 SB2	SAMPLED: 06/25/93 @ 0912						
	TPH	8015M/5030	1.0	105	ng/kg	7/01/93	19:20	ALR
5	710-SB2-07 SB2	SAMPLED: 06/25/93 @ 1002						
	TPH	8015M/5030	1.0	<1.00	ng/kg	7/01/93	19:20	ALR

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SMP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
6	710-MW1-02 MW1	SAMPLED: 06/26/93 @ 0846						
	TPH	8015M/5030	1.0	<1.00	mg/kg	7/01/93	19:20	ALR
7	710-MW1-02 MW1	SAMPLED: 06/26/93 @ 0846						
	VOLATILES	8240						
	Acetone		0.100	<0.100	mg/kg	7/01/93	14:46	ALR
	Benzene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Bromodichloromethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Bromomethane		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	Bromoform		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	2-Butanone		0.100	<0.100	mg/kg	7/01/93	14:46	ALR
	Carbon disulfide		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Carbon tetrachloride		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Chlorobenzene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Chloroethane		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	2-Chloroethylvinyl ether		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	Chloroform		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Chloromethane		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	Dibromochloromethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1-Dichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,2-Dichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1-Dichloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	trans-1,2-Dichloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,2-Dichloropropane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	cis-1,3-Dichloropropene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR

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Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis PA 15108

Date Reported 7/07/93
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Invoice No 233

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : Project #: 19195 David Martin

4P	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
7	710-MW1-02 MW1	SAMPLED: 06/26/93 @ 0846						
	trans-1,3-Dichloropropene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Ethylbenzene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	2-Hexanone		0.050	<0.050	mg/kg	7/01/93	14:46	ALR
	4-Methyl-2-pentanone		0.050	<0.050	mg/kg	7/01/93	14:46	ALR
	Methylene chloride		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Styrene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Tetrachloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Toluene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Total Xylenes		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1,2,2-Tetrachloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1,1-Trichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1,2-Trichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Trichloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Vinyl acetate		0.050	<0.050	mg/kg	7/01/93	14:46	ALR
	Vinyl chloride		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
8	710-MW1-06 MW1	SAMPLED: 06/26/93 @ 0948						
	TPH	8015M/5030	1.0	<1.00	mg/kg	7/01/93	19:20	ALR
9	710-SB1-01 SB1	SAMPLED: 06/25/93 @ 1700						
	VOLATILES	8240						
	Acetone		0.100	<0.100	mg/kg	7/01/93	14:46	ALR
	Benzene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Bromodichloromethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR

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AIR • FUEL • WATER • FOOD • WASTES

CERTIFICATE OF ANALYSIS

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Subject : Project #: 19195 David Martin

SMP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
9 710-SB1-01	SB1	SAMPLED: 06/25/93 @ 1700						
	Bromomethane		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	Bromoform		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	2-Butanone		0.100	<0.100	mg/kg	7/01/93	14:46	ALR
	Carbon disulfide		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Carbon tetrachloride		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Chlorobenzene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Chloroethane		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	2-Chloroethylvinyl ether		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	Chloroform		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Chloromethane		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	Dibromochloromethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1-Dichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,2-Dichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1-Dichloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	trans-1,2-Dichloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,2-Dichloropropane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	cis-1,3-Dichloropropene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	trans-1,3-Dichloropropene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Ethylbenzene		0.005	0.032	mg/kg	7/01/93	14:46	ALR
	2-Hexanone		0.050	<0.050	mg/kg	7/01/93	14:46	ALR
	4-Methyl-2-pentanone		0.050	<0.050	mg/kg	7/01/93	14:46	ALR
	Methylene chloride		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Styrene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Tetrachloroethene		0.005	0.014	mg/kg	7/01/93	14:46	ALR
	Toluene		0.005	0.080	mg/kg	7/01/93	14:46	ALR
	Total Xylenes		0.005	0.244	mg/kg	7/01/93	14:46	ALR

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Subject : Project #: 19195 David Martin

MP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
9	710-SB1-01	SB1	SAMPLED: 06/25/93 @ 1700					
	1,1,2,2-Tetrachloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1,1-Trichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1,2-Trichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Trichloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Vinyl acetate		0.050	<0.050	mg/kg	7/01/93	14:46	ALR
	Vinyl chloride		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
10	710-SB1-02	SB1	SAMPLED: 06/25/93 @ 1702					
	TPH	8015M/5030	1.0	<1.00	mg/kg	7/01/93	19:20	ALR
11	710-SB-1-06	SB1	SAMPLED: 06/25/93 @ 1730					
	TPH	8015M/5030	1.0	<1.00	mg/kg	7/01/93	19:20	ALR
12	710-MW2-02	MW2	SAMPLED: 06/26/93 @ 1535					
	VOLATILES	8240						
	Acetone		0.100	<0.100	mg/kg	7/01/93	14:46	ALR
	Benzene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Bromodichloromethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Bromomethane		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	Bromoform		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	2-Butanone		0.100	<0.100	mg/kg	7/01/93	14:46	ALR
	Carbon disulfide		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Carbon tetrachloride		0.005	<0.005	mg/kg	7/01/93	14:46	ALR

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Subject : Project #: 19195 David Martin

MP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
12	710-MW2-02 MW2	SAMPLED: 06/26/93 @ 1535						
	Chlorobenzene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Chloroethane		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	2-Chloroethylvinyl ether		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	Chloroform		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Chloromethane		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	Dibromochloromethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1-Dichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,2-Dichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1-Dichloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	trans-1,2-Dichloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,2-Dichloropropane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	cis-1,3-Dichloropropene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	trans-1,3-Dichloropropene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Ethylbenzene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	2-Hexanone		0.050	<0.050	mg/kg	7/01/93	14:46	ALR
	4-Methyl-2-pentanone		0.050	<0.050	mg/kg	7/01/93	14:46	ALR
	Methylene chloride		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Styrene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Tetrachloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Toluene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Total Xylenes		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1,2,2-Tetrachloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1,1-Trichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1,2-Trichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Trichloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Vinyl acetate		0.050	<0.050	mg/kg	7/01/93	14:46	ALR
	Vinyl chloride		0.010	<0.010	mg/kg	7/01/93	14:46	ALR

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Microbac Laboratories, Inc.

Microbac Mid-Atlantic Division
604 Morris Drive
Newport News VA 23605
(804)825-1000

AIR • FUEL • WATER • FOOD • WASTES

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Cust P.O.# 19195-62-SVZ

Subject : Project #: 19195 David Martin

MP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
13	710-MW2-02 MW2	SAMPLED: 06/26/93 @ 1535						
	TPH	8015M/5030	1.0	<1.00	mg/kg	7/01/93	19:20	ALR
14	710-MW2-03 MW2	SAMPLED: 06/26/93 @ 1555						
	TPH	8015M/5030	1.0	<1.00	mg/kg	7/01/93	19:20	ALR
15	710-MW2-07 MW2	SAMPLED: 06/26/93 @ 1415						
	TPH	8015M/5030	1.0	<1.00	mg/kg	7/01/93	19:20	ALR
16	710-SB3-02 SB3	SAMPLED: 06/26/93 @ 1323						
	VOLATILES	8240						
	Acetone		0.100	<0.100	mg/kg	7/01/93	14:46	ALR
	Benzene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Bromodichloromethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Bromomethane		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	Bromoform		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	2-Butanone		0.100	<0.100	mg/kg	7/01/93	14:46	ALR
	Carbon disulfide		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Carbon tetrachloride		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Chlorobenzene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Chloroethane		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	2-Chloroethylvinyl ether		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	Chloroform		0.005	<0.005	mg/kg	7/01/93	14:46	ALR

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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis PA 15108

Date Reported 7/07/93
Date Received 6/28/93
Order No 9306-00079
Invoice No 233

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : Project #: 19195 David Martin

MP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
16	710-SB3-02 SB3	SAMPLED: 06/26/93 @ 1323						
	Chloromethane		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	Dibromochloromethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1-Dichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,2-Dichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1-Dichloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	trans-1,2-Dichloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,2-Dichloropropane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	cis-1,3-Dichloropropene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	trans-1,3-Dichloropropene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Ethylbenzene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	2-Hexanone		0.050	<0.050	mg/kg	7/01/93	14:46	ALR
	4-Methyl-2-pentanone		0.050	<0.050	mg/kg	7/01/93	14:46	ALR
	Methylene chloride		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Styrene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Tetrachloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Toluene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Total Xylenes		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1,2,2-Tetrachloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1,1-Trichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1,2-Trichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Trichloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Vinyl acetate		0.050	<0.050	mg/kg	7/01/93	14:46	ALR
	Vinyl chloride		0.010	<0.010	mg/kg	7/01/93	14:46	ALR

7 710-SB3-08 SB3 SAMPLED: 06/26/93 @ 1330

TPH 8015M/5030 1.0 <1.00 mg/kg 7/01/93 19:20 ALR

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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
 Airport Office Park, Bldg. 3
 420 Rouser Road
 Coraopolis PA 15108

Date Reported 7/07/93
 Date Received 6/28/93
 Order No 9306-00079
 Invoice No 233

Cust # 202200
 Cust P.O.# 19195-62-SVZ

Subject : Project #: 19195 David Martin

MP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
18	710-SB3-08 SB3	SAMPLED: 06/26/93 @ 1445						
	TPH	8015M/5030	1.0	<1.00	mg/kg	7/01/93	19:20	ALR
19	710-SB4-01 SB4	SAMPLED: 06/27/93 @ 0925						
	TPH	8015M/5030	1.0	<1.00	mg/kg	7/01/93	19:20	ALR
20	710-SB4-02 SB4	SAMPLED: 06/27/93 @ 0937						
	VOLATILES	8240						
	Acetone		0.100	<0.100	mg/kg	7/01/93	14:46	ALR
	Benzene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Bromodichloromethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Bromomethane		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	Bromoform		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	2-Butanone		0.100	<0.100	mg/kg	7/01/93	14:46	ALR
	Carbon disulfide		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Carbon tetrachloride		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Chlorobenzene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Chloroethane		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	2-Chloroethylvinyl ether		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	Chloroform		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Chloromethane		0.010	<0.010	mg/kg	7/01/93	14:46	ALR
	Dibromochloromethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1-Dichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,2-Dichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR

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AIR • FUEL • WATER • FOOD • WASTES

CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis PA 15108

Date Reported 7/07/93
Date Received 6/28/93
Order No 9306-00079
Invoice No 233

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : Project #: 19195 David Martin

P	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
0	710-SB4-02 SB4	SAMPLED: 06/27/93 @ 0937						
	1,1-Dichloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	trans-1,2-Dichloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,2-Dichloropropane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	cis-1,3-Dichloropropene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	trans-1,3-Dichloropropene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Ethylbenzene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	2-Hexanone		0.050	<0.050	mg/kg	7/01/93	14:46	ALR
	4-Methyl-2-pentanone		0.050	<0.050	mg/kg	7/01/93	14:46	ALR
	Methylene chloride		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Styrene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Tetrachloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Toluene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Total Xylenes		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1,2,2-Tetrachloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1,1-Trichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	1,1,2-Trichloroethane		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Trichloroethene		0.005	<0.005	mg/kg	7/01/93	14:46	ALR
	Vinyl acetate		0.050	<0.050	mg/kg	7/01/93	14:46	ALR
	Vinyl chloride		0.010	<0.010	mg/kg	7/01/93	14:46	ALR

1	710-SB4-03 SB4	SAMPLED: 06/27/93 @ 0945						
	TPH	8015M/5030	1.0	<1.00	mg/kg	7/01/93	19:20	ALR
2	710-MW5-05 MW5	SAMPLED: 06/27/93 @ 1142						
	TPH	8015M/5030	1.0	<1.00	mg/kg	7/01/93	19:20	ALR

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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
 Airport Office Park, Bldg. 3
 420 Rouser Road
 Coraopolis PA 15108

Date Reported 7/07/93
 Date Received 6/28/93
 Order No 9306-00079
 Invoice No 233

Cust # 202200
 Cust P.O.# 19195-62-SVZ

Subject : Project #: 19195 David Martin

AP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
23	710-MW5-09 MW9	SAMPLED: 06/27/93 @ 1250						
	TPH	8015M/5030	1.0	<1.00	ng/kg	7/01/93	19:20	ALR

Respectfully Submitted: Andrea M. Caroe
 Andrea M. Caroe



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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis PA 15108

Date Reported 7/07/93
Date Received 6/29/93
Order No 9306-00085
Invoice No 234

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : Project #: 19195 David Martin

