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UNIGLASS INDUSTRIES SITE  
STATESVILLE, NORTH CAROLINA  
FILE NUMBER: 89-5283-2  
REPORT NUMBER: 1407

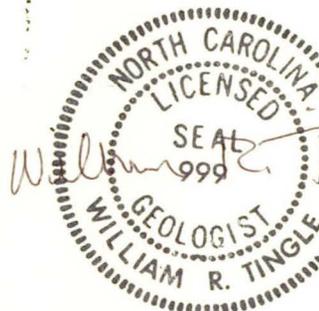
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DIVISION OF TRANSPORTATION & AERIAL  
MOBILITY REGIONAL OFFICE

JUN 26 1989

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June 22, 1989

Ms. Barbara S. Christian, P.G.  
State of North Carolina  
Department of Natural Resources and  
Community Development  
919 North Main Street  
Mooresville, North Carolina 28115

Reference: Uniglass Industries Site  
Statesville, North Carolina  
File Number: 89-5283-2  
Report Number: 1407

Dear Ms. Christian:

Transmitted with this letter is the result of our investigation of the three study sites at the former Uniglass Industries Plant in Statesville, North Carolina. This investigation implemented the recommendations of the preliminary contamination assessment of this site. In it we have assessed the extent of soil and groundwater contamination due to the four 30,000-gallon underground storage tanks and the one 10,000-gallon underground storage tank at this site. We have also investigated potential impacts of the landfill on nearby surface waters.

We trust that our report of investigations will meet with your approval, and we look forward to receiving your comments. Upon receipt of your comments, we are prepared to begin work on the remedial action plan.

Respectfully submitted,

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## 1.0 INTRODUCTION

### 1.1 OBJECTIVES

This report presents the results of the contamination assessment conducted by Universal Engineering Sciences (UES) for Springs Industries at the former Uniglass Plant located in Statesville, North Carolina. Currently, the facility is operating under the new name of Clark Schwebel Fiberglass Corporation.

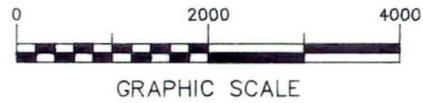
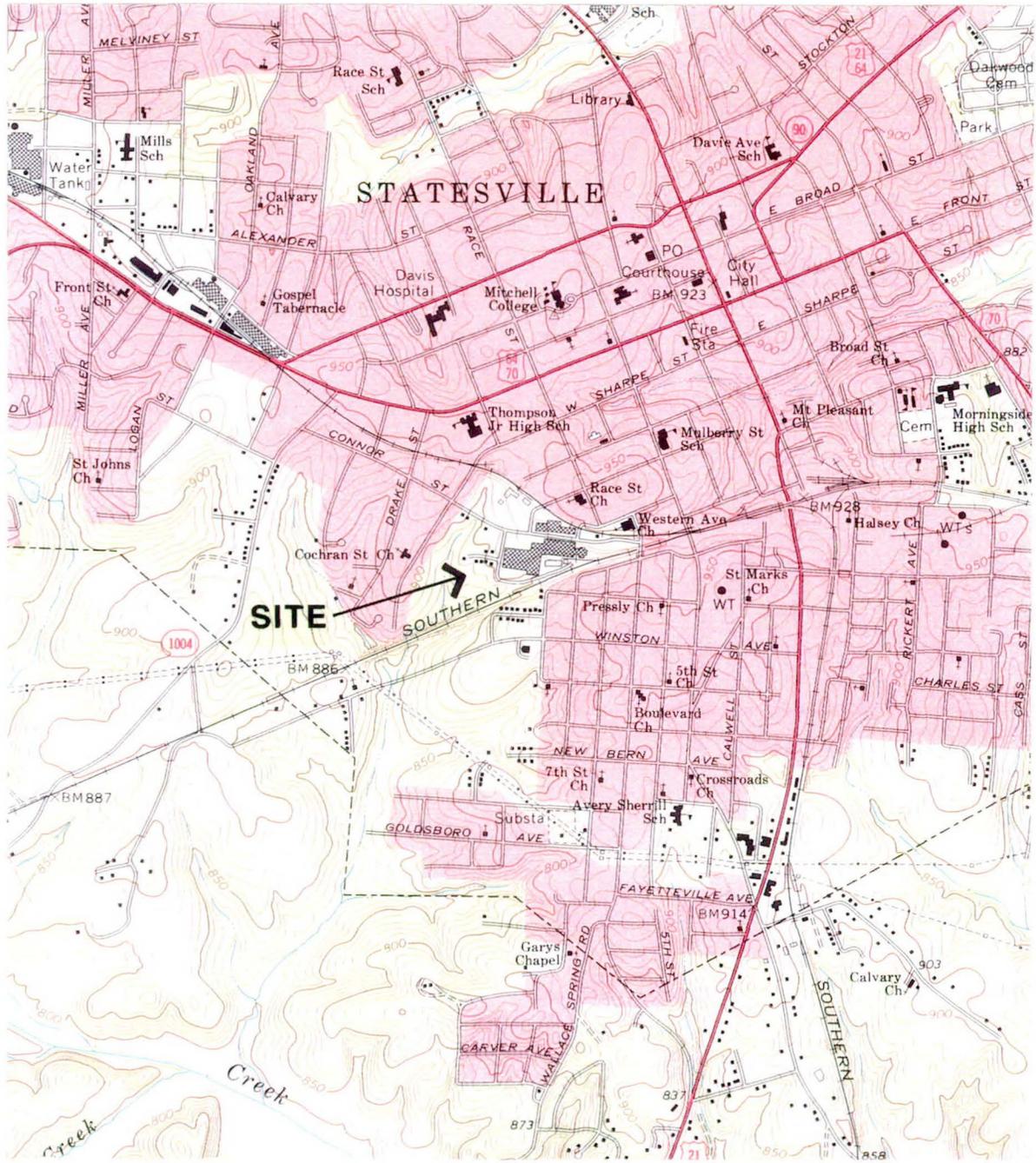
The Contamination Assessment Report (CAR) presented herein represents an extended investigation, based on the results of a preliminary site investigation, performed by Dames and Moore in August 1988. The objectives of this study were to define the areal and vertical extent of the soil/groundwater contamination at three separate locations within the plant boundaries, confirm sources of contamination, and to provide recommendations for additional information necessary to design a Remedial Action Plan in accordance with guidelines of the North Carolina Department of Natural Resources and Community Development (NCDNRCD).

## 2.0 BACKGROUND

### 2.1 SITE LOCATION AND DESCRIPTION

The former Uniglass Industries Plant is located in southwest Statesville north and south of Conner Street at the convergence of Southern and Alexander Railroads. The site location on a USGS topographic map is shown in Figure 2-1. The approximate site location coordinates are 35°46'30" N latitude and 80°53'15" W longitude. The total site area encompasses approximately 25 acres; however, the investigation was focused on plant property located south of Conner Street.





SOURCE: U.S.G.S. QUADRANGLE MAP - STATESVILLE WEST, N.C., DATED 1969

FIGURE 2-1 - U.S.G.S. SITE LOCATION MAP

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Topography at the site dips south to southwest ranging in elevation from approximately 940 feet msl in the northeast corner to 870 feet msl in the southwest corner of the site. Generally, surface topography dips towards a creek located west of the site.

The plant produces woven fiberglass products and has been in operation for many years.

The potential sources of contamination identified during the preliminary investigation include the following sources:

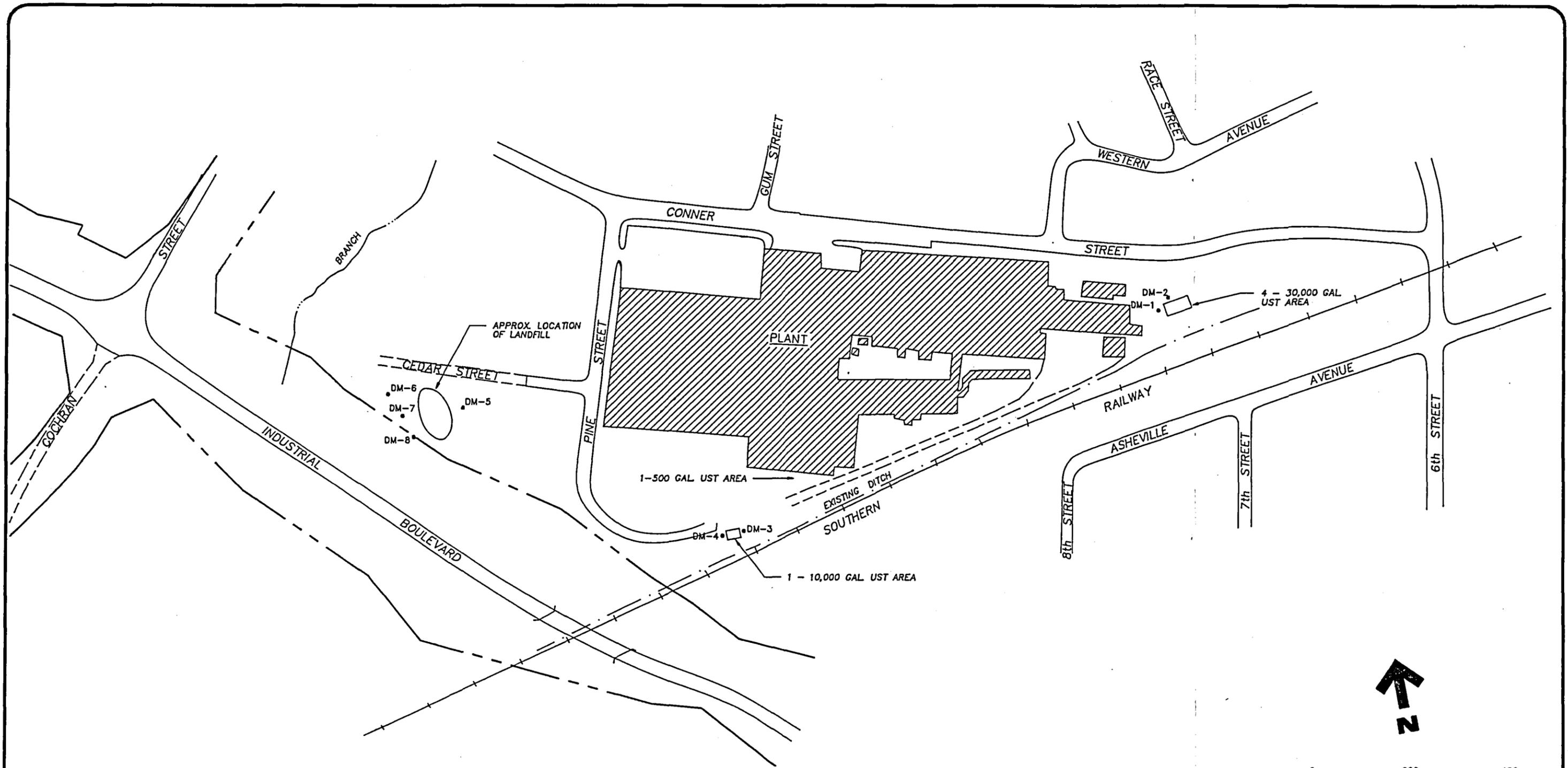
1. Four 30,000-gallon underground storage tanks (USTs) used to store diesel fuel, located in the upper parking lot.
2. One 10,000-gallon UST used for diesel storage, located in the loading dock area in the southwest portion of the site.
3. One 500-gallon UST gasoline tank located underneath the building in the southern portion of the site.
4. A plant landfill located along the western property boundary.

The location of each potential source are shown on the site plan in Figure 2-2.

## 2.2 PCAR SCOPE AND RESULTS

The field investigation during the Preliminary Contamination Assessment Report (PCAR) consisted of a total of eight Standard Penetration Test borings and the installation of seven monitor wells. Two monitor wells were installed at the 10,000-gallon UST, one monitor well was installed at the four 30,000-gallon USTs, and four wells were installed to monitor the landfill. These boring/monitor well locations are illustrated on Figure 2-2. The monitor well schedules, details, and boring log information are summarized in subsequent sections of this report.





NOTE: BORING ONLY PERFORMED AT DM-2 - MONITOR WELL NOT INSTALLED

SOURCE: "WELL LOCATIONS FOR SPRINGS INDUSTRIES" BY GERALD V. GRANT & ASSOCIATES, STATESVILLE, NC (DRAWING NO. 89044)

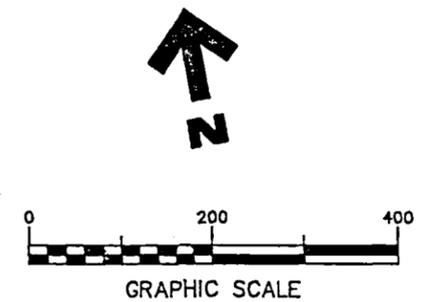


FIGURE 2-2 - POTENTIAL CONTAMINANT SOURCES / PCAR BORING AND WELL LOCATIONS

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The soil samples from the borings near the USTs were visually examined for fuel product, and groundwater from the wells analyzed for Purgeable Aromatic Hydrocarbons using EPA Method 602. The PCAR report states that free product was observed at DM-2 in the soil sample from a depth of 13.5 to 15.0 feet. Free product was also observed during water sample collection in monitor well DM-1. Both locations are at the four 30,000-gallon UST site at the upper parking lot.

No visible product was reported from borings DM-3 and DM-4 located adjacent to the 10,000-gallon UST. As mentioned previously, monitor wells DM-1, DM-3 and DM-4 were sampled and analyzed for EPA Method 602. Table 2-1 summarizes the detected analytes from the laboratory analyses.

Monitor wells DM-5, DM-6, DM-7 and DM-8 located at the landfill were analyzed for:

- Volatile Organic Compounds (EPA Method 624)
- Base, Neutral/Acid Extractable (EPA Method 625)
- Metals (EPA Method 200.7)
- Ammonia (EPA Method 350.2)
- Arsenic (EPA Method 206.2)
- Total Phenolics (EPA Method 420.2)

A summary of the detected analytes from these analyses are presented in Table 2-1. The results from the initial sampling effort, including the laboratory reports, are presented in Appendix C of the PCAR.



TABLE 2-1

**SUMMARY OF PCAR GROUNDWATER ANALYSIS  
 UNIGLASS INDUSTRIES, STATESVILLE, NORTH CAROLINA**

<u>Well No.</u>	<u>Parameter</u>	<u>Concentration (ug/L)*</u>
DM-1	Ethylbenzene	17
	m-xylene	26
	o-xylene	16
DM-3	Toluene	1.1
	Ethylbenzene	0.56
DM-4	Toluene	1.8
	M-xylene	4.1
DM-5	Toluene	8
	bis (2-ethylhexyl) phthalate	14
	Phenolics	223.42
	Zinc	86
	Beryllium	2
DM-6	bis (2-ethylhexyl) phthalate	4
	Phenolics	497.72
	Zinc	52
	Beryllium	2
	Cadmium	4
	Copper	10
	Nickel	20
	Ammonia, as Nitrogen	30
DM-7	bis (2-ethylhexyl) phthalate	6
	Phenolics	153.85
	Zinc	230
	Beryllium	5
	Cadmium	6
	Chromium	15
	Copper	20
	Ammonia, as Nitrogen	50
DM-8	n-nitrosodiphenylamine	3
	Phenolics	164.41
	Zinc	210
	Beryllium	9
	Cadmium	5
	Chromium	14
	Copper	10
Ammonia, as Nitrogen	30	
Method Blank	n-nitrosodiphenylamine	2

\* Monitor wells sampled on July 20 and 21, 1988.



The groundwater analyses for DM-1, DM-3 and DM-4 detected trace concentrations of VOAs in the groundwater.

In addition, the PCAR results suggested elevated metal concentrations in DM-6, DM-7, and DM-8 with respect to the upgradient well DM-5. However, detected metal concentrations could be indicators of natural background concentrations. The metals detected were compared to NCAD Title 15 groundwater quality standards for GA waters and detected concentrations for cadmium and chromium were below the allowable limits. There were no groundwater standards for the other detected metals.

Total recoverable phenolics were detected (153.85 to 497.72 ug/l) at all monitor well locations surrounding the landfill; the highest concentration was measured in sample DM-6.

It should be noted that the GA groundwater standard for phenol ( $C_6H_5OH$ ) is 1.0 ug/l. Phenol ( $C_6H_5OH$ ) is a priority pollutant phenolic tested for in EPA 625 acid extractables. None of the EPA 625 priority pollutant phenolics (including phenol) were detected in groundwater at the landfill. Therefore, the total phenolics detected would not represent an exceedance of the NCAD Title 15 groundwater standards for GA waters. Phenolics are a broad class of organic compounds some of which result from the microbial decay of organic matter.

The bis (2-ethylhexyl) phthalate (B2EHP), identified in DM-5, DM-6 and DM-7 and n-nitrosodiphenylamine (NDPA) found in DM-8 were assumed to be laboratory artifacts since B2EHP is a common analytical artifact and NDPA was detected in the method blank.

In summary, the results of the PCAR indicate a release of petroleum in the vicinity of the four 30,000-gallon USTs and the one 10,000-gallon UST. A tank tightness test conducted on the 500-gallon gasoline tank indicated that the tank was not leaking; therefore, no additional work at the 500-gallon tank was required.



The groundwater effects of the landfill appear to be minor. As a precaution, it was decided to check the surface water quality of the nearby stream.

### 3.0 FIELD INVESTIGATION

Based on the results of the PCAR, the field investigation for the full scale Contamination Assessment Report (CAR) was designed to assess the horizontal and vertical lithologic variations across the site, and to estimate the horizontal and vertical extent of groundwater and soils contamination.

#### 3.1 EQUIPMENT CLEANING PROCEDURES

All equipment used during drilling and soil sampling was cleaned prior to each use to assure that no cross-contamination of monitor wells or samples occurred due to drilling or to sampling procedures.

A high pressure steam cleaner was used to clean the drill rig and equipment, including all augers, spoons, and tools prior to drilling each new borehole.

In addition, split spoons were cleaned after each sampling event using the following protocol:

- Alconox soap and water wash
- Water rinse
- Isopropanol alcohol rinse
- Organic-free deionized water rinse

This method was also used to decontaminate the bailer during sampling activities.



### 3.2 STANDARD PENETRATION TEST

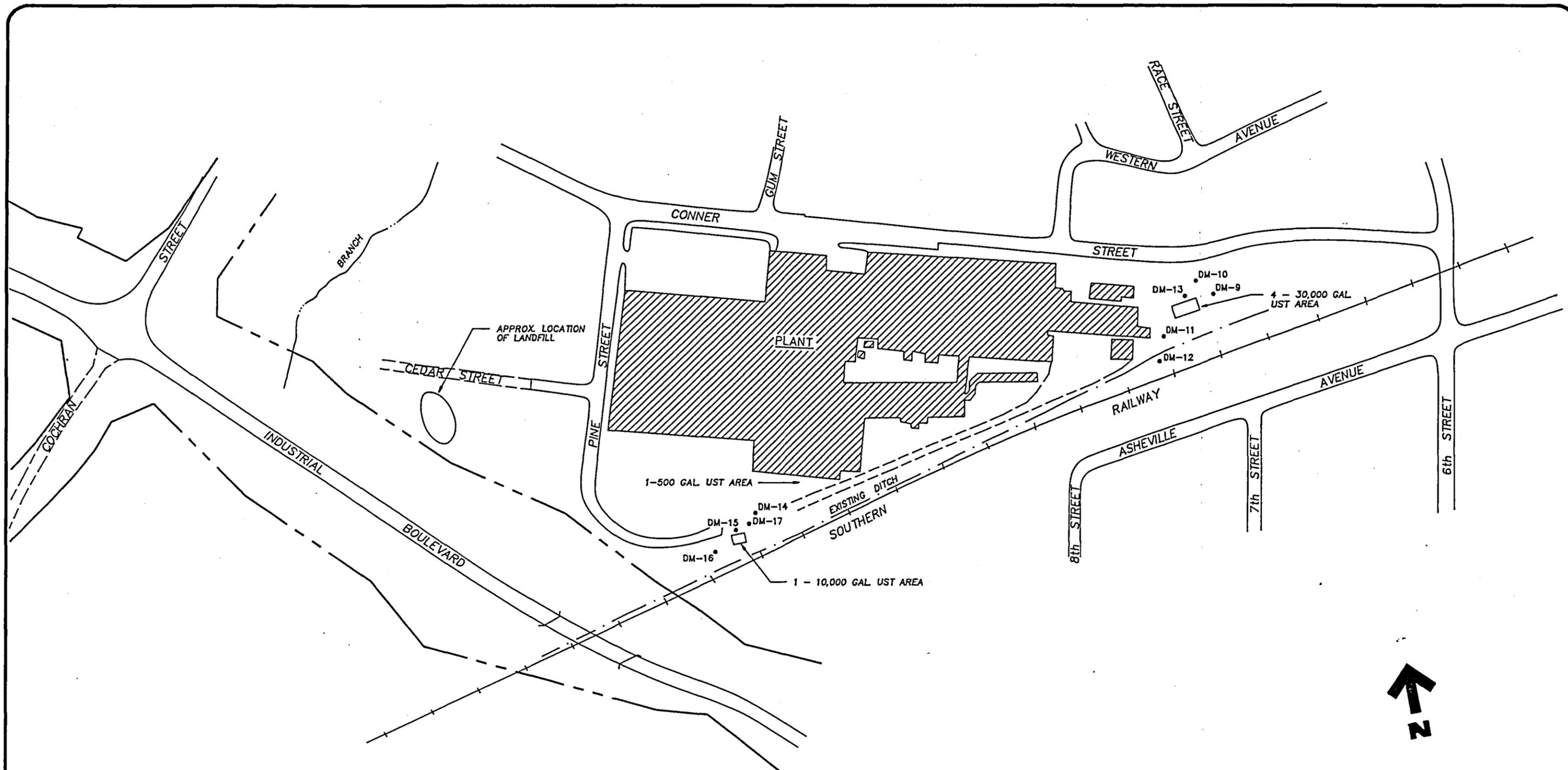
The Standard Penetration Test borings ranged in depth from 35 feet at boring location B-13, to 15 feet below grade at other locations. The location of each boring is illustrated on Figure 3-1. The strategic placement of each boring provides soils information within the tank area as well as upgradient and down-gradient from the contamination source. The placement rationale and the results of these tests will be addressed in later sections of this report. Each boring was sampled continuously to a depth of 10 feet, and every 5 feet thereafter. Lithologic changes occurring within the 5-foot intervals were noted by the geologist and recorded on the field logs.

The procedure for the Standard Penetration Test complies with the procedures in ASTM D-1586; however, continuous sampling is used to detect slight variations in the soil profile at shallow depths. The basic procedure for the Standard Penetration Test is as follows: A standard split-barrel sampler is driven into the soil by a 140-pound hammer falling 30 inches. The number of blows required to drive the sampler 1 foot, after seating 6 inches, is designated the penetration resistance, or N-value; this value is an index to soil strength and density.

### 3.3 MONITOR WELL INSTALLATION

In total, nine new 2-inch diameter monitor wells were installed at the site. The monitor well locations are shown on Figure 3-1. The following monitor well installation procedure was used: After the SPT boring was completed, each boring was redrilled to depth using a 2-1/4 inch I.D. hollow stem auger. Once the augers were advanced to depth, they are removed from the borehole. Due to the cohesiveness of the soils, the auger could be removed and the 2-inch diameter Trilock PVC well screen, and annular backfill riser pipe, could be installed directly into the borehole. The monitor well depths ranged between 15 feet and 35 feet below grade, depending on the depth of the water table. Table 3-1 summarizes the drilled depth and screened interval of the wells.





SOURCE: "WELL LOCATIONS FOR SPRINGS INDUSTRIES" BY GERALD V. GRANT & ASSOCIATES, STATESVILLE, NC (DRAWING NO. 89044)

FIGURE 3-1 - BORING / MONITOR WELL LOCATIONS



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TABLE 3-1

**MONITOR WELL DEPTHS AND SCREENED INTERVALS  
 UNIGLASS INDUSTRIES, STATESVILLE, NORTH CAROLINA**

<u>Well Numbers</u>	<u>Drilled Depth (ft)</u>	<u>Screened Intervals (ft)</u>
DM-4	13.5	2.5 - 12.5
DM-3, DM-16, DM-17	15.0	5.0 - 15.0
DM-11, DM-12, DM-15	15.0	5.0 - 15.0
DM-6, DM-7, DM-8	15.0	5.0 - 15.0
DM-9, DM-10	30.0	20.0 - 30.0
DM-13	35.0	25.0 - 35.0
DM-1	38.0	24.0 - 34.0

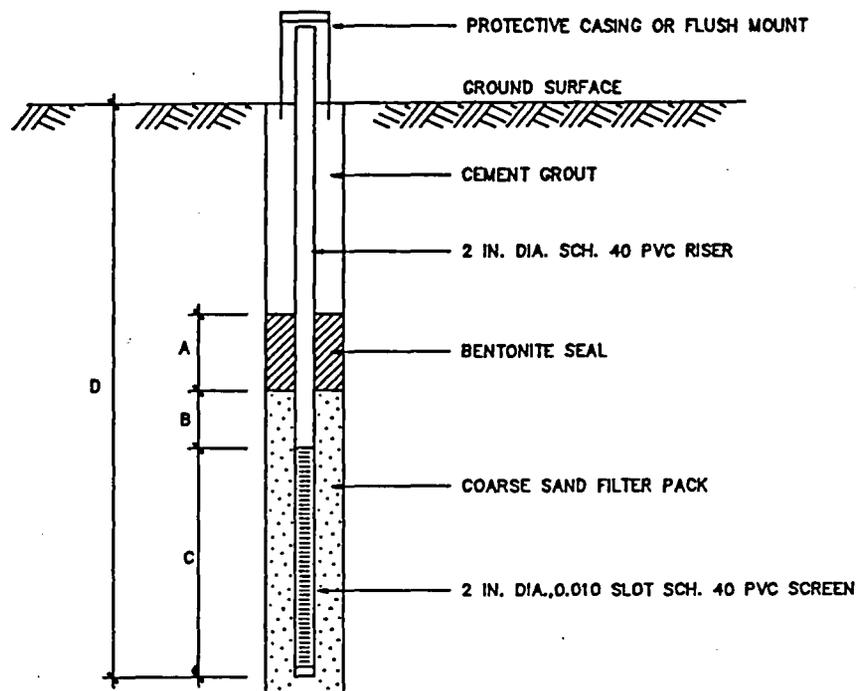
The generalized well detail is as follows: the annular space around the screen was filled with sterilized (20/30) silica sand to a minimum of 2.0 feet above the screened intervals. The depth of the sand was continuously measured with a weighted tape measure. On top of the sand, a 2-foot thick bentonite seal was then placed. The remaining annular space was then grouted with cement to the surface. Each well located in the paved area was installed flush to the ground and provided with a lockable cap and steel well protector cover. The concrete around the cover was slightly raised to enhance runoff around the well cap. Monitor well details are presented in Figure 3-2.

Monitor wells DM-11, DM-12 and DM-16 located outside traffic paths were provided with a 3-inch by 3-inch protective steel casing extending approximately 3 feet above grade. This protective steel casing was anchored approximately 2 feet into the cement grout surrounding the well and is equipped with a lockable cap. All wells were equipped with Master Locks, and the monitor well number was labeled on each casing or well cover.



# MONITOR WELL DETAIL

NOT TO SCALE



## MONITOR WELL SCHEDULE

WELL NO.	TOTAL DEPTH, D (FT)	SCREENED INTERVAL, C (FT)	SAND PACK ABOVE SCREEN, B (FT)	BENTONITE SEAL, A (FT)	AMOUNT BAILED DURING DEVELOPMENT (GAL)
DM-1	34.0	24.0 TO 34.0	1.5	1.5	-----
DM-3	15.0	5.0 TO 15.0	1.0	2.0	-----
DM-4	12.5	2.5 TO 12.5	0.5	1.0	-----
DM-5	27.0	17.0 TO 27.0	2.0	3.0	-----
DM-6	30.0	20.0 TO 30.0	4.0	1.5	-----
DM-7	30.0	20.0 TO 30.0	3.5	3.0	-----
DM-8	30.0	20.0 TO 30.0	4.0	3.0	-----
DM-9	30.0	20.0 TO 30.0	2.5	2.5	4.0
DM-10	30.0	20.0 TO 30.0	2.5	2.5	3.0
DM-11	15.0	5.0 TO 15.0	1.0	2.0	4.0
DM-12	15.0	5.0 TO 15.0	1.0	2.0	5.0
DM-13	35.0	25.0 TO 35.0	2.5	2.0	13.0
DM-14	15.0	5.0 TO 15.0	1.0	2.0	4.5
DM-15	15.0	5.0 TO 15.0	1.0	2.0	5.0
DM-16	15.0	5.0 TO 15.0	1.0	2.0	3.0
DM-17	15.0	5.0 TO 15.0	1.0	2.0	25.0

NOTE: MONITOR WELLS DM-1 THROUGH DM-8 INSTALLED FOR PRELIMINARY CONTAMINATION ASSESSMENT REPORT BY DAMES & MOORE, BETHESDA, MD (DATED AUGUST 22, 1989), THESE WELLS WERE DEVELOPED PRIOR TO SAMPLING

FIGURE 3-2 - MONITOR WELL DETAIL AND SCHEDULE



After installing, each well was developed to establish hydraulic connection with the surrounding aquifer and to remove any potential material introduced during the monitor well installation. A development schedule is presented on Figure 3-2.

#### 4.0 REGIONAL GEOLOGY AND HYDROLOGY

##### 4.1 REGIONAL GEOLOGY

The Statesville area lies within the piedmont province of North Carolina approximately 75 miles east of the Blue Ridge Mountains. The topography is characterized by low, rounded hills and gentle slopes with a thick layer of soil and weathered rock underlying most of the surface.

The area is underlain by a complex series of igneous and metamorphic rocks. These units occur as the mappable rock types on Figure 4-1. Three of these rock types are found near the study site; they include a composite gneiss, hornblende gneiss, and a mica/granite schist unit.

The composite gneiss is the most abundant rock type in the area. It contains chiefly mica (biotite) schist interlayered with granite. In many locations it is in contact with the schist-granite complex, and the differentiation of these two units is sometimes difficult.

Hornblende gneiss occurs near the study area, and it is usually deeply weathered. Large bodies of the hornblende genesis are not common since it usually occurs as beds a few inches to a few feet wide interlayered with other rock.

The last rock type which occurs near the study area is the mica-granit schist. These thinly laminated rocks contain a large amount of mica and show a strong schistose structure. They are usually interlayered with other rock types and occur in general northeast trending belts.



# GEOLOGIC MAP OF IREDELL COUNTY

## EXPLANATION

Triassic Paleozoic or older		Newark group shale and sandstone
		Granite
		Mica schist
		Mica schist and granite schist predominant
		Mica schist and hornblende gneiss schist predominant
		Hornblende gneiss
		Hornblende gneiss and granite gneiss predominant
		Composite gneiss chiefly quartz-biotite gneiss
		Composite gneiss with considerable hornblende gneiss
		Gabbro-diorite and allied basic rocks
		Granite and diorite granite predominant
	Diorite and granite diorite predominant	

Arrangement of units, one above the other, does not indicate chronological sequence. Geologic boundaries are approximate.

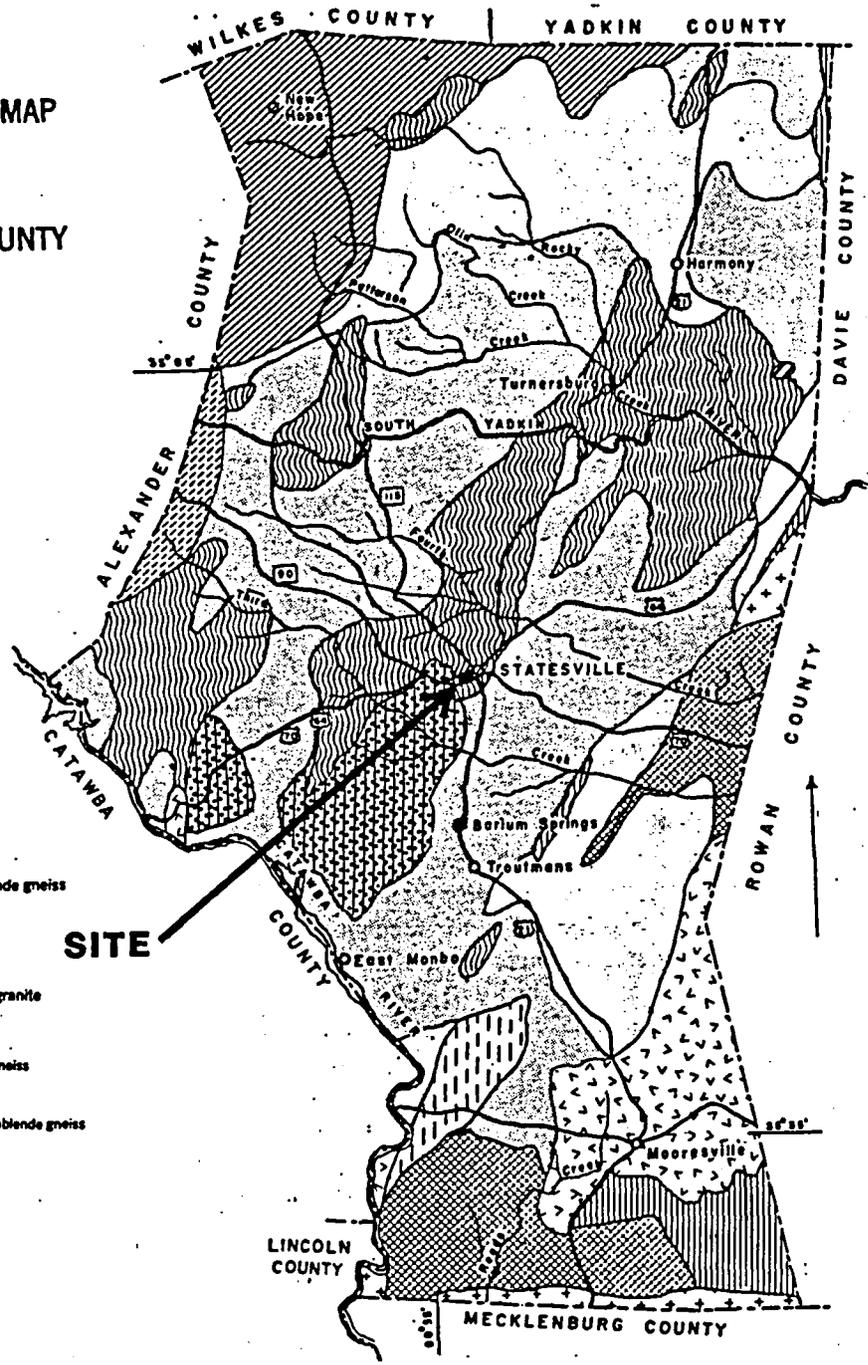


FIGURE 4-1 - REGIONAL GEOLOGY MAP



Detailed geologic investigation and mapping has not taken place in the Statesville area. Therefore, detailed information concerning structure of the rock masses is not published. Most of the rocks do, however, have some structural planes along which water may be transmitted.

Some of these structural planes may be due to faulting and folding; while others have developed along the borders of intrusive rocks. Joints generally trend northeastward and dip steeply. They are prominent in the schists and gneisses and are generally parallel and closely spaced. Veins and dikes commonly penetrate the rocks and are highly jointed, especially along their contact with the host rock.

#### **4.2 REGIONAL HYDROLOGY**

Most of Iredell County is drained by the South Yadkin River which flows eastward through the center of the county. Several tributaries flow generally southeastward to feed the South Yadkin River from the Statesville area. The closest named creek is Third Creek, which is located about 7,000 feet southwest of the study area. Two small headwater streams which feed a tributary to Third Creek are located near the site. The closest channel parallels the rear property line along the Southern Railway tracks and flows to the southwest. It drains an area of approximately 30 acres. The other stream is located about 1,000 feet west of the investigation site and drains an area of about 55 acres while flowing to the south.

No surface water bodies are located within 2,000 feet of the site.

#### **4.3 AQUIFER CLASSIFICATION**

To classify the groundwater at the site, North Carolina Administrative Code, Title 15, Subchapter 2L, Section 0.0200 was referenced. The groundwater classification at the site fits the Class GA waters category where the groundwater presents a potential source of water supply for drinking and other human consumptions without the necessity of treatment, except where necessary



to correct natural conditions. The underground water quality standard for this classification, specifically maximum allowable contaminant levels for toxic and deleterious substances, are outlined in Subsection 0.0202b. For substances not specified in this listing, the standard is the naturally occurring concentration as specified by the Director.

#### 4.4 HYDRAULIC PARAMETERS

To estimate hydraulic parameters of the upper aquifer at the site, a total of two slug-out tests were conducted at DM-13 and DM-10 at the four 30,000-gallon UST area and one slug test at DM-4 at the one 10,000-gallon site. The test was conducted using the OHS DL-50 Data Logger, which provided accurate ( $\pm 0.01$  ft) water table readings at one second intervals.