SMP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
1	710-MW3-08 MW3	SAMPLED: 06/27/93 @ 1825						
	TPH	8015M/5030	1.0	<1.00	mg/kg	7/02/93	10:08	CAP
2	710-MW3-08 MW3	SAMPLED: 06/27/93 @ 1825						
	VOLATILES	8240						
	Acetone		0.100	<0.100	mg/kg	7/01/93	19:20	ALR
	Benzene		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	Bromodichloromethane		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	Bromomethane		0.010	<0.010	mg/kg	7/01/93	19:20	ALR
	Bromoform		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	2-Butanone		0.100	<0.100	mg/kg	7/01/93	19:20	ALR
	Carbon disulfide		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	Carbon tetrachloride		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	Chlorobenzene		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	Chloroethane		0.010	<0.010	mg/kg	7/01/93	19:20	ALR
	2-Chloroethylvinyl ether		0.010	<0.010	mg/kg	7/01/93	19:20	ALR
	Chloroform		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	Chloromethane		0.010	<0.010	mg/kg	7/01/93	19:20	ALR
	Dibromochloromethane		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	1,1-Dichloroethane		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	1,2-Dichloroethane		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	1,1-Dichloroethene		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	trans-1,2-Dichloroethene		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	1,2-Dichloropropane		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	cis-1,3-Dichloropropene		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	trans-1,3-Dichloropropene		0.005	<0.005	mg/kg	7/01/93	19:20	ALR

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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis PA 15108

Date Reported 7/07/93
Date Received 6/29/93
Order No 9306-00085
Invoice No 234

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : Project #: 19195 David Martin

MP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
2	710-MW3-08 MW3	SAMPLED: 06/27/93 @ 1825						
	Ethylbenzene		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	2-Hexanone		0.050	<0.050	mg/kg	7/01/93	19:20	ALR
	4-Methyl-2-pentanone		0.050	<0.050	mg/kg	7/01/93	19:20	ALR
	Methylene chloride		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	Styrene		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	Tetrachloroethene		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	Toluene		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	Total Xylenes		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	1,1,2,2-Tetrachloroethane		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	1,1,1-Trichloroethane		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	1,1,2-Trichloroethane		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	Trichloroethene		0.005	<0.005	mg/kg	7/01/93	19:20	ALR
	Vinyl acetate		0.050	<0.050	mg/kg	7/01/93	19:20	ALR
	Vinyl chloride		0.010	<0.010	mg/kg	7/01/93	19:20	ALR
3	710-MW3-10 MW3	SAMPLED: 06/28/93 @ 0920						
	TPH	8015M/5030	1.0	<1.00	mg/kg	7/02/93	10:08	CAP
4	710-MW3-10-11-12 MW3	SAMPLED: 06/28/93 @ 0945						
	Grain Evaluation	ASTM D422		SEE ATTACHED		7/05/93	17:00	KW
5	710-MW6-07 MW6	SAMPLED: 06/28/93 @ 1242						
	TPH	8015M/5030	1.0	<1.00	mg/kg	7/02/93	10:08	CAP

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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis PA 15108

Date Reported 7/07/93
Date Received 6/29/93
Order No 9306-00085
Invoice No 234

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : Project #: 19195 David Martin

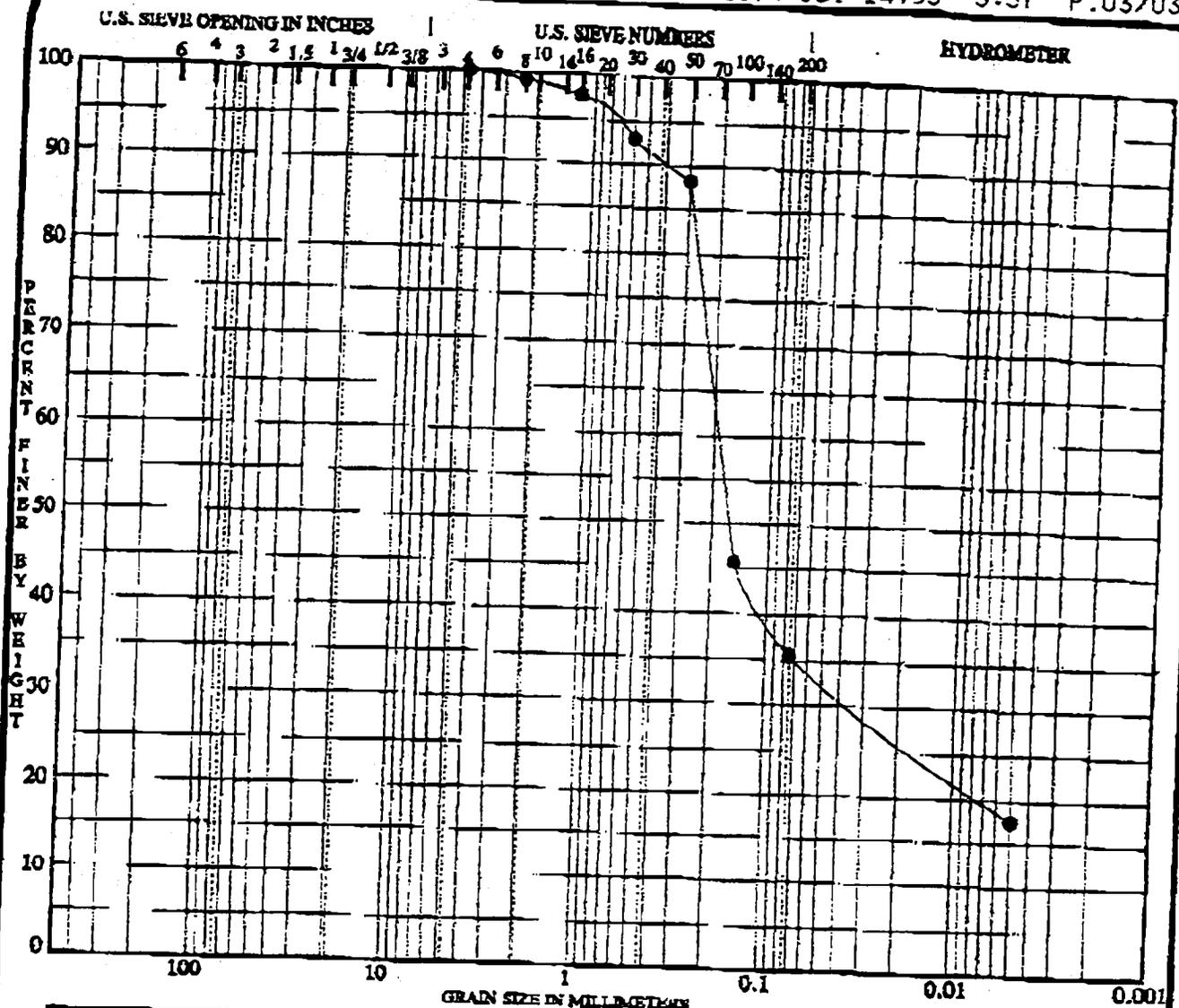
SMP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
6 710-MW6-09	MW6	SAMPLED: 06/28/93 @ 1300						
	TPH	8015M/5030	1.0	<1.00	mg/kg	7/02/93	10:08	CAP
7 710-MW4-07	MW4	SAMPLED: 06/28/93 @ 1812						
	TPH	8015M/5030	1.0	<1.00	mg/kg	7/02/93	10:08	CAP
8 710-MW4-08	MW4	SAMPLED: 06/28/93 @ 1825						
	TPH	8015M/5030	1.0	<1.00	mg/kg	7/02/93	10:08	CAP

Respectfully Submitted:



Andrea M. Caroe





CORRIES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

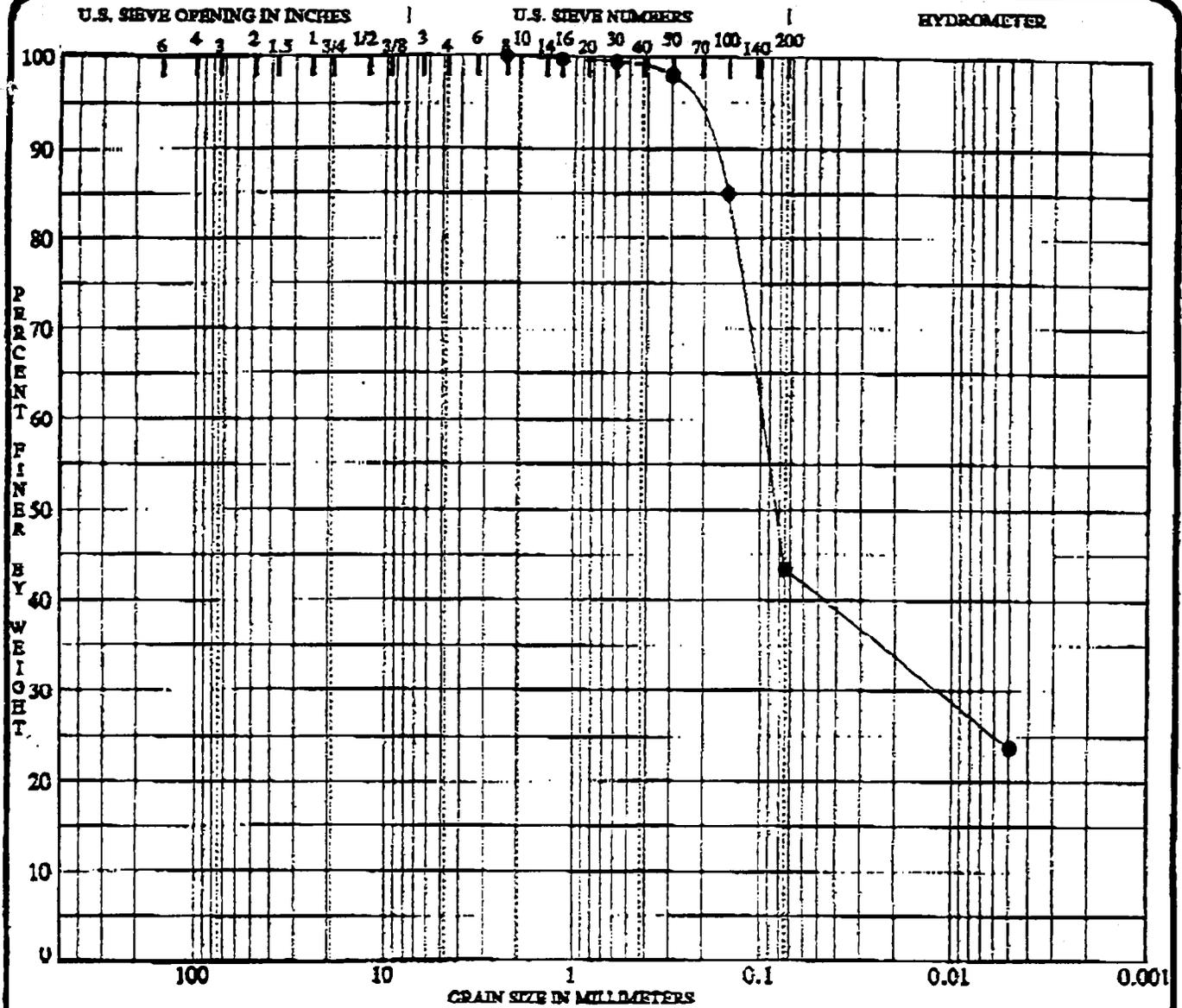
Specimen Identification	Classification	MC%	LL	PL	PI	Cc	Cu
MW-1 0.0	CLAYEY SAND SC		28	14	14		

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
MW-1 0.0	4.75	0.19	0.075		0.0	64.5	17.9	17.6

PROJECT MMA #19195, Naval Weapons Station, Yorktown - Yorktown, Virginia JOB NO. 9L1443
 DATE 7/13/93

GRADATION CURVES
 McCabum Testing Laboratories, Inc.
 1808 Hayward Ave Chesapeake Va

Date: David Martin



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	MC%	LL	PL	PI	Cs	Cu
● MW #3 0.0	CLAYEY SAND SC		48	23	17		

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● MW #3 0.0	2.36	0.10	0.012		0.0	56.5	19.8	23.7

PROJECT: Naval Weapons, Yorktown

JOB NO. 19195

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND-SILT MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50			MH	INORGANIC SILTS, MICAEOUS OR DIATOMACEOUS-FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis PA 15108