To perform the test, the monitor well was bailed until a substantial drop in the water table was noticed in the well. The probe was then inserted and the rise of the water was measured. The data are presented in Appendix B.

These data were analyzed using the Bower and Rice method (1976) which calculates the hydraulic conductivity coefficient (K). The hydraulic conductivities calculated by this method were 4.37, 1.22, and 4.03 feet per day (ft/day) for DM-10, DM-13, and DM-4.

All data calculations and graphs are presented in Appendix B.

#### 5.0 SITE HYDROGEOLOGY

The results of the seventeen Standard Penetration Test borings and sixteen monitor wells installed across the site during the PCAR and CAR field activities were used to evaluate the lithologic variations and groundwater flow system at the two UST areas and the landfill.



### 5.1 FOUR 30,000-GALLON UST AREA

A total of seven borings were drilled in this tank area. Borings B-1, B-2 and B-13 were installed adjacent to the tank pad; B-10 and B-9 were installed upgradient; and B-11 and B-12 were installed downgradient from the USTs Figure 3-1. The Log of Borings in Figure 5-1 show that the upper soils in this area consist of silty sand, clayey sand, and clay except in the tank backfill area (B-13) where medium to coarse sand is present. Cross section A-A' (Figure 5-1) illustrates that a 2- to 5-foot layer of silty sand overlies the area investigated, underlain by a clay which grades into a saprolite consisting of clayey and silty sand to a minimum depth of 40 feet below grade at which boring B-1 was terminated. Refer to Appendix A for all the cross section layouts.

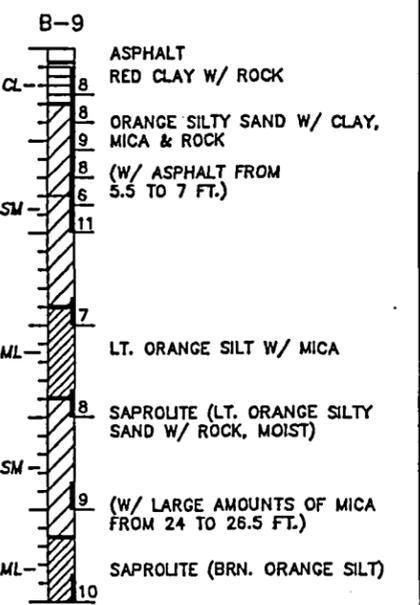
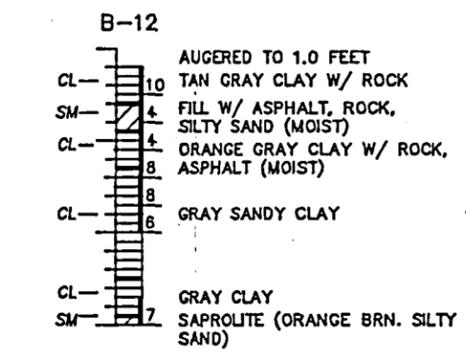
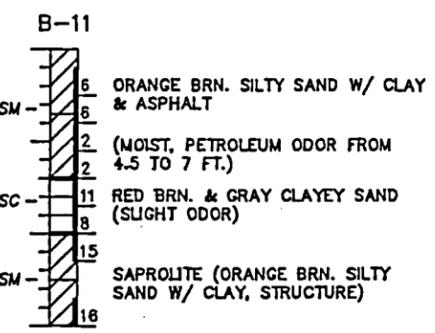
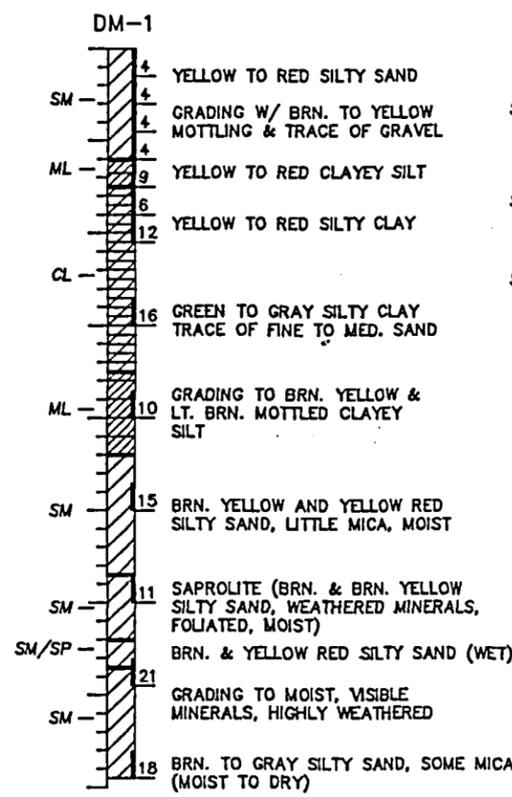
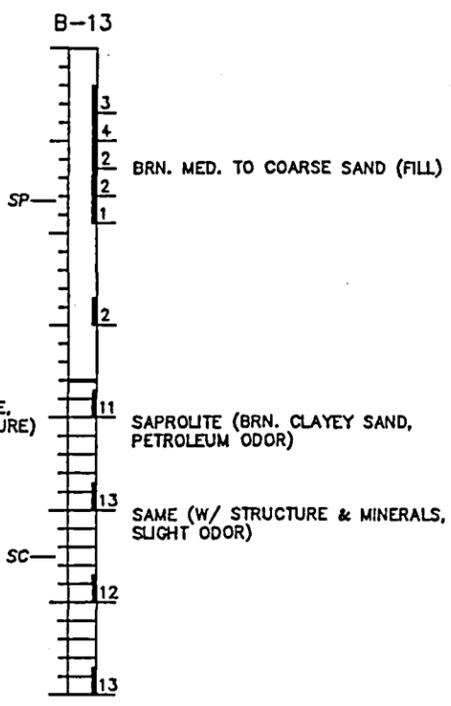
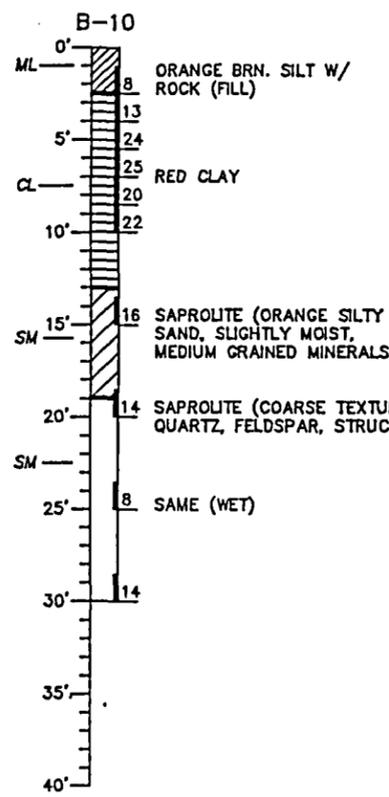
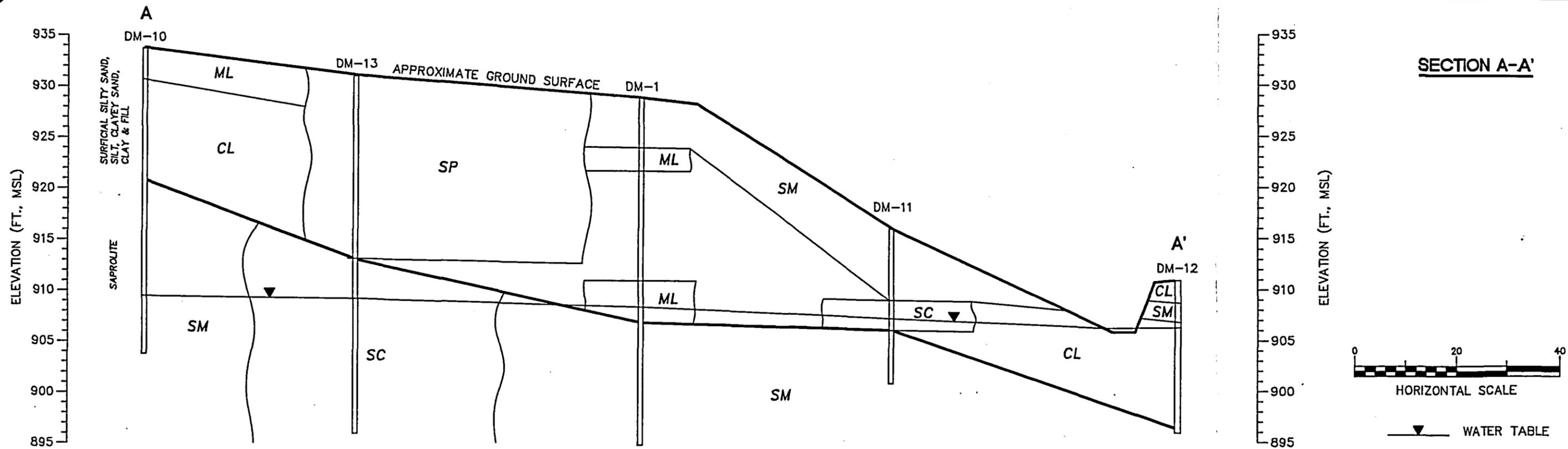
The depth to the water table was measured at each monitor well location and converted to an elevation referenced to mean sea level (feet msl). The water depths measured in monitor wells in this area ranged between 24.00 and 5.13 feet below grade, and the water table elevation varied between 909.63 and 906.06 feet msl. The shallower depths were measured in DM-11 and DM-12 located down slope from the USTs. Topography drops drastically towards the railroad tracks located south of the USTs. Groundwater flow in this area is downslope towards the tracks and downgradient towards the south-southwest.

A Groundwater Contour Map is shown on Figure 5-2. In addition, measured water table depths, top of casing elevations, and calculated groundwater table elevations are tabulated in this Figure.

### 5.2 ONE 10,000-GALLON UST AREA

A total of six borings were drilled in this area, which is located downgradient from the other USTs along the southern property boundary at the loading dock area. Refer to Figure 3-1 for the boring locations. Due to the shallow water table conditions, approximately 6 feet below grade, the borings were advanced to a maximum depth of 15 feet below grade. The boring logs and cross section





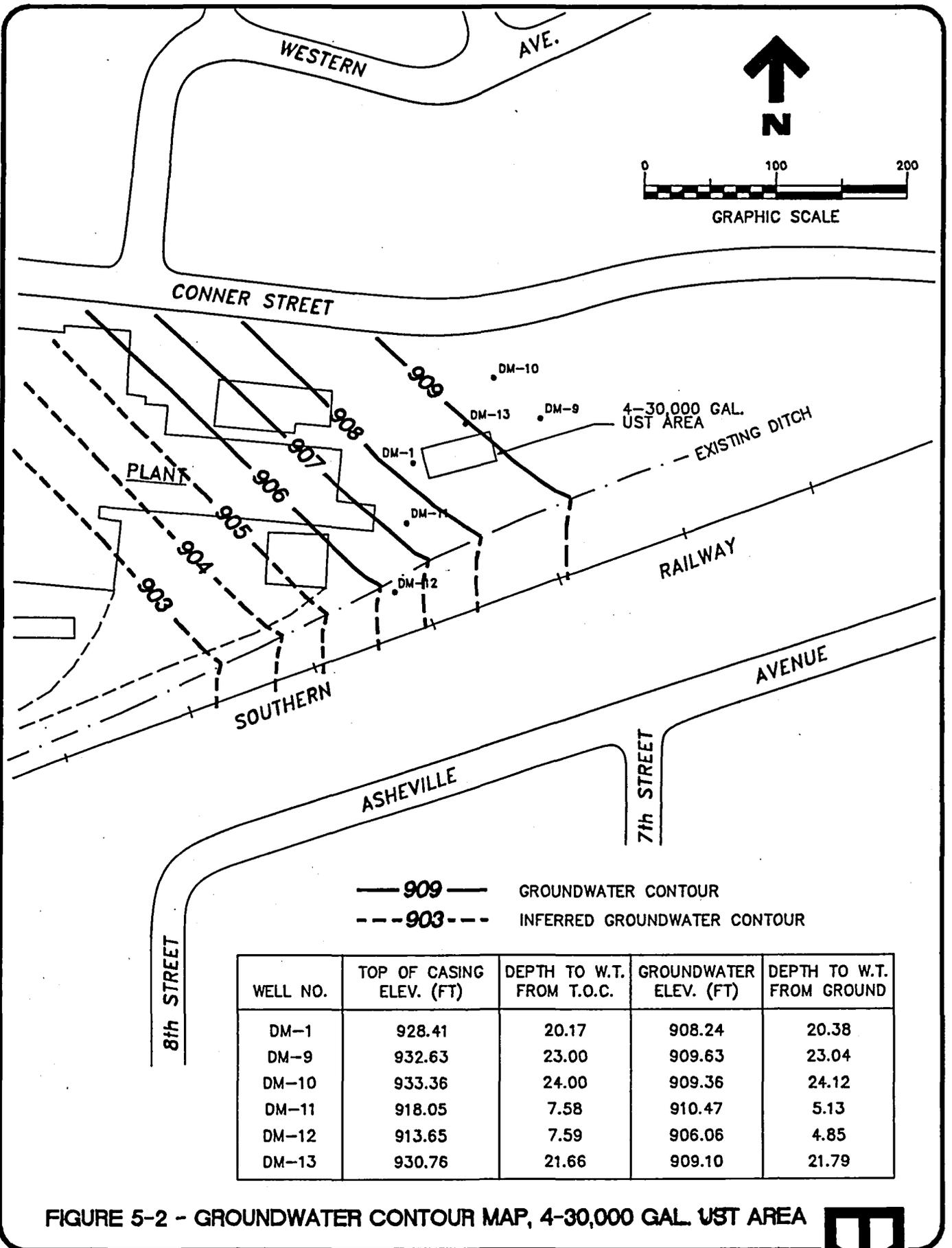
ML — U.S.C.S. SOIL CLASSIFICATION

BORING DM-1 PERFORMED 7/14/88 BY DAMES & MOORE, BETHESDA, MARYLAND  
BORINGS B-9 THROUGH B-13 PERFORMED 3/29-3/31/89 BY U.E.S.

FIGURE 5-1 - LOG OF BORINGS AND X-SECTION, 4-30,000 GAL. UST AREA

B0022-09





— 909 — GROUNDWATER CONTOUR  
 - - - 903 - - - INFERRED GROUNDWATER CONTOUR

WELL NO.	TOP OF CASING ELEV. (FT)	DEPTH TO W.T. FROM T.O.C.	GROUNDWATER ELEV. (FT)	DEPTH TO W.T. FROM GROUND
DM-1	928.41	20.17	908.24	20.38
DM-9	932.63	23.00	909.63	23.04
DM-10	933.36	24.00	909.36	24.12
DM-11	918.05	7.58	910.47	5.13
DM-12	913.65	7.59	906.06	4.85
DM-13	930.76	21.66	909.10	21.79

FIGURE 5-2 - GROUNDWATER CONTOUR MAP, 4-30,000 GAL. UST AREA

B0022-13



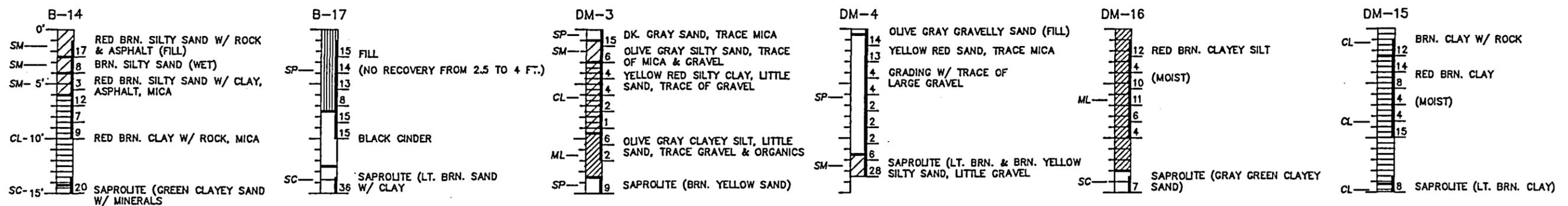
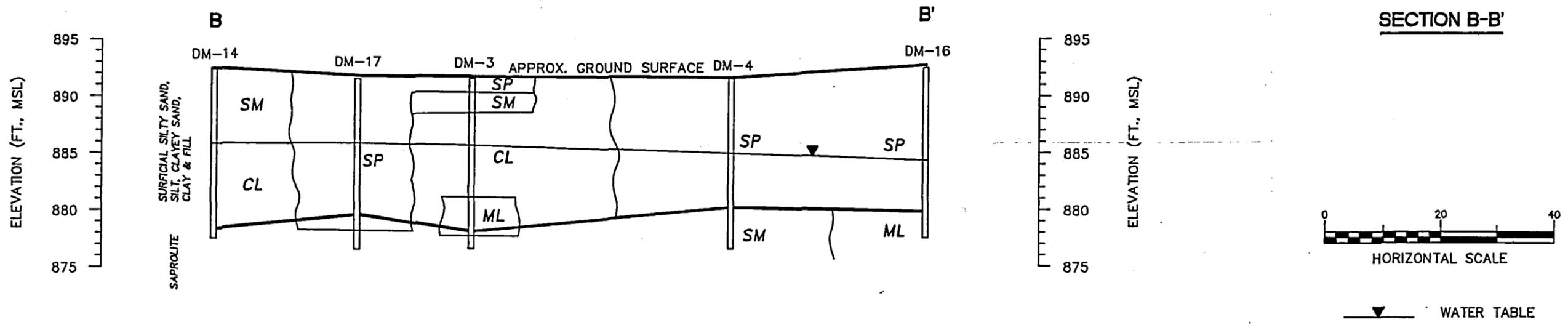
for this area are illustrated on Figure 5-3 and show that this area is underlain by clayey and silty sand to an approximate depth of 13 feet below grade. The presence of cinders, asphalt in the subsurface suggest that this area has been filled in the past with various materials. This would also account for the horizontal validity of the overall site lithology. Saprolite present as silty and clayey sands was encountered at all borings at an approximate depth of 13 to 14 feet below grade, and represents weathered bedrock.

The groundwater table at each monitor well at this location was measured and converted to feet msl. The measured water table depth ranged between 5.77 and 6.46 feet below grade, and the water table elevation varied between 885.72 and 884.15 feet msl. Groundwater flow is toward a ditch at the railroad tracks and downgradient towards the stream located west of this location. A Groundwater Contour Map was constructed and is presented on Figure 5-4. The groundwater flow direction is towards the southwest. All appropriate water table depths and elevation data is also presented on Figure 5-4.

### 5.3 LANDFILL AREA

The subsurface investigation performed at the landfill site consists of four Standard Penetration Test borings advanced to a maximum depth of 30 feet below grade, refer to Figure 3-1 for the boring locations. As mentioned previously, these borings were conducted during the PCAR investigation in July 1988. The Log of Borings and Area Cross Sections are shown on Figure 5-5. The Log of Borings illustrate that the subsurface stratigraphy at the landfill area consists primarily of silty clays and clayey silts (ML) to a maximum depth of 30 feet below grade. Boring location B-7 shows a well graded gravel mixture (GW) from a depth of approximately 12 to 20 feet below grade. This material could represent a cross-cutting stream deposit during the geomorphic development of this area. Boring DM-5 exhibited intermediate silty sand units. At a depth of 17.5 feet, the silty sand extended to a minimum depth of 30.0 feet below grade. The presence of saprolite was noted at all boring locations and ranged in depth from approximately 5.5 to 20.0 feet below grade.



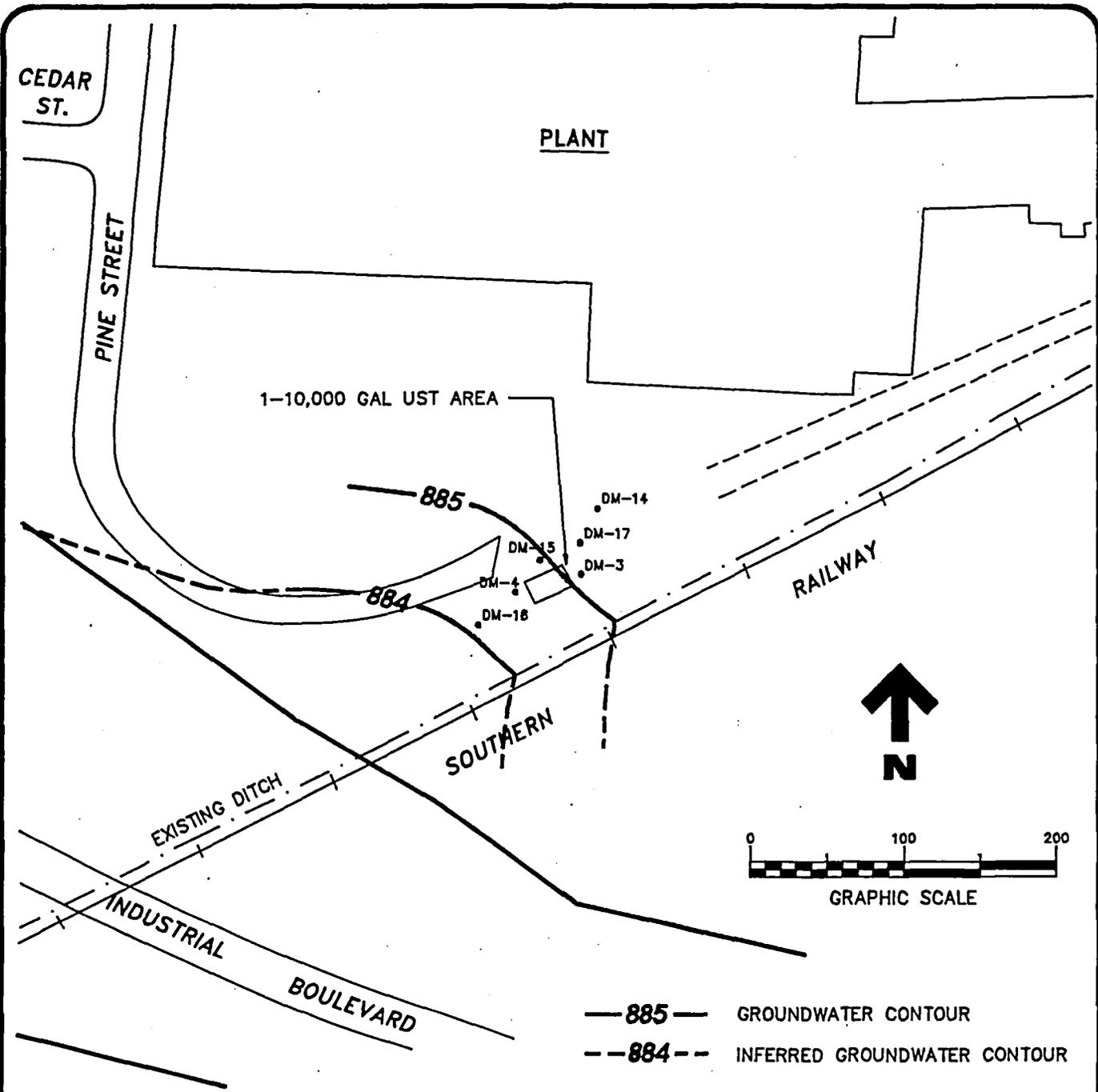


CL— U.S.C.S. SOIL CLASSIFICATION

BORINGS DM-3 & DM-4 PERFORMED 7/14/88 & 7/15/88 BY DAMES & MOORE, BETHESDA, MARYLAND  
 BORINGS B-14 THROUGH B-17 PERFORMED 3/29-3/31/89 BY U.E.S.

FIGURE 5-3 - LOG OF BORINGS AND X-SECTION, 1-10,000 GAL. UST AREA



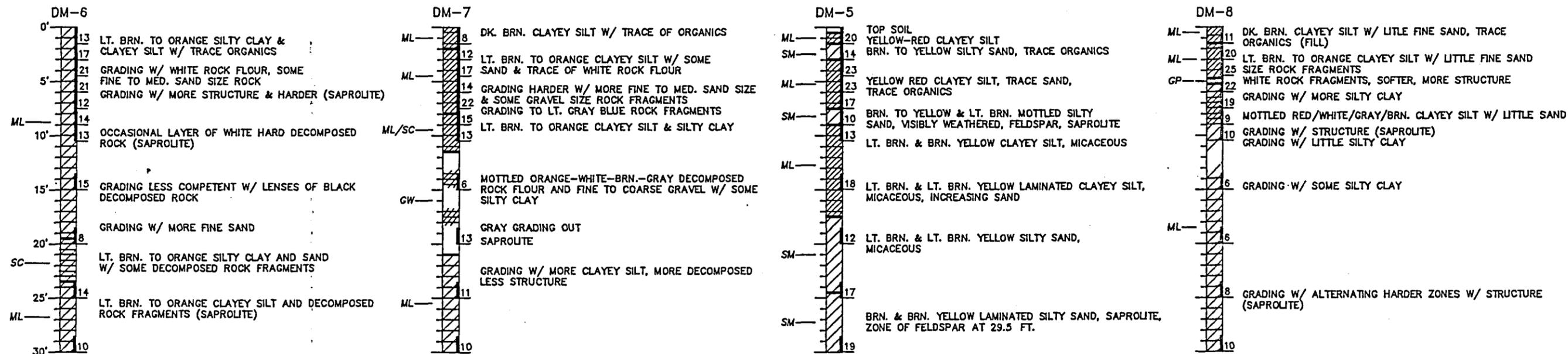
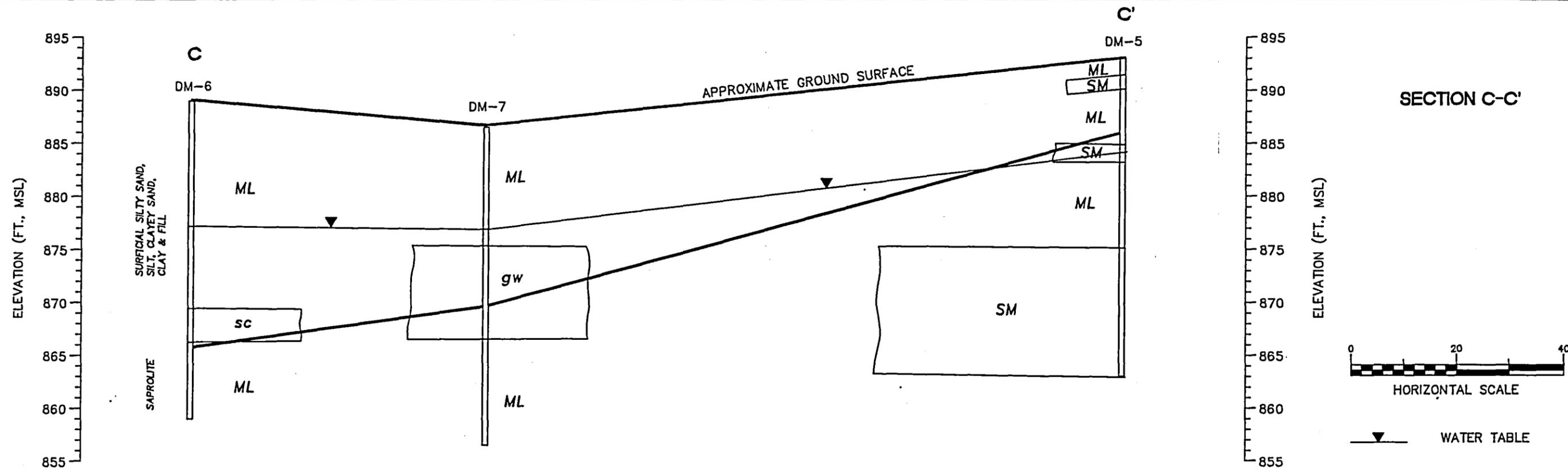


WELL NO.	TOP OF CASING ELEV. (FT)	DEPTH TO W.T. FROM T.O.C.	GROUNDWATER ELEV. (FT)	DEPTH TO W.T. FROM GROUND
DM-3	891.12	5.77	885.35	6.02
DM-4	891.03	6.24	884.79	6.49
DM-14	892.24	6.46	885.78	6.63
DM-15	891.28	6.45	884.83	6.65
DM-16	894.78	10.63	884.15	8.53
DM-17	891.52	5.80	885.72	5.98

FIGURE 5-4 - GROUNDWATER CONTOUR MAP, 1-10,000 GAL. UST AREA



B0022-14



ML — U.S.C.S. SOIL CLASSIFICATION

BORINGS DM-5 THROUGH DM-8 PERFORMED 7/17-7/19/88 BY DAMES & MOORE, BETHESDA, MARYLAND

FIGURE 5-5 - LOG OF BORINGS AND X-SECTION, LANDFILL AREA



Depth to the groundwater table as measured in the four monitor wells varied between 9.10 and 12.03 feet, and the water table elevation varied between 884.04 and 876.76 feet msl. (Figure 5-6). The constructed Groundwater Contour Map illustrates that groundwater flow at the landfill area is west towards the creek.

#### 5.4 SOIL SURVEY

The soil survey of Iredell County, North Carolina, June 1964 was used to identify the soils at the site. In total, five different soil types described as Fine Sandy Loams, Sandy Loam, and Clay Loam are found at the site. Figure 5-7 identifies the different soil types found.

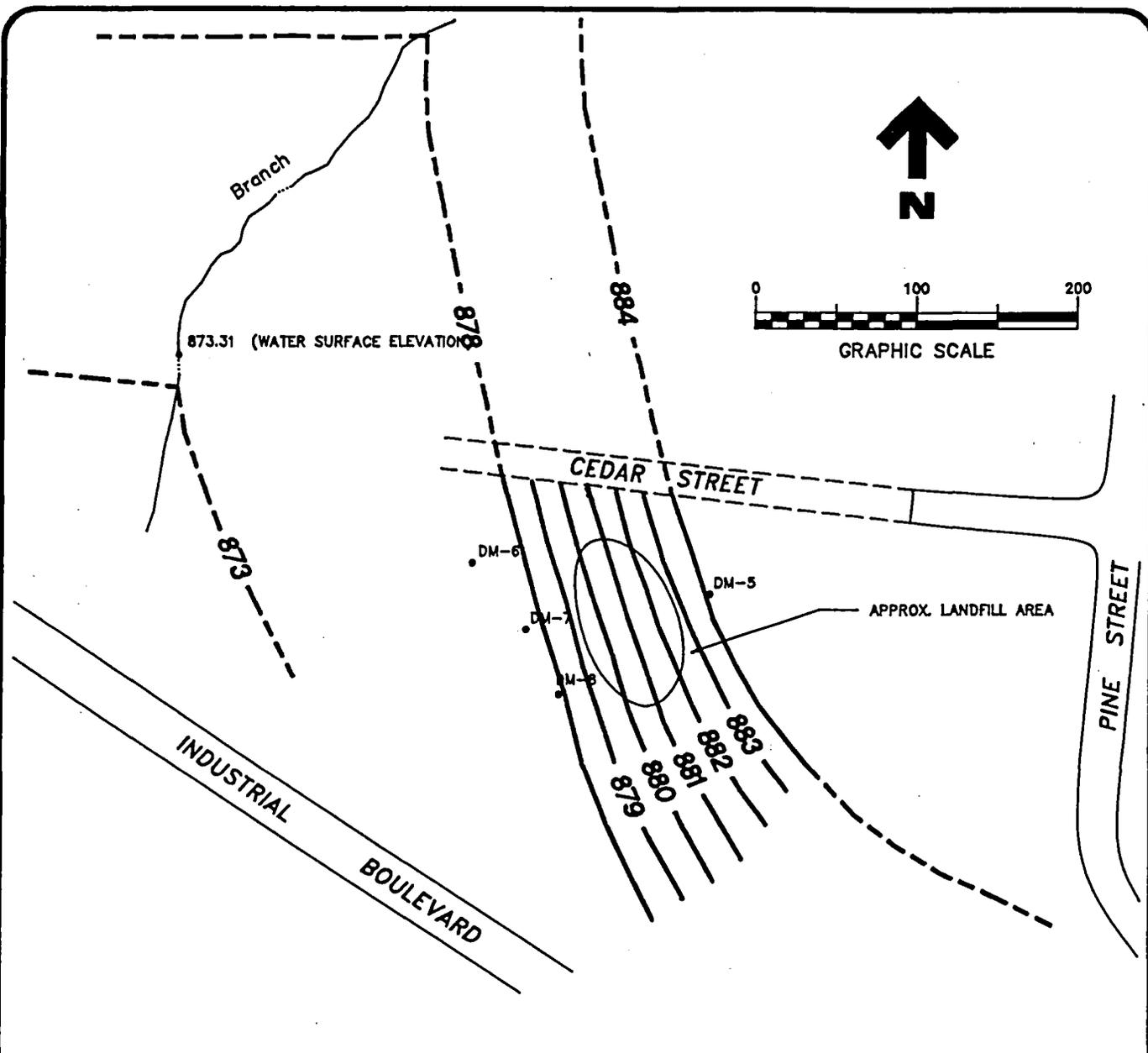
### 6.0 SOIL QUALITY

#### 6.1 FIELD SCREENING OF SOILS

To estimate the extent of the soils contamination by petroleum product at the two tank sites, soil samples were screened in the field using a calibrated photo ionization detector (PID) model HNU. To prepare each split spoon soil sample for PID analyses, the soil sample was collected in a new glass sampling jar, sealed and labeled, and placed aside. To test the samples, the lid was slightly opened to allow measurements. The probe was then inserted into the jar and the highest value was recorded.

The results of the PID analyses are summarized in Table 6-1.