Date Reported 7/08/93
Date Received 7/01/93
Order No 9307-00001
Invoice No 265

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yortown NWS David Martin

ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
1 710-W-MW3 MW3 SAMPLED: 1355							
Lead	7421	0.001	0.070	mg/L	7/08/93	14:41	JAS
2 710-W-MW3 MW3 SAMPLED: 1355							
TPH	418.1	1	<1	mg/L	7/07/93	9:00	CEA
3 710-W-MW3 MW3 SAMPLED: 1355							
VOLATILES	8240						
Acetone		0.100	<0.100	mg/L	7/06/93	22:55	ASV
Benzene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
Bromodichloromethane		0.005	<0.005	mg/L	7/06/93	22:55	ASV
Bromomethane		0.010	<0.010	mg/L	7/06/93	22:55	ASV
Bromoform		0.005	<0.005	mg/L	7/06/93	22:55	ASV
2-Butanone		0.100	<0.100	mg/L	7/06/93	22:55	ASV
Carbon disulfide		0.005	<0.005	mg/L	7/06/93	22:55	ASV
Carbon tetrachloride		0.005	<0.005	mg/L	7/06/93	22:55	ASV
Chlorobenzene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
Chloroethane		0.010	<0.010	mg/L	7/06/93	22:55	ASV
2-Chloroethylvinyl ether		0.010	<0.010	mg/L	7/06/93	22:55	ASV
Chloroform		0.005	<0.005	mg/L	7/06/93	22:55	ASV
Chloromethane		0.010	<0.010	mg/L	7/06/93	22:55	ASV
Dibromochloromethane		0.005	<0.005	mg/L	7/06/93	22:55	ASV
1,1-Dichloroethane		0.005	<0.005	mg/L	7/06/93	22:55	ASV
1,2-Dichloroethane		0.005	<0.005	mg/L	7/06/93	22:55	ASV
1,1-Dichloroethene		0.005	<0.005	mg/L	7/06/93	22:55	ASV

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AIR • FUEL • WATER • FOOD • WASTES

CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis PA 15108

Date Reported 7/08/93
Date Received 7/01/93
Order No 9307-00001
Invoice No 265

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yortown NWS David Martin

4P	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
3	710-W-MW3 MW3 SAMPLED: 1355							
	trans-1,2-Dichloroethene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	1,2-Dichloropropane		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	cis-1,3-Dichloropropene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	trans-1,3-Dichloropropene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Ethylbenzene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	2-Hexanone		0.050	<0.050	mg/L	7/06/93	22:55	ASV
	4-Methyl-2-pentanone		0.050	<0.050	mg/L	7/06/93	22:55	ASV
	Methylene Chloride		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Styrene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Tetrachloroethene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Toluene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Total Xylenes		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	1,1,2,2-Tetrachloroethane		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	1,1,1-Trichloroethane		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	1,1,2-Trichloroethane		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Trichloroethene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Vinyl acetate		0.050	<0.050	mg/L	7/06/93	22:55	ASV
	Vinyl Chloride		0.010	<0.010	mg/L	7/06/93	22:55	ASV

4 710-W-MW3 MW3 SAMPLED: 1355

SEMIVOLATILES

Acenaphthene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Acenaphthylene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Anthracene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Benzo (a) anthracene	8270	10	<10	ug/L	7/06/93	22:55	ASV

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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis PA 15108

Date Reported 7/08/93
Date Received 7/01/93
Order No 9307-00001
Invoice No 265

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yortown NWS David Martin

ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
4 710-W-MW3 MW3 SAMPLED: 1355							
Benzo (b) fluoranthene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Benzo (k) fluoranthene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Benzo (a) pyrene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Benzo (ghi) perylene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Benzyl butyl phthalate	8270	10	<10	ug/L	7/06/93	22:55	ASV
Bis(2-chloroethyl)ether	8270	10	<10	ug/L	7/06/93	22:55	ASV
Bis(2-chloroethoxy)methane	8270	10	<10	ug/L	7/06/93	22:55	ASV
Bis(2-ethylhexyl)phthalate	8270	10	<10	ug/L	7/06/93	22:55	ASV
Bis(2-chloroisopropyl)ether	8270	10	<10	ug/L	7/06/93	22:55	ASV
4-Bromophenyl phenyl ether	8270	10	<10	ug/L	7/06/93	22:55	ASV
2-Chloronaphthalene	8270	10	<10	ug/L	7/06/93	22:55	ASV
4-Chlorophenyl phenyl ether	8270	10	<10	ug/L	7/06/93	22:55	ASV
Chrysene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Dibenzo (a,h) anthracene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Di-(n-butyl) phthalate	8270	10	<10	ug/L	7/06/93	22:55	ASV
1,2-Dichlorobenzene	8270	10	<10	ug/L	7/06/93	22:55	ASV
1,3-Dichlorobenzene	8270	10	<10	ug/L	7/06/93	22:55	ASV
1,4-Dichlorobenzene	8270	10	<10	ug/L	7/06/93	22:55	ASV
3,3' Dichlorobenzidine	8270	50	<50	ug/L	7/06/93	22:55	ASV
Diethyl Phthalate	8270	10	<10	ug/L	7/06/93	22:55	ASV
Dimethyl phthalate	8270	10	<10	ug/L	7/06/93	22:55	ASV
2,4-Dinitrotoluene	8270	10	<10	ug/L	7/06/93	22:55	ASV
2,6-Dinitrotoluene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Di-(n-octyl) phthalate	8270	10	<10	ug/L	7/06/93	22:55	ASV
Fluoroanthene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Fluorene	8270	10	<10	ug/L	7/06/93	22:55	ASV

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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
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Date Reported 7/08/93
Date Received 7/01/93
Order No 9307-00001
Invoice No 265

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yortown NWS David Martin

4P	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
4	710-W-MW3 MW3 SAMPLED: 1355							
	Hexachlorobenzene	8270	10	<10 ug/L		7/06/93	22:55	ASV
	Hexachlorobutadiene	8270	10	<10 ug/L		7/06/93	22:55	ASV
	Hexachloroethane	8270	10	<10 ug/L		7/06/93	22:55	ASV
	Indeno(1,2,3-cd)pyrene	8270	10	<10 ug/L		7/06/93	22:55	ASV
	Isophorone	8270	10	<10 ug/L		7/06/93	22:55	ASV
	Naphthalene	8270	10	<10 ug/L		7/06/93	22:55	ASV
	Nitrobenzene	8270	10	<10 ug/L		7/06/93	22:55	ASV
	N-Nitroso-di-n-propylamine	8270	10	<10 ug/L		7/06/93	22:55	ASV
	N-Nitroso-dimethylamine	8270	10	<10 ug/L		7/06/93	22:55	ASV
	N-Nitroso-diphenylamine	8270	10	<10 ug/L		7/06/93	22:55	ASV
	Phenanthrene	8270	10	<10 ug/L		7/06/93	22:55	ASV
	Pyrene	8270	10	<10 ug/L		7/06/93	22:55	ASV
	1,2,4-Trichlorobenzene	8270	10	<10 ug/L		7/06/93	22:55	ASV
	Benzidine	8270	50	<50 ug/L		7/06/93	22:55	ASV
	Hexachlorocyclopentadiene	8270	10	<10 ug/L		7/06/93	22:55	ASV
	1,2-Diphenylhydrazine	8270	10	<10 ug/L		7/06/93	22:55	ASV
	Pyridine	8270	10	<10 ug/L		7/06/93	22:55	ASV
	4-Chloroaniline	8270	10	<10 ug/L		7/06/93	22:55	ASV
	2-Nitroaniline	8270	50	<50 ug/L		7/06/93	22:55	ASV
	3-Nitroaniline	8270	50	<50 ug/L		7/06/93	22:55	ASV
	4-Nitroaniline	8270	50	<50 ug/L		7/06/93	22:55	ASV
	Dibenzofuran	8270	10	<10 ug/L		7/06/93	22:55	ASV
	2-Methylnaphthalene	8270	10	<10 ug/L		7/06/93	22:55	ASV
	-----			0		7/20/93	15:07	PJ
	-----			0		7/20/93	15:07	PJ
	4-Chloro-3-methylphenol	8270	10	<10 ug/L		7/06/93	22:55	ASV

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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
 Airport Office Park, Bldg. 3
 420 Rouser Road
 Coraopolis PA 15108

Date Reported 7/08/93
 Date Received 7/01/93
 Order No 9307-00001
 Invoice No 265

Cust # 202200
 Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yortown NWS David Martin

P	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
4	710-W-MW3 MW3 SAMPLED: 1355							
	2-Chlorophenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2,4-Dichlorophenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2,4-Dimethylphenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2,4-Dinitrophenol	8270	50	<50	ug/L	7/06/93	22:55	ASV
	2-Methyl-4,6-dinitrophenol	8270	50	<50	ug/L	7/06/93	22:55	ASV
	2-Nitrophenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
	4-Nitrophenol	8270	50	<50	ug/L	7/06/93	22:55	ASV
	Pentachlorophenol	8270	50	<50	ug/L	7/06/93	22:55	ASV
	Phenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2,4,6-Trichlorophenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2-Methylphenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
	4-Methylphenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2,4,5-Trichlorophenol	8270	50	<50	ug/L	7/06/93	22:55	ASV
	Benzoic Acid	8270	50	<50	ug/L	7/06/93	22:55	ASV
	Benzyl Alcohol	8270	10	<10	ug/L	7/06/93	22:55	ASV
5	710-W-MW1 MW1 SAMPLED: 1531							
	Lead	7421	0.001	<0.001	mg/L	7/08/93	14:41	JAS
6	710-W-MW1 MW1 SAMPLED: 1531							
	TPH	418.1	1	<1	mg/L	7/07/93	9:00	CEA
7	710-W-MW1 MW1 SAMPLED: 1531							

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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis PA 15108

Date Reported 7/08/93
Date Received 7/01/93
Order No 9307-00001
Invoice No 265

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yortown NWS David Martin

MP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
7	710-W-MW1 MW1 SAMPLED: 1531							
	VOLATILES	8240						
	Acetone		0.100	<0.100	mg/L	7/06/93	22:55	ASV
	Benzene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Bromodichloromethane		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Bromomethane		0.010	<0.010	mg/L	7/06/93	22:55	ASV
	Bromoform		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	2-Butanone		0.100	<0.100	mg/L	7/06/93	22:55	ASV
	Carbon disulfide		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Carbon tetrachloride		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Chlorobenzene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Chloroethane		0.010	<0.010	mg/L	7/06/93	22:55	ASV
	2-Chloroethylvinyl ether		0.010	<0.010	mg/L	7/06/93	22:55	ASV
	Chloroform		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Chloromethane		0.010	<0.010	mg/L	7/06/93	22:55	ASV
	Dibromochloromethane		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	1,1-Dichloroethane		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	1,2-Dichloroethane		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	1,1-Dichloroethene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	trans-1,2-Dichloroethene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	1,2-Dichloropropane		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	cis-1,3-Dichloropropene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	trans-1,3-Dichloropropene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Ethylbenzene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	2-Hexanone		0.050	<0.050	mg/L	7/06/93	22:55	ASV
	4-Methyl-2-pentanone		0.050	<0.050	mg/L	7/06/93	22:55	ASV
	Methylene Chloride		0.005	<0.005	mg/L	7/06/93	22:55	ASV

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CERTIFICATE OF ANALYSIS

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420 Rouser Road
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Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yortown NWS David Martin

MP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
7	710-W-MW1 MW1 SAMPLED: 1531							
	Styrene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Tetrachloroethene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Toluene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Total Xylenes		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	1,1,2,2-Tetrachloroethane		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	1,1,1-Trichloroethane		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	1,1,2-Trichloroethane		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Trichloroethene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Vinyl acetate		0.050	<0.050	mg/L	7/06/93	22:55	ASV
	Vinyl Chloride		0.010	<0.010	mg/L	7/06/93	22:55	ASV

8 710-W-MW1 MW1 SAMPLED: 1531

SEMIVOLATILES

Acenaphthene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Acenaphthylene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Anthracene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Benzo (a) anthracene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Benzo (b) fluoranthene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Benzo (k) fluoranthene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Benzo (a) pyrene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Benzo (ghi) perylene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Benzyl butyl phthalate	8270	10	<10	ug/L	7/06/93	22:55	ASV
Bis(2-chloroethyl)ether	8270	10	<10	ug/L	7/06/93	22:55	ASV
Bis(2-chloroethoxy)methane	8270	10	<10	ug/L	7/06/93	22:55	ASV
Bis(2-ethylhexyl)phthalate	8270	10	<10	ug/L	7/06/93	22:55	ASV

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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis PA 15108

Date Reported 7/08/93
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Order No 9307-00001
Invoice No 265

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yortown NWS David Martin

SMP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
8	710-W-MW1 MW1 SAMPLED: 1531							
	Bis(2-chloroisopropyl)ether	8270	10	<10	ug/L	7/06/93	22:55	ASV
	4-Bromophenyl phenyl ether	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2-Chloronaphthalene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	4-Chlorophenyl phenyl ether	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Chrysene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Dibenzo (a,h) anthracene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Di-(n-butyl) phthalate	8270	10	<10	ug/L	7/06/93	22:55	ASV
	1,2-Dichlorobenzene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	1,3-Dichlorobenzene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	1,4 Dichlorobenzene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	3,3' Dichlorobenzidine	8270	50	<50	ug/L	7/06/93	22:55	ASV
	Diethyl Phthalate	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Dimethyl phthalate	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2,4-Dinitrotoluene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2,6-Dinitrotoluene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Di-(n-octyl) phthalate	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Fluoroanthene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Fluorene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Hexachlorobenzene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Hexachlorobutadiene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Hexachloroethane	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Indeno(1,2,3-cd)pyrene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Isophorone	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Naphthalene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Nitrobenzene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	N-Nitroso-di-n-propylamine	8270	10	<10	ug/L	7/06/93	22:55	ASV

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CERTIFICATE OF ANALYSIS

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Airport Office Park, Bldg. 3
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Date Reported 7/08/93
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Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yortown NWS David Martin

4P	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
8	710-W-MW1 MW1 SAMPLED: 1531							
	N-Nitroso-dimethylamine	8270	10	<10	ug/L	7/06/93	22:55	ASV
	N-Nitroso-diphenylamine	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Phenanthrene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Pyrene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	1,2,4-Trichlorobenzene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Benzidine	8270	50	<50	ug/L	7/06/93	22:55	ASV
	Hexachlorocyclopentadiene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	1,2-Diphenylhydrazine	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Pyridine	8270	10	<10	ug/L	7/06/93	22:55	ASV
	4-Chloroaniline	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2-Nitroaniline	8270	50	<50	ug/L	7/06/93	22:55	ASV
	3-Nitroaniline	8270	50	<50	ug/L	7/06/93	22:55	ASV
	4-Nitroaniline	8270	50	<50	ug/L	7/06/93	22:55	ASV
	Dibenzofuran	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2-Methylnaphthalene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	-----			0		7/20/93	15:07	PJ
	-----			0		7/20/93	15:07	PJ
	4-Chloro-3-methylphenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2-Chlorophenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2,4-Dichlorophenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2,4-Dimethylphenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2,4-Dinitrophenol	8270	50	<50	ug/L	7/06/93	22:55	ASV
	2-Methyl-4,6-dinitrophenol	8270	50	<10	ug/L	7/06/93	22:55	ASV
	2-Nitrophenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
	4-Nitrophenol	8270	50	<50	ug/L	7/06/93	22:55	ASV
	Pentachlorophenol	8270	50	<50	ug/L	7/06/93	22:55	ASV

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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis PA 15108

Date Reported 7/08/93
Date Received 7/01/93
Order No 9307-00001
Invoice No 265

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yortown NWS David Martin

SMP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
8	710-W-MW1 MW1 SAMPLED: 1531							
	Phenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2,4,6-Trichlorophenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2-Methylphenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
	4-Methylphenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2,4,5-Trichlorophenol	8270	50	<50	ug/L	7/06/93	22:55	ASV
	Benzoic Acid	8270	50	<50	ug/L	7/06/93	22:55	ASV
	Benzyl Alcohol	8270	10	<10	ug/L	7/06/93	22:55	ASV
9	710-W-MW6 MW6 SAMPLED: 1432							
	TPH	418.1	1	1	mg/L	7/07/93	9:00	CEA
10	710-W-MW6 MW6 SAMPLED: 1432							
	Lead	7421	0.001	0.064	mg/L	7/08/93	14:41	JAS
11	710-W-MW2 MW2 SAMPLED: 1545							
	TPH	418.1	1	<1	mg/L	7/07/93	9:00	CEA
12	710-W-MW2 MW2 SAMPLED: 1545							
	Lead	7421	0.001	<0.001	mg/L	7/08/93	14:41	JAS
13	710-W-MW2 MW2 SAMPLED: 1545							

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Date Reported 7/08/93
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Order No 9307-00001
Invoice No 265

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yortown NWS David Martin

MP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
13	710-W-MW2 MW2 SAMPLED: 1545							
	VOLATILES	8240						
	Acetone		0.100	<0.100	ng/L	7/06/93	22:55	ASV
	Benzene		0.005	<0.005	ng/L	7/06/93	22:55	ASV
	Bromodichloromethane		0.005	<0.005	ng/L	7/06/93	22:55	ASV
	Bromomethane		0.010	<0.010	ng/L	7/06/93	22:55	ASV
	Bromoform		0.005	<0.005	ng/L	7/06/93	22:55	ASV
	2-Butanone		0.100	<0.100	ng/L	7/06/93	22:55	ASV
	Carbon disulfide		0.005	<0.005	ng/L	7/06/93	22:55	ASV
	Carbon tetrachloride		0.005	<0.005	ng/L	7/06/93	22:55	ASV
	Chlorobenzene		0.005	<0.005	ng/L	7/06/93	22:55	ASV
	Chloroethane		0.010	<0.010	ng/L	7/06/93	22:55	ASV
	2-Chloroethylvinyl ether		0.010	<0.010	ng/L	7/06/93	22:55	ASV
	Chloroform		0.005	<0.005	ng/L	7/06/93	22:55	ASV
	Chloromethane		0.010	<0.010	ng/L	7/06/93	22:55	ASV
	Dibromochloromethane		0.005	<0.005	ng/L	7/06/93	22:55	ASV
	1,1-Dichloroethane		0.005	<0.005	ng/L	7/06/93	22:55	ASV
	1,2-Dichloroethane		0.005	<0.005	ng/L	7/06/93	22:55	ASV
	1,1-Dichloroethene		0.005	<0.005	ng/L	7/06/93	22:55	ASV
	trans-1,2-Dichloroethene		0.005	<0.005	ng/L	7/06/93	22:55	ASV
	1,2-Dichloropropane		0.005	<0.005	ng/L	7/06/93	22:55	ASV
	cis-1,3-Dichloropropene		0.005	<0.005	ng/L	7/06/93	22:55	ASV
	trans-1,3-Dichloropropene		0.005	<0.005	ng/L	7/06/93	22:55	ASV
	Ethylbenzene		0.005	<0.005	ng/L	7/06/93	22:55	ASV
	2-Hexanone		0.050	<0.050	ng/L	7/06/93	22:55	ASV
	4-Methyl-2-pentanone		0.050	<0.050	ng/L	7/06/93	22:55	ASV
	Methylene Chloride		0.005	<0.005	ng/L	7/06/93	22:55	ASV

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Invoice No 265

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yortown NWS David Martin

MP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
13	710-W-MW2 MW2 SAMPLED: 1545							
	Styrene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Tetrachloroethene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Toluene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Total Xylenes		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	1,1,2,2-Tetrachloroethane		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	1,1,1-Trichloroethane		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	1,1,2-Trichloroethane		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Trichloroethene		0.005	<0.005	mg/L	7/06/93	22:55	ASV
	Vinyl acetate		0.050	<0.050	mg/L	7/06/93	22:55	ASV
	Vinyl Chloride		0.010	<0.010	mg/L	7/06/93	22:55	ASV

14 710-W-MW2 MW2 SAMPLED: 1545

SEMIVOLATILES

Acenaphthene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Acenaphthylene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Anthracene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Benzo (a) anthracene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Benzo (b) fluoranthene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Benzo (k) fluoranthene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Benzo (a) pyrene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Benzo (ghi) perylene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Benzyl butyl phthalate	8270	10	<10	ug/L	7/06/93	22:55	ASV
Bis(2-chloroethyl)ether	8270	10	<10	ug/L	7/06/93	22:55	ASV
Bis(2-chloroethoxy)methane	8270	10	<10	ug/L	7/06/93	22:55	ASV
Bis(2-ethylhexyl)phthalate	8270	10	<10	ug/L	7/06/93	22:55	ASV

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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis PA 15108

Date Reported 7/08/93
Date Received 7/01/93
Order No 9307-00001
Invoice No 265

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yortown NWS David Martin

MP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
14	710-W-MW2 MW2 SAMPLED: 1545							
	Bis(2-chloroisopropyl)ether	8270	10	<10	ug/L	7/06/93	22:55	ASV
	4-Bromophenyl phenyl ether	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2-Chloronaphthalene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	4-Chlorophenyl phenyl ether	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Chrysene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Dibenzo (a,h) anthracene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Di-(n-butyl) phthalate	8270	10	<10	ug/L	7/06/93	22:55	ASV
	1,2-Dichlorobenzene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	1,3-Dichlorobenzene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	1,4 Dichlorobenzene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	3,3' Dichlorobenzidine	8270	50	<50	ug/L	7/06/93	22:55	ASV
	Diethyl Phthalate	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Dimethyl phthalate	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2,4-Dinitrotoluene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	2,6-Dinitrotoluene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Di-(n-octyl) phthalate	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Fluoroanthene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Fluorene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Hexachlorobenzene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Hexachlorobutadiene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Hexachloroethane	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Indeno(1,2,3-cd)pyrene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Isophorone	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Naphthalene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	Nitrobenzene	8270	10	<10	ug/L	7/06/93	22:55	ASV
	N-Nitroso-di-n-propylamine	8270	10	<10	ug/L	7/06/93	22:55	ASV

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Date Reported 7/08/93
Date Received 7/01/93
Order No 9307-00001
Invoice No 265

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yortown NWS David Martin

ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
4 710-W-MW2 MW2 SAMPLED: 1545							
N-Nitroso-dimethylamine	8270	10	<10	ug/L	7/06/93	22:55	ASV
N-Nitroso-diphenylamine	8270	10	<10	ug/L	7/06/93	22:55	ASV
Phenanthrene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Pyrene	8270	10	<10	ug/L	7/06/93	22:55	ASV
1,2,4-Trichlorobenzene	8270	10	<10	ug/L	7/06/93	22:55	ASV
Benzidine	8270	50	<50	ug/L	7/06/93	22:55	ASV
Hexachlorocyclopentadiene	8270	10	<10	ug/L	7/06/93	22:55	ASV
1,2-Diphenylhydrazine	8270	10	<10	ug/L	7/06/93	22:55	ASV
Pyridine	8270	10	<10	ug/L	7/06/93	22:55	ASV
4-Chloroaniline	8270	10	<10	ug/L	7/06/93	22:55	ASV
2-Nitroaniline	8270	50	<50	ug/L	7/06/93	22:55	ASV
3-Nitroaniline	8270	50	<50	ug/L	7/06/93	22:55	ASV
4-Nitroaniline	8270	50	<50	ug/L	7/06/93	22:55	ASV
Dibenzofuran	8270	10	<10	ug/L	7/06/93	22:55	ASV
2-Methylnaphthalene	8270	10	<10	ug/L	7/06/93	22:55	ASV
			0		7/20/93	15:07	PJ
			0		7/20/93	15:07	PJ
4-Chloro-3-methylphenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
2-Chlorophenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
2,4-Dichlorophenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
2,4-Dimethylphenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
2,4-Dinitrophenol	8270	50	<50	ug/L	7/06/93	22:55	ASV
2-Methyl-4,6-dinitrophenol	8270	50	<50	ug/L	7/06/93	22:55	ASV
2-Nitrophenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
4-Nitrophenol	8270	50	<50	ug/L	7/06/93	22:55	ASV
Pentachlorophenol	8270	50	<50	ug/L	7/06/93	22:55	ASV

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Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yortown NWS David Martin

ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
4 710-W-MW2 MW2 SAMPLED: 1545							
Phenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
2,4,6-Trichlorophenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
2-Methylphenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
4-Methylphenol	8270	10	<10	ug/L	7/06/93	22:55	ASV
2,4,5-Trichlorophenol	8270	50	<50	ug/L	7/06/93	22:55	ASV
Benzoic Acid	8270	50	<50	ug/L	7/06/93	22:55	ASV
Benzyl Alcohol	8270	10	<10	ug/L	7/06/93	22:55	ASV
5 710-Trip 1							
TPH	418.1	1	<1	mg/L	7/07/93	9:00	CEA
6 710-W-MW5 MW5 SAMPLED: 1303							
TPH	418.1	1	<1	mg/L	7/07/93	9:00	CEA
7 710-W-MW5 MW5 SAMPLED: 1303							
Lead	7421	0.001	0.025	mg/L	7/08/93	14:41	JAS

Respectfully Submitted:
Andrea M. Caroe





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Baker Environmental, Inc.
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420 Rouser Road
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Date Reported 7/13/93
Date Received 7/01/93
Order No 9307-00002
Invoice No 266