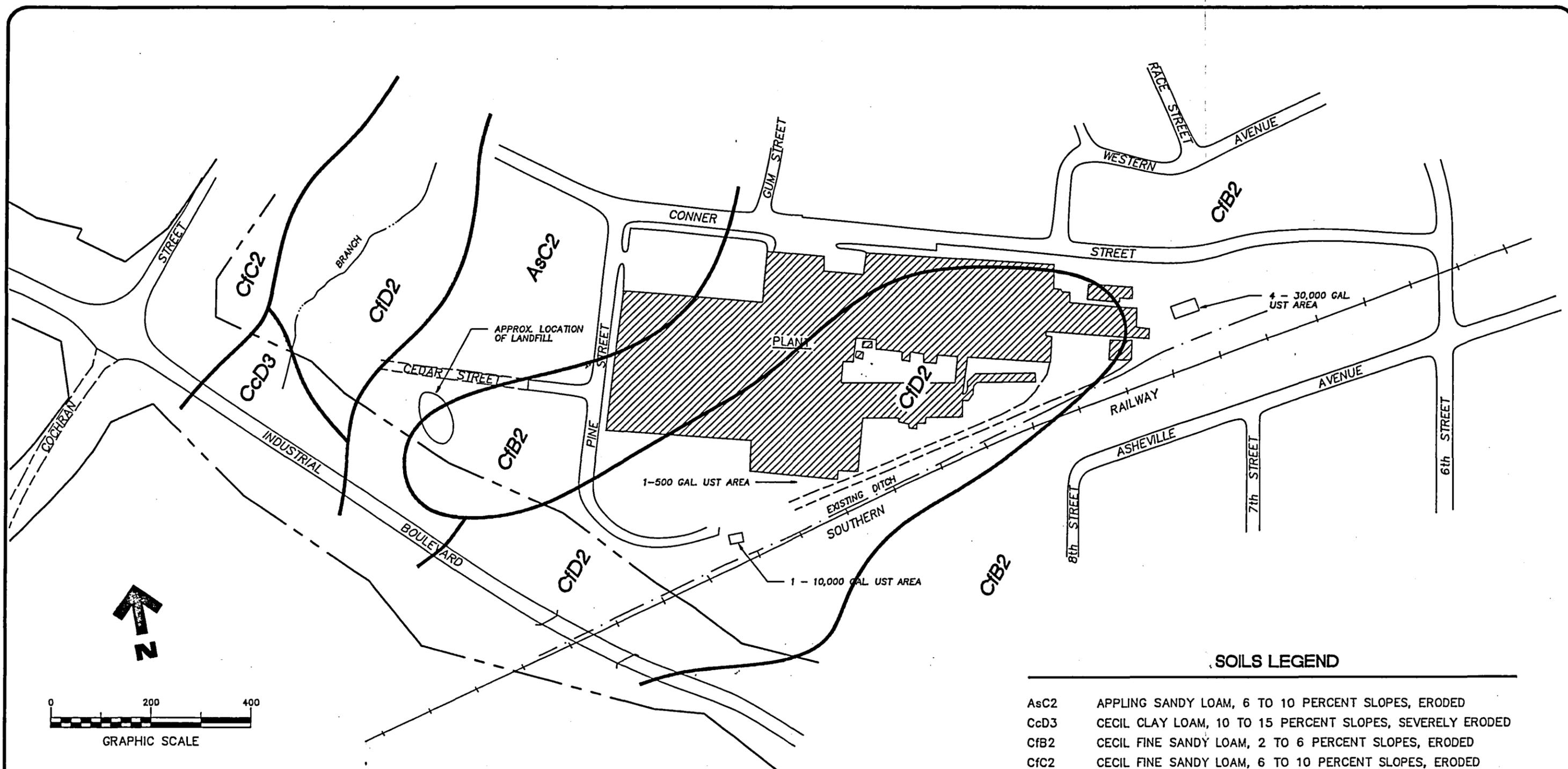


— 883 — GROUNDWATER CONTOUR  
 -- 878 -- INFERRED GROUNDWATER CONTOUR

WELL NO.	TOP OF CASING ELEV. (FT)	DEPTH TO W.T. FROM T.O.C.	GROUNDWATER ELEV. (FT)	DEPTH TO W.T. FROM GROUND
DM-5	894.79	10.75	884.04	9.31
DM-6	891.45	14.48	876.97	12.03
DM-7	888.74	11.98	876.76	9.72
DM-8	888.41	11.58	876.83	9.10

FIGURE 5-6 - GROUNDWATER CONTOUR MAP, LANDFILL AREA





**SOILS LEGEND**

- AsC2    APPLING SANDY LOAM, 6 TO 10 PERCENT SLOPES, ERODED
- CcD3    CECIL CLAY LOAM, 10 TO 15 PERCENT SLOPES, SEVERELY ERODED
- CfB2    CECIL FINE SANDY LOAM, 2 TO 6 PERCENT SLOPES, ERODED
- CfC2    CECIL FINE SANDY LOAM, 6 TO 10 PERCENT SLOPES, ERODED
- CfD2    CECIL FINE SANDY LOAM, 10 TO 15 PERCENT SLOPES, ERODED

SOIL TYPES AS SHOWN IN "SOIL SURVEY, IREDELL COUNTY, NORTH CAROLINA", ISSUED JUNE 1964 BY U.S.D.A.-S.C.S.  
 BASE MAP: "WELL LOCATIONS FOR SPRINGS INDUSTRIES" BY GERALD V. GRANT & ASSOCIATES, STATESVILLE, NC (DRAWING NO. 89044)

**FIGURE 5-7 - SOIL SURVEY**



B0022-12

TABLE 6-1

**OVA SOIL ANALYSES, PID RESPONSE (ppm)  
FORMER UNIGLASS INDUSTRIES SITE, STATESVILLE, NORTH CAROLINA**

Sample Depth (ft)	Borings								
	9	10	11	12	13	14	15	16	17
0.0 - 2.0	ND	ND	220	7	ND	ND	ND	ND	160
2.0 - 3.5	ND	ND	250	2	ND	ND	ND	ND	--
3.5 - 5.0	ND	ND	90	30	ND	ND	ND	ND	140
5.0 - 6.5	ND	ND	160	ND	ND	ND	5.5	ND	140
6.5 - 8.0	ND	ND	30	ND	ND	ND	3	ND	140
8.0 - 9.5	ND	ND	220	ND	4	ND	17	ND	120
13.5 - 15.0	ND	ND	85	ND	3	ND	ND	ND	140
18.5 - 20.0	ND	--	15	ND	20	--	--	--	--
23.5 - 25.0	ND	--	--	ND	10	--	--	--	--
28.5 - 30.0	--	--	--	--	ND	--	--	--	--

Measuring concentration of volatile organics with the PID in soils provides at best an estimate of the actual concentrations. However, the results from these in-field analyses are useful in estimating the extent of the contamination and to guide monitor well placement and total monitor well depth.

PID readings from the four 30,000-gallon UST area illustrated in Table 6-1 shows that the highest peaks recorded were at boring B-11 located downgradient from the UST site. Significant soils contamination at this boring location was detected in the upper 5 feet of the soil above the water table. Low concentrations of 15 ppm were detected in soil samples obtained from below the water table, from a depth of 13.5 to 15.0 feet. Soil samples from boring B-12



located downgradient from B-11 showed slight peaks in the upper 5.0 feet. These peaks, however, are believed to be unrelated to the petroleum contamination and are the result of instrument drift due to moisture or the presence of asphalt fill in the unsaturated zone. Results from the soils and groundwater analyses described in later sections of this report verified these assumptions. PID readings of 4 to 20 ppm were detected in the tank backfill at boring location B-13, suggesting soils contamination in the tank backfill area.

In summary, soils contamination in the four 30,000-gallon UST area seems to be present in the tank backfill area extending downslope past B-11 towards the railroad tracks. No soils contamination was detected at B-12 using the PID.

At the one 10,000-gallon UST area, the field analyses indicated positive PID readings on soil samples from borings B-15 and B-17. PID readings of 3 to 17 ppm were recorded at B-15 located adjacent to the UST. Higher PID readings of 120 to 160 ppm were recorded on soil samples from boring B-17 located upgradient of the UST.

The readings from B-17 were suspected to be false and are believed to represent instrument drift due to moisture and humidity accumulation in the instrument. This assumption was confirmed by the results of subsequent soil and groundwater laboratory analyses.

## 6.2 SOILS TPH ANALYSES

To verify PID analyses, soil samples were collected from each boring and analyzed in the laboratory for Total Petroleum Hydrocarbons (TPH). Table 6-2 summarizes the laboratory results. The complete laboratory results are presented in Appendix C.

To estimate the horizontal and vertical extent of the soils contamination, the field and laboratory results were combined and the extent of the soils contamination is illustrated on a Site Plan and cross section.



The vertical extent of the contamination was estimated based on laboratory data. Although contamination below the water table is considered groundwater contamination, TPH soil analyses from discrete soil samples can be used to estimate the vertical extent and concentration levels at the site.

**TABLE 6-2**  
**SOIL SAMPLE ANALYSES**  
**FORMER UNIGLASS INDUSTRIES SITE, STATESVILLE, NC**

<u>Laboratory Analyses</u>	<u>Sample</u>	<u>Depth (ft)</u>	<u>Concentration (ug/kg)</u>	<u>Detection Limit (ug/kg)</u>
TPH Mid-Boiling	B-09	20.0	ND	5000
TPH Mid-Boiling	B-10	25.0	ND	5000
TPH Mid-Boiling	B-11	6.5	5,000,000	5000
TPH Mid-Boiling	B-11	11.0	850,000	5000
TPH Mid-Boiling	B-11	15.0	ND	5000
TPH Mid-Boiling	B-12	15.0	ND	5000
TPH Mid-Boiling	B-13	20.0	150,000	5000
TPH Mid-Boiling	B-13	30.0	ND	5000
TPH Mid-Boiling	B-13	35.0	ND	5000
TPH Mid-Boiling	B-15	8.0	ND	5000
TPH Mid-Boiling	B-15	15.0	ND	5000
TPH Mid-Boiling	B-16	8.0	320,000*	5000
TPH Mid-Boiling	B-17	10.0	ND	5000

\* Does not match diesel. Quantification based on diesel standard; therefore concentration is an estimate.



Figure 6-1 shows the soil contamination in the three 30,000-gallon UST area to extend downgradient from the tank area towards the railroad tracks. The horizontal extent west of the USTs is estimated to be similar as the southern extension of the contamination due to relatively uniform hydraulic gradients surrounding the USTs. The highest TPH concentration was observed at B-11 with minor peaks detected at boring location B-13 located within the tank backfill area. The horizontal extent of the contamination did not, however, reach the railroad tracks at boring B-12, and thus seems confined to the backslope south of the USTs.

The TPH analyses showed no detected diesel contamination of soils at the one 10,000-gallon UST. However, the soil sample from boring B-16 downgradient from the 10,000-gallon UST, at a depth of 8 feet, yielded an approximate concentration of 320,000 ug/kg of an unknown compound other than diesel. Since the quantification in the TPH analyses was based on a diesel standard, the concentration obtained is an estimate. In addition, due to the methodology employed, the TPH analyses performed on the sample did not allow positive identification of the compound. It should be noted that during the field investigation, no unusual smell, odor, or staining was observed in the soils at this location. As mentioned previously, the PID did not respond to any samples tested from this boring location. Therefore, identification of the compound detected at B-16 with the TPH analyses is unknown at this point, however, it seems to be unrelated to the UST activities or diesel contamination.

In summary, TPH analyses did not detect any soils contamination attributable to UST activities. Therefore, no contamination map was constructed for the one 10,000-gallon UST.

### **6.3 PROPOSED TPH SOIL CLEANUP LEVELS**

To determine the soil cleanup level for the site, a Site Sensitivity Evaluation (SSE) was performed. Procedures for this method are outlined in Guidelines for Remediation of Soil Contaminated by Petroleum, DNRCD, March 1989. This method incorporates site specific hydrogeologic parameters and contaminant class to assign a site sensitivity evaluation score. Refer to Figure 6-2 for the SSE



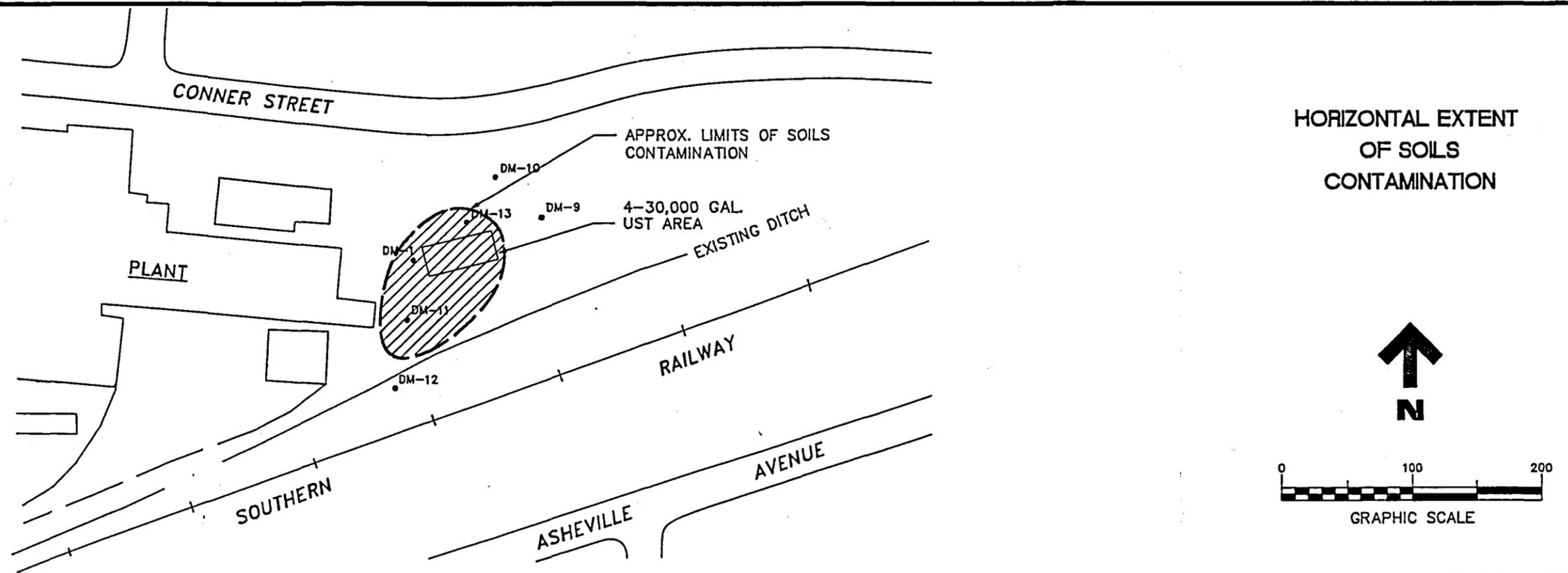
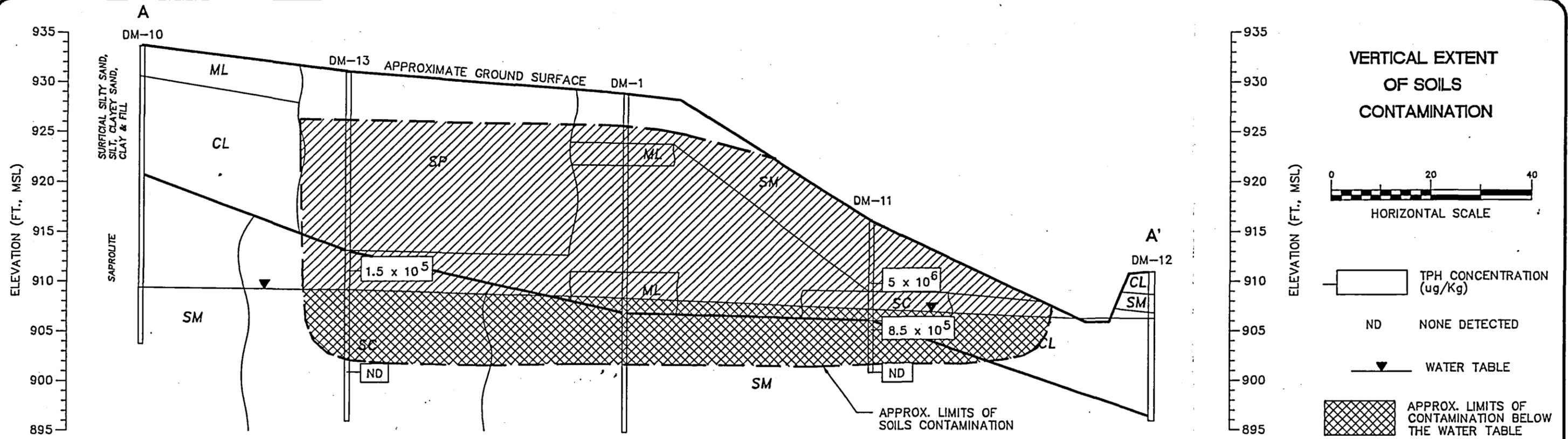


FIGURE 6-1 - APPROXIMATE HORIZONTAL AND VERTICAL EXTENT OF SOILS CONTAMINATION, 4-30,000 GAL UST AREA

B0022-21



**FIGURE 6-2**

# Site Sensitivity Evaluation (SSE)

*Guidelines for Remediation of Soil Contaminated by Petroleum*  
 North Carolina Division of Environmental Management

Characteristic	Condition	Available Score	Score
Soil pH	pH < 5.0 or 9.0 < pH	4	4
	8.0 < pH ≤ 9.0	3	
	5.0 ≤ pH < 6.0	2	
	6.0 ≤ pH ≤ 8.0	1	
Predominant Soil Group* Present within the Zone of Contamination & Underlying Soil  * see Figure 3 USCS Descriptions	GW, GP	10	4
	GM, GC	8	
	SW, SP	6	
	SM, SC	4	
	ML, CL, OL MH, CH, OH, Pt	2 0	
Are Relict Structures and/or Textures Present in the Zone of Contamination & Underlying Soil?	Yes	3	3
	No	0	
Contaminant Class	I Low to Medium Boiling Point Hydrocarbons (C1 - C15) Gasoline/Jet Fuel	10	5
	II High Boiling Point Hydrocarbons (C12 - C20) Kerosene/Diesel/Fuel Oil	5	
Artificial Conduits Present within the Zone of Contamination	• Present & Intersecting the Seasonal High Water Table	10	0
	• Present but not Intersecting the Seasonal High Water Table	5	
	• None Present	0	
Distance from Location of Deepest Contaminated Soil (≥ 10 ppm TPH) to Seasonal High Water Table	5 — 10 feet	10	10
	> 10 — 40 feet	5	
	> 40 feet	0	
Is the Top of Bedrock Located Above the Seasonal Low Water Table?	Yes	5	0
	No	0	
Is a Confining Layer Present Above the Seasonal High Water Table?	No	5	0
	Yes	0	
<b>Total Score</b>			<b>26</b>

	Site Sensitivity Evaluation Score	Soil Cleanup Level ppm of TPH
Very Sensitive • • • • • Least Sensitive	50 — 57	10
	43 — 49	25
	36 — 42	40
	28 — 35	55
	21 — 27	70
	14 — 20	85
	6 — 13	100

sheet. The SSE score can be correlated to a soil cleanup level of Table Petroleum Hydrocarbons (TPH) in ppb. For this site a SSE score of 26 was calculated corresponding to a TPH soil cleanup level of 70 ppm.

Figure 6-1 outlining the extent of the soils contamination at the four 30,000-gallon USTs, encompasses the 70 ppm concentration contour.

## 7.0 GROUNDWATER QUALITY

Groundwater samples were collected at each monitor well location in the vicinity of both UST areas. These samples were analyzed by Radian Laboratories using EPA Method 625 plus all peaks. This method of analyses was chosen in accordance with DNRCDC Guidance dated February 22, 1989. The samples were collected under UES's standard sampling protocol consisting of the following steps:

1. Each monitor well is developed using a Teflon bailer with disposable string, by removing a minimum of three well volumes of water from each well.
2. The samples are collected, sealed and labeled, and immediately stored on ice for shipment.
3. The bailer is cleaned after each sampling event using the following procedures.
  - a.alconox soap and water wash
  - b. clean water rinse
  - c. alcohol rinse
  - d. deionized water rinse

The results of the analyses are presented in Appendix C, and are summarized in Table 7-1.



TABLE 7-1

EPA 625 PLUS PEAKS GROUNDWATER ANALYSES  
UNIGLASS INDUSTRIES, STATESVILLE, NORTH CAROLINA

Compound	Four 30,000-Gallon UST's							One 10,000-Gallon UST					
	DM-1	DM-9	DM-10	DM-11	DM-12	DM-13	DM-13D	DM-3	DM-4	DM-14	DM-15	DM-16	DM-17
Bis (2-Ethylhexyl) Phthalate*	5	2	4	4	2	3	3	ND	ND	5	ND	2	4
Bis (2-Ethylhexyl) Ester*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7
Acenaphthene	ND	ND	ND	6	ND	5	3	ND	ND	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	15	ND	9	6	ND	ND	ND	ND	ND	ND
Fluorene	2	ND	ND	13	ND	8	9	ND	ND	ND	ND	ND	ND
4-Penten-2-ol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	32	ND	ND	ND	ND	180	90	ND	ND	ND	ND	ND	ND
Anthracene	2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Summation EPA 625 Target Compounds Except*	36	ND	ND	34	ND	202	108	ND	ND	ND	ND	ND	ND
Other Peaks	159	ND	ND	590	ND	231	215	6	ND	ND	ND	127	ND
Unknowns	56	ND	ND	228	ND	9	51	47	9	6	ND	349	ND
<b>Total Concentration</b>	<b>251</b>	<b>ND</b>	<b>ND</b>	<b>624</b>	<b>ND</b>	<b>433</b>	<b>374</b>	<b>53</b>	<b>9</b>	<b>6</b>	<b>ND</b>	<b>476</b>	<b>ND</b>
<b>Total Identified Hydrocarbons</b>	<b>195</b>	<b>ND</b>	<b>ND</b>	<b>396</b>	<b>ND</b>	<b>424</b>	<b>323</b>	<b>6</b>	<b>ND</b>	<b>ND</b>	<b>ND</b>	<b>127</b>	<b>ND</b>

\* Suspected to be laboratory artifacts, and were not included in the Total 625 Target Summation.

NOTES

1. All values are in ug/l.
2. ND = Not Detected
3. There were too many non-target peaks to list on this table; there was no duplication of non-target peaks between wells.
4. DM-13 and DM-13D are field duplicates.

Table 7-1 provides a summary of the detected compounds from the EPA 625 analyses. The detected EPA 625 target compounds are listed and a summation of the total detected concentrations is provided for each monitor well location. These totals do not include Bis (2-ethylhexyl) phtalate and Bis (2-ethylhexyl) ester since they are not considered diesel derivatives and are common laboratory artifacts. The summation of the compounds, however, provide the best estimate for semivolatile hydrocarbon concentrations in the groundwater. Other summations provided include all other identified peaks and unknown peaks. All laboratory data including all data for duplication, spikes and lab QA/QC are provided in Appendix A. Most other parts identified were petroleum related compounds with the exception of data from DM-16. A summation of total identified hydrocarbons including EPA 625 target compounds and other identified peaks provide a good estimate of the extent of the groundwater contamination by hydrocarbon. These concentrations were then used to construct a map showing the horizontal extent of the contaminant plume.

In addition, limited in-field groundwater analyses were conducted at each monitor well sampled by measuring conductivity, temperature, and pH. The results are presented in Table 7-2.

**TABLE 7-2**  
**IN-FIELD GROUNDWATER ANALYSES**  
**FORMER UNIGLASS PLANT SITE, STATESVILLE, NORTH CAROLINA**

<u>Well No.</u>	<u>Conductivity (2 mv/cm)</u>	<u>Temperature (°C)</u>	<u>pH</u>	<u>Amount Bailed (gallons)</u>
DM-1	--	14.6	5.20	5.0
DM-3	0.186	12.9	7.02	5.0
DM-4	0.321	12.6	6.76	3.0
DM-9	0.042	13.2	5.44	3.0
DM-10	0.031	13.3	5.59	5.0
DM-11	0.180	13.5	6.26	3.0
DM-12	0.165	12.7	6.23	3.5
DM-13	0.065	13.7	5.29	5.0
DM-14	0.219	15.6	6.63	4.0
DM-15	0.176	13.0	6.62	2.5
DM-16	0.285	12.4	4.92	3.0
DM-17	0.192	15.3	7.30	5.0



### **7.1 GROUNDWATER QUALITY FOUR 30,000-GALLON UST AREA**

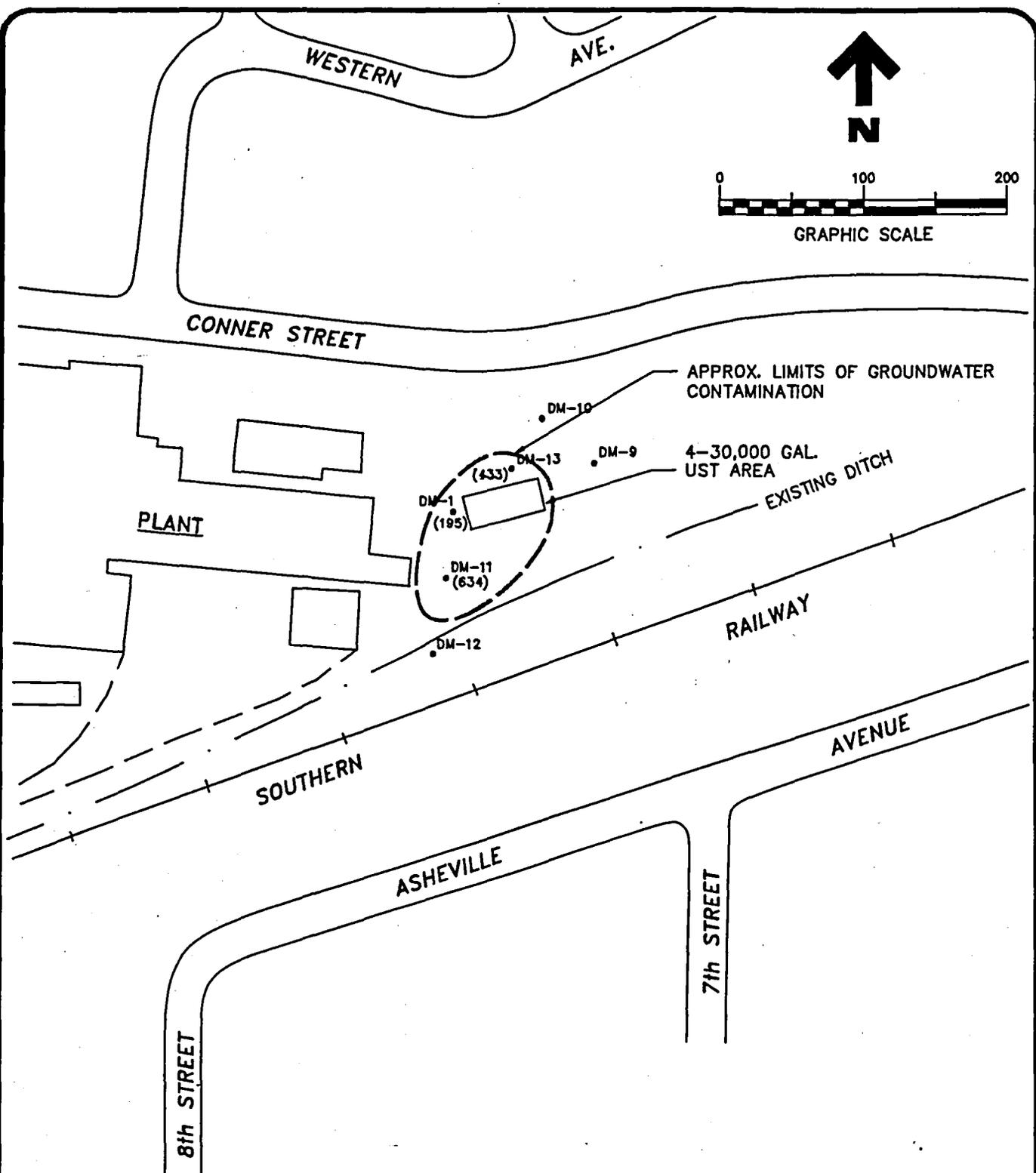
The highest concentration of hydrocarbons (634 ppb) detected in the groundwater was at monitor well DM-11 located downslope from the USTs. Concentrations of 446 ppb and 195 ppb were detected in well DM-13 and DM-1, respectively. Upgradient wells DM-9, DM-10, and downgradient well DM-12 showed no detectable hydrocarbons. Groundwater contamination in this area seems to be present in the UST backfill area and extends downslope towards the south. The estimated contaminant plume is illustrated on Figure 7-1. Due to the difficulty of the sloping terrain and the abundance of overhead power and telephone wires, the installation of additional monitor wells was not possible. However, the extent of the contaminant plume shown in Figure 7-1 is conservative and should encompass groundwater contamination.

### **7.2 GROUNDWATER QUALITY ONE 10,000-GALLON UST AREA**

The only monitor well exhibiting hydrocarbon concentrations in this area was DM-3 (53 ppb), located upgradient but immediately adjacent to the UST.

As mentioned previously, DM-16 showed a total of 476 ppb of unknowns and other peaks. No 625 target compounds were detected at this location. Due to the absence of any identified 625 targets or any other petroleum compounds at DM-16, the observed compounds are believed not to be related to the UST. This assumption is further supported by the fact that no compounds were detected at DM-4 located between the UST and DM-16 downgradient from the tank site.





( ) CONCENTRATION OF TOTAL IDENTIFIABLE EPA 625 HYDROCARBONS, ug/l

FIGURE 7-1 - CONTAMINANT PLUME, 4-30,000 GAL UST AREA

B0022-20



Groundwater contamination due to diesel contamination at the one 10,000-gallon UST location seems to be limited to the vicinity of DM-3 located immediately adjacent to the tank area. Due to a single contaminant point, no plume map was constructed.

### 8.0 SURFACE WATER QUALITY

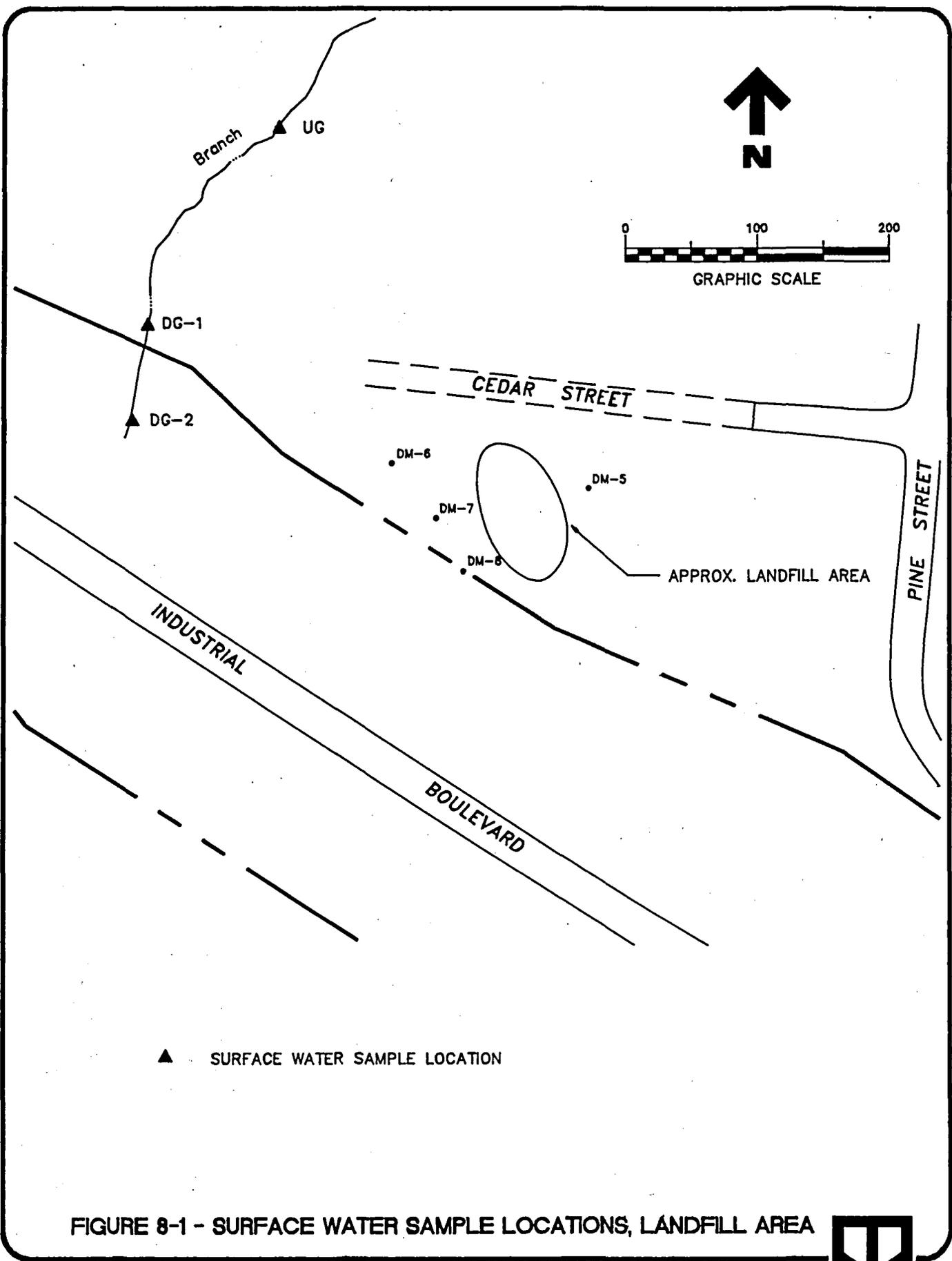
Three surface water samples were collected from the stream located west of the landfill. The sample locations are shown on Figure 8-1 and were selected to obtain one upgradient and two downgradient stream samples. These samples were used to assess potential degradation of the stream downgradient from the landfill area. The samples collected were analyzed using the following analyses:

- priority pollutant metals (EPA Method 200.7)
- total phenolics (EPA Method 420.2)
- ammonia as nitrate (EPA Method 350.1)
- hardness (SM 314A)

The results of these analyses are tabulated in Table 8-1. The complete analytical data from these analyses are presented in Appendix C.

The results of the surface water analyses indicate no apparent degradation of surface water, downgradient from the landfill. The majority of the metals were not detected with the exception of traces of lead, nickel, copper, and zinc. Those metals were detected at low levels easily attributable to background concentrations. No phenolics were detected in any surface water samples tested.





B0022-16

FIGURE 8-1 - SURFACE WATER SAMPLE LOCATIONS, LANDFILL AREA



**TABLE 8-1**

<u>Concentration (ug/ml)</u>	<u>Upgradient (UG)</u>	<u>Downgradient #1 (DG-1)</u>	<u>Downgradient #2 (DG-2)</u>
Silver (Ag)	<0.03	<0.03	<0.03
Arsenic (As)	<0.001	<0.001	<0.001
Beryllium (Be)	<0.002	<0.002	<0.002
Cadmium (Cd)	<0.005	<0.005	<0.005
Chromium (Cr)	<0.03	<0.03	<0.03
Copper (Cu)	<0.02	0.03*	<0.02
Mercury (Hg)**	ND	ND	ND
Nickel (Ni)	0.02*	<0.02	0.04*
Lead (Pb)	0.042	0.060	0.044
Antimony (Sb)	<0.2	<0.2	<0.2
Selenium (Se)	<0.002	<0.002	<0.002
Thallium (Tl)	<0.002	<0.002	<0.002
Zinc (Zn)	0.06*	0.07*	0.06*
Hardness	76.4	82.1	79.0
Total Phenolics	<0.005	<0.005	<0.005
Nitrogen Ammonia	0.14	0.05*	0.05*

\* Estimated result, less than five times the detection limit.

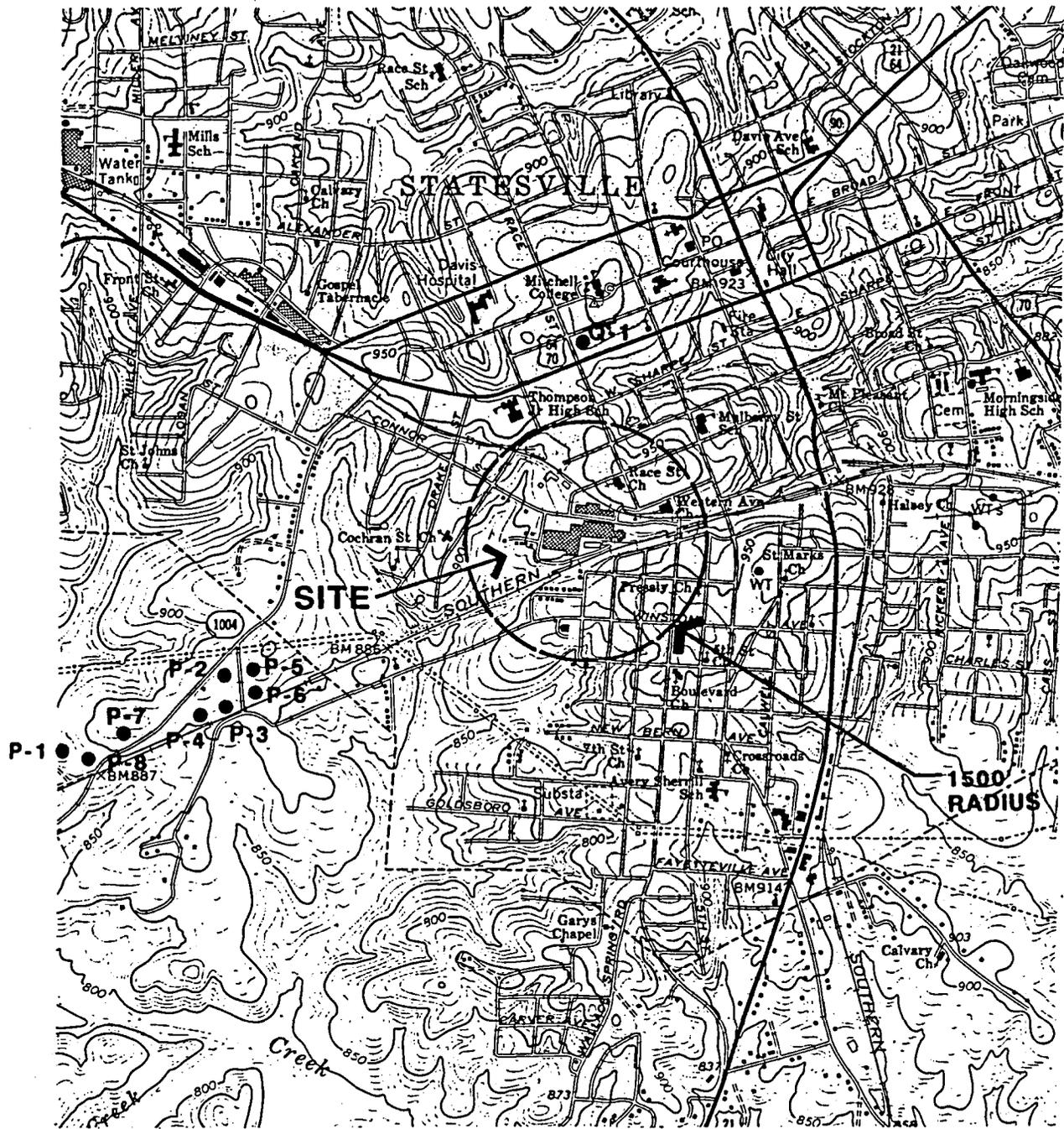
\*\* Detection limit - 0.0002 ug/ml

ND - None Detected

**9.0 GROUNDWATER USE**

Groundwater usage near the site is minimal. According to the Statesville utility department, the area within 1,500 feet of the site has been supplied with municipal water for over fifteen years. A field inspection of the neighborhoods surrounding the site substantiated this as no well houses or other evidence of private water supply was noted.