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yorktown NWS David Martin

ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
1 710-MW1-1-2 MW1 SAMPLED: 06/26/93 @ 0848							
Grain Evaluation	ASTM D422		SEE ATTACHED		7/13/93	16:00	KW
2 710-ER-1 EQUIP RINSATE SAMPLED: 06/30/93 @ 1005							
TPH	418.1	1	<1	mg/L	7/07/93	9:00	CEA
3 710-ER-2 EQUIP RINSATE SAMPLED: 06/30/93 @ 1011							
VOLATILES	8240						
Acetone	0.100		<0.100	mg/L	7/06/93	23:27	ASV
Benzene	0.005		<0.005	mg/L	7/06/93	23:27	ASV
Bromodichloromethane	0.005		<0.005	mg/L	7/06/93	23:27	ASV
Bromomethane	0.010		<0.010	mg/L	7/06/93	23:27	ASV
Bromoform	0.005		<0.005	mg/L	7/06/93	23:27	ASV
2-Butanone	0.100		<0.100	mg/L	7/06/93	23:27	ASV
Carbon disulfide	0.005		<0.005	mg/L	7/06/93	23:27	ASV
Carbon tetrachloride	0.005		<0.005	mg/L	7/06/93	23:27	ASV
Chlorobenzene	0.005		<0.005	mg/L	7/06/93	23:27	ASV
Chloroethane	0.010		<0.010	mg/L	7/06/93	23:27	ASV
2-Chloroethylvinyl ether	0.010		<0.010	mg/L	7/06/93	23:27	ASV
Chloroform	0.005		<0.005	mg/L	7/06/93	23:27	ASV
Chloromethane	0.010		<0.010	mg/L	7/06/93	23:27	ASV
Dibromochloromethane	0.005		<0.005	mg/L	7/06/93	23:27	ASV
1,1-Dichloroethane	0.005		<0.005	mg/L	7/06/93	23:27	ASV
1,2-Dichloroethane	0.005		<0.005	mg/L	7/06/93	23:27	ASV
1,1-Dichloroethene	0.005		<0.005	mg/L	7/06/93	23:27	ASV

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Date Reported 7/13/93
Date Received 7/01/93
Order No 9307-00002
Invoice No 266

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yorktown NWS David Martin

MP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
3	710-ER-2 EQUIP RINSATE SAMPLED: 06/30/93 @ 1011							
	trans-1,2-Dichloroethene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	1,2-Dichloropropane		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	cis-1,3-Dichloropropene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	trans-1,3-Dichloropropene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	Ethylbenzene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	2-Hexanone		0.050	<0.050	mg/L	7/06/93	23:27	ASV
	4-Methyl-2-pentanone		0.050	<0.050	mg/L	7/06/93	23:27	ASV
	Methylene Chloride		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	Styrene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	Tetrachloroethene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	Toluene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	Total Xylenes		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	1,1,2,2-Tetrachloroethane		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	1,1,1-Trichloroethane		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	1,1,2-Trichloroethane		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	Trichloroethene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	Vinyl acetate		0.050	<0.050	mg/L	7/06/93	23:27	ASV
	Vinyl Chloride		0.010	<0.010	mg/L	7/06/93	23:27	ASV

4	710-ER-3 EQUIP RINSATE SAMPLED: 06/30/93 @ 1020							
	Lead	7421	0.001	<0.001	mg/L	7/08/93	14:41	JAS

5 710-ER-4 EQUIP RINSATE SAMPLED: 06/30/93 @ 1027

SEMIVOLATILES

THIS CERTIFICATE OF ANALYSIS IS CONTINUED ON THE NEXT PAGE



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Microbac Laboratories, Inc.

Microbac Mid-Atlantic Division
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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis PA 15108

Date Reported 7/13/93
Date Received 7/01/93
Order No 9307-00002
Invoice No 266

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yorktown NWS David Martin

CP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
5	710-ER-4	EQUIP RINSATE SAMPLED: 06/30/93 @ 1027						
	Acenaphthene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Acenaphthylene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Anthracene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Benzo (a) anthracene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Benzo (b) fluoranthene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Benzo (k) fluoranthene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Benzo (a) pyrene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Benzo (ghi) perylene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Benzyl butyl phthalate	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Bis(2-chloroethyl)ether	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Bis(2-chloroethoxy)methane	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Bis(2-ethylhexyl)phthalate	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Bis(2-chloroisopropyl)ether	8270	10	<10	ug/L	7/06/93	23:27	ASV
	4-Bromophenyl phenyl ether	8270	10	<10	ug/L	7/06/93	23:27	ASV
	2-Chloronaphthalene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	4-Chlorophenyl phenyl ether	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Chrysene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Dibenzo (a,h) anthracene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Di-(n-butyl) phthalate	8270	10	<10	ug/L	7/06/93	23:27	ASV
	1,2-Dichlorobenzene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	1,3-Dichlorobenzene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	1,4 Dichlorobenzene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	3,3' Dichlorobenzidine	8270	50	<50	ug/L	7/06/93	23:27	ASV
	Diethyl Phthalate	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Dimethyl phthalate	8270	10	<10	ug/L	7/06/93	23:27	ASV
	2,4-Dinitrotoluene	8270	10	<10	ug/L	7/06/93	23:27	ASV

THIS CERTIFICATE OF ANALYSIS IS CONTINUED ON THE NEXT PAGE



CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
 Airport Office Park, Bldg. 3
 420 Rouser Road
 Coraopolis PA 15108

Date Reported 7/13/93
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 Invoice No 266

Cust # 202200
 Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yorktown NWS David Martin

SMP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
5 710-ER-4	EQUIP RINSATE SAMPLED: 06/30/93 @ 1027							
	2,6-Dinitrotoluene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Di-(n-octyl) phthalate	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Fluoroanthene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Fluorene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Hexachlorobenzene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Hexachlorobutadiene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Hexachloroethane	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Indeno(1,2,3-cd)pyrene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Isophorone	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Naphthalene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Nitrobenzene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	N-Nitroso-di-n-propylamine	8270	10	<10	ug/L	7/06/93	23:27	ASV
	N-Nitroso-dimethylamine	8270	10	<10	ug/L	7/06/93	23:27	ASV
	N-Nitroso-diphenylamine	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Phenanthrene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Pyrene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	1,2,4-Trichlorobenzene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Benzidine	8270	50	<50	ug/L	7/06/93	23:27	ASV
	Hexachlorocyclopentadiene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	1,2-Diphenylhydrazine	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Pyridine	8270	10	<10	ug/L	7/06/93	23:27	ASV
	4-Chloroaniline	8270	10	<10	ug/L	7/06/93	23:27	ASV
	2-Nitroaniline	8270	50	<50	ug/L	7/06/93	23:27	ASV
	3-Nitroaniline	8270	50	<50	ug/L	7/06/93	23:27	ASV
	4-Nitroaniline	8270	50	<50	ug/L	7/06/93	23:27	ASV
	Dibenzofuran	8270	10	<10	ug/L	7/06/93	23:27	ASV

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Baker Environmental, Inc.
 Airport Office Park, Bldg. 3
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Date Reported 7/13/93
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 Invoice No 266

Cust # 202200
 Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yorktown NWS David Martin

4P	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
5	710-ER-4 EQUIP RINSATE SAMPLED: 06/30/93 @ 1027							
	2-Methylnaphthalene	8270	10	<10 ug/L		7/06/93	23:27	ASV
	-----			0		7/20/93	15:01	PJ
	-----			0		7/20/93	15:01	PJ
	4-Chloro-3-methylphenol	8270	10	<10 ug/L		7/06/93	23:27	ASV
	2-Chlorophenol	8270	10	<10 ug/L		7/06/93	23:27	ASV
	2,4-Dichlorophenol	8270	10	<10 ug/L		7/06/93	23:27	ASV
	2,4-Dimethylphenol	8270	10	<10 ug/L		7/06/93	23:27	ASV
	2,4-Dinitrophenol	8270	50	<50 ug/L		7/06/93	23:27	ASV
	2-Methyl-4,6-dinitrophenol	8270	50	<50 ug/L		7/06/93	23:27	ASV
	2-Nitrophenol	8270	10	<10 ug/L		7/06/93	23:27	ASV
	4-Nitrophenol	8270	50	<50 ug/L		7/06/93	23:27	ASV
	Pentachlorophenol	8270	50	<50 ug/L		7/06/93	23:27	ASV
	Phenol	8270	10	<10 ug/L		7/06/93	23:27	ASV
	2,4,6-Trichlorophenol	8270	10	<10 ug/L		7/06/93	23:27	ASV
	2-Methylphenol	8270	10	<10 ug/L		7/06/93	23:27	ASV
	4-Methylphenol	8270	10	<10 ug/L		7/06/93	23:27	ASV
	2,4,5-Trichlorophenol	8270	50	<50 ug/L		7/06/93	23:27	ASV
	Benzoic Acid	8270	50	<50 ug/L		7/06/93	23:27	ASV
	Benzyl Alcohol	8270	10	<50 ug/L		7/06/93	23:27	ASV
6	710-W-MW7 MW7 SAMPLED: 06/30/93 @ 1122							
	TPH	418.1	1	<1 mg/L		7/07/93	9:00	CEA
7	710-W-MW7 MW7 SAMPLED: 06/30/93 @ 1122							
	Lead	7421	0.001	0.069 mg/L		7/08/93	14:41	JAS

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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
 Airport Office Park, Bldg. 3
 420 Rouser Road
 Coraopolis PA 15108

Date Reported 7/13/93
 Date Received 7/01/93
 Order No 9307-00002
 Invoice No 266

Cust # 202200
 Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yorktown NWS David Martin

MP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
8	710-W-MW4 MW4	SAMPLED: 06/30/93 @ 1201						
	TPH	418.1	1	<1	mg/L	7/08/93	16:50	JAS
9	710-W-MW4 MW4	SAMPLED: 06/30/93 @ 1201						
	Lead	7421	0.001	0.181	mg/L	7/08/93	14:41	JAS
10	710-W-MW4 MW4	SAMPLED: 06/30/93 @ 1201						
	VOLATILES	8240						
	Acetone	0.100		<0.100	mg/L	7/06/93	23:27	ASV
	Benzene	0.005		<0.005	mg/L	7/06/93	23:27	ASV
	Bromodichloromethane	0.005		<0.005	mg/L	7/06/93	23:27	ASV
	Bromomethane	0.010		<0.010	mg/L	7/06/93	23:27	ASV
	Bromoform	0.005		<0.005	mg/L	7/06/93	23:27	ASV
	2-Butanone	0.100		<0.100	mg/L	7/06/93	23:27	ASV
	Carbon disulfide	0.005		<0.005	mg/L	7/06/93	23:27	ASV
	Carbon tetrachloride	0.005		<0.005	mg/L	7/06/93	23:27	ASV
	Chlorobenzene	0.005		<0.005	mg/L	7/06/93	23:27	ASV
	Chloroethane	0.010		<0.010	mg/L	7/06/93	23:27	ASV
	2-Chloroethylvinyl ether	0.010		<0.010	mg/L	7/06/93	23:27	ASV
	Chloroform	0.005		<0.005	mg/L	7/06/93	23:27	ASV
	Chloromethane	0.010		<0.010	mg/L	7/06/93	23:27	ASV
	Dibromochloromethane	0.005		<0.005	mg/L	7/06/93	23:27	ASV
	1,1-Dichloroethane	0.005		<0.005	mg/L	7/06/93	23:27	ASV
	1,2-Dichloroethane	0.005		<0.005	mg/L	7/06/93	23:27	ASV

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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis PA 15108

Date Reported 7/13/93
Date Received 7/01/93
Order No 9307-00002
Invoice No 266

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yorktown NWS David Martin

MP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
10	710-W-MW4 MW4	SAMPLED: 06/30/93 @ 1201						
	1,1-Dichloroethene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	trans-1,2-Dichloroethene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	1,2-Dichloropropane		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	cis-1,3-Dichloropropene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	trans-1,3-Dichloropropene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	Ethylbenzene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	2-Hexanone		0.050	<0.050	mg/L	7/06/93	23:27	ASV
	4-Methyl-2-pentanone		0.050	<0.050	mg/L	7/06/93	23:27	ASV
	Methylene Chloride		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	Styrene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	Tetrachloroethene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	Toluene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	Total Xylenes		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	1,1,2,2-Tetrachloroethane		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	1,1,1-Trichloroethane		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	1,1,2-Trichloroethane		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	Trichloroethene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	Vinyl acetate		0.050	<0.050	mg/L	7/06/93	23:27	ASV
	Vinyl Chloride		0.010	<0.010	mg/L	7/06/93	23:27	ASV
1	710-W-MW4 MW4	SAMPLED: 06/30/93 @ 1201						

SEMIVOLATILES

Acenaphthene	8270	10	<10	ug/L	7/06/93	23:27	ASV
Acenaphthylene	8270	10	<10	ug/L	7/06/93	23:27	ASV
Anthracene	8270	10	<10	ug/L	7/06/93	23:27	ASV

THIS CERTIFICATE OF ANALYSIS IS CONTINUED ON THE NEXT PAGE



CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
 Airport Office Park, Bldg. 3
 420 Rouser Road
 Coraopolis PA 15108

Date Reported 7/13/93
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 Invoice No 266

Cust # 202200
 Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yorktown NWS David Martin

ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
.1 710-W-MW4 MW4 SAMPLED: 06/30/93 @ 1201							
Benzo (a) anthracene	8270	10	<10	ug/L	7/06/93	23:27	ASV
Benzo (b) fluoranthene	8270	10	<10	ug/L	7/06/93	23:27	ASV
Benzo (k) fluoranthene	8270	10	<10	ug/L	7/06/93	23:27	ASV
Benzo (a) pyrene	8270	10	<10	ug/L	7/06/93	23:27	ASV
Benzo (ghi) perylene	8270	10	<10	ug/L	7/06/93	23:27	ASV
Benzyl butyl phthalate	8270	10	<10	ug/L	7/06/93	23:27	ASV
Bis(2-chloroethyl)ether	8270	10	<10	ug/L	7/06/93	23:27	ASV
Bis(2-chloroethoxy)methane	8270	10	<10	ug/L	7/06/93	23:27	ASV
Bis(2-ethylhexyl)phthalate	8270	10	<10	ug/L	7/06/93	23:27	ASV
Bis(2-chloroisopropyl)ether	8270	10	<10	ug/L	7/06/93	23:27	ASV
4-Bromophenyl phenyl ether	8270	10	<10	ug/L	7/06/93	23:27	ASV
2-Chloronaphthalene	8270	10	<10	ug/L	7/06/93	23:27	ASV
4-Chlorophenyl phenyl ether	8270	10	<10	ug/L	7/06/93	23:27	ASV
Chrysene	8270	10	<10	ug/L	7/06/93	23:27	ASV
Dibenzo (a,h) anthracene	8270	10	<10	ug/L	7/06/93	23:27	ASV
Di-(n-butyl) phthalate	8270	10	<10	ug/L	7/06/93	23:27	ASV
1,2-Dichlorobenzene	8270	10	<10	ug/L	7/06/93	23:27	ASV
1,3-Dichlorobenzene	8270	10	<10	ug/L	7/06/93	23:27	ASV
1,4 Dichlorobenzene	8270	10	<10	ug/L	7/06/93	23:27	ASV
3,3' Dichlorobenzidine	8270	50	<50	ug/L	7/06/93	23:27	ASV
Diethyl Phthalate	8270	10	<10	ug/L	7/06/93	23:27	ASV
Dimethyl phthalate	8270	10	<10	ug/L	7/06/93	23:27	ASV
2,4-Dinitrotoluene	8270	10	<10	ug/L	7/06/93	23:27	ASV
2,6-Dinitrotoluene	8270	10	<10	ug/L	7/06/93	23:27	ASV
Di-(n-octyl) phthalate	8270	10	<10	ug/L	7/06/93	23:27	ASV
Fluoroanthene	8270	10	<10	ug/L	7/06/93	23:27	ASV

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CERTIFICATE OF ANALYSIS

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Subject : WO#: 19195 Yorktown NWS David Martin

ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
11 710-W-MW4 MW4 SAMPLED: 06/30/93 @ 1201							
Fluorene	8270	10	<10 ug/L		7/06/93	23:27	ASV
Hexachlorobenzene	8270	10	<10 ug/L		7/06/93	23:27	ASV
Hexachlorobutadiene	8270	10	<10 ug/L		7/06/93	23:27	ASV
Hexachloroethane	8270	10	<10 ug/L		7/06/93	23:27	ASV
Indeno(1,2,3-cd)pyrene	8270	10	<10 ug/L		7/06/93	23:27	ASV
Isophorone	8270	10	<10 ug/L		7/06/93	23:27	ASV
Naphthalene	8270	10	<10 ug/L		7/06/93	23:27	ASV
Nitrobenzene	8270	10	<10 ug/L		7/06/93	23:27	ASV
N-Nitroso-di-n-propylamine	8270	10	<10 ug/L		7/06/93	23:27	ASV
N-Nitroso-dimethylamine	8270	10	<10 ug/L		7/06/93	23:27	ASV
N-Nitroso-diphenylamine	8270	10	<10 ug/L		7/06/93	23:27	ASV
Phenanthrene	8270	10	<10 ug/L		7/06/93	23:27	ASV
Pyrene	8270	10	<10 ug/L		7/06/93	23:27	ASV
1,2,4-Trichlorobenzene	8270	10	<10 ug/L		7/06/93	23:27	ASV
Benzidine	8270	50	<50 ug/L		7/06/93	23:27	ASV
Hexachlorocyclopentadiene	8270	10	<10 ug/L		7/06/93	23:27	ASV
1,2-Diphenylhydrazine	8270	10	<10 ug/L		7/06/93	23:27	ASV
Pyridine	8270	10	<10 ug/L		7/06/93	23:27	ASV
4-Chloroaniline	8270	10	<10 ug/L		7/06/93	23:27	ASV
2-Nitroaniline	8270	50	<50 ug/L		7/06/93	23:27	ASV
3-Nitroaniline	8270	50	<50 ug/L		7/06/93	23:27	ASV
4-Nitroaniline	8270	50	<50 ug/L		7/06/93	23:27	ASV
Dibenzofuran	8270	10	<10 ug/L		7/06/93	23:27	ASV
2-Methylnaphthalene	8270	10	<10 ug/L		7/06/93	23:27	ASV
			0		7/20/93	15:01	PJ
			0		7/20/93	15:01	PJ

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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
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Date Reported 7/13/93
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Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yorktown NWS David Martin

ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
710-W-MW4 MW4 SAMPLED: 06/30/93 @ 1201							
4-Chloro-3-methylphenol	8270	10	<10	ug/L	7/06/93	23:27	ASV
2-Chlorophenol	8270	10	<10	ug/L	7/06/93	23:27	ASV
2,4-Dichlorophenol	8270	10	<10	ug/L	7/06/93	23:27	ASV
2,4-Dimethylphenol	8270	10	<10	ug/L	7/06/93	23:27	ASV
2,4-Dinitrophenol	8270	50	<50	ug/L	7/06/93	23:27	ASV
2-Methyl-4,6-dinitrophenol	8270	50	<50	ug/L	7/06/93	23:27	ASV
2-Nitrophenol	8270	10	<10	ug/L	7/06/93	23:27	ASV
4-Nitrophenol	8270	50	<50	ug/L	7/06/93	23:27	ASV
Pentachlorophenol	8270	50	<50	ug/L	7/06/93	23:27	ASV
Phenol	8270	10	<10	ug/L	7/06/93	23:27	ASV
2,4,6-Trichlorophenol	8270	10	<10	ug/L	7/06/93	23:27	ASV
2-Methylphenol	8270	10	<10	ug/L	7/06/93	23:27	ASV
4-Methylphenol	8270	10	<10	ug/L	7/06/93	23:27	ASV
2,4,5-Trichlorophenol	8270	50	<50	ug/L	7/06/93	23:27	ASV
Benzoic Acid	8270	50	<50	ug/L	7/06/93	23:27	ASV
Benzyl Alcohol	8270	10	<10	ug/L	7/06/93	23:27	ASV
710-TRIP 2							
VOLATILES	8240						
Acetone		0.100	<0.100	mg/L	7/06/93	23:27	ASV
Benzene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
Bromodichloromethane		0.005	<0.005	mg/L	7/06/93	23:27	ASV
Bromomethane		0.010	<0.010	mg/L	7/06/93	23:27	ASV
Bromoform		0.005	<0.005	mg/L	7/06/93	23:27	ASV
2-Butanone		0.100	<0.100	mg/L	7/06/93	23:27	ASV

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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis PA 15108

Date Reported 7/13/93
Date Received 7/01/93
Order No 9307-00002
Invoice No 266

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yorktown NWS David Martin

ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
2 710-TRIP 2							
Carbon disulfide		0.005	<0.005	mg/L	7/06/93	23:27	ASV
Carbon tetrachloride		0.005	<0.005	mg/L	7/06/93	23:27	ASV
Chlorobenzene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
Chloroethane		0.010	0.010	mg/L	7/06/93	23:27	ASV
2-Chloroethylvinyl ether		0.010	0.010	mg/L	7/06/93	23:27	ASV
Chloroform		0.005	<0.005	mg/L	7/06/93	23:27	ASV
Chloromethane		0.010	<0.010	mg/L	7/06/93	23:27	ASV
Dibromochlormethane		0.005	<0.005	mg/L	7/06/93	23:27	ASV
1,1-Dichloroethane		0.005	<0.005	mg/L	7/06/93	23:27	ASV
1,2-Dichloroethane		0.005	<0.005	mg/L	7/06/93	23:27	ASV
1,1-Dichloroethene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
trans-1,2-Dichloroethene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
1,2-Dichloropropane		0.005	<0.005	mg/L	7/06/93	23:27	ASV
cis-1,3-Dichloropropene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
trans-1,3-Dichloropropene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
Ethylbenzene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
2-Hexanone		0.050	<0.050	mg/L	7/06/93	23:27	ASV
4-Methyl-2-pentanone		0.050	<0.050	mg/L	7/06/93	23:27	ASV
Methylene Chloride		0.005	<0.005	mg/L	7/06/93	23:27	ASV
Styrene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
Tetrachloroethene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
Toluene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
Total Xylenes		0.005	<0.005	mg/L	7/06/93	23:27	ASV
1,1,2,2-Tetrachloroethane		0.005	<0.005	mg/L	7/06/93	23:27	ASV
1,1,1-Trichloroethane		0.005	<0.005	mg/L	7/06/93	23:27	ASV
1,1,2-Trichloroethane		0.005	<0.005	mg/L	7/06/93	23:27	ASV

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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis PA 15108

Date Reported 7/13/93
Date Received 7/01/93
Order No 9307-00002
Invoice No 266

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yorktown NWS David Martin

AP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
2	710-TRIP 2							
	Trichloroethene		0.005	<0.005	mg/L	7/06/93	23:27	ASV
	Vinyl acetate		0.050	<0.050	mg/L	7/06/93	23:27	ASV
	Vinyl Chloride		0.010	<0.010	mg/L	7/06/93	23:27	ASV
3	710-W-MWZA MW2	SAMPLED: 07/01/93 @ 0730						
	TPH	418.1	1	<1	mg/L	7/08/93	16:50	JAS
4	710-W-MWZA MW2	SAMPLED: 07/01/93 @ 0730						
	Lead	7421	0.001	<0.001	mg/L	7/08/93	14:41	JAS
5	710-W-MW4A MW4	SAMPLED: 07/01/93 @ 0745						
	SEMIVOLATILES							
	Acenaphthene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Acenaphthylene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Anthracene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Benzo (a) anthracene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Benzo (b) fluoranthene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Benzo (k) fluoranthene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Benzo (a) pyrene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Benzo (ghi) perylene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Benzyl butyl phthalate	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Bis(2-chloroethyl)ether	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Bis(2-chloroethoxy)methane	8270	10	<10	ug/L	7/06/93	23:27	ASV

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Date Reported 7/13/93
Date Received 7/01/93
Order No 9307-00002
Invoice No 266

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yorktown NWS David Martin

MP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
15	710-W-MW4A MW4	SAMPLED: 07/01/93 @ 0745						
	Bis(2-ethylhexyl)phthalate	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Bis(2-chloroisopropyl)ether	8270	10	<10	ug/L	7/06/93	23:27	ASV
	4-Bromophenyl phenyl ether	8270	10	<10	ug/L	7/06/93	23:27	ASV
	2-Chloronaphthalene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	4-Chlorophenyl phenyl ether	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Chrysene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Dibenzo (a,h) anthracene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Di-(n-butyl) phthalate	8270	10	<10	ug/L	7/06/93	23:27	ASV
	1,2-Dichlorobenzene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	1,3-Dichlorobenzene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	1,4 Dichlorobenzene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	3,3' Dichlorobenzidine	8270	50	<50	ug/L	7/06/93	23:27	ASV
	Diethyl Phthalate	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Dimethyl phthalate	8270	10	<10	ug/L	7/06/93	23:27	ASV
	2,4-Dinitrotoluene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	2,6-Dinitrotoluene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Di-(n-octyl) phthalate	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Fluoroanthene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Fluorene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Hexachlorobenzene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Hexachlorobutadiene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Hexachloroethane	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Indeno(1,2,3-cd)pyrene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Isophorone	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Naphthalene	8270	10	<10	ug/L	7/06/93	23:27	ASV
	Nitrobenzene	8270	10	<10	ug/L	7/06/93	23:27	ASV

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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis PA 15108