SOURCE: NORTH CAROLINA DEPT. OF NAT. RESOURCES & COMMUNITY DEVELOPMENT, DIV. OF ENVIRONMENTAL MANAGEMENT, GROUNDWATER SECTION

FIGURE 9-1 - POTABLE WELL LOCATION MAP



Records from the Mooresville office of the North Carolina Department of Natural Resources and Community Development, Groundwater Section, indicate that closest water supply well is 2,500 feet due north of the site. The next closest wells are located in a group approximately 4,000 feet southwest of the site. Most of the wells were drilled 10 to 25 years ago and personnel with the Groundwater Section expressed doubt that the wells are still in use. The Well Location Map is shown on Figure 9-1, and the corresponding well records are presented in Appendix C.

## 10. CONCLUSIONS

The data presented in this report indicate that soils and groundwater contamination due to petroleum products has occurred at the four 30,000-gallon UST area.

The extent of the soils contamination at the four 30,000-gallon UST area was defined by TPH analyses and in-field PID testing. A Site Sensitivity Analysis was performed to establish proposed soil clean up levels. This analyses establishes a maximum allowable soils contaminant level of 70 ppm. The extent of the soils contamination includes the tank backfill area and slope area south of the tank site towards the railroad tracks. The soils contamination did not extend to the tracks past the railroad ditch. No visual evidence of petroleum contamination was observed at the railroad ditch. The installation of additional borings or wells in the area southwest of the tank site was not possible due to overhead utilities and telephone lines. The maximum horizontal extent of the groundwater plume closely resembles the extent of the soils contamination. The maximum depth of the contamination based on the TPH analyses is at approximately 902 feet msl approximately 7 feet below the observed water table.

At the one 10,000-gallon UST area TPH analyses detected no petroleum contamination at the boring locations performed in this area. The groundwater analyses detected concentrations of 53 ppb of identifiable hydrocarbons at DM-3 located adjacent to the UST tank area. This information suggests that no apparent soil contamination is present at the one 10,000-gallon UST area with groundwater contamination found adjacent to the tank at one monitor well location (DM-3).



At the landfill site two downgradient samples and one upgradient sample were taken from the stream to evaluate potential surface water impacts from the landfill. No elevated levels of metals were detected in the stream. In addition, the levels of metals detected did not exceed GA groundwater standards and can be attributed to background levels. No phenolics were detected in the surface water samples. The phenolics detected in the monitor wells during the PCAR, are not priority pollutant phenolics (i.e. phenol) and can be attributed to the breakdown of organic material in the soils. Therefore, the phenolics levels in the monitor wells do not exceed GA groundwater standards as per North Carolina Code Title 15, Subchapter 2L, Section .0200.

The detected groundwater pollution at the landfill site is minimal.

#### 11. RECOMMENDATIONS

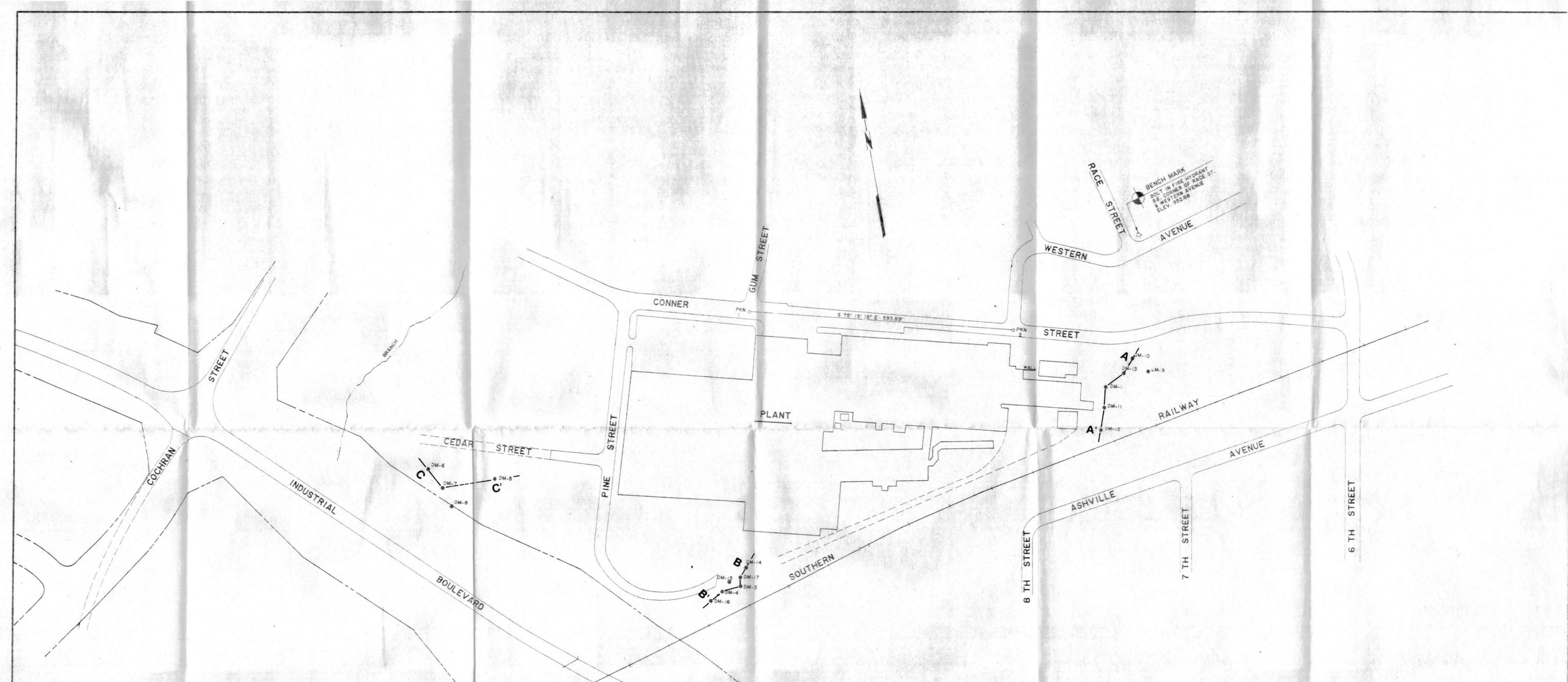
Based on the results of this investigation, a Remedial Action Plan (RAP) should be prepared outlining the following procedures.

- Based on the results of the surface water sampling at the landfill, no further action is recommended at the landfill site.
- The one 10,000-gallon diesel UST should be properly abandoned in accordance with UST guidelines for tank abandonment procedures.
- The four 30,000-gallon USTs should be abandoned in accordance with the above mentioned rules. In addition, the contaminated soils should be removed, disposed or treated, to meet the 70 ppm SSE levels.

Due to the limited extent of groundwater contamination, the low hydraulic conductivity of the soils, and the lack of potable wells in the vicinity of the site, there appears to be no need for groundwater treatment.



**APPENDIX A**



LEGEND:  
PKN - PK NAIL

NO.	(EAST) X COORDINATE	(NORTH) Y COORDINATE	ELEVATION	
			TOP OF CASING	GROUND
DM-1	10,756.6242	9,680.6918	928.41	928.62
DM-3	9,965.2287	9,393.0767	891.12	891.37
DM-4	9,822.1857	9,388.2747	891.03	891.28
DM-5	9,364.6744	9,735.2998	894.79	893.35
DM-6	9,221.8455	9,784.1355	891.45	889.00
DM-7	9,246.6953	9,737.0985	888.74	886.48
DM-8	9,259.6009	9,692.3688	888.41	885.93
DM-9	10,858.2704	9,697.8879	932.63	932.67
DM-10	10,827.9851	9,733.6009	933.36	933.48
DM-11	10,743.9232	9,636.7470	918.05	915.60
DM-12	10,726.5496	9,586.5531	913.65	910.91
DM-13	10,801.7949	9,703.4411	930.76	930.89
DM-14	9,885.6527	9,432.7765	892.24	892.41
DM-15	9,841.6405	9,407.2371	891.29	891.48
DM-16	9,792.4849	9,372.9030	894.78	892.68
DM-17	9,868.5831	9,412.8035	891.52	891.70
PKN-1	10,000.0000	10,000.0000		921.70
PKN-2	10,574.3348	9,848.8477		934.82



UNIVERSAL ENGINEERING SCIENCES  
ORLANDO, FLORIDA

APPENDIX A



WELL LOCATIONS FOR SPRINGS INDUSTRIES			
SCALE: 1" = 100'	APPROVED BY: <i>Gerald V. Grant</i>	DRAWN BY: LDP	
DATE: 04-12-89			
STATESVILLE INSIDE TOWNSHIP	IREDELL COUNTY	NORTH CAROLINA	
GERALD V. GRANT & ASSOCIATES	P.O. BOX 268		DRAWING NUMBER: 89044
STATESVILLE, N.C. 28677 PH. (704) 872-3136			

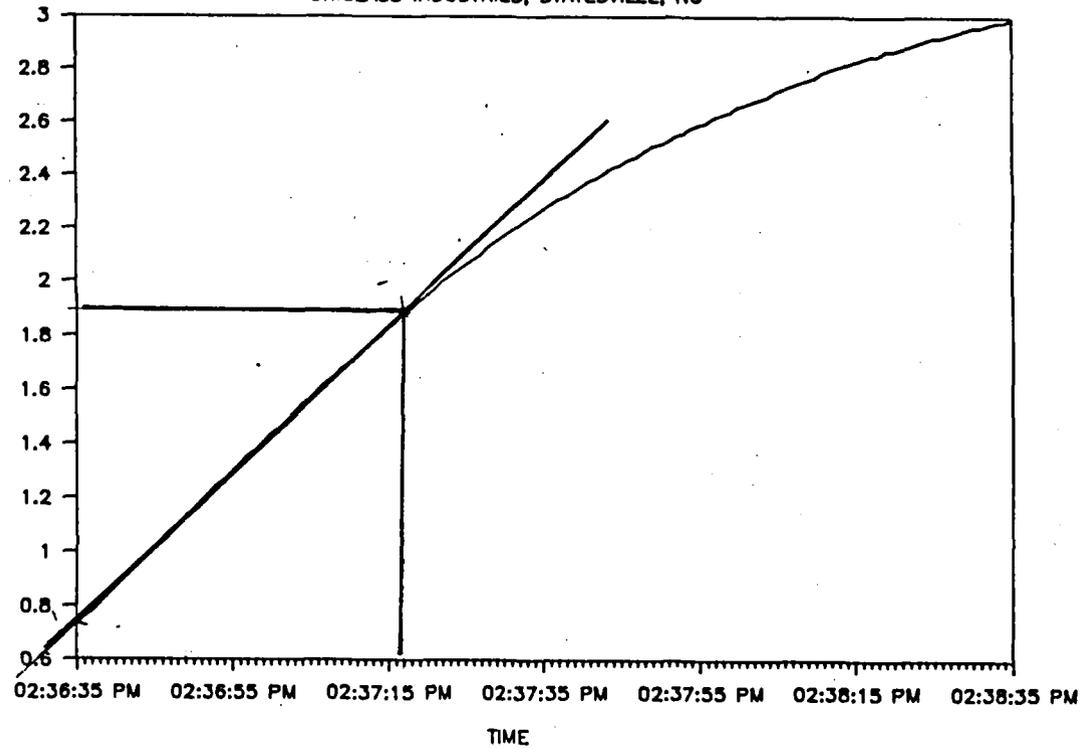
**APPENDIX B**

B-1

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05-Apr-09 02:36:36 PM	10	0.76	05-Apr-09 02:37:38 PM	10	2.32
05-Apr-09 02:36:37 PM	10	0.78	05-Apr-09 02:37:39 PM	10	2.34
05-Apr-09 02:36:38 PM	10	0.81	05-Apr-09 02:37:40 PM	10	2.36
05-Apr-09 02:36:39 PM	10	0.84	05-Apr-09 02:37:41 PM	10	2.38
05-Apr-09 02:36:40 PM	10	0.87	05-Apr-09 02:37:42 PM	10	2.39
05-Apr-09 02:36:41 PM	10	0.90	05-Apr-09 02:37:43 PM	10	2.41
05-Apr-09 02:36:42 PM	10	0.93	05-Apr-09 02:37:44 PM	10	2.43
05-Apr-09 02:36:43 PM	10	0.96	05-Apr-09 02:37:45 PM	10	2.44
05-Apr-09 02:36:44 PM	10	0.99	05-Apr-09 02:37:46 PM	10	2.46
05-Apr-09 02:36:45 PM	10	1.02	05-Apr-09 02:37:47 PM	10	2.47
05-Apr-09 02:36:46 PM	10	1.05	05-Apr-09 02:37:48 PM	10	2.49
05-Apr-09 02:36:47 PM	10	1.08	05-Apr-09 02:37:49 PM	10	2.51
05-Apr-09 02:36:48 PM	10	1.10	05-Apr-09 02:37:50 PM	10	2.52
05-Apr-09 02:36:49 PM	10	1.13	05-Apr-09 02:37:51 PM	10	2.53
05-Apr-09 02:36:50 PM	10	1.16	05-Apr-09 02:37:52 PM	10	2.55
05-Apr-09 02:36:51 PM	10	1.19	05-Apr-09 02:37:53 PM	10	2.56
05-Apr-09 02:36:52 PM	10	1.22	05-Apr-09 02:37:54 PM	10	2.58
05-Apr-09 02:36:53 PM	10	1.25	05-Apr-09 02:37:55 PM	10	2.59
05-Apr-09 02:36:54 PM	10	1.27	05-Apr-09 02:37:56 PM	10	2.60
05-Apr-09 02:36:55 PM	10	1.30	05-Apr-09 02:37:57 PM	10	2.62
05-Apr-09 02:36:56 PM	10	1.33	05-Apr-09 02:37:58 PM	10	2.63
05-Apr-09 02:36:57 PM	10	1.36	05-Apr-09 02:37:59 PM	10	2.64
05-Apr-09 02:36:58 PM	10	1.38	05-Apr-09 02:38:00 PM	10	2.66
05-Apr-09 02:36:59 PM	10	1.41	05-Apr-09 02:38:01 PM	10	2.67
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05-Apr-09 02:37:01 PM	10	1.46	05-Apr-09 02:38:03 PM	10	2.69
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05-Apr-09 02:37:03 PM	10	1.52	05-Apr-09 02:38:05 PM	10	2.72
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05-Apr-09 02:37:06 PM	10	1.60	05-Apr-09 02:38:08 PM	10	2.75
05-Apr-09 02:37:07 PM	10	1.63	05-Apr-09 02:38:09 PM	10	2.76
05-Apr-09 02:37:08 PM	10	1.65	05-Apr-09 02:38:10 PM	10	2.77
05-Apr-09 02:37:09 PM	10	1.68	05-Apr-09 02:38:11 PM	10	2.79
05-Apr-09 02:37:10 PM	10	1.70	05-Apr-09 02:38:12 PM	10	2.80
05-Apr-09 02:37:11 PM	10	1.73	05-Apr-09 02:38:13 PM	10	2.81
05-Apr-09 02:37:12 PM	10	1.75	05-Apr-09 02:38:14 PM	10	2.82
05-Apr-09 02:37:13 PM	10	1.78	05-Apr-09 02:38:15 PM	10	2.83
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05-Apr-09 02:37:15 PM	10	1.83	05-Apr-09 02:38:17 PM	10	2.85
05-Apr-09 02:37:16 PM	10	1.85	05-Apr-09 02:38:18 PM	10	2.85
05-Apr-09 02:37:17 PM	10	1.88	05-Apr-09 02:38:19 PM	10	2.87
05-Apr-09 02:37:18 PM	10	1.90	05-Apr-09 02:38:20 PM	10	2.87
05-Apr-09 02:37:19 PM	10	1.93	05-Apr-09 02:38:21 PM	10	2.88
05-Apr-09 02:37:20 PM	10	1.95	05-Apr-09 02:38:22 PM	10	2.89
05-Apr-09 02:37:21 PM	10	1.97	05-Apr-09 02:38:23 PM	10	2.90
05-Apr-09 02:37:22 PM	10	2.00	05-Apr-09 02:38:24 PM	10	2.91
05-Apr-09 02:37:23 PM	10	2.02	05-Apr-09 02:38:25 PM	10	2.92
05-Apr-09 02:37:24 PM	10	2.04	05-Apr-09 02:38:26 PM	10	2.92
05-Apr-09 02:37:25 PM	10	2.06	05-Apr-09 02:38:27 PM	10	2.93
05-Apr-09 02:37:26 PM	10	2.08	05-Apr-09 02:38:28 PM	10	2.94
05-Apr-09 02:37:27 PM	10	2.10	05-Apr-09 02:38:29 PM	10	2.95
05-Apr-09 02:37:28 PM	10	2.13	05-Apr-09 02:38:30 PM	10	2.96
05-Apr-09 02:37:29 PM	10	2.15	05-Apr-09 02:38:31 PM	10	2.96
05-Apr-09 02:37:30 PM	10	2.17	05-Apr-09 02:38:32 PM	10	2.97
05-Apr-09 02:37:31 PM	10	2.19	05-Apr-09 02:38:33 PM	10	2.98
05-Apr-09 02:37:32 PM	10	2.21	05-Apr-09 02:38:34 PM	10	2.98
05-Apr-09 02:37:33 PM	10	2.23	05-Apr-09 02:38:35 PM	10	2.99
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### SLUG TEST DATA DM-10

UNIGLASS INDUSTRIES, STATESVILLE, NC

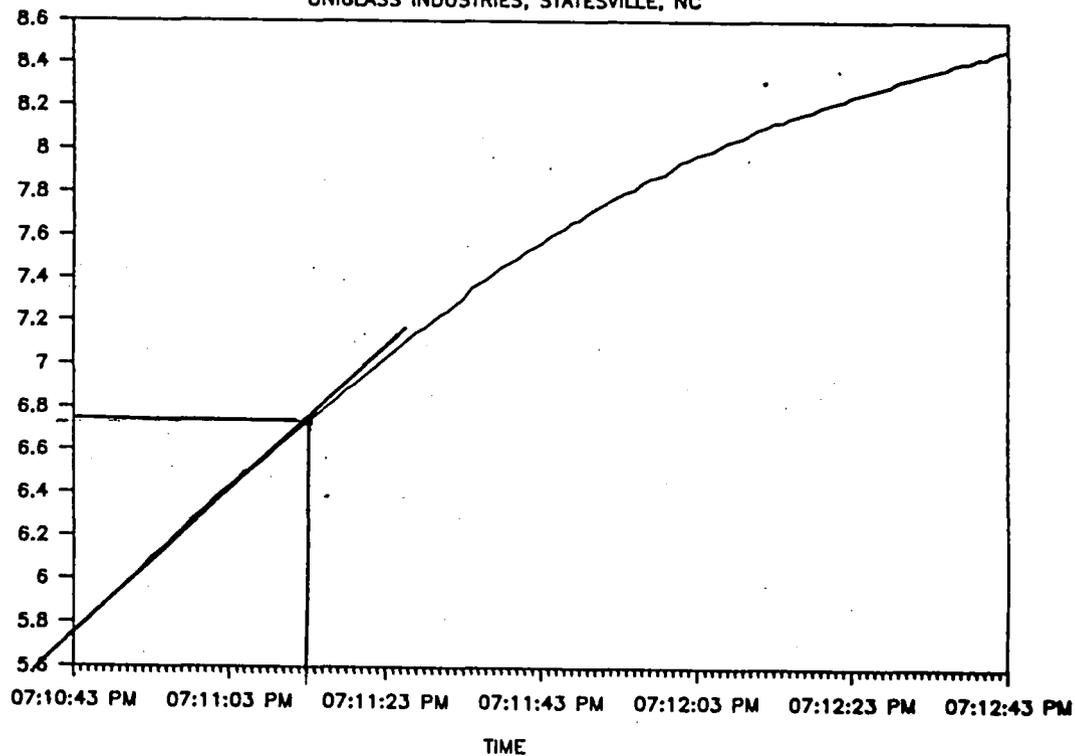


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05-Apr-09	07:10:47 PM	13	5.88
05-Apr-09	07:10:48 PM	13	5.92
05-Apr-09	07:10:49 PM	13	5.95
05-Apr-09	07:10:50 PM	13	5.99
05-Apr-09	07:10:51 PM	13	6.02
05-Apr-09	07:10:52 PM	13	6.06
05-Apr-09	07:10:53 PM	13	6.10
05-Apr-09	07:10:54 PM	13	6.13
05-Apr-09	07:10:55 PM	13	6.16
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05-Apr-09	07:11:38 PM	13	7.46

05-Apr-09	07:11:42 PM	13	7.55
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05-Apr-09	07:11:45 PM	13	7.62
05-Apr-09	07:11:46 PM	13	7.64
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05-Apr-09	07:11:58 PM	13	7.88
05-Apr-09	07:11:59 PM	13	7.89
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05-Apr-09	07:12:01 PM	13	7.95
05-Apr-09	07:12:02 PM	13	7.96
05-Apr-09	07:12:03 PM	13	7.98
05-Apr-09	07:12:04 PM	13	7.99
05-Apr-09	07:12:05 PM	13	8.00
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05-Apr-09	07:12:08 PM	13	8.05
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05-Apr-09	07:12:12 PM	13	8.11
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05-Apr-09	07:12:20 PM	13	8.21
05-Apr-09	07:12:21 PM	13	8.22
05-Apr-09	07:12:22 PM	13	8.23
05-Apr-09	07:12:23 PM	13	8.25
05-Apr-09	07:12:24 PM	13	8.26
05-Apr-09	07:12:25 PM	13	8.27
05-Apr-09	07:12:26 PM	13	8.28
05-Apr-09	07:12:27 PM	13	8.29
05-Apr-09	07:12:28 PM	13	8.30
05-Apr-09	07:12:29 PM	13	8.32
05-Apr-09	07:12:30 PM	13	8.33
05-Apr-09	07:12:31 PM	13	8.34
05-Apr-09	07:12:32 PM	13	8.35
05-Apr-09	07:12:33 PM	13	8.36
05-Apr-09	07:12:34 PM	13	8.37
05-Apr-09	07:12:35 PM	13	8.38
05-Apr-09	07:12:36 PM	13	8.40
05-Apr-09	07:12:37 PM	13	8.41
05-Apr-09	07:12:38 PM	13	8.41
05-Apr-09	07:12:39 PM	13	8.43
05-Apr-09	07:12:40 PM	13	8.43
05-Apr-09	07:12:41 PM	13	8.45

## SLUG TEST DATA DM-13

UNIGLASS INDUSTRIES, STATESVILLE, NC

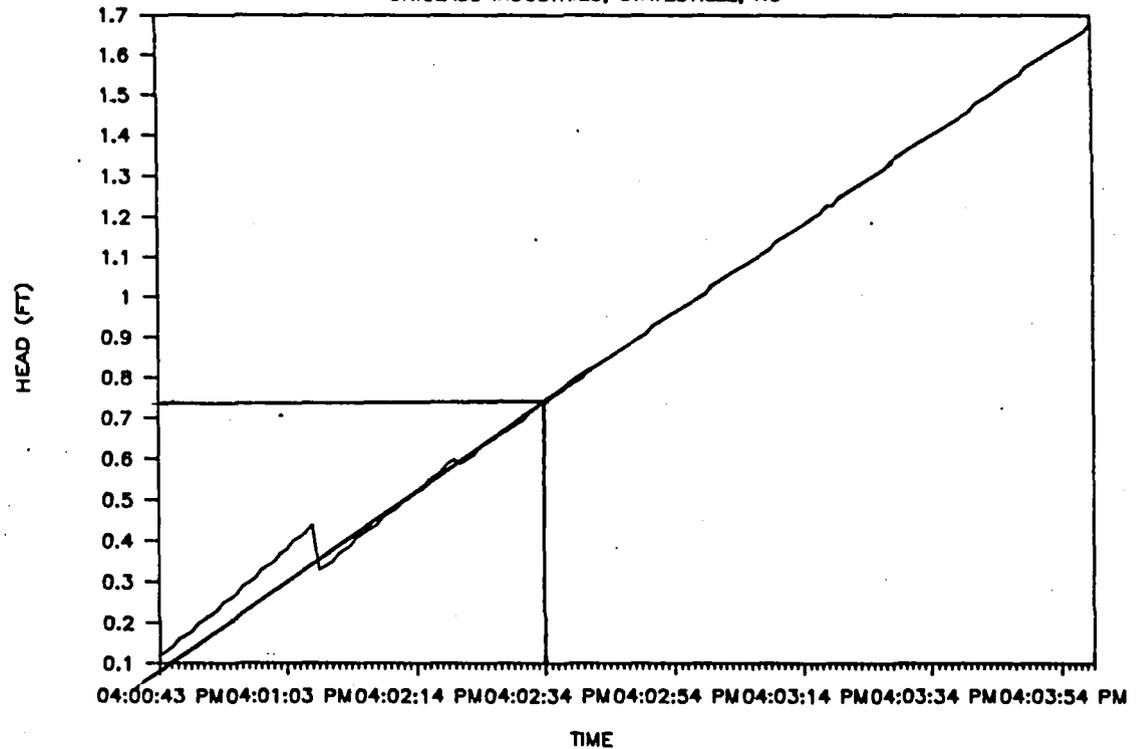


05-Apr-89 04:00:43 PM	4	0.12
05-Apr-89 04:00:44 PM	4	0.13
05-Apr-89 04:00:45 PM	4	0.14
05-Apr-89 04:00:46 PM	4	0.16
05-Apr-89 04:00:47 PM	4	0.17
05-Apr-89 04:00:48 PM	4	0.18
05-Apr-89 04:00:49 PM	4	0.20
05-Apr-89 04:00:50 PM	4	0.21
05-Apr-89 04:00:51 PM	4	0.22
05-Apr-89 04:00:52 PM	4	0.23
05-Apr-89 04:00:53 PM	4	0.25
05-Apr-89 04:00:54 PM	4	0.26
05-Apr-89 04:00:55 PM	4	0.27
05-Apr-89 04:00:56 PM	4	0.29
05-Apr-89 04:00:57 PM	4	0.30
05-Apr-89 04:00:58 PM	4	0.31
05-Apr-89 04:00:59 PM	4	0.33
05-Apr-89 04:01:00 PM	4	0.34
05-Apr-89 04:01:01 PM	4	0.35
05-Apr-89 04:01:02 PM	4	0.37
05-Apr-89 04:01:03 PM	4	0.38
05-Apr-89 04:01:04 PM	4	0.40
05-Apr-89 04:01:05 PM	4	0.41
05-Apr-89 04:01:06 PM	4	0.42
05-Apr-89 04:01:07 PM	4	0.44
05-Apr-89 04:01:09 PM	4	0.33
05-Apr-89 04:02:00 PM	4	0.34
05-Apr-89 04:02:01 PM	4	0.35
05-Apr-89 04:02:02 PM	4	0.37
05-Apr-89 04:02:03 PM	4	0.38
05-Apr-89 04:02:04 PM	4	0.39
05-Apr-89 04:02:05 PM	4	0.41
05-Apr-89 04:02:06 PM	4	0.42
05-Apr-89 04:02:07 PM	4	0.43
05-Apr-89 04:02:08 PM	4	0.44
05-Apr-89 04:02:09 PM	4	0.46
05-Apr-89 04:02:10 PM	4	0.47
05-Apr-89 04:02:11 PM	4	0.48
05-Apr-89 04:02:12 PM	4	0.50
05-Apr-89 04:02:13 PM	4	0.51
05-Apr-89 04:02:14 PM	4	0.52
05-Apr-89 04:02:15 PM	4	0.53
05-Apr-89 04:02:16 PM	4	0.55
05-Apr-89 04:02:17 PM	4	0.56
05-Apr-89 04:02:18 PM	4	0.57
05-Apr-89 04:02:19 PM	4	0.59
05-Apr-89 04:02:20 PM	4	0.60
05-Apr-89 04:02:21 PM	4	0.59
05-Apr-89 04:02:22 PM	4	0.60
05-Apr-89 04:02:23 PM	4	0.61
05-Apr-89 04:02:24 PM	4	0.63
05-Apr-89 04:02:25 PM	4	0.64
05-Apr-89 04:02:26 PM	4	0.65
05-Apr-89 04:02:27 PM	4	0.66
05-Apr-89 04:02:28 PM	4	0.67
05-Apr-89 04:02:29 PM	4	0.68
05-Apr-89 04:02:30 PM	4	0.69
05-Apr-89 04:02:31 PM	4	0.70

05-Apr-89 04:02:32 PM	4	0.72
05-Apr-89 04:02:33 PM	4	0.73
05-Apr-89 04:02:34 PM	4	0.74
05-Apr-89 04:02:35 PM	4	0.75
05-Apr-89 04:02:36 PM	4	0.76
05-Apr-89 04:02:37 PM	4	0.77
05-Apr-89 04:02:38 PM	4	0.78
05-Apr-89 04:02:39 PM	4	0.79
05-Apr-89 04:02:40 PM	4	0.80
05-Apr-89 04:02:41 PM	4	0.82
05-Apr-89 04:02:42 PM	4	0.83
05-Apr-89 04:02:43 PM	4	0.84
05-Apr-89 04:02:44 PM	4	0.85
05-Apr-89 04:02:45 PM	4	0.86
05-Apr-89 04:02:46 PM	4	0.87
05-Apr-89 04:02:47 PM	4	0.88
05-Apr-89 04:02:48 PM	4	0.89
05-Apr-89 04:02:49 PM	4	0.90
05-Apr-89 04:02:50 PM	4	0.91
05-Apr-89 04:02:51 PM	4	0.93
05-Apr-89 04:02:52 PM	4	0.94
05-Apr-89 04:02:53 PM	4	0.95
05-Apr-89 04:02:54 PM	4	0.96
05-Apr-89 04:02:55 PM	4	0.97
05-Apr-89 04:02:56 PM	4	0.98
05-Apr-89 04:02:57 PM	4	0.99
05-Apr-89 04:02:58 PM	4	1.00
05-Apr-89 04:02:59 PM	4	1.01
05-Apr-89 04:03:00 PM	4	1.03
05-Apr-89 04:03:01 PM	4	1.04
05-Apr-89 04:03:02 PM	4	1.05
05-Apr-89 04:03:03 PM	4	1.06
05-Apr-89 04:03:04 PM	4	1.07
05-Apr-89 04:03:05 PM	4	1.08
05-Apr-89 04:03:06 PM	4	1.09
05-Apr-89 04:03:07 PM	4	1.10
05-Apr-89 04:03:08 PM	4	1.11
05-Apr-89 04:03:09 PM	4	1.12
05-Apr-89 04:03:10 PM	4	1.14
05-Apr-89 04:03:11 PM	4	1.15
05-Apr-89 04:03:12 PM	4	1.16
05-Apr-89 04:03:13 PM	4	1.17
05-Apr-89 04:03:14 PM	4	1.18
05-Apr-89 04:03:15 PM	4	1.19
05-Apr-89 04:03:16 PM	4	1.20
05-Apr-89 04:03:17 PM	4	1.21
05-Apr-89 04:03:18 PM	4	1.23
05-Apr-89 04:03:19 PM	4	1.23
05-Apr-89 04:03:20 PM	4	1.25
05-Apr-89 04:03:21 PM	4	1.26
05-Apr-89 04:03:22 PM	4	1.27
05-Apr-89 04:03:23 PM	4	1.28
05-Apr-89 04:03:24 PM	4	1.29
05-Apr-89 04:03:25 PM	4	1.30
05-Apr-89 04:03:26 PM	4	1.31
05-Apr-89 04:03:27 PM	4	1.32
05-Apr-89 04:03:28 PM	4	1.34
05-Apr-89 04:03:29 PM	4	1.35

## SLUG TEST DATA DM-4

UNIGLASS INDUSTRIES, STATESVILLE, NC



05-Apr-89 04:03:30 PM	4	1.36
05-Apr-89 04:03:31 PM	4	1.37
05-Apr-89 04:03:32 PM	4	1.38
05-Apr-89 04:03:33 PM	4	1.39
05-Apr-89 04:03:34 PM	4	1.40
05-Apr-89 04:03:35 PM	4	1.41
05-Apr-89 04:03:36 PM	4	1.42
05-Apr-89 04:03:37 PM	4	1.43
05-Apr-89 04:03:38 PM	4	1.44
05-Apr-89 04:03:39 PM	4	1.45
05-Apr-89 04:03:40 PM	4	1.46
05-Apr-89 04:03:41 PM	4	1.48
05-Apr-89 04:03:42 PM	4	1.49
05-Apr-89 04:03:43 PM	4	1.50
05-Apr-89 04:03:44 PM	4	1.51
05-Apr-89 04:03:45 PM	4	1.52
05-Apr-89 04:03:46 PM	4	1.53
05-Apr-89 04:03:47 PM	4	1.54
05-Apr-89 04:03:48 PM	4	1.55
05-Apr-89 04:03:49 PM	4	1.57
05-Apr-89 04:03:50 PM	4	1.58
05-Apr-89 04:03:51 PM	4	1.59
05-Apr-89 04:03:52 PM	4	1.60
05-Apr-89 04:03:53 PM	4	1.61
05-Apr-89 04:03:54 PM	4	1.62
05-Apr-89 04:03:55 PM	4	1.63
05-Apr-89 04:03:56 PM	4	1.64
05-Apr-89 04:03:57 PM	4	1.65
05-Apr-89 04:03:58 PM	4	1.66
05-Apr-89 04:03:59 PM	4	1.68

**APPENDIX C**

Page 1  
Received: 04/05/89

RAS Sacramento REPORT  
04/13/89 05:24:37

Work Order # S9-04-038

REPORT Universal Engineering  
TO 3532 Maggie Blvd.  
Orlando FL 32811

PREPARED Radian Analytical Services  
BY 10395 Old Placerville Road  
Sacramento,  
California 95827

  
CERTIFIED BY

ATTEN Bill Adams

ATTEN \_\_\_\_\_  
PHONE 916-362-5332

CONTACT LMDAY

CLIENT UNIV ENGR SAMPLES 10  
COMPANY Universal Engineering  
FACILITY 3532 Maggie Blvd.  
Orlando FL 32811

SAMPLE B-16 #5 CONTAINS A MID-BOILING HYDROCARBON WHICH DOES NOT MATCH DIESEL. QUANTITATION IS BASED ON THE DIESEL STANDARD AND RESULTS ARE REPORTED AS E = ESTIMATED VALUE.

WORK ID CLARK-SCHWEBEL, NC; TPH-HEAVY  
TAKEN 3/30, 31/89 & 4/1/89  
TRANS Fedex 2489553805  
TYPE Soil  
P.O. # 89-5283-2  
INVOICE under separate cover

### SAMPLE IDENTIFICATION

### TEST CODES and NAMES used on this report

- 01 B-16 #5 SOIL →
- 02 B-11 #4 SOIL
- 03 B-11 #7 SOIL
- 04 B-17 #5 SOIL
- 05 B-15 #5 SOIL
- 06 B-19 #7 SOIL
- 07 B-11 #8 SOIL
- 07 B-11 #8 MS SOIL ?
- 07 B-11 #8 MSD SOIL
- 08 B-12 #7 SOIL
- 09 B-17 #6 SOIL
- 10 REAGENT BLANK SOIL

EX TPH Extraction for TPH by SP  
TPH S Petroleum Hydrocarbons

Appendix A

Comments, Notes and Definitions

## Notes and Definitions

Radian Work Order: S9-04-038

\* Est. result less than 5 times detection limit  
A Analytical and/or post-digestion spike  
B Detected in blank, result not corrected  
C Confirmed on second column  
D Sample diluted for this analyte  
E Estimated result - see report narrative  
G Exceeds calibration range  
J Detected at less than detection limit  
NA Not analyzed  
NC Not calculated  
ND Not detected at specified detection limit  
NR Analyte not requested  
NS Not spiked  
N/A Not available  
P Previously confirmed  
Q Outside control limits  
R Detected in blank, result corrected  
S Determined by Method of Standard Addition  
U Unconfirmed-2nd column not requested  
X Not confirmed by analysis on 2nd column

## Notes and Definitions

Radian Work Order: 59-04-038

\*

The asterisk(\*) is used to flag results which are less than five times the method specified detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the method detection limit is approached. These results should be considered approximate.

- A This flag indicates that a spike is an analytical and/or post-digestion spike. These spikes have not been subjected to the extraction or digestion step.
- B This flag indicates that the analyte was detected in the reagent blank but the sample results are not corrected for the amount in the blank.
- C Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The C flag indicates that the analyte has been confirmed by analysis on a second column.
- D This flag identifies all analytes identified in analysis at a secondary dilution factor. In an analysis some compounds can exceed the calibration range of the instrument. Therefore two analyses are performed, one at the concentration of the majority of the analytes, and a second with the sample diluted so that high concentration analyte(s) fall within the calibration range.

## Notes and Definitions

Page: A-4

Radian Work Order: S9-04-038

- E The reported value is estimated because of the presence of interference. The potential source of the interference is included in the report narrative.
- Q This flag identifies a GC/MS result whose concentration exceeds the calibration range for that specific analysis. Usually if one or more compounds have a response greater than full scale, the sample or extract is diluted and re-analyzed.
- J Indicates an estimated value for GC/MS data. This flag is used either when estimating a concentration for tentatively identified compounds where a response factor of 1 is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit.
- NA This analyte was not analyzed.
- NC Applies to RPD and spike recovery results. The relative percent difference (RPD) and spike recovery are not calculated when a result value is less than five times the detection limit or obvious matrix interferences are present. See \* definition for further explanation of the unreliability of data near the detection limit. A spike recovery is not calculated when the sample result is greater than four times the spike added concentration because the spike added concentration is considered insignificant.

Notes and Definitions

Radian Work Order: S9-04-038

ND

This flag (or < ) is used to denote analytes which are not detected at or above the specified detection limit. The value to the right of the < symbol is the method specified detection limit for the sample.

NR This analyte was not requested by the client.

NS This analyte or surrogate was not added ( spiked ) to the sample for this analysis.

N/A A result or value is not available for this parameter, usually a detection limit.

P Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The P flag indicates that the analyte has been confirmed previously. This flag is applicable to analyses of samples arising from a regular sampling program of a specific sample source; for example, a quarterly well monitoring program.

Radian Work Order: S9-04-038

Q

This quality control standard is outside method or laboratory specified control limits. This flag is applied to matrix spike, analytical GC spike, and surrogate recoveries; and to RPD(relative percent difference) values for duplicate analyses and matrix spike/matrix spike duplicate result.

R This flag indicates that the analyte was detected in the reagent blank and the sample results are corrected for the amount in the blank.

S This flag indicates that a specific result from a metals analysis has been obtained using the Method of Standard Addition.

U Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The U flag indicates that second column was not requested.

X Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The X flag indicates a second column confirmation was performed but the analyte was not confirmed and is likely a false positive.

Radian Work Order: S9-04-038

**TERMS USED IN THIS REPORT:**

**Analyte** - A chemical for which a sample is to be analyzed. The analysis will meet EPA method and GC specifications.

**Compound** - See Analyte.

**Detection Limit** - The method specified detection limit, which is the lower limit of quantitation specified by EPA for a method. Radian staff regularly assess their laboratories' method detection limits to verify that they meet or are lower than those specified by EPA. Detection limits which are higher than method limits are based on experimental values at the 99% confidence level. Note, the detection limit may vary from that specified by EPA based on sample size, dilution or cleanup. (Refer to Factor, below)

**EPA Method** - The EPA specified method used to perform an analysis. EPA has specified standard methods for analysis of environmental samples. Radian will perform its analyses and accompanying GC tests in conformance with EPA methods unless otherwise specified.

**Factor** - Default method detection limits are based on analysis of clean water samples. A factor is required to calculate sample specific detection limits based on alternate matrices (soil or water), use of cleanup procedures, or dilution of extracts/digestates. For example, extraction or digestion of 10 grams of soil in contrast to 1 liter of water will result in a factor of 100.

**Matrix** - The sample material. Generally, it will be soil, water, air, oil, or solid waste.

**Radian Work Order** - The unique Radian identification code assigned to the samples reported in the analytical summary.

Units - ug/L	micrograms per liter (parts per billion); liquids/water
ug/Kg	micrograms per kilogram (parts per billion); soils/solids
ug/M3	micrograms per cubic meter; air samples
mg/L	milligrams per liter (parts per million); liquids/water
mg/Kg	milligrams per kilogram (parts per million); soils/solids
%	percent; usually used for percent recovery of GC standards
uS/cm	conductance unit; microSiemens/centimeter
mL/hr	milliliters per hour; rate of settlement of matter in water
NTU	turbidity unit; nephelometric turbidity unit
CU	color unit; equal to 1 mg/L of chloroplatinate salt

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Received: 04/03/89

RAS Sacramento REPORT  
04/11/89 13:48:55

Work Order # 59-04-020

REPORT Universal Engineering  
TO 3532 Maggie Blvd.  
Orlando FL 32811

PREPARED Radian Analytical Services  
BY 10395 Old Placerville Road  
Sacramento,  
California 95827

ATTEN Bill Adams

ATTEN

PHONE 916-362-5332

*Paul Hale*  
CERTIFIED BY

CONTACT LMDAY

CLIENT UNIV ENGR SAMPLES 4  
COMPANY Universal Engineering  
FACILITY 3532 Maggie Blvd.  
Orlando FL 32811

WORK ID CLARK SCHIVEBEL FIBERGLASS  
TAKEN 3/29-3/30/89  
TRANS FED EX: 2489554006  
TYPE SOIL  
P. O. # 89-5283-2  
INVOICE under separate cover

SAMPLE IDENTIFICATION

TEST CODES and NAMES used on this report

- 01 B-9 SOIL
- 02 B-10 SOIL
- 03 B-13 SOIL
- 03 B-13 MS SOIL
- 03 B-13 MSD SOIL
- 04 REAGENT BLANK

- EX IPH Extraction for IPH by SP
- IPH 9 Petroleum Hydrocarbons

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 Received: 04/05/89

RAS Sacramento REPORT  
 Results By Test

Work Order # 59-04-038

TEST CODE	Sample <u>01</u>	Sample <u>02</u>	Sample <u>03</u>	Sample <u>04</u>	Sample <u>05</u>
default units	(entered units)				
EX_TPH	04/05/89	04/05/89	04/05/89	04/05/89	04/05/89
Date Completed					

TEST CODE	Sample <u>06</u>	Sample <u>07</u>	Sample <u>08</u>	Sample <u>09</u>	Sample <u>10</u>
default units	(entered units)				
EX_TPH	04/05/89	04/05/89	04/05/89	04/05/89	04/05/89
Date Completed		04/05/89	04/05/89		

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 Received: 04/05/89

RAS Sacramento REPORT  
 Results By Test

Work Order # S9-04-038

SAMPLE	Test: EX TPH
Sample Id	Date Completed
01	04/05/89
B-16 #5 SOIL	
02	04/05/89
B-11 #4 SOIL	
03	04/05/89
B-11 #7 SOIL	
04	04/05/89
B-17 #5 SOIL	
05	04/05/89
B-15 #5 SOIL	
06	04/05/89
B-15 #7 SOIL	
07	04/05/89
B-11 #8 SOIL	
	04/05/89
	04/05/89
08	04/05/89
B-12 #7 SOIL	
09	04/05/89
B-17 #6 SOIL	
10	04/05/89
REAGENT BLANK S	

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Received: 04/05/89

RAS Sacramento  
Results by Sample

REPORT

Work Order # S9-04-038

SAMPLE ID <u>B-16 #5 SOIL</u>	SAMPLE # <u>01</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>03/30/89</u> Category _____
EX_TPH <u>04/05/89</u>	
Date Completed	

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Received: 04/05/89

RAS Sacramento REPORT  
Results by Sample

Work Order # S9-04-038

SAMPLE ID B-16 #5 SOIL FRACTION 01A TEST CODE TPH S NAME Petroleum Hydrocarbons  
Date & Time Collected 03/30/89 Category \_\_\_\_\_

SOIL TOTAL PETROLEUM HYDROCARBONS - CALIFORNIA LUFT (1)

VERIFIED JD

ANALYST DC  
INSTRMT B

FILE # 829040764

INJECTED 04/02/89

UNITS ug/Kg

CAS#	COMPOUND	RESULT	DET LIMIT	FACTOR
71-43-2	Benzene	<u>NA</u>	<u>30</u>	<u>99</u>
108-88-3	Toluene	<u>NA</u>	<u>30</u>	<u>99</u>
100-41-4	Ethylbenzene	<u>NA</u>	<u>30</u>	<u>99</u>
1330-20-7	Total Xylenes	<u>NA</u>	<u>50</u>	<u>99</u>
	TPH Gasoline	<u>NA</u>	<u>5000</u>	<u>99</u>
	TPH Mid-Boiling	<u>320000 E</u>	<u>5000</u>	<u>99</u>
106-93-4	1,2-Dibromoethane	<u>NA</u>	<u>500</u>	<u>99</u>

(1) See Appendix A for Glossary of Report and Data Flag Definitions

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Received: 04/05/89

RAS Sacramento      REPORT  
Results by Sample

Work Order # S9-04-038

SAMPLE ID <u>B-11 #4 SOIL</u>	SAMPLE # <u>02</u> FRACTIONS: <u>A</u>	
	Date & Time Collected <u>03/31/89</u>	Category _____
EX_TPH <u>04/05/89</u>		
Date Completed		

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Received: 04/05/89

RAS Sacramento REPORT  
Results by Sample

Work Order # 59-04-038

SAMPLE ID B-11 #4 SOIL

FRACTION Q2A TEST CODE TPH S NAME Petroleum Hydrocarbons  
Date & Time Collected 03/31/89 Category \_\_\_\_\_

SOIL TOTAL PETROLEUM HYDROCARBONS - CALIFORNIA LUFT (1)

VERIFIED JD

ANALYST DC  
INSTRMT B

FILE # 829040931

INJECTED 04/09/89

UNITS ug/Kg

CAS#	COMPOUND	RESULT	DET LIMIT	FACTOR
71-43-2	Benzene	<u>NA</u>	<u>1500</u>	<u>4900</u>
108-88-3	Toluene	<u>NA</u>	<u>1500</u>	<u>4900</u>
100-41-4	Ethylbenzene	<u>NA</u>	<u>1500</u>	<u>4900</u>
1330-20-7	Total Xylenes	<u>NA</u>	<u>2500</u>	<u>4900</u>
	TPH Gasoline	<u>NA</u>	<u>250000</u>	<u>4900</u>
	TPH Mid-Boiling	<u>5.0E6</u>	<u>250000</u>	<u>4900</u>
106-93-4	1,2-Dibromoethane	<u>NA</u>	<u>25000</u>	<u>4900</u>

(1) See Appendix A for Glossary of Report and Data Flag Definitions

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Received: 04/05/89

RAS Sacramento REPORT  
Results by Sample

Work Order # 59-04-038

SAMPLE ID <u>B-11 #7 SOIL</u>	SAMPLE # <u>03</u> FRACTIONS: <u>A</u>	Category _____
EX <u>TPH 04/05/89</u> Date Completed	Date & Time Collected <u>03/31/89</u>	

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 Received: 04/05/89

RAS Sacramento REPORT  
 Results by Sample

Work Order # S9-04-038

SAMPLE ID B-11 #7 SOIL FRACTION Q3A TEST CODE TPH S NAME Petroleum Hydrocarbons  
 Date & Time Collected 03/31/89 Category \_\_\_\_\_

SOIL TOTAL PETROLEUM HYDROCARBONS - CALIFORNIA LUFT (1)

VERIFIED JD

ANALYST DC  
 INSTRMT B

FILE # 829040932

INJECTED 04/09/89

UNITS ug/Kg

CAS#	COMPOUND	RESULT	DET LIMIT	FACTOR
71-43-2	Benzene	<u>NA</u>	<u>600</u>	<u>2000</u>
108-88-3	Toluene	<u>NA</u>	<u>600</u>	<u>2000</u>
100-41-4	Ethylbenzene	<u>NA</u>	<u>600</u>	<u>2000</u>
1330-20-7	Total Xylenes	<u>NA</u>	<u>1000</u>	<u>2000</u>
	TPH Gasoline	<u>NA</u>	<u>100000</u>	<u>2000</u>
	TPH Mid-Boiling	<u>850000</u>	<u>100000</u>	<u>2000</u>
106-93-4	1,2-Dibromoethane	<u>NA</u>	<u>10000</u>	<u>2000</u>

(1) See Appendix A for Glossary of Report and Data Flag Definitions

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RAS Sacramento REPORT  
Results by Sample

Work Order # S9-04-038

SAMPLE ID B-17 #5 SOIL	SAMPLE # 04 FRACTIONS: A
EX_TPH 04/05/89	Date & Time Collected 03/30/89
Date Completed	Category

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RAS Sacramento REPORT  
Results by Sample

Work Order # S9-04-038

SAMPLE ID B-17 #5 SOIL

FRACTION 04A TEST CODE TPH S  
Date & Time Collected 03/30/89

NAME Petroleum Hydrocarbons  
Category \_\_\_\_\_

SOIL TOTAL PETROLEUM HYDROCARBONS - CALIFORNIA LUFT (1)

VERIFIED JD

ANALYST DC  
INSTRMT 8

FILE # 829040762

INJECTED 04/07/89

UNITS ug/Kg

CAS#	COMPOUND	RESULT	DET LIMIT	FACTOR
71-43-2	Benzene	<u>NA</u>	<u>29</u>	<u>98</u>
108-88-3	Toluene	<u>NA</u>	<u>29</u>	<u>98</u>
100-41-4	Ethylbenzene	<u>NA</u>	<u>29</u>	<u>98</u>
1330-20-7	Total Xylenes	<u>NA</u>	<u>49</u>	<u>98</u>
	TPH Gasoline	<u>NA</u>	<u>4900</u>	<u>98</u>
	TPH Mid-Boiling	<u>ND</u>	<u>4900</u>	<u>98</u>
106-93-4	1,2-Dibromoethane	<u>NA</u>	<u>490</u>	<u>98</u>

(1) See Appendix A for Glossary of Report and Data Flag Definitions

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RAS Sacramento REPORT  
Results by Sample

Work Order # S9-04-038

SAMPLE ID B-15 #5 SOIL	SAMPLE # 05 FRACTIONS: A
EX_TPH 04/05/89	Date & Time Collected 04/01/89
Date Completed	Category

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RAS Sacramento REPORT  
Results by Sample

Work Order # 59-04-038

SAMPLE ID B-15 #5 SOIL FRACTION 05A TEST CODE TPH S NAME Petroleum Hydrocarbons  
Date & Time Collected 04/01/89 Category \_\_\_\_\_

SOIL TOTAL PETROLEUM HYDROCARBONS - CALIFORNIA LUFT (1)

VERIFIED JD

ANALYST DC  
INSTRMT B

FILE # 829040763

INJECTED 04/07/89

UNITS ug/Kg

CAS#	COMPOUND	RESULT	DET LIMIT	FACTOR
71-43-2	Benzene	<u>NA</u>	<u>30</u>	<u>99</u>
108-88-3	Toluene	<u>NA</u>	<u>30</u>	<u>99</u>
100-41-4	Ethylbenzene	<u>NA</u>	<u>30</u>	<u>99</u>
1330-20-7	Total Xylenes	<u>NA</u>	<u>50</u>	<u>99</u>
	TPH Gasoline	<u>NA</u>	<u>5000</u>	<u>99</u>
	TPH Mid-Boiling	<u>ND</u>	<u>5000</u>	<u>99</u>
106-93-4	1,2-Dibromoethane	<u>NA</u>	<u>500</u>	<u>99</u>

(1) See Appendix A for Glossary of Report and Data Flag Definitions

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RAS Sacramento REPORT  
Results by Sample

Work Order # 59-04-038

SAMPLE ID B-15 #7 SOIL	SAMPLE # 06 FRACTIONS: A
EX_TPH 04/05/89	Date & Time Collected 04/01/89
Date Completed	Category

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RAS Sacramento REPORT  
Results by Sample

Work Order # 59-04-038

SAMPLE ID B-15 #7 SOIL FRACTION 06A TEST CODE TPH S NAME Petroleum Hydrocarbons  
Date & Time Collected 04/01/89 Category \_\_\_\_\_

SOIL TOTAL PETROLEUM HYDROCARBONS - CALIFORNIA LUFT (1)

VERIFIED JD

ANALYST DC  
INSTRMT 8

FILE # 829040759

INJECTED 04/07/89

UNITS ug/Kg

CAS#	COMPOUND	RESULT	DET LIMIT	FACTOR
71-43-2	Benzene	<u>NA</u>	<u>29</u>	<u>98</u>
108-88-3	Toluene	<u>NA</u>	<u>29</u>	<u>98</u>
100-41-4	Ethylbenzene	<u>NA</u>	<u>29</u>	<u>98</u>
1330-20-7	Total Xylenes	<u>NA</u>	<u>49</u>	<u>98</u>
	TPH Gasoline	<u>NA</u>	<u>4900</u>	<u>98</u>
	TPH Mid-Boiling	<u>ND</u>	<u>4900</u>	<u>98</u>
106-93-4	1,2-Dibromoethane	<u>NA</u>	<u>490</u>	<u>98</u>

(1) See Appendix A for Glossary of Report and Data Flag Definitions

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RAS Sacramento REPORT  
Results by Sample

Work Order # S9-04-038

SAMPLE ID <u>B-11 #8 SOIL</u>	SAMPLE # <u>07</u> FRACTIONS: <u>A</u>	Category _____
EX <u>TPH 04/05/89</u> Date Completed	Date & Time Collected <u>03/31/89</u>	

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RAS Sacramento REPORT  
 Results by Sample

Work Order # 59-04-038

SAMPLE ID B-11 #8 SOIL FRACTION 07A TEST CODE TPH S NAME Petroleum Hydrocarbons  
 Date & Time Collected 03/31/89 Category \_\_\_\_\_

SOIL TOTAL PETROLEUM HYDROCARBONS - CALIFORNIA LUFT (1)

VERIFIED JD

ANALYST DC  
 INSTRMT 8

FILE # 829040770

INJECTED 04/07/89

UNITS ug/Kg

CAS#	COMPOUND	RESULT	DET LIMIT	FACTOR
71-43-2	Benzene	<u>NA</u>	<u>30</u>	<u>99</u>
108-88-3	Toluene	<u>NA</u>	<u>30</u>	<u>99</u>
100-41-4	Ethylbenzene	<u>NA</u>	<u>30</u>	<u>99</u>
1330-20-7	Total Xylenes	<u>NA</u>	<u>50</u>	<u>99</u>
	TPH Gasoline	<u>NA</u>	<u>5000</u>	<u>99</u>
	TPH Mid-Boiling	<u>ND</u>	<u>5000</u>	<u>99</u>
106-93-4	1,2-Dibromoethane	<u>NA</u>	<u>500</u>	<u>99</u>

(1) See Appendix A for Glossary of Report and Data Flag Definitions

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RAS Sacramento REPORT  
Results by Sample

Work Order # S9-04-038

SAMPLE ID <u>B-11 #8 MS SOIL</u>	SAMPLE # <u>07</u> FRACTIONS: <u>B</u>	
	Date & Time Collected <u>03/31/89</u>	Category _____
EX <u>TPH 04/05/89</u>		
Date Completed		

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RAS Sacramento REPORT  
Results by Sample

Work Order # 59-04-038

SAMPLE ID B-11 #8 MS SOIL FRACTION Q7B TEST CODE TPH S NAME Petroleum Hydrocarbons  
Date & Time Collected 03/31/89 Category \_\_\_\_\_

SOIL TOTAL PETROLEUM HYDROCARBONS - CALIFORNIA LUFT (1)

VERIFIED JD

ANALYST DC  
INSTRMT 8

FILE # 829040771

INJECTED 04/07/89

UNITS % RECOV.

CAS#	COMPOUND	RESULT	DET LIMIT	FACTOR
71-43-2	Benzene	<u>NA</u>	<u>30</u>	<u>99</u>
108-88-3	Toluene	<u>NA</u>	<u>30</u>	<u>99</u>
100-41-4	Ethylbenzene	<u>NA</u>	<u>30</u>	<u>99</u>
1330-20-7	Total Xylenes	<u>NA</u>	<u>50</u>	<u>99</u>
	TPH Gasoline	<u>NA</u>	<u>5000</u>	<u>99</u>
	TPH Mid-Boiling	<u>74</u>	<u>5000</u>	<u>99</u>
106-93-4	1,2-Dibromoethane	<u>NA</u>	<u>500</u>	<u>99</u>

(1) See Appendix A for Glossary of Report and Data Flag Definitions

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Results by Sample

Work Order # S9-04-038

SAMPLE ID B-11 #8 MSD SOIL	SAMPLE # 07 FRACTIONS: C
EX TPH 04/05/89	Date & Time Collected 03/31/89
Date Completed	Category

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RAS Sacramento REPORT  
 Results by Sample

Work Order # S9-04-038

SAMPLE ID B-11 #8 MSD SOIL FRACTION 07C TEST CODE TPH S NAME Petroleum Hydrocarbons  
 Date & Time Collected 03/31/89 Category \_\_\_\_\_

SOIL TOTAL PETROLEUM HYDROCARBONS - CALIFORNIA LUFT (1)

VERIFIED JD

ANALYST DC  
 INSTRMT 8

FILE # 829040772

INJECTED 04/07/89

UNITS % RECOV.

CAS#	COMPOUND	RESULT	DET LIMIT	FACTOR
71-43-2	Benzene	<u>NA</u>	<u>29</u>	<u>98</u>
108-88-3	Toluene	<u>NA</u>	<u>29</u>	<u>98</u>
100-41-4	Ethylbenzene	<u>NA</u>	<u>29</u>	<u>98</u>
1330-20-7	Total Xylenes	<u>NA</u>	<u>49</u>	<u>98</u>
	TPH Gasoline	<u>NA</u>	<u>4900</u>	<u>98</u>
	TPH Mid-Boiling	<u>B1</u>	<u>4900</u>	<u>98</u>
106-93-4	1,2-Dibromoethane	<u>NA</u>	<u>490</u>	<u>98</u>

(1) See Appendix A for Glossary of Report and Data Flag Definitions

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RAS Sacramento REPORT  
Results by Sample

Work Order # 59-04-038

SAMPLE ID <u>B-12 #7 SOIL</u>	SAMPLE # <u>08</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>04/01/89</u> Category _____
EX_TPH <u>04/05/89</u>	
Date Completed	

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RAS Sacramento REPORT  
Results by Sample

Work Order # S9-04-038

SAMPLE ID B-12 #7 SOIL FRACTION 08A TEST CODE TPH S NAME Petroleum Hydrocarbons  
Date & Time Collected 04/01/89 Category \_\_\_\_\_

SOIL TOTAL PETROLEUM HYDROCARBONS - CALIFORNIA LUFT (1)

VERIFIED JD

ANALYST DC  
INSTRMT B

FILE # 829040768

INJECTED 04/07/89

UNITS ug/Kg

CAS#	COMPOUND	RESULT	DET LIMIT	FACTOR
71-43-2	Benzene	<u>NA</u>	<u>29</u>	<u>98</u>
108-88-3	Toluene	<u>NA</u>	<u>29</u>	<u>98</u>
100-41-4	Ethylbenzene	<u>NA</u>	<u>29</u>	<u>98</u>
1330-20-7	Total Xylenes	<u>NA</u>	<u>49</u>	<u>98</u>
	TPH Gasoline	<u>NA</u>	<u>4900</u>	<u>98</u>
	TPH Mid-Boiling	<u>ND</u>	<u>4900</u>	<u>98</u>
106-93-4	1,2-Dibromoethane	<u>NA</u>	<u>490</u>	<u>98</u>

(1) See Appendix A for Glossary of Report and Data Flag Definitions

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RAS Sacramento REPORT  
Results by Sample

Work Order # S9-04-038

SAMPLE ID B-17 #6 SOIL	SAMPLE # 09 FRACTIONS: A	Category
EX TPH 04/05/89	Date & Time Collected 03/30/89	
Date Completed		

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RAS Sacramento REPORT  
 Results by Sample

Work Order # S9-04-038

SAMPLE ID B-17 #6 SOIL FRACTION 09A TEST CODE TPH S NAME Petroleum Hydrocarbons  
 Date & Time Collected 03/30/89 Category \_\_\_\_\_

SOIL TOTAL PETROLEUM HYDROCARBONS - CALIFORNIA LUFT (1)

VERIFIED JD

ANALYST DC  
 INSTRMT 8

FILE # 829040769

INJECTED 04/07/89

UNITS ug/Kg

CAS#	COMPOUND	RESULT	DET LIMIT	FACTOR
71-43-2	Benzene	<u>NA</u>	<u>29</u>	<u>98</u>
108-88-3	Toluene	<u>NA</u>	<u>29</u>	<u>98</u>
100-41-4	Ethylbenzene	<u>NA</u>	<u>29</u>	<u>98</u>
1330-20-7	Total Xylenes	<u>NA</u>	<u>49</u>	<u>98</u>
	TPH Gasoline	<u>NA</u>	<u>4900</u>	<u>98</u>
	TPH Mid-Boiling	<u>ND</u>	<u>4900</u>	<u>98</u>
106-93-4	1,2-Dibromoethane	<u>NA</u>	<u>490</u>	<u>98</u>

(1) See Appendix A for Glossary of Report and Data Flag Definitions

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RAS Sacramento REPORT  
Results by Sample

Work Order # S9-04-038

SAMPLE ID	REAGENT BLANK SOIL	SAMPLE # 10	FRACTIONS: A
		Date & Time Collected	not specified
		Category	
EX TPH	04/05/89		
	Date Completed		

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RAS Sacramento REPORT  
 Results by Sample

Work Order # S9-04-038

SAMPLE ID REAGENT BLANK SOIL FRACTION 10A TEST CODE TPH S NAME Petroleum Hydrocarbons  
 Date & Time Collected not specified Category

SOIL TOTAL PETROLEUM HYDROCARBONS - CALIFORNIA LUFT (1)

VERIFIED JD

ANALYST DC  
 INSTRMT B

FILE # 829040758

INJECTED 04/07/89

UNITS ug/Kg

CAS#	COMPOUND	RESULT	DET LIMIT	FACTOR
71-43-2	Benzene	<u>NA</u>	<u>30</u>	<u>100</u>
108-88-3	Toluene	<u>NA</u>	<u>30</u>	<u>100</u>
100-41-4	Ethylbenzene	<u>NA</u>	<u>30</u>	<u>100</u>
1330-20-7	Total Xylenes	<u>NA</u>	<u>50</u>	<u>100</u>
	TPH Gasoline	<u>NA</u>	<u>5000</u>	<u>100</u>
	TPH Mid-Boiling	<u>ND</u>	<u>5000</u>	<u>100</u>
106-93-4	1,2-Dibromoethane	<u>NA</u>	<u>500</u>	<u>100</u>

(1) See Appendix A for Glossary of Report and Data Flag Definitions

Appendix A

Comments, Notes and Definitions

Radian Work Order: 59-04-020

\* Est. result less than 5 times detection limit  
A Analytical and/or post-digestion spike  
B Detected in blank, result not corrected  
C Confirmed on second column  
D Sample diluted for this analyte  
E Estimated result - see report narrative  
G Exceeds calibration range  
J Detected at less than detection limit  
NA Not analyzed  
NC Not calculated  
ND Not detected at specified detection limit  
NR Analyte not requested  
NS Not spiked  
N/A Not available  
P Previously confirmed  
Q Outside control limits  
R Detected in blank, result corrected  
S Determined by Method of Standard Addition  
U Unconfirmed-2nd column not requested  
X Not confirmed by analysis on 2nd column

Radian Work Order: SF-04-020

- \* The asterisk(\*) is used to flag results which are less than five times the method specified detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the method detection limit is approached. These results should be considered approximate.
- A This flag indicates that a spike is an analytical and/or post-digestion spike. These spikes have not been subjected to the extraction or digestion step.
- B This flag indicates that the analyte was detected in the reagent blank but the sample results are not corrected for the amount in the blank.
- C Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The C flag indicates that the analyte has been confirmed by analysis on a second column.
- D This flag identifies all analytes identified in analysis at a secondary dilution factor. In an analysis some compounds can exceed the calibration range of the instrument. Therefore two analyses are performed, one at the concentration of the majority of the analytes, and a second with the sample diluted so that high concentration analyte(s) fall within the calibration range.

Radian Work Order: SF-04-050

E

The reported value is estimated because of the presence of interference. The potential source of the interference is included in the report narrative.

G This flag identifies a GC/MS result whose concentration exceeds the calibration range for that specific analysis. Usually if one or more compounds have a response greater than full scale, the sample or extract is diluted and re-analyzed.

J Indicates an estimated value for GC/MS data. This flag is used either when estimating a concentration for tentatively identified compounds where a response factor of 1 is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit.

NA This analyte was not analyzed.

NC Applies to RPD and spike recovery results. The relative percent difference (RPD) and spike recovery are not calculated when a result value is less than five times the detection limit or obvious matrix interferences are present. See # definition for further explanation of the unreliability of data near the detection limit. A spike recovery is not calculated when the sample result is greater than four times the spike added concentration because the spike added concentration is considered insignificant.

Radian Work Order: 89-04-020

ND

This flag (or C) is used to denote analytes which are not detected at or above the specified detection limit. The value to the right of the C symbol is the method specified detection limit for the sample.

NR This analyte was not requested by the client.

NS This analyte or surrogate was not added (spiked) to the sample for this analysis.

NVA A result or value is not available for this parameter, usually a detection limit.

P Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The P flag indicates that the analyte has been confirmed previously. This flag is applicable to analyses of samples arising from a regular sampling program of a specific sample source; for example, a quarterly well monitoring program.

Radian Work Order: S9-04-020

- Q This quality control standard is outside method or laboratory specified control limits. This flag is applied to matrix spike, analytical GC spike, and surrogate recoveries; and to RPD (relative percent difference) values for duplicate analyses and matrix spike/matrix spike duplicate result.
- R This flag indicates that the analyte was detected in the reagent blank and the sample results are corrected for the amount in the blank.
- S This flag indicates that a specific result from a metals analysis has been obtained using the Method of Standard Addition.
- U Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The U flag indicates that second column was not requested.
- X Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The X flag indicates a second column confirmation was performed but the analyte was not confirmed and is likely a false positive.

Radian Work Order: 59-04-070

**TERMS USED IN THIS REPORT:**

**Analyte** - A chemical for which a sample is to be analyzed. The analysis will meet EPA method and QC specifications.

**Compound** - See Analyte.

**Detection Limit** - The method specified detection limit, which is the lower limit of quantitation specified by EPA for a method. Radian staff regularly assess their laboratories' method detection limits to verify that they meet or are lower than those specified by EPA. Detection limits which are higher than method limits are based on experimental values at the 99% confidence level. Note, the detection limit may vary from that specified by EPA based on sample size, dilution or cleanup. (Refer to Factor, below)

**EPA Method** - The EPA specified method used to perform an analysis. EPA has specified standard methods for analysis of environmental samples. Radian will perform its analyses and accompanying QC tests in conformance with EPA methods unless otherwise specified.

**Factor** - Default method detection limits are based on analysis of clean water samples. A factor is required to calculate sample specific detection limits based on alternate matrices (soil or water), use of cleanup procedures, or dilution of extracts/digestates. For example, extraction or digestion of 10 grams of soil in contrast to 1 liter of water will result in a factor of 100.

**Matrix** - The sample material. Generally, it will be soil, water, air, oil, or solid waste.

**Radian Work Order** - The unique Radian identification code assigned to the samples reported in the analytical summary

Units - ug/L	micrograms per liter (parts per billion); liquids/water
ug/Kg	micrograms per kilogram (parts per billion); soils/solids
ug/M3	micrograms per cubic meter; air samples
mg/L	milligrams per liter (parts per million); liquids/water
mg/Kg	milligrams per kilogram (parts per million); soils/solids
%	percent; usually used for percent recovery of QC standards
uS/cm	conductance unit, microSiemens/centimeter
mL/hr	milliliters per hour; rate of settlement of matter in water
NTU	turbidity unit, nephelometric turbidity unit
CU	color unit, equal to 1 mg/L of chloroplatinate salt

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RAS Sacramento  
REPORT  
Results By Test

Work Order # S9-04-020

TEST CODE	Sample 01	Sample 02	Sample 03	Sample 04
default units	(entered units)	(entered units)	(entered units)	(entered units)
EX_TPH	04/03/89	04/03/89	04/03/89	04/03/89
Date Completed			04/03/89	
			04/03/89	

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RAS Sacramento REPORT  
Results By Test

Work Order # S9-04-020

SAMPLE	Test: EX TPH
Sample Id	Date Completed
01 8-9 SOIL	04/03/89
02 B-10 SOIL	04/03/89
03 B-13 SOIL	04/03/89
	04/03/89
04 REAGENT BLANK	04/03/89

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RAS Sacramento REPORT  
Results by Sample

Work Order # S9-04-020

SAMPLE ID B-9 SOIL	SAMPLE # 01 FRACTIONS: A	Category
EX TPH 04/03/89	Date & Time Collected 03/29/89	
Date Completed		

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RAS Sacramento REPORT  
 Results by Sample

Work Order # 59-04-020

SAMPLE ID B-9 SOIL FRACTION 01A TEST CODE TPH S NAME Petroleum Hydrocarbons  
 Date & Time Collected 03/29/89 Category \_\_\_\_\_

SOIL TOTAL PETROLEUM HYDROCARBONS - CALIFORNIA LUFT (1)

VERIFIED JD

ANALYST DC  
 INSTRM1 8

FILE # 82904091B

INJECTED 04/02/89

UNITS ug/Kg

CAS#	COMPOUND	RESULT	DET LIMIT	FACTOR
71-43-2	Benzene	NA	30	100
108-88-3	Toluene	NA	30	100
100-41-4	Ethylbenzene	NA	30	100
1330-20-7	Total Xylenes	NA	50	100
	TPH Gasoline	NA	5000	100
	TPH Mid-Boiling	ND	5000	100
106-93-4	1,2-Dibromoethane	NA	500	100

(1) See Appendix A for Glossary of Report and Data Flag Definitions

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RAS Sacramento  
Results by Sample

REPORT

Work Order # S9-04-020

SAMPLE ID B-10 SOIL	SAMPLE # 02 FRACTIONS: A	Category
EX TPH 04/03/89	Date & Time Collected 03/29/89	
Date Completed		

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RAS Sacramento REPORT  
Results by Sample

Work Order # 59-04-020

SAMPLE ID B-10 SOIL FRACTION DEA TEST CODE TPH S NAME Petroleum Hydrocarbons  
Date & Time Collected 03/27/89 Category \_\_\_\_\_

SOIL TOTAL PETROLEUM HYDROCARBONS - CALIFORNIA LIST (1)

VERIFIED JD

ANALYST DC  
INSTRNT B

FILE # 829040919

INJECTED 04/02/89

UNITS ug/Kg

CAS#	COMPOUND	RESULT	DEI LIMIT	FACTOR
71-43-2	Benzene	NA	30	100
108-88-3	Toluene	NA	30	100
100-41-4	Ethylbenzene	NA	30	100
1330-20-7	Total Xylenes	NA	50	100
	TPH Gasoline	NA	5000	100
	TPH Mid-Boiling	ND	5000	100
106-93-4	1,2-Dibromoethane	NA	500	100

(1) See Appendix A for Glossary of Report and Data Flag Definitions

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RAS Sacramento REPORT  
Results by Sample

Work Order # 59-04-020

SAMPLE ID B-13 SOIL	SAMPLE # Q3 FRACTIONS: A
EX TPH 04/03/89	Date & Time Collected 03/30/89
Date Completed	Category

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RAS Sacramento REPORT  
 Results by Sample

Work Order # 59-04-020

SAMPLE ID: B-13 SOIL FRACTION Q3A TEST CODE TPH S NAME Petroleum Hydrocarbons  
 Date & Time Collected 03/30/89 Category \_\_\_\_\_

SOIL TOTAL PETROLEUM HYDROCARBONS - CALIFORNIA LUFT (1) VERIFIED JD

ANALYST DC FILE # 829040923  
 INSTRNT B INJECTED 04/02/89 UNITS ug/Kg

CASH	COMPOUND	RESULT	DET LIMIT	FACTOR
71-43-2	Benzene	NA	30	100
100-88-3	Toluene	NA	30	100
100-41-4	Ethylbenzene	NA	30	100
1330-20-7	Total xylenes	NA	50	100
	TPH Gasoline	NA	5000	100
	TPH Mid-Boiling	150000	5000	100
106-93-4	1,2-Dibromoethane	NA	500	100

(1) See Appendix A for Glossary of Report and Data Flag Definitions

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Results by Sample

Work Order # S9-04-020

SAMPLE ID B-13 MS SOIL	SAMPLE # 03 FRACTIONS: B	Category
EX TPH 04/03/89	Date & Time Collected 03/30/89	
Date Completed		

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RAS Sacramento REPORT  
Results by Sample

Work Order # S9-04-020

SAMPLE ID B-12 MS SOIL FRACTION 02B TEST CODE IPH 3 NAME Petroleum Hydrocarbons  
Date & Time Collected 03/30/89 Category \_\_\_\_\_

SOIL TOTAL PETROLFUM HYDROCARBONS - CALIFORNIA LUFT (1)

VERIFIED JD

ANALYST DC  
INSTRMT B

FILE # 829040924

INJECTED 04/07/89

UNITS % RECOV.