Date Reported 7/13/93
Date Received 7/01/93
Order No 9307-00002
Invoice No 266

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yorktown NWS David Martin

ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
5 710-W-MW4A MW4 SAMPLED: 07/01/93 @ 0745							
N-Nitroso-di-n-propylamine	8270	10	<10	ug/L	7/06/93	23:27	ASV
N-Nitroso-dimethylamine	8270	10	<10	ug/L	7/06/93	23:27	ASV
N-Nitroso-diphenylamine	8270	10	<10	ug/L	7/06/93	23:27	ASV
Phenanthrene	8270	10	<10	ug/L	7/06/93	23:27	ASV
Pyrene	8270	10	<10	ug/L	7/06/93	23:27	ASV
1,2,4-Trichlorobenzene	8270	10	<10	ug/L	7/06/93	23:27	ASV
Benzidine	8270	50	<50	ug/L	7/06/93	23:27	ASV
Hexachlorocyclopentadiene	8270	10	<10	ug/L	7/06/93	23:27	ASV
1,2-Diphenylhydrazine	8270	10	<10	ug/L	7/06/93	23:27	ASV
Pyridine	8270	10	<10	ug/L	7/06/93	23:27	ASV
4-Chloroaniline	8270	10	<10	ug/L	7/06/93	23:27	ASV
2-Nitroaniline	8270	50	<50	ug/L	7/06/93	23:27	ASV
3-Nitroaniline	8270	50	<50	ug/L	7/06/93	23:27	ASV
4-Nitroaniline	8270	50	<50	ug/L	7/06/93	23:27	ASV
Dibenzofuran	8270	10	<10	ug/L	7/06/93	23:27	ASV
2-Methylnaphthalene	8270	10	<10	ug/L	7/06/93	23:27	ASV
-----			0		7/20/93	15:01	PJ
-----			0		7/20/93	15:01	PJ
4-Chloro-3-methylphenol	8270	10	<10	ug/L	7/06/93	23:27	ASV
2-Chlorophenol	8270	10	<10	ug/L	7/06/93	23:27	ASV
2,4-Dichlorophenol	8270	10	<10	ug/L	7/06/93	23:27	ASV
2,4-Dimethylphenol	8270	10	<10	ug/L	7/06/93	23:27	ASV
2,4-Dinitrophenol	8270	50	<50	ug/L	7/06/93	23:27	ASV
2-Methyl-4,6-dinitrophenol	8270	50	<50	ug/L	7/06/93	23:27	ASV
2-Nitrophenol	8270	10	<10	ug/L	7/06/93	23:27	ASV
4-Nitrophenol	8270	50	<50	ug/L	7/06/93	23:27	ASV

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CERTIFICATE OF ANALYSIS

Baker Environmental, Inc.
Airport Office Park, Bldg. 3
420 Rouser Road
Coraopolis PA 15108

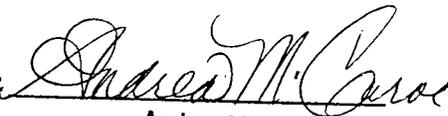
Date Reported 7/13/93
Date Received 7/01/93
Order No 9307-00002
Invoice No 266

Cust # 202200
Cust P.O.# 19195-62-SVZ

Subject : WO#: 19195 Yorktown NWS David Martin

MP	ANALYSIS	METHOD	MDL	RESULTS	UNITS	DATE	TIME	INI
15 710-W-MW4A	MW4	SAMPLED: 07/01/93 @ 0745						
	Pentachlorophenol	8270	50	<50	ug/L	7/06/93	23:27	ASV
	Phenol	8270	10	<10	ug/L	7/06/93	23:27	ASV
	2,4,6-Trichlorophenol	8270	10	<10	ug/L	7/06/93	23:27	ASV
	2-Methylphenol	8270	10	<10	ug/L	7/06/93	23:27	ASV
	4-Methylphenol	8270	10	<10	ug/L	7/06/93	23:27	ASV
	2,4,5-Trichlorophenol	8270	50	<50	ug/L	7/06/93	23:27	ASV
	Benzoic Acid	8270	50	<50	ug/L	7/06/93	23:27	ASV
	Benzyl Alcohol	8270	10	<10	ug/L	7/06/93	23:27	ASV

Respectfully Submitted:


Andrea M. Caroe



QC SUMMARY REPORT
FOR

BAKER ENVIRONMENTAL, INC.

PROJECT #: Yorktown Naval Weapons Station

D.O. #: 19195-62-SVZ

MATRIX : SOIL

<u>Sample ID.</u>	<u>Laboratory ID.</u>	<u>Analysis Requested</u>
710-MW7-05	9306-00079 1	TPH by GC 8015/5030
710-MW7-05	9306-00079 2	Volatiles 8240
710-MW7-08	9306-00079 3	TPH by GC 8015/5030
710-SB2-02	9306-00079 4	TPH by GC 8015/5030
710-SB2-07	9306-00079 5	TPH by GC 8015/5030
710-MW1-02	9306-00079 6	TPH by GC 8015/5030
710-MW1-02	9306-00079 7	Volatiles 8240
710-MW1-06	9306-00079 8	TPH by GC 8015/5030
710-SB1-01	9306-00079 9	Volatiles 8240
710-SB1-02	9306-00079 10	TPH by GC 8015/5030
710-SB1-06	9306-00079 11	TPH by GC 8015/5030
710-MW2-02	9306-00079 12	Volatiles 8240
710-MW2-02	9306-00079 13	TPH by GC 8015/5030
710-MW2-03	9306-00079 14	TPH by GC 8015/5030
710-MW2-07	9306-00079 15	TPH by GC 8015/5030
710-SB3-02	9306-00079 16	Volatiles 8240
710-SB3-03	9306-00079 17	TPH by GC 8015/5030
710-SB3-08	9306-00079 18	TPH by GC 8015/5030
710-SB4-01	9306-00079 19	TPH by GC 8015/5030
710-SB4-02	9306-00079 20	Volatiles 8240
710-SB4-03	9306-00079 21	TPH by GC 8015/5030
710-MW5-05	9306-00079 22	TPH by GC 8015/5030
710-MW5-09	9306-00079 23	TPH by GC 8015/5030

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QUALITY CONTROL CHECKLIST
8015M/5030 - TPH BY GC

Date Analyzed: 07/01/93

Sample Batch: 9306-00079 Sample 1,3,4,5,6,8,10,11,13,14,15,17,18,19,21,22,23

Matrix: SOIL

Batch Analysis

	PASS	FAIL
I. Method Blank	X	
II. Outside Reference	X	
III. Matrix Spike	X	
IV. Matrix Spike Duplicate	X	

	<u>MS</u>	<u>MSD</u>	<u>SAMPLE</u>	<u>RPD</u>	<u>REFERENCE</u> <u>%REC</u>	<u>LIMITS</u> <u>%REC</u>
Diesel						
Gasoline	88	84	9306-00079	6 4.7	N/A	N/A
Gasoline	91	88	9306-00079	18 3.4	N/A	N/A
Kerosene						
Mineral Spirits						
Motor Oil						

Sample Analysis

<u>Laboratory I.D.</u>	<u>**H.T.</u>	<u>**I.S.</u>	<u>%Recovery</u> <u>Surrogate</u>
	<u>i/o</u>	<u>p/f</u>	<u>71-127</u>
9306-00079 1	i	p	87
9306-00079 3	i	p	76
9306-00079 4	i	p	*65
9306-00079 5	i	p	76
9306-00079 6	i	p	74
9306-00079 8	i	p	76
9306-00079 10	i	p	72
9306-00079 11	i	p	75
9306-00079 13	i	p	76
9306-00079 14	i	p	78
9306-00079 15	i	p	97
9306-00079 17	i	p	72
9306-00079 18	i	p	71
9306-00079 19	i	p	71
9306-00079 21	i	p	79
9306-00079 22	i	p	80
9306-00079 23	i	p	74

*9306-00079 Sample 4 had heavier compounds that offered matrix interference of surrogate recoveries.

**H.T.(Holding Time) - in or out

**I.S. - (Internal Standard) - pass or fail

Microbac Mid-Atlantic

QUALITY CONTROL CHECKLIST
8240-Volatile GC/MS Analysis

Date Analyzed: 07/01/93

Sample Batch: 9306-00079 Sample 2, 7, 9, 12, 16 & 20

Matrix: SOIL

Batch Analysis

	PASS	FAIL
I. Mass Spec Tuning Criteria	X	
II. Initial/Continuing Calibration	X	
III. Method Blank	X	
IV. Outside Reference	X	
V. Matrix Spike/Matrix Spike Duplicate	X	

	MS	MSD	RPD	LIMITS	
				%REC	%RPD
1,1-Dichloroethene	87	92	6	61-145	14
Trichloroethene	102	104	2	71-120	14
Benzene	88	89	1	76-127	11
Toluene	114	109	5	76-125	13
Chlorobenzene	95	90	5	75-130	13

Sample Analysis

Laboratory I.D.	H.T. I.S.		1st	2nd	3rd
	i/o	p/f	Surrogate 70-121	Surrogate 81-117	Surrogate 74-121
9306-00079	2	i p	94	100	83
9306-00079	7	i p	96	99	78
9306-00079	9	i p	97	* 78	75
9306-00079	12	i p	101	96	80
9306-00079	16	i p	97	98	77
9306-00079	20	i p	85	107	85

*Low recovery on second surrogate due to negative matrix interference in the sample.

H.T. - Holding Time (in/out)

I.S. - Internal Standard (pass/fail)

QC SUMMARY REPORT
FOR
BAKER ENVIRONMENTAL, INC.

PROJECT #: Yorktown Naval Weapons Station

D.O. #: 19195-62-SVZ

MATRIX : SOIL

<u>Sample ID.</u>	<u>Laboratory ID.</u>	<u>Analysis Requested</u>
710-MW3-08	9306-00085 1	TPH by GC 8015/5030
710-MW3-05	9306-00085 2	Volatiles 8240
710-MW3-10	9306-00085 3	TPH by GC 8015/5030
710-MW3-10-11-12	9306-00085 4	ASTM D422/Grain
710-MW6-07	9306-00085 5	TPH by GC 8015/5030
710-MW6-09	9306-00085 6	TPH by GC 8015/5030
710-MW4-07	9306-00085 7	TPH by GC 8015/5030
710-MW4-08	9306-00085 8	TPH by GC 8015/5030

Microbac Mid-Atlantic

QUALITY CONTROL CHECKLIST
8015M/5030 - TPH BY GC

Date Analyzed: 07/02/93

Sample Batch: 9306-00085 Sample 1, 3, 5, 6, 7, 8

Matrix: SOIL

Batch Analysis

		PASS	FAIL
I.	Method Blank	X	
II.	Outside Reference	X	
III.	Matrix Spike	X	
IV.	Matrix Spike Duplicate	X	

	<u>MS</u>	<u>MSD</u>	<u>SAMPLE</u>	<u>RPD</u>	<u>REFERENCE %REC</u>	<u>LIMITS %REC</u>
Diesel						
Gasoline	92	84	9306-00085 3	8.4	91	50-100
Kerosene						
Mineral Spirits						
Motor Oil						

Sample Analysis

<u>Laboratory I.D.</u>	<u>**H.T.</u>	<u>**I.S.</u>	<u>%Recovery Surrogate</u>
	<u>i/o</u>	<u>p/f</u>	<u>71-127</u>
9306-00085 1	i	p	N/A
9306-00085 3	i	p	N/A
9306-00085 5	i	p	N/A
9306-00085 6	i	p	N/A
9306-00085 7	i	p	N/A
9306-00085 8	i	p	N/A

**H.T.(Holding Time) - in or out

**I.S. - (Internal Standard) - pass or fail

Microbac Mid-Atlantic

QUALITY CONTROL CHECKLIST
8240-Volatile GC/MS Analysis

Date Analyzed: 07/01/93

Sample Batch: 9306-00085 Sample 2

Matrix: SOIL

Batch Analysis

	PASS	FAIL
I. Mass Spec Tuning Criteria	X	
II. Initial/Continuing Calibration	X	
III. Method Blank	X	
IV. Outside Reference	X	
V. Matrix Spike/Matrix Spike Duplicate	X	

	<u>MS</u>	<u>MSD</u>	<u>RPD</u>	<u>LIMITS</u>	
				<u>%REC</u>	<u>%RPD</u>
1,1-Dichloroethene	87	92	5	61-145	14
Trichloroethene	102	104	2	71-120	14
Benzene	88	89	1	76-127	11
Toluene	114	109	5	76-125	13
Chlorobenzene	95	90	5	75-130	13

Sample Analysis

<u>Laboratory I.D.</u>	<u>H.T.</u>	<u>I.S.</u>	<u>1st</u>	<u>2nd</u>	<u>3rd</u>
	<u>i/o</u>	<u>p/f</u>	<u>Surrogate</u>	<u>Surrogate</u>	<u>Surrogate</u>
			70-121	81-117	74-121
9306-00085 2	i	p	85	105	85

H.T. - Holding Time (in/out)

I.S. - Internal Standard (pass/fail)

QC SUMMARY REPORT
FOR

BAKER ENVIRONMENTAL, INC.