CASH	COMPOUND	RESULT	DET LIMIT	FACTOR
71-43-2	Benzene	NA	30	99
109-88-3	Toluene	NA	30	99
100-41-4	Ethylbenzene	NA	30	99
1330-20-7	Total Xylenes	NA	30	99
	TPH Gasoline	NA	5000	99
	IPH Mid-Boiling	103	5000	99
105-73-4	1,2-Dibromoethane	NA	500	99

(1) See Appendix A For Glossary of Report and Data Flag Definitions

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RAS Sacramento REPORT  
Results by Sample

Work Order # 89-04-020

SAMPLE ID 8-13 MSD SOIL	SAMPLE # 03 FRACTIONS: C
	Date & Time Collected 03/30/89 Category
EX TPH 04/03/89	
Date Completed	

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 Received: 04/03/89

RAS Sacramento REPORT  
 Results by Sample

Work Order # 59-04-020

SAMPLE ID B-13 NSO SOIL FRACTION QSC TEST CODE TPH S NAME Petroleum Hydrocarbons  
 Date & Time Collected 03/30/89 Category \_\_\_\_\_

SOIL TOTAL PEIROLEUN HYDROCARBONS - CALIFORNIA LUFT (1) VERIFIED JD

ANALYST DC  
 INSTRNT B

FILE # 829040925

INJECTED 04/09/89

UNITS % RECOV.

CAS#	COMPOUND	RESULT	DEI LIMIT	FACTOR
71-43-2	Benzene	NA	30	100
108-88-3	Toluene	NA	30	100
100-41-4	Ethylbenzene	NA	30	100
1330-20-7	Total xylenes	NA	50	100
	TPH Gasoline	NA	5000	100
	TPH Mid-Boiling	99	5000	100
108-93-4	1,2-Dibromoethane	NA	500	100

(1) See Appendix A For Glossary of Report and Data Flag Definitions

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SAS Sacramento

REPORT

Work Order # 59-04-020

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Results by Sample

SAMPLE ID REAGENT BLANK	SAMPLE # 04 FRACTIONS: A
EX TPH 04/03/89	Date & Time Collected not specified
Date Completed	Category

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RAS Sacramento REPORT  
Results by Sample

Work Order # 59-04-020

SAMPLE ID REAGENT BLANK FRACTION 09A TEST CODE TPH S NAME Petroleum Hydrocarbons  
Date & Time Collected not specified Category                     

SOIL TOTAL PETROLEUM HYDROCARBONS - CALIFORNIA LIST (1) VERIFIED JD

ANALYST DC FILE # 82904094  
INSTRNT 8 INJECTED 04/05/89 UNITS ug/Kg

CASE#	COMPOUND	RESULT	DEI LIMIT	FACTOR
71-43-2	Benzene	NA	30	100
108-88-3	Toluene	NA	30	100
100-41-4	Ethylbenzene	NA	30	100
1330-20-7	Total xylenes	NA	50	100
	TPH Gasoline	NA	5000	100
	TPH Mid-Boiling	ND	5000	100
106-93-4	1,2-Dibromethane	NA	500	100

(1) See Appendix A for Glossary of Report and Data Flag Definitions

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RAS Sacramento REPORT  
05/03/89 15:31:10

Work Order # 59-04-270

REPORT Universal Engineering  
TO 3532 Maggie Blvd.  
Orlando FL 32811

PREPARED Radian Analytical Services  
BY 10395 Old Placerville Road  
Sacramento,  
California 95827

ATTEN Bill Adams

ATTEN \_\_\_\_\_  
PHONE 916-362-5332

*Paul H. Kalo*  
CERTIFIED BY \_\_\_\_\_

CLIENT UNIV ENGR SAMPLES 3  
COMPANY Universal Engineering  
FACILITY 3532 Maggie Blvd.  
Orlando FL 32811

CONTACT LMDAY

WORK ID CLARK SCHIVEBEL FIBERGLASS  
TAKEN 3/29-3/30/89  
TRANS FED EX: 2489554006  
TYPE SOIL  
P.O. # 89-5283-2  
INVOICE under separate cover

SAMPLE IDENTIFICATION

TEST CODES and NAMES used on this report

- 01 B-13 #10 SOIL
- 02 B-13 #11 SOIL
- 03 REAGENT BLANK SOIL

- EX TPH Extraction for TPH by SP
- TPH S Petroleum Hydrocarbons

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RAS Sacramento REPORT  
 Results By Test

Work Order # 59-04-270

TEST CODE	Sample 01	Sample 02	Sample 03
default units	(entered units)	(entered units)	(entered units)
EX_TPH	04/26/89	04/26/89	04/26/89
Date Completed	DATE COMPLETED	DATE COMPLETED	DATE COMPLETED

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RAS Sacramento REPORT  
Results By Test

Work Order # S9-04-270

SAMPLE	Test: EX TPH
Sample Id	Date Completed
01	04/26/89
B-13 #10 SOIL	DATE COMPLETED
02	04/26/89
B-13 #11 SOIL	DATE COMPLETED
03	04/26/89
REAGENT BLANK S	DATE COMPLETED

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RAS Sacramento REPORT  
Results by Sample

Work Order # S9-04-270

SAMPLE ID <u>B-13 #10 SOIL</u>	SAMPLE # <u>01</u> FRACTIONS: <u>A</u>
	Date & Time Collected <u>03/30/89</u> Category _____
EX_TPH <u>04/26/89</u>	
DATE COMPLETED	

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RAS Sacramento REPORT  
Results by Sample

Work Order # 59-04-270

SAMPLE ID B-13 #10 SOIL FRACTION 01A TEST CODE TPH S NAME Petroleum Hydrocarbons  
Date & Time Collected 03/30/89 Category \_\_\_\_\_

SOIL TOTAL PETROLEUM HYDROCARBONS - CALIFORNIA LUFT (1)

VERIFIED JD

ANALYST DC  
INSTRMT B

FILE # 829042814

INJECTED 04/28/89

UNITS ug/kg

CAS#	COMPOUND	RESULT	DEI LIMIT	FACTOR
71-43-2	Benzene	<u>NA</u>	<u>29</u>	<u>98</u>
108-88-3	Toluene	<u>NA</u>	<u>29</u>	<u>98</u>
100-41-4	Ethylbenzene	<u>NA</u>	<u>29</u>	<u>98</u>
1330-20-7	Total Xylenes	<u>NA</u>	<u>49</u>	<u>98</u>
	TPH Gasoline	<u>NA</u>	<u>4900</u>	<u>98</u>
	TPH Mid-Boiling	<u>ND</u>	<u>4900</u>	<u>98</u>
106-93-4	1,2-Dibromoethane	<u>NA</u>	<u>490</u>	<u>98</u>

(1) See Appendix A for Glossary of Report and Data Flag Definitions

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RAS Sacramento

REPORT

Work Order # S9-04-270

Received: 04/26/89

Results by Sample

SAMPLE ID B-13 #11 SOIL	SAMPLE # 02 FRACTIONS: A
	Date & Time Collected 03/30/89
	Category
EX TPH 04/26/89	
DATE COMPLETED	

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 Received: 04/26/89

RAS Sacramento REPORT  
 Results by Sample

Work Order # 59-04-270

SAMPLE ID B-13 #11 SOIL FRACTION 02A TEST CODE TPH S NAME Petroleum Hydrocarbons  
 Date & Time Collected 03/30/89 Category \_\_\_\_\_

SOIL TOTAL PETROLEUM HYDROCARBONS - CALIFORNIA LUFT (1)

VERIFIED JD

ANALYST DC FILE # 829042815  
 INSTRMT 8 INJECTED 04/28/89 UNITS ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT	FACTOR
71-43-2	Benzene	NA	29	98
108-88-3	Toluene	NA	29	98
100-41-4	Ethylbenzene	NA	29	98
1330-20-7	Total Xylenes	NA	49	98
	TPH Gasoline	NA	4900	98
	TPH Mid-Boiling	ND	4900	98
106-93-4	1,2-Dibromoethane	NA	490	98

(1) See Appendix A for Glossary of Report and Data Flag Definitions

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RAS Sacramento REPORT  
 Results by Sample

Work Order # S9-04-270

SAMPLE ID	REAGENT BLANK SOIL	SAMPLE # 03	FRACTIONS: A
EX_TPH 04/26/89		Date & Time Collected	not specified
DATE COMPLETED		Category	

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RAS Sacramento REPORT  
Results by Sample

Work Order # S9-04-270

SAMPLE ID REAGENT BLANK SOIL FRACTION Q3A TEST CODE TPH S NAME Petroleum Hydrocarbons  
Date & Time Collected not specified Category \_\_\_\_\_

SOIL TOTAL PETROLEUM HYDROCARBONS - CALIFORNIA LUFT (1)

VERIFIED JD

ANALYST DC  
INSTRMT 8

FILE # 82904287

INJECTED 04/28/89

UNITS ug/kg

CAS#	COMPOUND	RESULT	DET LIMIT	FACTOR
71-43-2	Benzene	<u>NA</u>	<u>30</u>	<u>100</u>
108-88-3	Toluene	<u>NA</u>	<u>30</u>	<u>100</u>
100-41-4	Ethylbenzene	<u>NA</u>	<u>30</u>	<u>100</u>
1330-20-7	Total Xylenes	<u>NA</u>	<u>50</u>	<u>100</u>
	TPH Gasoline	<u>NA</u>	<u>5000</u>	<u>100</u>
	TPH Mid-Boiling	<u>ND</u>	<u>5000</u>	<u>100</u>
106-93-4	1,2-Dibromoethane	<u>NA</u>	<u>500</u>	<u>100</u>

(1) See Appendix A for Glossary of Report and Data Flag Definitions

Appendix A

Comments, Notes and Definitions

Radian Work Order: S9-04-270

\* Est. result less than 5 times detection limit  
A Analytical and/or post-digestion spike  
B Detected in blank, result not corrected  
C Confirmed on second column  
D Sample diluted for this analyte  
E Estimated result - see report narrative  
G Exceeds calibration range  
J Detected at less than detection limit  
NA Not analyzed  
NC Not calculated  
ND Not detected at specified detection limit  
NR Analyte not requested  
NS Not spiked  
N/A Not available  
P Previously confirmed  
Q Outside control limits  
R Detected in blank, result corrected  
S Determined by Method of Standard Addition  
U Unconfirmed-2nd column not requested  
X Not confirmed by analysis on 2nd column

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\*

The asterisk(\*) is used to flag results which are less than five times the method specified detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the method detection limit is approached. These results should be considered approximate.

- A This flag indicates that a spike is an analytical and/or post-digestion spike. These spikes have not been subjected to the extraction or digestion step.
- B This flag indicates that the analyte was detected in the reagent blank but the sample results are not corrected for the amount in the blank.
- C Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The C flag indicates that the analyte has been confirmed by analysis on a second column.
- D This flag identifies all analytes identified in analysis at a secondary dilution factor. In an analysis some compounds can exceed the calibration range of the instrument. Therefore two analyses are performed, one at the concentration of the majority of the analytes, and a second with the sample diluted so that high concentration analyte(s) fall within the calibration range.

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E

The reported value is estimated because of the presence of interference. The potential source of the interference is included in the report narrative.

G

This flag identifies a GC/MS result whose concentration exceeds the calibration range for that specific analysis. Usually if one or more compounds have a response greater than full scale, the sample or extract is diluted and re-analyzed.

J

Indicates an estimated value for GC/MS data. This flag is used either when estimating a concentration for tentatively identified compounds where a response factor of 1 is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit.

NA

This analyte was not analyzed.

NC

Applies to RPD and spike recovery results. The relative percent difference (RPD) and spike recovery are not calculated when a result value is less than five times the detection limit or obvious matrix interferences are present. See \* definition for further explanation of the unreliability of data near the detection limit. A spike recovery is not calculated when the sample result is greater than four times the spike added concentration because the spike added concentration is considered insignificant.

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ND

This flag (or < ) is used to denote analytes which are not detected at or above the specified detection limit. The value to the right of the < symbol is the method specified detection limit for the sample.

NR This analyte was not requested by the client.

NS This analyte or surrogate was not added ( spiked ) to the sample for this analysis.

N/A A result or value is not available for this parameter, usually a detection limit.

P Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The P flag indicates that the analyte has been confirmed previously. This flag is applicable to analyses of samples arising from a regular sampling program of a specific sample source; for example, a quarterly well monitoring program.

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Q

This quality control standard is outside method or laboratory specified control limits. This flag is applied to matrix spike, analytical QC spike, and surrogate recoveries; and to RPD(relative percent difference) values for duplicate analyses and matrix spike/matrix spike duplicate result.

R

This flag indicates that the analyte was detected in the reagent blank and the sample results are corrected for the amount in the blank.

S

This flag indicates that a specific result from a metals analysis has been obtained using the Method of Standard Addition.

U

Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The U flag indicates that second column was not requested.

X

Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The X flag indicates a second column confirmation was performed but the analyte was not confirmed and is likely a false positive.

Radian Work Order: S9-04-270

TERMS USED IN THIS REPORT:

Analyte - A chemical for which a sample is to be analyzed. The analysis will meet EPA method and GC specifications.

Compound - See Analyte.

Detection Limit - The method specified detection limit, which is the lower limit of quantitation specified by EPA for a method. Radian staff regularly assess their laboratories' method detection limits to verify that they meet or are lower than those specified by EPA. Detection limits which are higher than method limits are based on experimental values at the 99% confidence level. Note, the detection limit may vary from that specified by EPA based on sample size, dilution or cleanup. (Refer to Factor, below)

EPA Method - The EPA specified method used to perform an analysis. EPA has specified standard methods for analysis of environmental samples. Radian will perform its analyses and accompanying GC tests in conformance with EPA methods unless otherwise specified.

Factor - Default method detection limits are based on analysis of clean water samples. A factor is required to calculate sample specific detection limits based on alternate matrices (soil or water), use of cleanup procedures, or dilution of extracts/digestates. For example, extraction or digestion of 10 grams of soil in contrast to 1 liter of water will result in a factor of 100.

Matrix - The sample material. Generally, it will be soil, water, air, oil, or solid waste.

Radian Work Order - The unique Radian identification code assigned to the samples reported in the analytical summary.

Units - ug/L	micrograms per liter (parts per billion); liquids/water
ug/Kg	micrograms per kilogram (parts per billion); soils/solids
ug/M3	micrograms per cubic meter; air samples
mg/L	milligrams per liter (parts per million); liquids/water
mg/Kg	milligrams per kilogram (parts per million); soils/solids
%	percent; usually used for percent recovery of GC standards
uS/cm	conductance unit; microSiemens/centimeter
mL/hr	milliliters per hour; rate of settlement of matter in water
NTU	turbidity unit; nephelometric turbidity unit
CU	color unit; equal to 1 mg/L of chloroplatinate salt

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Received: 04/06/89

PERIMETER PARK REPORT  
05/21/89 11:57:51

Work Order # P9-04-011

REPORT Universal Engineering  
TO 3532 Maggie Blvd  
Orlando, FL 32811

PREPARED Radian Analytical Services  
BY Bldg. 900 Perimeter Park  
Morrisville, NC 27560

*Lucas A. Petkovich*  
CERTIFIED BY

ATTEN Bill Adam

ATTEN \_\_\_\_\_  
PHONE 919-481-0212

CONTACT LMDAY

CLIENT UNIVERSAL EN SAMPLES 17  
COMPANY Universal Engineering  
FACILITY 3532 Maggie Blvd.  
Orlando, FL 32811

WORK ID Clark Schwebel Fiberglass  
TAKEN Thomas Zankeet  
TRANS Fed Ex# 2210713466  
TYPE Water by Method 625 + TICs  
P.O. # 89-5283-2  
INVOICE under separate cover

SAMPLE IDENTIFICATION

TEST CODES and NAMES used on this report

- 01 DW 17
- 02 DW 15
- 03 DW 4
- 04 DW 14
- 05 DW 16
- 06 DW 11
- 07 DW 3
- 08 DW 12
- 09 DW 9
- 10 DW 13
- 11 DW 1
- 12 DW 13 (Duplicate)
- 13 Equipment Blank
- 14 DW 10
- 15 Method Spike
- 16 Method Spike Dup
- 17 Method Blank #1

- 3520 EPA METHOD 3520 LIQ-LIQ
- 625 Semivolatle Organics
- MSNS S Extra Peaks for GC/MS(BNA)

SAMPLE		Test: 3520
Sample Id		DATE EXTRACTED
	01	no data
DW 17	02	04/06/89
DW 15	03	04/06/89
DW 4	04	04/06/89
DW 14	05	04/06/89
DW 16	06	04/06/89
DW 11	07	04/06/89
DW 3	08	04/06/89
DW 12	09	04/06/89
DW 9	10	04/06/89
DW 13	11	04/06/89
DW 1	12	04/06/89
DW 13 (Duplica	13	04/06/89
Equipment Blank	14	04/06/89
DW 10		

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PERIMETER PARK  
Results By Test

Work Order # P9-04-011  
Continued From Above

SAMPLE	Test: 3520
Sample Id	DATE EXTRACTED
15	04/06/89
Method Spike	
16	04/06/89
Method Spike Du	
17	04/06/89
Method Blank #1	

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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011

SAMPLE ID DW 17 FRACTION 01A TEST CODE 625 NAME Semivolatile Organics  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

ORGANICS ANALYSIS DATA SHEET  
SEMIVOLATILE COMPOUNDS by METHOD 625

ANALYST RH EXTRACTD 04/06/89 FILE # 45B0812 VERIFIED \_\_\_\_\_ LC \_\_\_\_\_  
INSTRMT 4500B INJECTD 04/27/89 UNITS ug/L

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
_____	62-75-9	n-nitrosodimethylamine	ND	10
_____	108-95-2	phenol	ND	1.5
_____	111-44-4	bis(2-chloroethyl) ether	ND	5.7
_____	95-57-8	2-chlorophenol	ND	3.3
_____	541-73-1	1,3-dichlorobenzene	ND	1.9
_____	106-46-7	1,4-dichlorobenzene	ND	4.4
_____	95-50-1	1,2-dichlorobenzene	ND	1.9
_____	108-60-1	bis(2-chloroisopropyl) ether	ND	5.7
_____	621-64-7	n-nitroso-di-n-propylamine	ND	12
_____	67-72-1	hexachloroethane	ND	1.6
_____	98-95-3	nitrobenzene	ND	1.9
_____	78-59-1	isophorone	ND	2.2
_____	88-75-5	2-nitrophenol	ND	3.6
_____	105-67-9	2,4-dimethylphenol	ND	2.7
_____	111-91-1	bis(2-chloroethoxy)methane	ND	5.3
_____	120-83-2	2,4-dichlorophenol	ND	2.7
_____	120-82-1	1,2,4-trichlorobenzene	ND	1.9
_____	91-20-3	naphthalene	ND	1.6
_____	87-68-3	hexachlorobutadiene	ND	0.90
_____	59-50-7	4-chloro-3-methylphenol	ND	3.0
_____	77-47-4	hexachlorocyclopentadiene	ND	6.0
_____	88-06-2	2,4,6-trichlorophenol	ND	2.7
_____	91-58-7	2-chloronaphthalene	ND	1.9
_____	131-11-3	dimethyl phthalate	ND	1.6
_____	208-96-8	acenaphthylene	ND	3.5
_____	83-32-9	acenaphthene	ND	1.9
_____	51-28-5	2,4-dinitrophenol	ND	42

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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011  
Continued From Above

SAMPLE ID DW 17

FRACTION 01A TEST CODE 625  
Date & Time Collected 04/04/89

NAME Semivolatile Organics  
Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	100-02-7	4-nitrophenol	ND	2.4
	606-20-2	2,6-dinitrotoluene	ND	1.9
	121-14-2	2,4-dinitrotoluene	ND	5.7
	84-66-2	diethylphthalate	ND	1.9
	7005-72-3	4-chlorophenyl-phenylether	ND	4.2
	86-73-7	fluorene	ND	1.9
	534-52-1	4,6-dinitro-2-methylphenol	ND	24
	86-30-6	n-nitrosodiphenylamine	ND	1.9
	101-55-3	4-bromophenyl-phenylether	ND	1.9
	118-74-1	hexachlorobenzene	ND	1.9
	87-86-5	pentachlorophenol	ND	3.6
	85-01-8	phenanthrene	ND	5.4
	120-12-7	anthracene	ND	1.9
	84-74-2	di-n-butylphthalate	ND	2.5
	206-44-0	fluoranthene	ND	2.2
	92-87-5	benzidine	ND	44
	129-00-0	pyrene	ND	1.9
	85-68-7	butylbenzylphthalate	ND	2.5
	91-94-1	3,3'-dichlorobenzidine	ND	17
	56-55-3	benzo(a)anthracene	ND	7.8
	117-81-7	bis(2-ethylhexyl)phthalate	4.0 *	2.5
	218-01-9	chrysene	ND	2.5
	117-84-0	di-n-octyl phthalate	ND	2.5
	205-99-2	benzo(b)fluoranthene	ND	4.8
	207-08-9	benzo(k)fluoranthene	ND	2.5
	50-32-8	benzo(a)pyrene	ND	2.5
	193-39-5	indeno(1,2,3-cd)pyrene	ND	3.7
	53-70-3	dibenz(a,h)anthracene	ND	2.5
	191-24-2	benzo(ghi)perylene	ND	4.1
	103-23-1	Hexadinoic acid, Bis(2-ethylhexyl)ester	7.0	

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PERIMETER PARK REPORT  
 Results by Sample

Work Order # P9-04-011  
 Continued From Above

SAMPLE ID DW 17 FRACTION 01A TEST CODE 625 NAME Semivolatile Organics  
 Date & Time Collected 04/04/89 Category \_\_\_\_\_

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	2-fluorophenol	47 %
_____	d5-phenol	59 %
_____	d5-nitrobenzene	74 %
_____	2-fluorobiphenyl	67 %
_____	2,4,6-tribromophenol	51 %
_____	d14-terphenyl	44 %

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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011

SAMPLE ID DW 15 FRACTION 02A TEST CODE 625 NAME Semivolatile Organics  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

ORGANICS ANALYSIS DATA SHEET  
SEMIVOLATILE COMPOUNDS by METHOD 625

ANALYST RH EXTRACTD 04/06/89 FILE # 45B0813 VERIFIED \_\_\_\_\_ LC \_\_\_\_\_  
INSTRMT 4500B INJECTD 04/27/89 UNITS ug/L

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
_____	62-75-9	n-nitrosodimethylamine	ND	10
_____	108-95-2	phenol	ND	1.5
_____	111-44-4	bis(2-chloroethyl) ether	ND	5.7
_____	95-57-8	2-chlorophenol	ND	3.3
_____	541-73-1	1,3-dichlorobenzene	ND	1.9
_____	106-46-7	1,4-dichlorobenzene	ND	4.4
_____	95-50-1	1,2-dichlorobenzene	ND	1.9
_____	108-60-1	bis(2-chloroisopropyl) ether	ND	5.7
_____	621-64-7	n-nitroso-di-n-propylamine	ND	12
_____	67-72-1	hexachloroethane	ND	1.6
_____	98-95-3	nitrobenzene	ND	1.9
_____	78-59-1	isophorone	ND	2.2
_____	88-75-5	2-nitrophenol	ND	3.6
_____	105-67-9	2,4-dimethylphenol	ND	2.7
_____	111-91-1	bis(2-chloroethoxy)methane	ND	5.3
_____	120-83-2	2,4-dichlorophenol	ND	2.7
_____	120-82-1	1,2,4-trichlorobenzene	ND	1.9
_____	91-20-3	naphthalene	ND	1.6
_____	87-68-3	hexachlorobutadiene	ND	0.90
_____	59-50-7	4-chloro-3-methylphenol	ND	3.0
_____	77-47-4	hexachlorocyclopentadiene	ND	6.0
_____	88-06-2	2,4,6-trichlorophenol	ND	2.7
_____	91-58-7	2-chloronaphthalene	ND	1.9
_____	131-11-3	dimethyl phthalate	ND	1.6
_____	208-96-8	acenaphthylene	ND	3.5
_____	83-32-9	acenaphthene	ND	1.9
_____	51-28-5	2,4-dinitrophenol	ND	42



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PERIMETER PARK REPORT  
 Results by Sample

Work Order # P9-04-011  
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SAMPLE ID DW 15 FRACTION Q2A TEST CODE 625 NAME Semivolatile Organics  
 Date & Time Collected 04/04/89 Category \_\_\_\_\_

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	2-fluorophenol	_____ 23 %
_____	d5-phenol	_____ 17 %
_____	d5-nitrobenzene	_____ 73 %
_____	2-fluorobiphenyl	_____ 72 %
_____	2, 4, 6-tribromophenol	_____ 15 %
_____	d14-terphenyl	_____ 38 %

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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011

SAMPLE ID DW 4 FRACTION Q3A TEST CODE 625 NAME Semivolatile Organics  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

ORGANICS ANALYSIS DATA SHEET  
SEMIVOLATILE COMPOUNDS by METHOD 625

ANALYST RH  
INSTRMT 4500B

EXTRCTD 04/06/89  
INJECTD 04/27/89

FILE # 45B0814

UNITS \_\_\_\_\_ VERIFIED \_\_\_\_\_ LC  
ug/L

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
_____	62-75-9	n-nitrosodimethylamine	ND	10
_____	108-95-2	phenol	ND	1.5
_____	111-44-4	bis(2-chloroethyl) ether	ND	5.7
_____	95-57-8	2-chlorophenol	ND	3.3
_____	541-73-1	1,3-dichlorobenzene	ND	1.9
_____	106-46-7	1,4-dichlorobenzene	ND	4.4
_____	95-50-1	1,2-dichlorobenzene	ND	1.9
_____	108-60-1	bis(2-chloroisopropyl)ether	ND	5.7
_____	621-64-7	n-nitroso-di-n-propylamine	ND	12
_____	67-72-1	hexachloroethane	ND	1.6
_____	98-95-3	nitrobenzene	ND	1.9
_____	78-59-1	isophorone	ND	2.2
_____	88-75-5	2-nitrophenol	ND	3.6
_____	105-67-9	2,4-dimethylphenol	ND	2.7
_____	111-91-1	bis(2-chloroethoxy)methane	ND	5.3
_____	120-83-2	2,4-dichlorophenol	ND	2.7
_____	120-82-1	1,2,4-trichlorobenzene	ND	1.9
_____	91-20-3	naphthalene	ND	1.6
_____	87-68-3	hexachlorobutadiene	ND	0.90
_____	59-50-7	4-chloro-3-methylphenol	ND	3.0
_____	77-47-4	hexachlorocyclopentadiene	ND	6.0
_____	88-06-2	2,4,6-trichlorophenol	ND	2.7
_____	91-58-7	2-chloronaphthalene	ND	1.9
_____	131-11-3	dimethyl phthalate	ND	1.6
_____	208-96-8	acenaphthylene	ND	3.5
_____	83-32-9	acenaphthene	ND	1.9
_____	51-28-5	2,4-dinitrophenol	ND	42



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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011  
Continued From Above

SAMPLE ID DW 4 FRACTION Q3A TEST CODE 625 NAME Semivolatile Organics  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	2-fluorophenol	34 %
_____	d5-phenol	23 %
_____	d5-nitrobenzene	75 %
_____	2-fluorobiphenyl	80 %
_____	2, 4, 6-tribromophenol	19 %
_____	d14-terphenyl	55 %

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PERIMETER PARK REPORT  
 Results by Sample

Work Order # P9-04-011

SAMPLE ID DW 14 FRACTION Q4A TEST CODE 625 NAME Semivolatile Organics  
 Date & Time Collected 04/04/89 Category \_\_\_\_\_

ORGANICS ANALYSIS DATA SHEET  
 SEMIVOLATILE COMPOUNDS by METHOD 625

ANALYST MAH EXTRACTD 04/06/89 FILE # 45B0817 VERIFIED \_\_\_\_\_ LC \_\_\_\_\_  
 INSTRMT 4500B INJECTD 04/28/89 UNITS ug/L

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
_____	62-75-9	n-nitrosodimethylamine	ND	10
_____	108-95-2	phenol	ND	1.5
_____	111-44-4	bis(2-chloroethyl) ether	ND	5.7
_____	95-57-8	2-chlorophenol	ND	3.3
_____	541-73-1	1,3-dichlorobenzene	ND	1.9
_____	106-46-7	1,4-dichlorobenzene	ND	4.4
_____	95-50-1	1,2-dichlorobenzene	ND	1.9
_____	108-60-1	bis(2-chloroisopropyl)ether	ND	5.7
_____	621-64-7	n-nitroso-di-n-propylamine	ND	12
_____	67-72-1	hexachloroethane	ND	1.6
_____	98-95-3	nitrobenzene	ND	1.9
_____	78-59-1	isophorone	ND	2.2
_____	88-75-5	2-nitrophenol	ND	3.6
_____	105-67-9	2,4-dimethylphenol	ND	2.7
_____	111-91-1	bis(2-chloroethoxy)methane	ND	5.3
_____	120-83-2	2,4-dichlorophenol	ND	2.7
_____	120-82-1	1,2,4-trichlorobenzene	ND	1.9
_____	91-20-3	naphthalene	ND	1.6
_____	87-68-3	hexachlorobutadiene	ND	0.90
_____	59-50-7	4-chloro-3-methylphenol	ND	3.0
_____	77-47-4	hexachlorocyclopentadiene	ND	6.0
_____	88-06-2	2,4,6-trichlorophenol	ND	2.7
_____	91-58-7	2-chloronaphthalene	ND	1.9
_____	131-11-3	dimethyl phthalate	ND	1.6
_____	208-96-8	acenaphthylene	ND	3.5
_____	83-32-9	acenaphthene	ND	1.9
_____	51-28-5	2,4-dinitrophenol	ND	42



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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011  
Continued From Above

SAMPLE ID DW 14

FRACTION 04A TEST CODE 625  
Date & Time Collected 04/04/89

NAME Semivolatile Organics  
Category \_\_\_\_\_

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	2-fluorophenol	30 %
_____	d5-phenol	70 %
_____	d5-nitrobenzene	77 %
_____	2-fluorobiphenyl	73 %
_____	2,4,6-tribromophenol	61 %
_____	d14-terphenyl	58 %

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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011

SAMPLE ID DW 16 FRACTION Q5A TEST CODE 625 NAME Semivolatile Organics  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

ORGANICS ANALYSIS DATA SHEET  
SEMIVOLATILE COMPOUNDS by METHOD 625

ANALYST MAH EXTRACTD 04/06/89 FILE # 45B0818 VERIFIED \_\_\_\_\_ LC \_\_\_\_\_  
INSTRMT 4500B INJECTD 04/28/89 UNITS ug/L

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
_____	62-75-9	n-nitrosodimethylamine	ND	10
_____	108-95-2	phenol	ND	1.5
_____	111-44-4	bis(2-chloroethyl) ether	ND	5.7
_____	95-57-8	2-chlorophenol	ND	3.3
_____	541-73-1	1,3-dichlorobenzene	ND	1.9
_____	106-46-7	1,4-dichlorobenzene	ND	4.4
_____	95-50-1	1,2-dichlorobenzene	ND	1.9
_____	108-60-1	bis(2-chloroisopropyl)ether	ND	5.7
_____	621-64-7	n-nitroso-di-n-propylamine	ND	12
_____	67-72-1	hexachloroethane	ND	1.6
_____	98-95-3	nitrobenzene	ND	1.9
_____	78-59-1	isophorone	ND	2.2
_____	88-75-5	2-nitrophenol	ND	3.6
_____	105-67-9	2,4-dimethylphenol	ND	2.7
_____	111-91-1	bis(2-chloroethoxy)methane	ND	5.3
_____	120-83-2	2,4-dichlorophenol	ND	2.7
_____	120-82-1	1,2,4-trichlorobenzene	ND	1.9
_____	91-20-3	naphthalene	ND	1.6
_____	87-68-3	hexachlorobutadiene	ND	0.90
_____	59-50-7	4-chloro-3-methylphenol	ND	3.0
_____	77-47-4	hexachlorocyclopentadiene	ND	6.0
_____	88-06-2	2,4,6-trichlorophenol	ND	2.7
_____	91-58-7	2-chloronaphthalene	ND	1.9
_____	131-11-3	dimethyl phthalate	ND	1.6
_____	208-96-8	acenaphthylene	ND	3.5
_____	83-32-9	acenaphthene	ND	1.9
_____	51-28-5	2,4-dinitrophenol	ND	42



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PERIMETER PARK REPORT  
 Results by Sample

Work Order # P9-04-011  
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SAMPLE ID DW 16 FRACTION 05A TEST CODE 625 NAME Semivolatile Organics  
 Date & Time Collected 04/04/89 Category \_\_\_\_\_

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	2-fluorophenol	____ 33 %
_____	d5-phenol	____ 46 %
_____	d5-nitrobenzene	____ 78 %
_____	2-fluorobiphenyl	____ 75 %
_____	2,4,6-tribromophenol	____ 43 %
_____	d14-terphenyl	____ 47 %



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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011  
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SAMPLE ID DW 16 FRACTION 05A TEST CODE MSNS S NAME Extra Peaks for GC/MS(BNA)  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	_____	_____%
_____	_____	_____%
(1) See Appendix A for Glossary of Report and Data Flag Definitions		
_____	_____	_____%
_____	_____	_____%
_____	_____	_____%

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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011

SAMPLE ID DW 11 FRACTION 06A TEST CODE 625 NAME Semivolatile Organics  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

ORGANICS ANALYSIS DATA SHEET  
SEMIVOLATILE COMPOUNDS by METHOD 625

ANALYST MAH EXTRACTD 04/06/89 FILE # 45B0821 VERIFIED \_\_\_\_\_ LC \_\_\_\_\_  
INSTRMT 4500B INJECTD 04/28/89 UNITS ug/L

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
_____	62-75-9	n-nitrosodimethylamine	ND	10
_____	108-95-2	phenol	ND	1.5
_____	111-44-4	bis(2-chloroethyl) ether	ND	5.7
_____	95-57-8	2-chlorophenol	ND	3.3
_____	541-73-1	1,3-dichlorobenzene	ND	1.9
_____	106-46-7	1,4-dichlorobenzene	ND	4.4
_____	95-50-1	1,2-dichlorobenzene	ND	1.9
_____	108-60-1	bis(2-chloroisopropyl)ether	ND	5.7
_____	621-64-7	n-nitroso-di-n-propylamine	ND	12
_____	67-72-1	hexachloroethane	ND	1.6
_____	98-95-3	nitrobenzene	ND	1.9
_____	78-59-1	isophorone	ND	2.2
_____	88-75-5	2-nitrophenol	ND	3.6
_____	105-67-9	2,4-dimethylphenol	ND	2.7
_____	111-91-1	bis(2-chloroethoxy)methane	ND	5.3
_____	120-83-2	2,4-dichlorophenol	ND	2.7
_____	120-82-1	1,2,4-trichlorobenzene	ND	1.9
_____	91-20-3	naphthalene	70	1.6
_____	87-68-3	hexachlorobutadiene	ND	0.90
_____	59-50-7	4-chloro-3-methylphenol	ND	3.0
_____	77-47-4	hexachlorocyclopentadiene	ND	6.0
_____	88-06-2	2,4,6-trichlorophenol	ND	2.7
_____	91-58-7	2-chloronaphthalene	ND	1.9
_____	131-11-3	dimethyl phthalate	ND	1.6
_____	208-96-8	acenaphthylene	ND	3.5
_____	83-32-9	acenaphthene	6.0 *	1.9
_____	51-28-5	2,4-dinitrophenol	ND	42



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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011  
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SAMPLE ID DW 11 FRACTION 06A TEST CODE 625 NAME Semivolatiles Organics  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	2-fluorophenol	_____ 14 %
_____	d5-phenol	_____ 22 %
_____	d5-nitrobenzene	_____ 74 %
_____	2-fluorobiphenyl	_____ 75 %
_____	2,4,6-tribromophenol	_____ 29 %
_____	d14-terphenyl	_____ 50 %



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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011  
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SAMPLE ID DW 11 FRACTION 06A TEST CODE MSNS S NAME Extra Peaks for GC/MS(BNA)  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	_____	_____%
_____	_____	_____%
(1) See Appendix A for Glossary of Report and Data Flag Definitions		
_____	_____	_____%
_____	_____	_____%
_____	_____	_____%

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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011

SAMPLE ID DW 3

FRACTION 07A TEST CODE 625  
Date & Time Collected 04/04/89

NAME Semivolatile Organics  
Category

ORGANICS ANALYSIS DATA SHEET  
SEMIVOLATILE COMPOUNDS by METHOD 625

ANALYST MAH  
INSTRMT 4500B

EXTRCTD 04/06/89  
INJECTD 04/28/89

FILE # 45B0822

UNITS VERIFIED LC  
ug/L

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
_____	62-75-9	n-nitrosodimethylamine	ND	10
_____	108-95-2	phenol	ND	1.5
_____	111-44-4	bis(2-chloroethyl) ether	ND	5.7
_____	95-57-8	2-chlorophenol	ND	3.3
_____	541-73-1	1,3-dichlorobenzene	ND	1.9
_____	106-46-7	1,4-dichlorobenzene	ND	4.4
_____	95-50-1	1,2-dichlorobenzene	ND	1.9
_____	108-60-1	bis(2-chloroisopropyl)ether	ND	5.7
_____	621-64-7	n-nitroso-di-n-propylamine	ND	12
_____	67-72-1	hexachloroethane	ND	1.6
_____	98-95-3	nitrobenzene	ND	1.9
_____	78-59-1	isophorone	ND	2.2
_____	88-75-5	2-nitrophenol	ND	3.6
_____	105-67-9	2,4-dimethylphenol	ND	2.7
_____	111-91-1	bis(2-chloroethoxy)methane	ND	5.3
_____	120-83-2	2,4-dichlorophenol	ND	2.7
_____	120-82-1	1,2,4-trichlorobenzene	ND	1.9
_____	91-20-3	naphthalene	ND	1.6
_____	87-68-3	hexachlorobutadiene	ND	0.90
_____	59-50-7	4-chloro-3-methylphenol	ND	3.0
_____	77-47-4	hexachlorocyclopentadiene	ND	6.0
_____	88-06-2	2,4,6-trichlorophenol	ND	2.7
_____	91-58-7	2-chloronaphthalene	ND	1.9
_____	131-11-3	dimethyl phthalate	ND	1.6
_____	208-96-8	acenaphthylene	ND	3.5
_____	83-32-7	acenaphthene	ND	1.9
_____	51-28-5	2,4-dinitrophenol	ND	42

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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011  
Continued From Above

SAMPLE ID DW 3

FRACTION 07A TEST CODE 625  
Date & Time Collected 04/04/89

NAME Semivolatile Organics  
Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	100-02-7	4-nitrophenol	ND	2.4
	606-20-2	2,6-dinitrotoluene	ND	1.9
	121-14-2	2,4-dinitrotoluene	ND	5.7
	84-66-2	diethylphthalate	ND	1.9
	7005-72-3	4-chlorophenyl-phenylether	ND	4.2
	86-73-7	fluorene	ND	1.9
	534-52-1	4,6-dinitro-2-methylphenol	ND	24
	86-30-6	n-nitrosodiphenylamine	ND	1.9
	101-55-3	4-bromophenyl-phenylether	ND	1.9
	118-74-1	hexachlorobenzene	ND	1.9
	87-86-5	pentachlorophenol	ND	3.6
	85-01-8	phenanthrene	ND	5.4
	120-12-7	anthracene	ND	1.9
	84-74-2	di-n-butylphthalate	ND	2.5
	206-44-0	fluoranthene	ND	2.2
	92-87-5	benzidine	ND	44
	129-00-0	pyrene	ND	1.9
	85-68-7	butylbenzylphthalate	ND	2.5
	91-94-1	3,3'-dichlorobenzidine	ND	17
	56-55-3	benzo(a)anthracene	ND	7.8
	117-81-7	bis(2-ethylhexyl)phthalate	ND	2.5
	218-01-9	chrysene	ND	2.5
	117-84-0	di-n-octyl phthalate	ND	2.5
	205-99-2	benzo(b)fluoranthene	ND	4.8
	207-08-9	benzo(k)fluoranthene	ND	2.5
	50-32-8	benzo(a)pyrene	ND	2.5
	193-39-5	indeno(1,2,3-cd)pyrene	ND	3.7
	53-70-3	dibenz(a,h)anthracene	ND	2.5
	191-24-2	benzo(ghi)perylene	ND	4.1
		Unknown	8.0	
	625-31-0	4-Penten-2-ol	6.0	
		Unknown	13	
		Unknown	11	
		Unknown	11	
		Unknown	4.0	

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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011  
Continued From Above

SAMPLE ID DW 3 FRACTION 07A TEST CODE 625 NAME Semivolatile Organics  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	2-fluorophenol	12 %
_____	d5-phenol	16 %
_____	d5-nitrobenzene	76 %
_____	2-fluorobiphenyl	78 %
_____	2,4,6-tribromophenol	16 %
_____	d14-terphenyl	56 %

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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011

SAMPLE ID DW 12 FRACTION OBA TEST CODE 625 NAME Semivolatile Organics  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

ORGANICS ANALYSIS DATA SHEET  
SEMIVOLATILE COMPOUNDS by METHOD 625

ANALYST MAH  
INSTRMT 4500B

EXTRCTD 04/06/89  
INJECTD 04/28/89

FILE # 45B0823

UNITS \_\_\_\_\_ VERIFIED \_\_\_\_\_ LC \_\_\_\_\_  
ug/L

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
_____	62-75-9	n-nitrosodimethylamine	ND	10
_____	108-95-2	phenol	ND	1.5
_____	111-44-4	bis(2-chloroethyl) ether	ND	5.7
_____	95-57-8	2-chlorophenol	ND	3.3
_____	541-73-1	1,3-dichlorobenzene	ND	1.9
_____	106-46-7	1,4-dichlorobenzene	ND	4.4
_____	95-50-1	1,2-dichlorobenzene	ND	1.9
_____	108-60-1	bis(2-chloroisopropyl)ether	ND	5.7
_____	621-64-7	n-nitroso-di-n-propylamine	ND	12
_____	67-72-1	hexachloroethane	ND	1.6
_____	98-95-3	nitrobenzene	ND	1.9
_____	78-59-1	isophorone	ND	2.2
_____	88-75-5	2-nitrophenol	ND	3.6
_____	105-67-9	2,4-dimethylphenol	ND	2.7
_____	111-91-1	bis(2-chloroethoxy)methane	ND	5.3
_____	120-83-2	2,4-dichlorophenol	ND	2.7
_____	120-82-1	1,2,4-trichlorobenzene	ND	1.9
_____	91-20-3	naphthalene	ND	1.6
_____	87-68-3	hexachlorobutadiene	ND	0.90
_____	59-50-7	4-chloro-3-methylphenol	ND	3.0
_____	77-47-4	hexachlorocyclopentadiene	ND	6.0
_____	88-06-2	2,4,6-trichlorophenol	ND	2.7
_____	91-58-7	2-chloronaphthalene	ND	1.9
_____	131-11-3	dimethyl phthalate	ND	1.6
_____	208-96-8	acenaphthylene	ND	3.5
_____	83-32-9	acenaphthene	ND	1.9
_____	51-28-5	2,4-dinitrophenol	ND	4.2



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PERIMETER PARK  
Results by Sample

Work Order # P9-04-011  
Continued From Above

SAMPLE ID DW 12      FRACTION 08A      TEST CODE 625      NAME Semivolatile Organics  
Date & Time Collected 04/04/89      Category \_\_\_\_\_

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	2-fluorophenol	50 %
_____	d5-phenol	67 %
_____	d5-nitrobenzene	70 %
_____	2-fluorobiphenyl	70 %
_____	2,4,6-tribromophenol	75 %
_____	d14-terphenyl	57 %

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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011

SAMPLE ID DW 9

FRACTION 09A TEST CODE 625 NAME Semivolatile Organics  
Date & Time Collected 04/04/89 Category

ORGANICS ANALYSIS DATA SHEET  
SEMIVOLATILE COMPOUNDS by METHOD 625

ANALYST RH  
INSTRMT 4500B

EXTRCTD 04/06/89  
INJECTD 04/28/89

FILE # 45B0824

UNITS VERIFIED LC  
ug/L

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	62-75-9	n-nitrosodimethylamine	ND	10
	108-95-2	phenol	ND	1.5
	111-44-4	bis(2-chloroethyl) ether	ND	5.7
	95-57-8	2-chlorophenol	ND	3.3
	541-73-1	1,3-dichlorobenzene	ND	1.9
	106-46-7	1,4-dichlorobenzene	ND	4.4
	95-50-1	1,2-dichlorobenzene	ND	1.9
	108-60-1	bis(2-chloroisopropyl)ether	ND	5.7
	621-64-7	n-nitroso-di-n-propylamine	ND	12
	67-72-1	hexachloroethane	ND	1.6
	98-95-3	nitrobenzene	ND	1.9
	78-59-1	isophorone	ND	2.2
	88-75-5	2-nitrophenol	ND	3.6
	105-67-9	2,4-dimethylphenol	ND	2.7
	111-91-1	bis(2-chloroethoxy)methane	ND	5.3
	120-83-2	2,4-dichlorophenol	ND	2.7
	120-82-1	1,2,4-trichlorobenzene	ND	1.9
	91-20-3	naphthalene	ND	1.6
	87-68-3	hexachlorobutadiene	ND	0.90
	59-50-7	4-chloro-3-methylphenol	ND	3.0
	77-47-4	hexachlorocyclopentadiene	ND	6.0
	88-06-2	2,4,6-trichlorophenol	ND	2.7
	91-58-7	2-chloronaphthalene	ND	1.9
	131-11-3	dimethyl phthalate	ND	1.6
	208-96-8	acenaphthylene	ND	3.5
	83-32-9	acenaphthene	ND	1.9
	51-28-5	2,4-dinitrophenol	ND	42



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PERIMETER PARK REPORT  
 Results by Sample

Work Order # P9-04-011  
 Continued From Above

SAMPLE ID DW 9 FRACTION 09A TEST CODE 625 NAME Semivolatile Organics  
 Date & Time Collected 04/04/89 Category \_\_\_\_\_

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	2-fluorophenol	14 %
_____	d5-phenol	45 %
_____	d5-nitrobenzene	82 %
_____	2-fluorobiphenyl	79 %
_____	2,4,6-tribromophenol	42 %
_____	d14-terphenyl	87 %

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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011

SAMPLE ID DW 13 FRACTION 10A TEST CODE 625 NAME Semivolatile Organics  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

ORGANICS ANALYSIS DATA SHEET  
SEMIVOLATILE COMPOUNDS by METHOD 625

ANALYST \_\_\_\_\_ RH EXTRACTD 04/06/89 FILE # 45B0825 VERIFIED \_\_\_\_\_ LC  
INSTRMT 4500B INJECTD 04/28/89 UNITS ug/L

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
_____	62-75-9	n-nitrosodimethylamine	ND	10
_____	108-95-2	phenol	ND	1.5
_____	111-44-4	bis(2-chloroethyl) ether	ND	5.7
_____	95-57-8	2-chlorophenol	ND	3.3
_____	541-73-1	1,3-dichlorobenzene	ND	1.9
_____	106-46-7	1,4-dichlorobenzene	ND	4.4
_____	95-50-1	1,2-dichlorobenzene	ND	1.9
_____	108-60-1	bis(2-chloroisopropyl)ether	ND	5.7
_____	621-64-7	n-nitroso-di-n-propylamine	ND	12
_____	67-72-1	hexachloroethane	ND	1.6
_____	98-95-3	nitrobenzene	ND	1.9
_____	78-59-1	isophorone	ND	2.2
_____	88-75-5	2-nitrophenol	ND	3.6
_____	105-67-9	2,4-dimethylphenol	ND	2.7
_____	111-91-1	bis(2-chloroethoxy)methane	ND	5.3
_____	120-83-2	2,4-dichlorophenol	ND	2.7
_____	120-82-1	1,2,4-trichlorobenzene	ND	1.9
_____	91-20-3	naphthalene	180	1.6
_____	87-68-3	hexachlorobutadiene	ND	0.90
_____	59-50-7	4-chloro-3-methylphenol	ND	3.0
_____	77-47-4	hexachlorocyclopentadiene	ND	6.0
_____	88-06-2	2,4,6-trichlorophenol	ND	2.7
_____	91-58-7	2-chloronaphthalene	ND	1.9
_____	131-11-3	dimethyl phthalate	ND	1.6
_____	208-96-8	acenaphthylene	ND	3.5
_____	83-32-9	acenaphthene	5.0 *	1.9
_____	51-28-5	2,4-dinitrophenol	ND	42



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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011  
Continued From Above

SAMPLE ID DW 13 FRACTION 10A TEST CODE 625 NAME Semivolatile Organics  
Date & Time Collected 04/04/89 Category

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	2-fluorophenol	38 %
_____	d5-phenol	62 %
_____	d5-nitrobenzene	74 %
_____	2-fluorobiphenyl	73 %
_____	2,4,6-tribromophenol	48 %
_____	d14-terphenyl	82 %



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PERIMETER PARK REPORT  
 Results by Sample

Work Order # P9-04-011  
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SAMPLE ID DW 13 FRACTION 10A TEST CODE MSNS S NAME Extra Peaks for GC/MS(BNA)  
 Date & Time Collected 04/04/89 Category \_\_\_\_\_

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	_____	_____%
_____	_____	_____%
(1) See Appendix A for Glossary of Report and Data Flag Definitions		
_____	_____	_____%
_____	_____	_____%
_____	_____	_____%

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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011

SAMPLE ID DW 1

FRACTION 11A TEST CODE 625

NAME Semivolatile Organics

Date & Time Collected 04/04/89

Category \_\_\_\_\_

ORGANICS ANALYSIS DATA SHEET  
SEMIVOLATILE COMPOUNDS by METHOD 625

ANALYST \_\_\_\_\_ RH  
INSTRMT 4500B

EXTRCTD 04/06/89  
INJECTD 04/28/89

FILE # 45B0826

UNITS \_\_\_\_\_ VERIFIED \_\_\_\_\_ LC  
ug/L

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
_____	62-75-9	n-nitrosodimethylamine	ND	10
_____	108-95-2	phenol	ND	1.5
_____	111-44-4	bis(2-chloroethyl) ether	ND	5.7
_____	95-57-8	2-chlorophenol	ND	3.3
_____	541-73-1	1,3-dichlorobenzene	ND	1.9
_____	106-46-7	1,4-dichlorobenzene	ND	4.4
_____	95-50-1	1,2-dichlorobenzene	ND	1.9
_____	108-60-1	bis(2-chloroisopropyl) ether	ND	5.7
_____	621-64-7	n-nitroso-di-n-propylamine	ND	12
_____	67-72-1	hexachloroethane	ND	1.6
_____	98-95-3	nitrobenzene	ND	1.9
_____	78-59-1	isophorone	ND	2.2
_____	88-75-5	2-nitrophenol	ND	3.6
_____	105-67-9	2,4-dimethylphenol	ND	2.7
_____	111-91-1	bis(2-chloroethoxy)methane	ND	5.3
_____	120-83-2	2,4-dichlorophenol	ND	2.7
_____	120-82-1	1,2,4-trichlorobenzene	ND	1.9
_____	91-20-3	naphthalene	32	1.6
_____	87-68-3	hexachlorobutadiene	ND	0.90
_____	59-50-7	4-chloro-3-methylphenol	ND	3.0
_____	77-47-4	hexachlorocyclopentadiene	ND	6.0
_____	88-06-2	2,4,6-trichlorophenol	ND	2.7
_____	91-58-7	2-chloronaphthalene	ND	1.9
_____	131-11-3	dimethyl phthalate	ND	1.6
_____	208-96-8	acenaphthylene	ND	3.5
_____	83-32-7	acenaphthene	ND	1.9
_____	51-28-5	2,4-dinitrophenol	ND	42

SAMPLE ID DW 1

FRACTION 11A TEST CODE 625  
Date & Time Collected 04/04/89

NAME Semivolatile Organics  
Category

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	100-02-7	4-nitrophenol	ND	2.4
	606-20-2	2,6-dinitrotoluene	ND	1.9
	121-14-2	2,4-dinitrotoluene	ND	5.7
	84-66-2	diethylphthalate	ND	1.9
	7005-72-3	4-chlorophenyl-phenylether	ND	4.2
	86-73-7	fluorene	2.0 *	1.9
	534-52-1	4,6-dinitro-2-methylphenol	ND	24
	86-30-6	n-nitrosodiphenylamine	ND	1.9
	101-55-3	4-bromophenyl-phenylether	ND	1.9
	118-74-1	hexachlorobenzene	ND	1.9
	87-86-5	pentachlorophenol	ND	3.6
	85-01-8	phenanthrene	ND	5.4
	120-12-7	anthracene	2.0 *	1.9
	84-74-2	di-n-butylphthalate	ND	2.5
	206-44-0	fluoranthene	ND	2.2
	92-87-5	benzidine	ND	44
	129-00-0	pyrene	ND	1.9
	85-68-7	butylbenzylphthalate	ND	2.5
	91-94-1	3,3'-dichlorobenzidine	ND	17
	56-55-3	benzo(a)anthracene	ND	7.8
	117-81-7	bis(2-ethylhexyl)phthalate	5.0 *	2.5
	218-01-9	chrysene	ND	2.5
	117-84-0	di-n-octyl phthalate	ND	2.5
	205-99-2	benzo(b)fluoranthene	ND	4.8
	207-08-9	benzo(k)fluoranthene	ND	2.5
	50-32-8	benzo(a)pyrene	ND	2.5
	193-39-5	indeno(1,2,3-cd)pyrene	ND	3.7
	53-70-3	dibenz(a,h)anthracene	ND	2.5
	191-24-2	benzo(ghi)perylene	ND	4.1

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PERIMETER PARK REPORT  
 Results by Sample

Work Order # P9-04-011  
 Continued From Above

SAMPLE ID DW 1

FRACTION 11A TEST CODE 625  
 Date & Time Collected 04/04/89

NAME Semivolatile Organics  
 Category \_\_\_\_\_

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	2-fluorophenol	65 %
_____	d5-phenol	78 %
_____	d5-nitrobenzene	77 %
_____	2-fluorobiphenyl	74 %
_____	2,4,6-tribromophenol	80 %
_____	d14-terphenyl	66 %

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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011

SAMPLE ID DW 1

FRACTION 11A TEST CODE MSNS S NAME Extra Peaks for GC/MS(BNA)  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

ORGANICS ANALYSIS DATA SHEET  
EXTRA COMPOUND PEAKS FOR SEMIVOLATILES

VERIFIED LC

ANALYST RH  
INSTRMT 4500B

INJECTD 04/28/89

FILE # 45B0826  
FACTOR \_\_\_\_\_

UNITS ug/L

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT	FACTOR
	611-14-3	Benzene, 1-ethyl-2-methyl	6.0		
	108-67-8	Benzene, 1,3,5-trimethyl	7.0		
	496-11-7	1H-Indene, 2,3-dihydro	5.0		
		Unknown	10		
	1074-55-1	Benzene, 1-methyl-1,4-propyl	7.0		
	874-41-9	Benzene, 1-ethyl-1,2,4-dimethyl	5.0		
		Unknown	8.0		
	119-64-2	Naphthalene, 1,2,3,4-tetrahydro	6.0		
		Unknown	10		
	2809-64-5	Naphthalene, 1,2,3,4-tetrahydro-			
		5-methyl	8.0		
	2471-83-2	1h-Indene, 1-ethylidene	30		
	441-89-6	Benzaldehyde, alpha-ethylidene	16		
	92-52-4	1,1'-Biphenyl	13		
	1127-76-0	Naphthalene, 1-ethyl	5.0		
	571-61-9	Naphthalene, 1,5-dimethyl	15		
	575-41-7	Naphthalene, 1,3-dimethyl	42		
		Unknown	12		
		Unknown	11		
		Unknown	5.0		

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Results by Sample

Continued From Above

SAMPLE ID DW 1

FRACTION 11A

TEST CODE MSNS S

NAME Extra Peaks for GC/MS(BNA)

Date & Time Collected 04/04/89

Category

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	_____	_____%
_____	_____	_____%
(1) See Appendix A for Glossary of Report and Data Flag Definitions		
_____	_____	_____%
_____	_____	_____%
_____	_____	_____%

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PERIMETER PARK REPORT  
 Results by Sample

Work Order # P9-04-011

SAMPLE ID DW 13 (Duplicate) FRACTION 12A TEST CODE 625 NAME Semivolatile Organics  
 Date & Time Collected 04/04/89 Category \_\_\_\_\_

ORGANICS ANALYSIS DATA SHEET  
 SEMIVOLATILE COMPOUNDS by METHOD 625

ANALYST RH INSTRMT 4500B EXTRCTD 04/06/89 INJECTD 05/01/89 FILE # 45B0833 UNITS \_\_\_\_\_ VERIFIED \_\_\_\_\_ LC \_\_\_\_\_  
 ug/L

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
_____	62-75-9	n-nitrosodimethylamine	ND	10
_____	108-95-2	phenol	ND	1.5
_____	111-44-4	bis(2-chloroethyl) ether	ND	5.7
_____	95-57-8	2-chlorophenol	ND	3.3
_____	541-73-1	1,3-dichlorobenzene	ND	1.9
_____	106-46-7	1,4-dichlorobenzene	ND	4.4
_____	95-50-1	1,2-dichlorobenzene	ND	1.9
_____	108-60-1	bis(2-chloroisopropyl) ether	ND	5.7
_____	621-64-7	n-nitroso-di-n-propylamine	ND	12
_____	67-72-1	hexachloroethane	ND	1.6
_____	98-95-3	nitrobenzene	ND	1.9
_____	78-59-1	isophorone	ND	2.2
_____	88-75-5	2-nitrophenol	ND	3.6
_____	105-67-9	2,4-dimethylphenol	ND	2.7
_____	111-91-1	bis(2-chloroethoxy)methane	ND	5.3
_____	120-83-2	2,4-dichlorophenol	ND	2.7
_____	120-82-1	1,2,4-trichlorobenzene	ND	1.9
_____	91-20-3	naphthalene	90	1.6
_____	87-68-3	hexachlorobutadiene	ND	0.90
_____	59-50-7	4-chloro-3-methylphenol	ND	3.0
_____	77-47-4	hexachlorocyclopentadiene	ND	6.0
_____	88-06-2	2,4,6-trichlorophenol	ND	2.7
_____	91-58-7	2-chloronaphthalene	ND	1.9
_____	131-11-3	dimethyl phthalate	ND	1.6
_____	208-96-8	acenaphthylene	ND	3.5
_____	83-32-9	acenaphthene	3.0 *	1.9
_____	51-28-5	2,4-dinitrophenol	ND	42



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PERIMETER PARK                      REPORT  
Results by Sample

Work Order # P9-04-011  
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SAMPLE ID DW 13 (Duplicate)                      FRACTION 12A      TEST CODE 625      NAME Semivolatile Organics  
Date & Time Collected 04/04/89                      Category \_\_\_\_\_

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	2-fluorophenol	52 %
_____	d5-phenol	68 %
_____	d5-nitrobenzene	78 %
_____	2-fluorobiphenyl	77 %
_____	2,4,6-tribromophenol	76 %
_____	d14-terphenyl	73 %

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PERIMETER PARK REPORT  
 Results by Sample

Work Order # P9-04-011

SAMPLE ID DW 13 (Duplicate) FRACTION 12A TEST CODE MSNS 5 NAME Extra Peaks for GC/MS(BNA)  
 Date & Time Collected 04/04/89 Category \_\_\_\_\_

ORGANICS ANALYSIS DATA SHEET  
 EXTRA COMPOUND PEAKS FOR SEMIVOLATILES

ANALYST MAH  
 INSTRMT 4500B

INJECTD 05/01/89

FILE # 4580833  
 FACTOR \_\_\_\_\_

VERIFIED LC

UNITS ug/L

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT	FACTOR
	100-41-4	Ethylbenzene	36		
	611-15-4	1-Ethenyl-2-methylbenzene	36		
	1074-43-7	1-Methyl-3-propylbenzene	20		
	1758-88-9	1,4-Dimethyl-2-ethylbenzene	24		
	1074-43-7	1-Methyl-3-propylbenzene	9.0		
	7525-62-4	1-Ethenyl-3-ethylbenzene	10		
	119-64-2	1,2,3,4-Tetrahydronaphthalene	4.0		
	2809-64-5	1,2,3,4-Tetrahydro-5-methylnaphthalene	5.0		
	2471-83-2	1H-Indene, 1-ethylidene	25		
		C10H10	15		
	827-54-3	2-Ethenylnaphthalene	25		
	569-41-5	1,8-Dimethylnaphthalene	16		
		Unknown	6.0		
		Unknown	27		
		Unknown	18		
		C13H12	14		

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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011  
Continued From Above

SAMPLE ID DW 13 (Duplicate) FRACTION 12A TEST CODE MSNS S NAME Extra Peaks for GC/MS(BNA)  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	_____	_____%
_____	_____	_____%
(1) See Appendix A for Glossary of Report and Data Flag Definitions		
_____	_____	_____%
_____	_____	_____%
_____	_____	_____%

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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011

SAMPLE ID Equipment Blank FRACTION 13A TEST CODE 625 NAME Semivolatile Organics  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

ORGANICS ANALYSIS DATA SHEET  
SEMIVOLATILE COMPOUNDS by METHOD 625

ANALYST RH EXTRACTD 04/06/89 FILE # 45B082B VERIFIED \_\_\_\_\_ LC  
INSTRMT 4500B INJECTD 04/28/89 UNITS ug/L

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
_____	62-75-9	n-nitrosodimethylamine	ND	10
_____	108-95-2	phenol	ND	1.5
_____	111-44-4	bis(2-chloroethyl) ether	ND	5.7
_____	95-57-8	2-chlorophenol	ND	3.3
_____	541-73-1	1,3-dichlorobenzene	ND	1.9
_____	106-46-7	1,4-dichlorobenzene	ND	4.4
_____	95-50-1	1,2-dichlorobenzene	ND	1.9
_____	108-60-1	bis(2-chloroisopropyl) ether	ND	5.7
_____	621-64-7	n-nitroso-di-n-propylamine	ND	12
_____	67-72-1	hexachloroethane	ND	1.6
_____	98-95-3	nitrobenzene	ND	1.9
_____	78-59-1	isophorone	ND	2.2
_____	88-75-5	2-nitrophenol	ND	3.6
_____	105-67-9	2,4-dimethylphenol	ND	2.7
_____	111-91-1	bis(2-chloroethoxy)methane	ND	5.3
_____	120-83-2	2,4-dichlorophenol	ND	2.7
_____	120-82-1	1,2,4-trichlorobenzene	ND	1.9
_____	91-20-3	naphthalene	ND	1.6
_____	87-68-3	hexachlorobutadiene	ND	0.90
_____	59-50-7	4-chloro-3-methylphenol	ND	3.0
_____	77-47-4	hexachlorocyclopentadiene	ND	6.0
_____	88-06-2	2,4,6-trichlorophenol	ND	2.7
_____	91-58-7	2-chloronaphthalene	ND	1.9
_____	131-11-3	dimethyl phthalate	ND	1.6
_____	208-96-8	acenaphthylene	ND	3.5
_____	83-32-9	acenaphthene	ND	1.9
_____	51-28-5	2,4-dinitrophenol	ND	42



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PERIMETER PARK REPORT  
 Results by Sample

Work Order # P9-04-011  
 Continued From Above

SAMPLE ID Equipment Blank FRACTION 13A TEST CODE 625 NAME Semivolatile Organics  
 Date & Time Collected 04/04/89 Category \_\_\_\_\_

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	2-fluorophenol	60 %
_____	d5-phenol	71 %
_____	d5-nitrobenzene	81 %
_____	2-fluorobiphenyl	75 %
_____	2,4,6-tribromophenol	64 %
_____	d14-terphenyl	101 %

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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011

SAMPLE ID DW 10 FRACTION 14A TEST CODE 625 NAME Semivolatile Organics  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

ORGANICS ANALYSIS DATA SHEET  
SEMIVOLATILE COMPOUNDS by METHOD 625

ANALYST MAH EXTRACTD 04/06/89 FILE # 45B0834 VERIFIED \_\_\_\_\_ LC  
INSTRMT 4500B INJECTD 05/01/89 UNITS ug/L

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
_____	62-75-9	n-nitrosodimethylamine	ND	10
_____	108-95-2	phenol	ND	1.5
_____	111-44-4	bis(2-chloroethyl) ether	ND	5.7
_____	95-57-8	2-chlorophenol	ND	3.3
_____	541-73-1	1,3-dichlorobenzene	ND	1.9
_____	106-46-7	1,4-dichlorobenzene	ND	4.4
_____	95-50-1	1,2-dichlorobenzene	ND	1.9
_____	108-60-1	bis(2-chloroisopropyl)ether	ND	5.7
_____	621-64-7	n-nitroso-di-n-propylamine	ND	12
_____	67-72-1	hexachloroethane	ND	1.6
_____	98-95-3	nitrobenzene	ND	1.9
_____	78-59-1	isophorone	ND	2.2
_____	88-75-5	2-nitrophenol	ND	3.6
_____	105-67-9	2,4-dimethylphenol	ND	2.7
_____	111-91-1	bis(2-chloroethoxy)methane	ND	5.3
_____	120-83-2	2,4-dichlorophenol	ND	2.7
_____	120-82-1	1,2,4-trichlorobenzene	ND	1.9
_____	91-20-3	naphthalene	ND	1.6
_____	87-68-3	hexachlorobutadiene	ND	0.90
_____	59-50-7	4-chloro-3-methylphenol	ND	3.0
_____	77-47-4	hexachlorocyclopentadiene	ND	6.0
_____	88-06-2	2,4,6-trichlorophenol	ND	2.7
_____	91-58-7	2-chloronaphthalene	ND	1.9
_____	131-11-3	dimethyl phthalate	ND	1.6
_____	208-96-8	acenaphthylene	ND	3.5
_____	83-32-9	acenaphthene	ND	1.9
_____	51-28-5	2,4-dinitrophenol	ND	42



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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011  
Continued From Above

SAMPLE ID DW 10 FRACTION 14A TEST CODE 625 NAME Semivolatile Organics  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	2-fluorophenol	23 %
_____	d5-phenol	18 %
_____	d5-nitrobenzene	84 %
_____	2-fluorobiphenyl	79 %
_____	2,4,6-tribromophenol	66 %
_____	d14-terphenyl	63 %

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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011

SAMPLE ID Method Spike FRACTION 15A TEST CODE 625 NAME Semivolatile Organics  
Date & Time Collected not specified Category \_\_\_\_\_

ORGANICS ANALYSIS DATA SHEET  
SEMIVOLATILE COMPOUNDS by METHOD 625

ANALYST MAH  
INSTRMT 4500B

EXTRCTD 04/06/89  
INJECTD 05/01/89

FILE # 4580836

VERIFIED LC  
UNITS %

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
_____	62-75-9	n-nitrosodimethylamine	ND	10
_____	108-95-2	phenol	17	1.5
_____	111-44-4	bis(2-chloroethyl) ether	ND	5.7
_____	95-57-8	2-chlorophenol	29	3.3
_____	541-73-1	1,3-dichlorobenzene	ND	1.9
_____	106-46-7	1,4-dichlorobenzene	41	4.4
_____	95-50-1	1,2-dichlorobenzene	ND	1.9
_____	108-60-1	bis(2-chloroisopropyl) ether	ND	5.7
_____	621-64-7	n-nitroso-di-n-propylamine	54	12
_____	67-72-1	hexachloroethane	ND	1.6
_____	98-95-3	nitrobenzene	ND	1.9
_____	78-59-1	isophorone	ND	2.2
_____	88-75-5	2-nitrophenol	ND	3.6
_____	105-67-9	2,4-dimethylphenol	ND	2.7
_____	111-91-1	bis(2-chloroethoxy)methane	ND	5.3
_____	120-83-2	2,4-dichlorophenol	ND	2.7
_____	120-82-1	1,2,4-trichlorobenzene	42	1.9
_____	91-20-3	naphthalene	ND	1.6
_____	87-68-3	hexachlorobutadiene	ND	0.90
_____	59-50-7	4-chloro-3-methylphenol	29	3.0
_____	77-47-4	hexachlorocyclopentadiene	ND	6.0
_____	88-06-2	2,4,6-trichlorophenol	ND	2.7
_____	91-58-7	2-chloronaphthalene	ND	1.9
_____	131-11-3	dimethyl phthalate	ND	1.6
_____	208-96-8	acenaphthylene	ND	3.5
_____	83-32-9	acenaphthene	52	1.9
_____	51-28-5	2,4-dinitrophenol	ND	42



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Received: 04/06/89

PERIMETER PARK  
Results by Sample

Work Order # P9-04-011  
Continued From Above

SAMPLE ID Method Spike FRACTION 15A TEST CODE 625 NAME Semivolatile Organics  
Date & Time Collected not specified Category

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	2-fluorophenol	<u>21</u> %
_____	d5-phenol	<u>20</u> %
_____	d5-nitrobenzene	<u>60</u> %
_____	2-fluorobiphenyl	<u>61</u> %
_____	2,4,6-tribromophenol	<u>34</u> %
_____	d14-terphenyl	<u>56</u> %

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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011

SAMPLE ID Method Spike Dup FRACTION 16A TEST CODE 625 NAME Semivolatile Organics  
Date & Time Collected not specified Category \_\_\_\_\_

ORGANICS ANALYSIS DATA SHEET  
SEMIVOLATILE COMPOUNDS by METHOD 625

ANALYST MAH INSTRMT 4500B EXTRCTD 04/06/89 INJECTD 05/01/89 FILE # 45B0837 UNITS \_\_\_\_\_ VERIFIED \_\_\_\_\_ LC \_\_\_\_\_ %

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
_____	62-75-9	n-nitrosodimethylamine	ND	10
_____	108-95-2	phenol	72	1.5
_____	111-44-4	bis(2-chloroethyl) ether	ND	5.7
_____	95-57-8	2-chlorophenol	79	3.3
_____	541-73-1	1,3-dichlorobenzene	ND	1.9
_____	106-46-7	1,4-dichlorobenzene	50	4.4
_____	95-50-1	1,2-dichlorobenzene	ND	1.9
_____	108-60-1	bis(2-chloroisopropyl)ether	ND	5.7
_____	621-64-7	n-nitroso-di-n-propylamine	81	12
_____	67-72-1	hexachloroethane	ND	1.6
_____	98-95-3	nitrobenzene	ND	1.9
_____	78-59-1	isophorone	ND	2.2
_____	88-75-5	2-nitrophenol	ND	3.6
_____	105-67-9	2,4-dimethylphenol	ND	2.7
_____	111-91-1	bis(2-chloroethoxy)methane	ND	5.3
_____	120-83-2	2,4-dichlorophenol	ND	2.7
_____	120-82-1	1,2,4-trichlorobenzene	56	1.9
_____	91-20-3	naphthalene	ND	1.6
_____	87-68-3	hexachlorobutadiene	ND	0.90
_____	59-50-7	4-chloro-3-methylphenol	84	3.0
_____	77-47-4	hexachlorocyclopentadiene	ND	6.0
_____	88-06-2	2,4,6-trichlorophenol	ND	2.7
_____	91-58-7	2-chloronaphthalene	ND	1.9
_____	131-11-3	dimethyl phthalate	ND	1.6
_____	208-96-8	acenaphthylene	ND	3.5
_____	83-32-9	acenaphthene	78	1.9
_____	51-28-5	2,4-dinitrophenol	ND	42



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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011  
Continued From Above

SAMPLE ID Method Spike Dup FRACTION 16A TEST CODE 625 NAME Semivolatile Organics  
Date & Time Collected not specified Category \_\_\_\_\_

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	2-fluorophenol	____ 64 %
_____	d5-phenol	____ 85 %
_____	d5-nitrobenzene	____ 80 %
_____	2-fluorobiphenyl	____ 82 %
_____	2,4,6-tribromophenol	____ 91 %
_____	d14-terphenyl	____ 82 %

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PERIMETER PARK REPORT  
 Results by Sample

Work Order # P9-04-011

SAMPLE ID Method Blank #1 FRACTION 17A TEST CODE 625 NAME Semivolatile Organics  
 Date & Time Collected not specified Category

ORGANICS ANALYSIS DATA SHEET  
 SEMIVOLATILE COMPOUNDS by METHOD 625

ANALYST RH  
 INSTRMT 4500B

EXTRCTD 04/06/89  
 INJECTD 04/27/89

FILE # 45B0811

UNITS ug/L VERIFIED LC

SCAN	CAS #	COMPOUND	RESULT	DET LIMIT
	62-75-9	n-nitrosodimethylamine	ND	10
	108-95-2	phenol	ND	1.5
	111-44-4	bis(2-chloroethyl) ether	ND	5.7
	95-57-8	2-chlorophenol	ND	3.3
	541-73-1	1,3-dichlorobenzene	ND	1.9
	106-46-7	1,4-dichlorobenzene	ND	4.4
	95-50-1	1,2-dichlorobenzene	ND	1.9
	108-60-1	bis(2-chloroisopropyl)ether	ND	5.7
	621-64-7	n-nitroso-di-n-propylamine	ND	12
	67-72-1	hexachloroethane	ND	1.6
	98-95-3	nitrobenzene	ND	1.9
	78-59-1	isophorone	ND	2.2
	88-75-5	2-nitrophenol	ND	3.6
	105-67-9	2,4-dimethylphenol	ND	2.7
	111-91-1	bis(2-chloroethoxy)methane	ND	5.3
	120-83-2	2,4-dichlorophenol	ND	2.7
	120-82-1	1,2,4-trichlorobenzene	ND	1.9
	91-20-3	naphthalene	ND	1.6
	87-68-3	hexachlorobutadiene	ND	0.90
	59-50-7	4-chloro-3-methylphenol	ND	3.0
	77-47-4	hexachlorocyclopentadiene	ND	6.0
	88-06-2	2,4,6-trichlorophenol	ND	2.7
	91-58-7	2-chloronaphthalene	ND	1.9
	131-11-3	dimethyl phthalate	ND	1.6
	208-96-8	acenaphthylene	ND	3.5
	83-32-9	acenaphthene	ND	1.9
	51-28-5	2,4-dinitrophenol	ND	42



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PERIMETER PARK REPORT  
Results by Sample

Work Order # P9-04-011  
Continued From Above

SAMPLE ID Method Blank #1 FRACTION 17A TEST CODE 625 NAME Semivolatile Organics  
Date & Time Collected not specified Category

SURROGATE RECOVERIES

SCAN	COMPOUND	RECOVERY
_____	2-fluorophenol	<u>72</u> %
_____	d5-phenol	<u>80</u> %
_____	d5-nitrobenzene	<u>78</u> %
_____	2-fluorobiphenyl	<u>77</u> %
_____	2,4,6-tribromophenol	<u>79</u> %
_____	d14-terphenyl	<u>103</u> %



Radian Work Order: P9-04-011

- A Analytical and/or post-digestion spike
- B Detected in blank, result not corrected
- C Confirmed on second column
- D Sample diluted for this analyte
- E Estimated result - see report narrative
- G Exceeds calibration range
- J Detected at less than detection limit
- NA Not analyzed
- NC Not calculated
- ND Not detected at specified detection limit
- NR Analyte not requested
- NS Not spiked
- N/A Not available
- P PREVIOUSLY CONFIRMED
- Q Outside control limits
- R Detected in blank, result corrected
- S Determined by Method of Standard Addition
- U Unconfirmed-2nd column not requested
- X Not confirmed by analysis on 2nd column
- \* Est. result less than 5 times detection limit

Radian Work Order: P9-04-011

A

This flag indicates that a spike is an analytical and/or post-digestion spike. These spikes have not been subjected to the extraction or digestion step

B

This flag indicates that the analyte was detected in the reagent blank but the sample results are not corrected for the amount in the blank.