PROJECT #: Yorktown Naval Weapons Station

D.O. #: 19195-62-SVZ

MATRIX : GROUNDWATER

<u>Sample ID.</u>	<u>Laboratory ID.</u>	<u>Analysis Requested</u>
710-W-MW3	9307-00001 1	Lead 7421
	9307-00001 2	TPH 418.1
	9307-00001 3	Volatiles 8240
	9307-00001 4	Semivolatiles 8270
710-W-MW1	9307-00001 5	Lead 7421
	9307-00001 6	TPH 418.1
	9307-00001 7	Volatiles 8240
	9307-00001 8	Semivolatiles 8270
710-W-MW6	9307-00001 9	TPH 418.1
	9307-00001 10	Lead 7421
710-W-MW2	9307-00001 11	TPH 418.1
	9307-00001 12	Lead 7421
	9307-00001 13	Volatiles 8240
	9307-00001 14	Semivolatiles 8270
710-Trip 1	9307-00001 15	TPH 418.1
710-W-MW5	9307-00001 16	TPH 418.1
	9307-00001 17	Lead 7421

Microbac Mid-Atlantic

QUALITY CONTROL CHECKLIST

Matrix: Groundwater

Sample Batch: 9307-00001 Sample 1, 5, 10, 12, and 17

Batch Analysis

<u>ANALYSIS</u>	<u>DATE PREPARED</u>	<u>DATE ANALYZED</u>	<u>METHOD</u>	<u>METHOD BLANK</u>	<u>%RECOVERY AUDIT</u>	<u>%MATRIX SPIKES</u>	<u>RPD</u>
Lead	07/06/93	07/08/93	7421	<0.001	104	99.8	9.4

Microbac Mid-Atlantic

QUALITY CONTROL CHECKLIST

Matrix: Groundwater

Sample Batch: 9307-00001 Sample 2, 6, 9, 11, 15, and 16

Batch Analysis

<u>ANALYSIS</u>	<u>DATE PREPARED</u>	<u>DATE ANALYZED</u>	<u>METHOD</u>	<u>METHOD BLANK</u>	<u>%RECOVERY AUDIT</u>	<u>%MATRIX SPIKES</u>	<u>RPD</u>
TPH	07/07/93	07/07/93	418.1	<1	N/A	N/A	N/A

Microbac Mid-Atlantic

QUALITY CONTROL CHECKLIST
8240-Volatile GC/MS Analysis

Date Analyzed: 07/06/93

Sample Batch: 9307-00001 Sample 3, 7, and 13

Matrix: GROUNDWATER

Batch Analysis

	PASS	FAIL
I. Mass Spec Tuning Criteria	X	
II. Initial/Continuing Calibration	X	
III. Method Blank	X	
IV. Outside Reference	X	
V. Matrix Spike/Matrix Spike Duplicate	X	

	MS	MSD	RPD	LIMITS	
				%REC	%RPD
1,1-Dichloroethene	98	92	6	61-145	14
Trichloroethene	113	112	1	71-120	14
Benzene	98	102	4	76-127	11
Toluene	119	124	4	76-125	13
Chlorobenzene	108	111	3	75-130	13

Sample Analysis

Laboratory I.D.	H.T. I.S.		1st	2nd	3rd
	i/o	p/f	Surrogate	Surrogate	Surrogate
			70-121	81-117	74-121
9307-00001 3	i	p	101	105	94
9307-00001 7	i	p	101	110	91
9307-00001 13	i	p	100	107	87

H.T. - Holding Time (in/out)

I.S. - Internal Standard (pass/fail)

Microbac Mid-Atlantic

QUALITY CONTROL CHECKLIST
8270-Semivolatile GC/MS Analysis

Date Analyzed: 07/06/93

Sample Batch: 9307-00001 Sample 4, 8, and 14

Matrix: Groundwater

Batch Analysis

	PASS	FAIL
I. Mass Spec Tuning Criteria	X	
II. Initial/Continuing Calibration	X	
III. Method Blank	X	
IV. Outside Reference	X	
V. Matrix Spike/Matrix Spike Duplicate	X	

	MS	MSD	RPD	LIMITS	
				%REC	%RPD
Phenol	21	21	0	12-89	42
2-Chlorophenol	49	47	4	27-123	40
1,4 Dichlorobenzene	50	54	8	36-97	28
N-Nitroso-di-n-propene	55	51	8	41-116	38
1,2,4-Trichlorobenzene	54	59	9	39-98	28
4-Chloro-3-methylphenol	55	54	2	23-97	42
Acenaphthene	61	63	3	46-118	31
4-Nitrophenol	18	21	15	10-80	50
2,4-Dinitrotoluene	57	55	4	24-96	38
Pentachlorophenol	74	92	22	9-103	50
Pyrene	54	56	4	26-127	31

Sample Analysis

Laboratory I.D.	H.T.	I.S.	1st	2nd	3rd	4th	5th	6th	
			Surrogate	Surrogate	Surrogate	Surrogate	Surrogate	Surrogate	
	i/o	p/f	21-100	10-94	35-114	43-110	10-120	33-141	
9307-00001	4	i	p	39	24	62	86	71	76
9307-00001	8	i	p	38	23	70	88	79	72
9307-00001	14	i	p	40	25	69	91	74	76

H.T. - Holding Time (In or Out)

I.S. - Internal Standard (Pass or Fail)

Microbac Mid-Atlantic

QC SUMMARY REPORT
FOR

BAKER ENVIRONMENTAL, INC.

PROJECT #: Yorktown Naval Weapons Station

D.O. #: 19195-62-SVZ

MATRIX : GROUNDWATER

<u>Sample ID.</u>	<u>Laboratory ID.</u>	<u>Analysis Requested</u>
710-MW1-1-2 (Soil)	9307-00002 1	ASTM D422/Grain
710-ER-1	9307-00002 2	TPH 418.1
710-ER-2	9307-00002 3	Volatiles 8240
710-ER-3	9307-00002 4	Lead 7421
710-ER-4	9307-00002 5	Semivolatiles 8270
710-W-MW7	9307-00002 6	TPH 418.1
710-W-MW7	9307-00002 7	Lead 7421
710-W-MW4	9307-00002 8	TPH 418.1
710-W-MW4	9307-00002 9	Lead 7421
710-W-MW4	9307-00002 10	Volatiles 8240
710-W-MW4	9307-00002 11	Semivolatiles 8270
710-Trip 2	9307-00002 12	Volatiles 8240
710-W-MW2A	9307-00002 13	TPH 418.1
710-W-MW2A	9307-00002 14	Lead 7421
710-W-MW4A	9307-00002 15	Semivolatiles 8270

Microbac Mid-Atlantic

QUALITY CONTROL CHECKLIST

Matrix: Groundwater

Sample Batch: 9307-00002 Sample 2, 6, 8, and 13

Batch Analysis

<u>ANALYSIS</u>	<u>DATE PREPARED</u>	<u>DATE ANALYZED</u>	<u>METHOD</u>	<u>METHOD BLANK</u>	<u>%RECOVERY AUDIT</u>	<u>%MATRIX SPIKES</u>	<u>RPD</u>
TPH	07/07/93	07/07/93	418.1	<1	N/A	N/A	N/A

Microbac Mid-Atlantic

QUALITY CONTROL CHECKLIST

Matrix: Groundwater

Sample Batch: 9307-00002 Sample 4, 7, 9, and 14

Batch Analysis

<u>ANALYSIS</u>	<u>DATE PREPARED</u>	<u>DATE ANALYZED</u>	<u>METHOD</u>	<u>METHOD BLANK</u>	<u>%RECOVERY AUDIT</u>	<u>%MATRIX SPIKES</u>	<u>RPD</u>
Lead	07/06/93	07/08/93	7421	<0.001	104	99.8	9.4

Microbac Mid-Atlantic

QUALITY CONTROL CHECKLIST
8240-Volatile GC/MS Analysis

Date Analyzed: 07/06/93

Sample Batch: 9307-00002 Sample 3, 10, and 12

Matrix: GROUNDWATER

Batch Analysis

	PASS	FAIL
I. Mass Spec Tuning Criteria	X	
II. Initial/Continuing Calibration	X	
III. Method Blank	X	
IV. Outside Reference	X	
V. Matrix Spike/Matrix Spike Duplicate	X	

	MS	MSD	RPD	LIMITS	
				%REC	%RPD
1,1-Dichloroethene	98	92	6	61-145	14
Trichloroethene	113	112	1	71-120	14
Benzene	98	102	4	76-127	11
Toluene	119	124	4	76-125	13
Chlorobenzene	108	111	3	75-130	13

Sample Analysis

Laboratory I.D.	H.T.	I.S.	1st Surrogate	2nd Surrogate	3rd Surrogate
	i/o	p/f	70-121	81-117	74-121
9307-00002 3	i	p	103	102	91
9307-00002 10	i	p	103	109	91
9307-00002 12	i	p	101	104	87

H.T. - Holding Time (in/out)

I.S. - Internal Standard (pass/fail)

Microbac Mid-Atlantic

QUALITY CONTROL CHECKLIST
8270-Semivolatile GC/MS Analysis

Date Analyzed: 07/06/93

Sample Batch: 9307-00002 Sample 5, 11, and 15

Matrix: Groundwater

Batch Analysis

	PASS	FAIL
I. Mass Spec Tuning Criteria	X	
II. Initial/Continuing Calibration	X	
III. Method Blank	X	
IV. Outside Reference	X	
V. Matrix Spike/Matrix Spike Duplicate	X	

	MS	MSD	RPD	LIMITS	
				%REC	%RPD
Phenol	21	21	0	12-89	42
2-Chlorophenol	49	47	4	27-123	40
1,4 Dichlorobenzene	50	54	8	36-97	28
N-Nitroso-di-n-propene	55	51	8	41-116	38
1,2,4-Trichlorobenzene	54	59	9	39-98	28
4-Chloro-3-methylphenol	55	54	2	23-97	42
Acenaphthene	61	63	3	46-118	31
4-Nitrophenol	18	21	15	10-80	50
2,4-Dinitrotoluene	57	55	4	24-96	38
Pentachlorophenol	74	92	22	9-103	50
Pyrene	54	56	4	26-127	31

Sample Analysis

Laboratory I.D.	H.T.	I.S.	1st	2nd	3rd	4th	5th	6th
			Surrogate	Surrogate	Surrogate	Surrogate	Surrogate	Surrogate
	i/o	p/f	21-100	10-94	35-114	43-110	10-120	33-141
9307-00002 5	i	p	31	19	72	91	70	80
9307-00002 11	i	p	28	17	63	90	56	68
9307-00002 15	i	p	35	21	62	83	69	71

H.T. - Holding Time (In or Out)

I.S. - Internal Standard (Pass or Fail)

ABBREVIATIONS

< - less than. The number following this sign is the minimum detection limit obtained using the method and instrumentation.

> - greater than. The number following this sign was the highest detectable limit using the method and instrumentation.

% - percent. Parts per hundred. Expressed as either w/v (weight per volume) or w/w (weight per weight).

AA - Atomic Absorption

BNA - Base Neutral and Acid Extractables

BOD - Biochemical Oxygen Demand

BTEX - Benzene, Toluene, Ethylbenzene, Xylenes

C - Degrees of temperature/ Celcius.

COD - Chemical Oxygen Demand

EOX - Extractable Organic Halides (solids)

EP TOX - EP Toxicity

F - Degrees of temperature/ Fahrenheit.

g - gram. Weight measurement used in the metric system.

GC - Gas Chromatography

GC/MS - Gas Chromatography/Mass Spectrometry

ICP - Inductively Coupled Plasma

IPE - Isopropyl Ether

IR - Infrared

kg - kilogram. Weight measurement used in the metric system. 1000 grams equals one kilogram.

l - liter. Volume measurement in the metric system. 1000 milliliters equals one liter.

MBAS - Methylene Blue Activated Substances

MF - membrane filtration. Analytical method used in bacteriological testing resulting in counting colonies.

mg - milligram. Weight measurement used in the metric system. 1000 milligrams equals one gram.

mg/kg - milligram per kilogram. Parts per million in solid samples.

mg/l - milligram per liter. Parts per million in aqueous solutions.

ml - milliliter. Volume measurement used in the metric system. 1000 milliliters equals one liter.

MPN - most probable number. Analytical method used in bacteriological testing resulting in bacteria counts derived from multiple dilutions.

MS - Matrix Spike

MSD - Matrix Spike Duplicate

MTBE - Methyl tertiary butyl ether

NPDES - National Pollution Discharge Elimination System

NTU - Nephelometric Turbidity Units. Units of turbidity as outlined in the method.

PCB - Polychlorinated Biphenyls

ppb - parts per billion.

ppm - parts per million.

QA - Quality Assurance

QC - Quality Control

RCRA - Resource Conservation Recovery Act

RPD - Relative Percent Difference

SDWA - Standard Drinking Water Act

TCLP - Toxicity Characteristic Leaching Procedure

TDS - Total Dissolved Solids

THM - Trihalomethane

TKN - Total Kjeldahl Nitrogen

TOC - Total Organic Carbon

TOX - Total Organic Halides (or Halogens)

TPH - Total Petroleum Hydrocarbons

TS - Total Solids

TSS - Total Suspended Solids

ug - micrograms. 1000 micrograms equal one milligram.

ug/g - micrograms per gram.

ug/kg - micrograms per kilogram. Parts per billion in solid samples.

ul - microliter. 1000 microliters equals one milliliter.

UST - Underground Storage Tanks

VOC - Volatile Organic Compounds

ZHE - Zero Headspace Extraction