C

Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The C flag indicates that the analyte has been confirmed by analysis on a second column.

D

This flag identifies all analytes identified in analysis at a secondary dilution factor. In an analysis some compounds can exceed the calibration range of the instrument. Therefore two analyses are performed, one at the concentration of the majority of the analytes, and a second with the sample diluted so that high concentration analyte(s) fall within the calibration range.

E

The reported value is estimated because of the presence of interference. The potential source of the interference is included in the report narrative.

Radian Work Order: P9-04-011

G

This flag identifies a GC/MS result whose concentration exceeds the calibration range for that specific analysis. Usually if one or more compounds have a response greater than full scale, the sample or extract is diluted and re-analyzed.

J Indicates an estimated value for GC/MS data. This flag is used either when estimating a concentration for tentatively identified compounds where a response factor of 1 is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit.

NA This analyte was not analyzed.

NC Applies to RPD and spike recovery results. The relative percent difference (RPD) and spike recovery are not calculated when a result value is less than five times the detection limit or obvious matrix interferences are present. See \* definition for further explanation of the unreliability of data near the detection limit. A spike recovery is not calculated when the sample result is greater than four times the spike added concentration because the spike added concentration is considered insignificant.

ND This flag (or < ) is used to denote analytes which are not detected at or above the specified detection limit. The value to the right of the < symbol is the method specified detection limit for the sample.

Radian Work Order: P9-04-011

NR

This analyte was not requested by the client.

NS This analyte or surrogate was not added ( spiked ) to the sample for this analysis.

N\A A result or value is not available for this parameter, usually a detection limit.

P MOST METHODS OF ANALYSIS BY GAS CHROMATOGRAPHY RECOMMEND REANALYSIS ON A SECOND COLUMN OF DISSIMILAR PHASE TO RESOLVE COMPOUNDS OF INTEREST FROM INTERFERENCES THAT MAY OCCUR AND FOR ANALYTE CONFIRMATION. THE P FLAG INDICATES THAT THE ANALYTE HAS BEEN CONFIRMED PREVIOUSLY. THIS FLAG IS APPLICABLE TO ANALYSES OF SAMPLES ARISING FROM A REGULAR SAMPLING PROGRAM AS A SPECIFIC SAMPLE SOURCE; FOR EXAMPLE, A QUARTERLY WELL MONITORING WELL PROGRAM.

Q This quality control standard is outside method or laboratory specified control limits. This flag is applied to matrix spike, analytical QC spike, and surrogate recoveries; and to RPD (relative percent difference) values for duplicate analyses and matrix spike/matrix spike duplicate result.

Radian Work Order: P9-04-011

R

This flag indicates that the analyte was detected in the reagent blank and the sample results are corrected for the amount in the blank.

S This flag indicates that a specific result from a metals analysis has been obtained using the Method of Standard Addition.

U Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The U flag indicates that second column was not requested.

X Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The X flag indicates a second column confirmation was performed but the analyte was not confirmed and is likely a false positive.

\* The asterisk(\*) is used to flag results which are less than five times the method specified detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the method detection limit is approached. These results should be considered approximate.

Radian Work Order: P9-04-011

TERMS USED IN THIS REPORT:

Analyte - A chemical for which a sample is to be analyzed. The analysis will meet EPA method and QC specifications.

Compound - See Analyte.

Detection Limit - The method specified detection limit, which is the lower limit of quantitation specified by EPA for a method. Radian staff regularly assess their laboratories' method detection limits to verify that they meet or are lower than those specified by EPA. Detection limits which are higher than method limits are based on experimental values at the 99% confidence level. Note, the detection limit may vary from that specified by EPA based on sample size, dilution or cleanup. (Refer to Factor, below)

EPA Method - The EPA specified method used to perform an analysis. EPA has specified standard methods for analysis of environmental samples. Radian will perform its analyses and accompanying QC tests in conformance with EPA methods unless otherwise specified.

Factor - Default method detection limits are based on analysis of clean water samples. A factor is required to calculate sample specific detection limits based on alternate matrices (soil or water), use of cleanup procedures, or dilution of extracts/digestates. For example, extraction or digestion of 10 grams of soil in contrast to 1 liter of water will result in a factor of 100.

Matrix - The sample material. Generally, it will be soil, water, air, oil, or solid waste.

Radian Work Order - The unique Radian identification code assigned to the samples reported in the analytical summary.

Units - ug/L	micrograms per liter (parts per billion); liquids/water
ug/Kg	micrograms per kilogram (parts per billion); soils/solids
ug/M3	micrograms per cubic meter; air samples
mg/L	milligrams per liter (parts per million); liquids/water
mg/Kg	milligrams per kilogram (parts per million); soils/solids
%	percent; usually used for percent recovery of QC standards
uS/cm	conductance unit; microSiemens/centimeter
mL/hr	milliliters per hour; rate of settlement of matter in water
NTU	turbidity unit; nephelometric turbidity unit
CU	color unit; equal to 1 mg/L of chloroplatinate salt

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RAS - Austin REPORT  
 04/25/89 07:59:43

Work Order # 89-04-086

REPORT Universal Engineering  
 TO 3532 Maggie Bl.  
Orlando, FL 32811

PREPARED Radian Analytical Services  
 BY 8501 Mo-pac Bl.  
PO Box 201088  
Austin, TX 78720-1088

  
 CERTIFIED BY

ATTEN Bill Adams

ATTEN \_\_\_\_\_  
 PHONE 512-454-4797

CONTACT LMDAY

CLIENT UNIV ENG SAMPLES 5  
 COMPANY Universal Engineering  
 FACILITY \_\_\_\_\_

WORK ID Unioglass Industrial  
 TAKEN TZ  
 TRANS FedEx  
 TYPE water  
 P.O. # 89-5283-2  
 INVOICE under separate cover

**SAMPLE IDENTIFICATION**

**TEST CODES and NAMES used on this report**

- 01 DG-1
- 02 DG-2
- 03 U-6
- 04 DG-1 MS
- 05 DG-1 MSD

- AG E Silver, ICPES
- AS G Arsenic, graphite AA
- BE E Beryllium, ICPES
- CD E Cadmium, ICPES
- CR E Chromium, ICPES
- CU E Copper, ICPES
- DG3020 Digestion, method 3020
- DG6010 Digestion, method 6010
- HARD Hardness
- HG C Mercury, cold vapor
- NH3 Nitrogen, Ammonia
- NI E Nickel, ICPES
- PB G Lead, graphite AA
- PHEN Total phenolics
- SB E Antimony, ICPES
- SE G Selenium, graphite AA
- TL G Thallium, graphite AA
- ZN E Zinc, ICPES

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 Received: 04/07/89

RAS - Austin REPORT  
 Results By Test

Work Order # 89-04-086

SAMPLE	Test: <u>AG E</u> ug/ml	Test: <u>AS G</u> ug/ml	Test: <u>BE E</u> ug/ml	Test: <u>CD E</u> ug/ml	Test: <u>CR E</u> ug/ml
Sample Id					
DG-1 01	<0.03	<0.001	<0.002	<0.005	<0.03
DG-2 02	<0.03	<0.001	<0.002	<0.005	<0.03
U-6 03	<0.03	<0.001	<0.002	<0.005	<0.03
DG-1 MS 04	84 % recovery	88 % recovery	96 % recovery	88 % recovery	90 % recovery
DG-1 MSD 05	88 % recovery	88 % recovery	95 % recovery	87 % recovery	90 % recovery

SAMPLE	Test: <u>CU E</u> ug/ml	Test: <u>DG3020</u> date complete	Test: <u>DG6010</u> date complete	Test: <u>HARD</u> ug/ml	Test: <u>NH3</u> mg/L as N
Sample Id					
DG-1 01	0.03*	04/12/89	04/18/89	82.1	0.05*
DG-2 02	<0.02	04/12/89	04/18/89	79.0	0.05*
U-6 03	<0.02	04/12/89	04/18/89	76.4	0.14
DG-1 MS 04	92 % recovery	04/12/89	04/18/89		108 % recovery
DG-1 MSD 05	91 % recovery	04/12/89	04/18/89		108 % recovery

SAMPLE	Test: <u>NI E</u>	Test: <u>PB G</u>	Test: <u>FHEN</u>	Test: <u>SB E</u>	Test: <u>SE G</u>
Sample Id	ug/ml	ug/ml	mg/L as phenol	ug/ml	ug/ml
01 DG-1	<0.02	0.060	<0.005	<0.2	<0.002
02 DG-2	0.04*	0.044	<0.005	<0.2	<0.002
03 U-6	0.02*	0.0420	<0.005	<0.2	<0.0020
04 DG-1 MS	91 % recovery	180 % recovery	101 % recovery	88 % recovery	72 % recovery
05 DG-1 MSD	88 % recovery	169 % recovery	103 % recovery	88 % recovery	72 % recovery

SAMPLE	Test: <u>TL G</u>	Test: <u>ZN E</u>
Sample Id	ug/ml	ug/ml
01 DG-1	<0.002	0.07*
02 DG-2	<0.002	0.06*
03 U-6	<0.002	0.06*
04 DG-1 MS	100 % recovery	91 % recovery
05 DG-1 MSD	100 % recovery	90 % recovery

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RAS - Austin REPORT  
Results by Sample

Work Order # 89-04-086

SAMPLE ID DG-1 FRACTION 01A TEST CODE HG C NAME Mercury, cold vapor  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

VERIFIED RHH

ANALYST MZ  
INSTRMT 403

ANALYZED 04/19/89

UNITS ug/ml

ANALYTE	RESULT	DET LIMIT
Mercury	<u>ND</u>	<u>0.0002</u>

(1)See Appendix A for glossary of report and data flag definitions.

SAMPLE ID DG-2 FRACTION 02A TEST CODE HG C NAME Mercury, cold vapor  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

VERIFIED RHH

ANALYST MZ  
INSTRMT 403

ANALYZED 04/19/89

UNITS ug/ml

ANALYTE	RESULT	DET LIMIT
Mercury	<u>ND</u>	<u>0.0002</u>

(1)See Appendix A for glossary of report and data flag definitions.

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RAS - Austin REPORT  
Results by Sample

Work Order # 89-04-086

SAMPLE ID U-6 FRACTION Q3A TEST CODE HG C NAME Mercury, cold vapor  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

VERIFIED RHH

ANALYST MZ  
INSTRMT 403 ANALYZED 04/19/89 UNITS ug/ml

ANALYTE	RESULT	DET LIMIT
Mercury	<u>ND</u>	<u>0.0002</u>

(1)See Appendix A for glossary of report and data flag definitions.

SAMPLE ID DG-1 MS FRACTION Q4A TEST CODE HG C NAME Mercury, cold vapor  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

VERIFIED RHH

ANALYST MZ  
INSTRMT 403 ANALYZED 04/19/89 UNITS %RCVRY

ANALYTE	RESULT	DET LIMIT
Mercury	<u>110</u>	<u>0.0002</u>

(1)See Appendix A for glossary of report and data flag definitions.

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RAS - Austin REPORT  
Results by Sample

Work Order # 89-04-086

SAMPLE ID DG-1 MSD

FRACTION Q5A TEST CODE HG C NAME Mercury, cold vapor  
Date & Time Collected 04/04/89 Category \_\_\_\_\_

VERIFIED RHH

ANALYST MZ  
INSTRMT 403

ANALYZED 04/19/89

UNITS %RCVRY

ANALYTE	RESULT	DET LIMIT
Mercury	<u>106</u>	<u>0.0002</u>

(1) See Appendix A for glossary of report and data flag definitions.

Appendix A

Comments, Notes and Definitions

## Notes and Definitions

Radian Work Order: 87-04-086

\* Est. result less than 5 times detection limit  
A Analytical and/or post-digestion spike  
B Detected in blank, result not corrected  
C Confirmed on second column  
D Sample diluted for this analyte  
E Estimated result - see report narrative  
Q Exceeds calibration range  
J Detected at less than detection limit  
NA Not analyzed  
NC Not calculated  
ND Not detected at specified detection limit  
NR Analyte not requested  
NS Not spiked  
N/A Not available  
P Previously confirmed  
Q Outside control limits  
R Detected in blank, result corrected  
S Determined by Method of Standard Addition  
U Unconfirmed-2nd column not requested  
X Not confirmed by analysis on 2nd column

Radian Work Order: 89-04-086

\*

The asterisk(\*) is used to flag results which are less than five times the method specified detection limit. Studies have shown that the uncertainty of the analysis will increase exponentially as the method detection limit is approached. These results should be considered approximate.

- A This flag indicates that a spike is an analytical and/or post-digestion spike. These spikes have not been subjected to the extraction or digestion step.
- B This flag indicates that the analyte was detected in the reagent blank but the sample results are not corrected for the amount in the blank.
- C Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The C flag indicates that the analyte has been confirmed by analysis on a second column.
- D This flag identifies all analytes identified in analysis at a secondary dilution factor. In an analysis some compounds can exceed the calibration range of the instrument. Therefore two analyses are performed, one at the concentration of the majority of the analytes, and a second with the sample diluted so that high concentration analyte(s) fall within the calibration range.

Radian Work Order: 87-04-086

E

The reported value is estimated because of the presence of interference. The potential source of the interference is included in the report narrative.

G This flag identifies a GC/MS result whose concentration exceeds the calibration range for that specific analysis. Usually if one or more compounds have a response greater than full scale, the sample or extract is diluted and re-analyzed.

J Indicates an estimated value for GC/MS data. This flag is used either when estimating a concentration for tentatively identified compounds where a response factor of 1 is assumed, or when the mass spectral data indicate the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit.

NA This analyte was not analyzed.

NC Applies to RPD and spike recovery results. The relative percent difference (RPD) and spike recovery are not calculated when a result value is less than five times the detection limit or obvious matrix interferences are present. See \* definition for further explanation of the unreliability of data near the detection limit. A spike recovery is not calculated when the sample result is greater than four times the spike added concentration because the spike added concentration is considered insignificant.

Radian Work Order: 89-04-086

ND

This flag (or < ) is used to denote analytes which are not detected at or above the specified detection limit. The value to the right of the < symbol is the method specified detection limit for the sample.

NR This analyte was not requested by the client.

NS This analyte or surrogate was not added ( spiked ) to the sample for this analysis.

N/A A result or value is not available for this parameter, usually a detection limit.

P Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The P flag indicates that the analyte has been confirmed previously. This flag is applicable to analyses of samples arising from a regular sampling program as a specific sample source; for example, a quarterly well monitoring program.

Radian Work Order: 87-04-086

Q

This quality control standard is outside method or laboratory specified control limits. This flag is applied to matrix spike, analytical QC spike, and surrogate recoveries; and to RPD(relative percent difference) values for duplicate analyses and matrix spike/matrix spike duplicate result.

R This flag indicates that the analyte was detected in the reagent blank and the sample results are corrected for the amount in the blank.

S This flag indicates that a specific result from a metals analysis has been obtained using the Method of Standard Addition.

U Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The U flag indicates that second column was not requested.

X Most methods of analysis by gas chromatography recommend reanalysis on a second column of dissimilar phase to resolve compounds of interest from interferences that may occur and for analyte confirmation. The X flag indicates a second column confirmation was performed but the analyte was not confirmed and is likely a false positive.

Radian Work Order: 89-04-086

**TERMS USED IN THIS REPORT:**

**Analyte** - A chemical for which a sample is to be analyzed. The analysis will meet EPA method and QC specifications.

**Compound** - See Analyte.

**Detection Limit** - The method specified detection limit, which is the lower limit of quantitation specified by EPA for a method. Radian staff regularly assess their laboratories' method detection limits to verify that they meet or are lower than those specified by EPA. Detection limits which are higher than method limits are based on experimental values at the 99% confidence level. Note, the detection limit may vary from that specified by EPA based on sample size, dilution or cleanup.  
(Refer to Factor, below)

**EPA Method** - The EPA specified method used to perform an analysis. EPA has specified standard methods for analysis of environmental samples. Radian will perform its analyses and accompanying QC tests in conformance with EPA methods unless otherwise specified.

**Factor** - Default method detection limits are based on analysis of clean water samples. A factor is required to calculate sample specific detection limits based on alternate matrices (soil or water), use of cleanup procedures, or dilution of extracts/digestates. For example, extraction or digestion of 10 grams of soil in contrast to 1 liter of water will result in a factor of 100.

**Matrix** - The sample material. Generally, it will be soil, water, air, oil, or solid waste.

**Radian Work Order** - The unique Radian identification code assigned to the samples reported in the analytical summary.

Units - ug/L	micrograms per liter (parts per billion); liquids/water
ug/Kg	micrograms per kilogram (parts per billion); soils/solids
ug/M <sup>3</sup>	micrograms per cubic meter; air samples
mg/L	milligrams per liter (parts per million); liquids/water
mg/Kg	milligrams per kilogram (parts per million); soils/solids
%	percent; usually used for percent recovery of QC standards
uS/cm	conductance unit; microSiemens/centimeter
mL/hr	milliliters per hour; rate of settlement of matter in water
NTU	turbidity unit; nephelometric turbidity unit
CU	color unit; equal to 1 mg/L of chloroplatinate salt

**APPENDIX D**

NORTH CAROLINA  
ENVIRONMENTAL MANAGEMENT COMMISSION  
DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT  
**APPLICATION FOR PERMIT TO CONSTRUCT MONITOR/RECOVERY WELL(S)**

To: NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION MARCH 27, 1989

Gentlemen:

In accordance with the provisions of Article 7, Chapter 87, General Statutes of North Carolina, and regulations pursuant thereto, application is hereby made by

UNIGLASS INDUSTRIES for a permit to construct a  
(name of well owner)

monitor/recovery well(s) as described below and in the accompanying data submitted as a part of this application.

- (a) Name of property owner: UNIGLASS INDUSTRIES
- (b) Location of property: CONNER STREET STATESVILLE IREDELL  
(Road, Industry, Community, etc.) Town County
- (c) Type of facility or site being monitored: UNDERGROUND STORAGE TANK
- (d) Types of contamination being monitored or recovered: PETROLEUM  
& SOLID WASTE LANDFILL
- (e) Existing monitor well numbers: DM-1 THROUGH DM-8 NEW DM-9 THROUGH DM-
- (f) Existing monitor wells showing contamination (well no.): \_\_\_\_\_
- (g) Estimated water-table depth: 15 TO 20 feet
- (h) Estimated date of construction: Begin MARCH 29, 1989 Complete APRIL 5, 1989
- (i) Drilling contractor: SUBSURFACE INVESTIGATIONS INC.
- (j) Location of well: Provide a detailed map showing the location of the proposed well(s), and of any wells in an existing monitoring system (if applicable), in relation to the pollution source(s) being monitored and to at least two (2) nearby permanent reference points such as roads, intersections, and streams. Identify roads with State Highway road identification numbers. (Show all existing water supply wells within a radius of 1,000 feet of the proposed well.)
- (k) Well construction diagram: Provide a diagram showing proposed construction specifications, including diameter, estimated depth, screens, sand pack, grout, type of materials, etc.

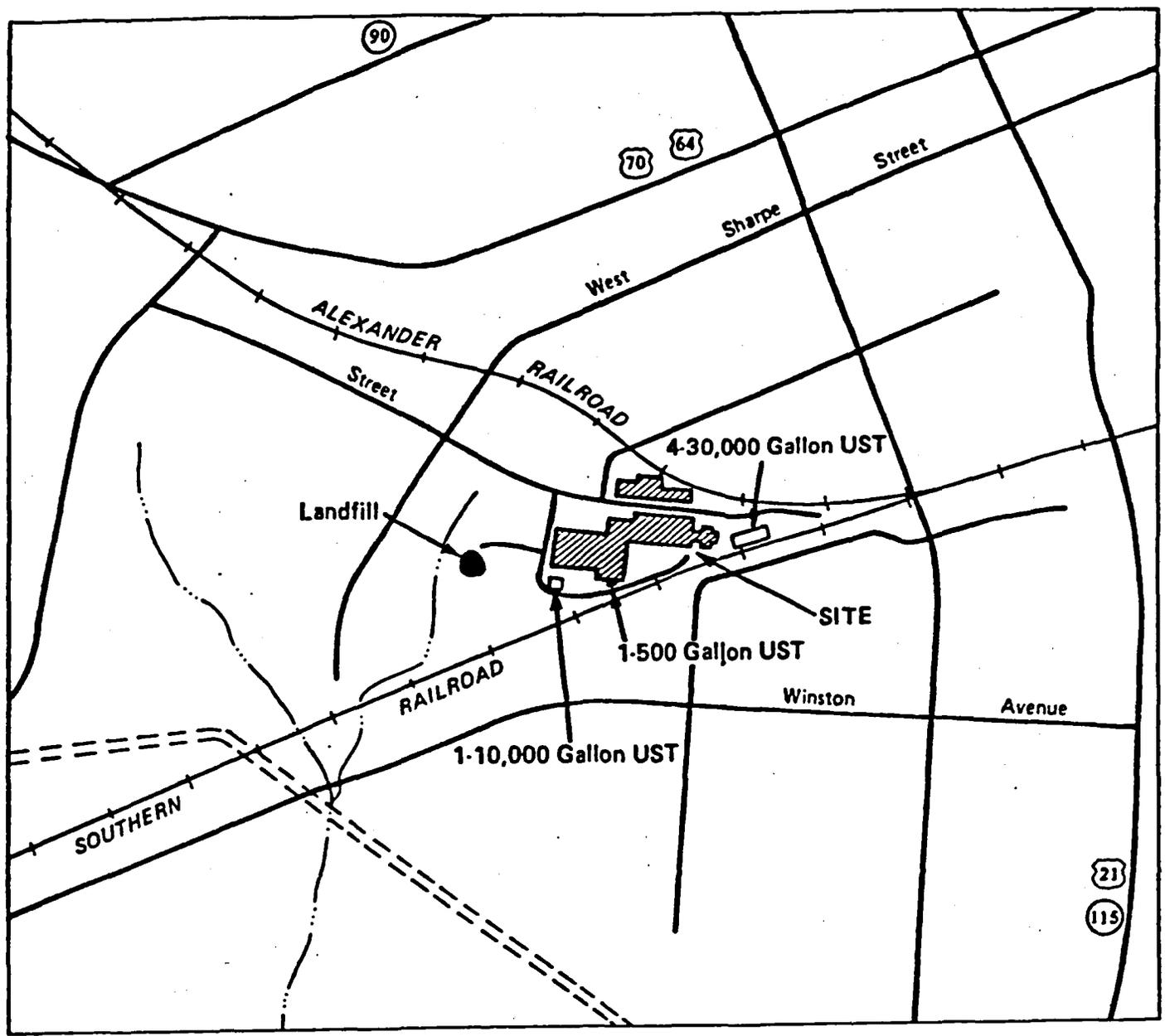
The Applicant hereby agrees the proposed well will be constructed in accordance with approved specifications and conditions of the Well Construction Permit. As regulated under the Well Construction Standards (Title 15 - North Carolina Administrative Code, Subchapter 2C)

UNIGLASS INDUSTRIES  
CONNER STREET  
STATESVILLE, N.C.  
(Mailing Address of Well Owner-Required)  
SUBSURFACE INVESTIGATIONS INC  
P.O. BOX 241308  
CHARLOTTE, NORTH CAROLINA 28224  
(Mailing Address of Agent-if other than above)

Wm. B. Smith  
Signature of Well Owner or Agent  
SUBSURFACE INVESTIGATIONS INC  
PRESIDENT.  
Title (if applicable)

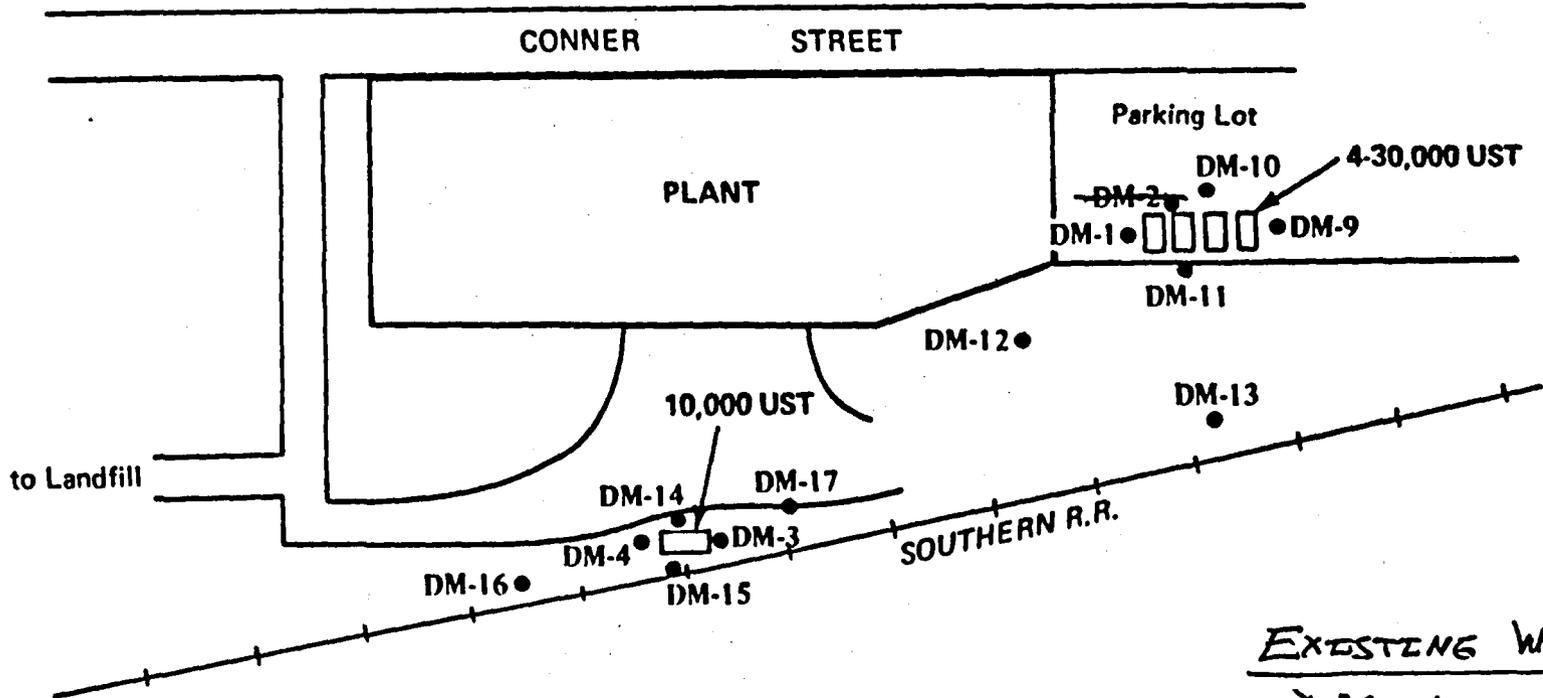
FOR OFFICE USE ONLY

PERMIT NO. \_\_\_\_\_ issued \_\_\_\_\_ 19\_\_



APPROXIMATE LOCATIONS OF STUDY AREAS,  
UNIGLASS INDUSTRIES PLANT,  
STATESVILLE, NORTH CAROLINA, JULY 1988

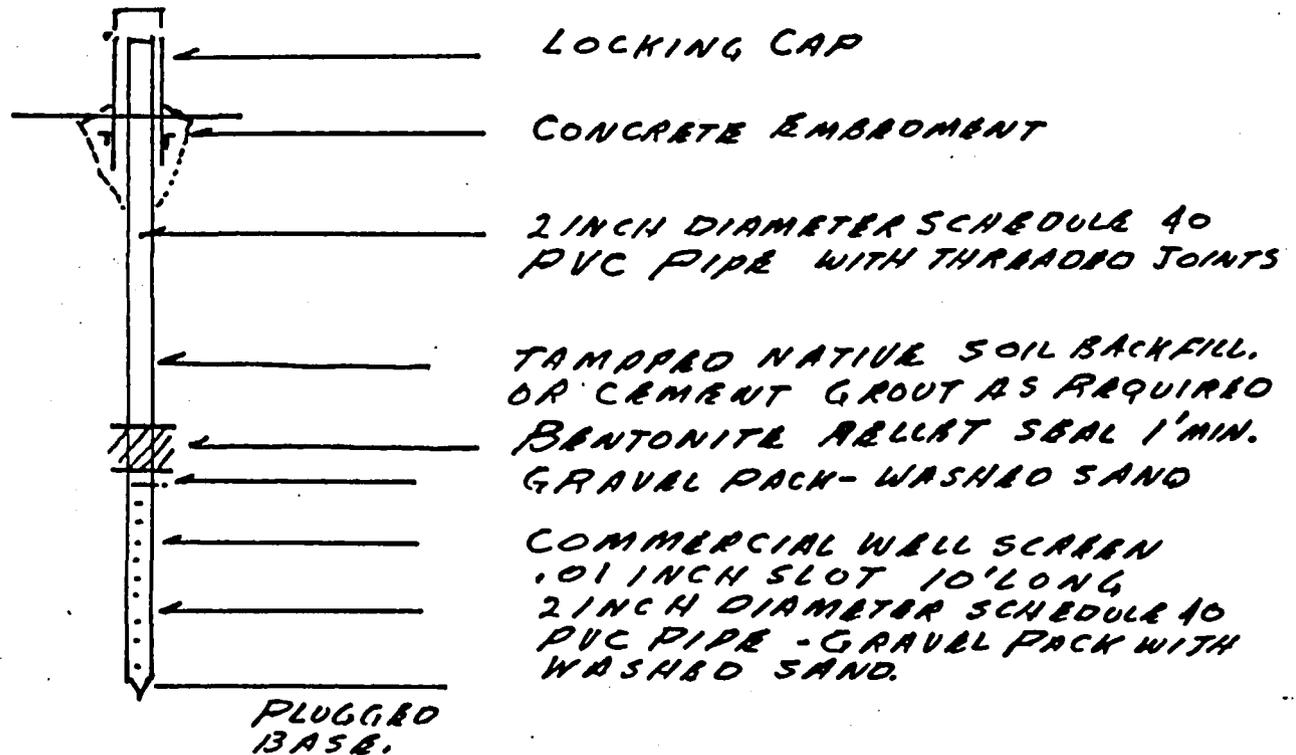
D-3



PROPOSED MONITORING WELL LOCATIONS

EXISTING WELLS  
 DM-1  
 DM-3  
 DM-4  
 DM-5 - DM-8,  
 LANDFILL

SKETCH OF SITE, NOT TO SCALE



Legend



**SUBSURFACE INVESTIGATIONS, INC.**  
GEOTECHNICAL ENGINEERS  
CONSTRUCTION QUALITY CONTROL

Project

MONITOR WELL CROSS SECTION  
UNIGLASS INDUSTRIES  
CORNER STREET,  
STATESVILLE, NORTH CAROLINA.

Scale: *NONE.*



Tom Z.  
Review and  
verify.

State of North Carolina  
Department of Natural Resources and Community Development  
Mooresville Regional Office

James G. Martin, Governor  
William W. Cobey, Jr., Secretary

Albert F. Hilton, Regional Manager

DIVISION OF ENVIRONMENTAL MANAGEMENT

April 5, 1989

Mr. Nick Odum  
Springs Industries  
205 North White Street  
Fort Mill, S.C. 29715

4/18/89 -  
Bill - Check for our  
compliance. Let me know.  
Subject: Well Construction Permit *Nick*  
No. 48-0233-WM-0058  
Iredell County, N. C.

Dear Mr. Odum:

In accordance with your application received March 29, 1989 we are forwarding herewith Well Construction Permit No. 48-0233-WM-0058 dated April 5, 1989 issued to Springs Industries for the construction of nine (9) monitor wells.

This Permit will be effective from the date of issuance and shall be subject to the conditions and limitations as specified therein.

Sincerely,

*Brenda J. Smith*  
Brenda J. Smith, P.G.  
Regional Supervisor

Enclosure

cc: Permits & Engineering  
Subsurface Investigations, Inc.

NORTH CAROLINA  
ENVIRONMENTAL MANAGEMENT COMMISSION  
DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT  
PERMIT FOR THE CONSTRUCTION OF A WELL OR WELL SYSTEM

In accordance with the provisions of Article 7, Chapter 87, North Carolina General Statutes, and other applicable Laws, Rules and Regulations,

PERMISSION IS HEREBY GRANTED TO

Springs Industries

FOR THE CONSTRUCTION OF NINE MONITOR WELL(S) to be constructed in the Charlotte Belt Geologic Unit, located at Conner Street, Statesville in Iredell County in accordance with the application dated March 27, 1989 and in conformity with specifications and supporting data, all of which are filed with the Department of Natural Resources and Community Development and are considered a part of this Permit.

This Permit is for well construction only, and does not waive any provisions or requirements of the Water Use Act of 1967, or any other applicable laws or regulations.

Construction of a well under this Permit shall be in compliance with the North Carolina Well Construction Regulations and Standards, and any other laws and regulations pertaining to well construction.

This Permit will be effective from the date of its issuance until October 5, 1989 and shall be subject to other specified conditions, limitations, or exceptions as follows:

1. The borehole shall not penetrate to a depth greater than the depth to be monitored or the depth from which contaminants are to be recovered.
2. The well shall not hydraulically connect separate aquifers.

3. All water-bearing zones that are known to contain polluted, saline, or other nonpotable water shall be adequately cased and cemented off so that pollution of the overlying and underlying groundwater zones will not occur.
4. Construction materials shall be compatible with the contaminants to be monitored or recovered. The casing shall equal or exceed Schedule 40.
5. The well shall be constructed in such a manner that water from land surface cannot migrate into the gravel pack or well screen area.
6. When a sand pack is placed around the screen, a seal shall be installed above the sand.
7. Grout shall be placed in the annular space between the casing and the borehole wall from land surface to a depth within two feet above the top of the well screen or to the bottom of the casing for open end wells. The top of the well screen should not be above the mean high seasonal water level.
8. All wells shall be secured to reasonably insure against unauthorized access and use. The well shall be permanently labeled with a warning that it is for monitoring purposes and the entrance to the well must be secured with a lockable cap.
9. All wells shall be afforded reasonable protection against damage during construction and use.
10. Each well shall have permanently affixed an identification plate.
11. A completed GW-1 and copies of all water quality results must be submitted for each well to the Division of Environmental Management.
12. When any monitor well is no longer useful for its intended purpose, it shall be properly abandoned and an abandonment report filed with the Division of Environmental Management.

Permit issued this the 5th day of April, 1989.

FOR THE NORTH CAROLINA ENVIRONMENTAL MANAGEMENT COMMISSION

*Brenda J. Smith*

\_\_\_\_\_  
Brenda J. Smith, P.G., Regional Supervisor  
Division of Environmental Management

By Authority of the Environmental Management Commission

Permit No. 48-0233-WM-0058

**APPENDIX E**

RECORD / 110

NORTH CAROLINA DEPARTMENT OF WATER AND AIR RESOURCES  
DIVISION OF GROUND WATER  
BOX 9392 - RALEIGH, N. C.

MAR 2 1970

IR 1291

N. C. Dept. of Water & Air Resources  
Ground Water Division  
Well Permit No.:

WELL RECORD

Drilling Contractor Air Drilling Co. Reg. No. 2111

1. Town Statesville, N.C. County Iredell

2. Location 618 Walnut St. Quadrangle No. K66(9-1)  
Show a sketch of location on back of form

3. Owner Bishop James P. Dees  
Address 618 Walnut St., Statesville, N.C.

4. Topography: draw, slope, hilltop, valley, flat

5. Use of Well Domestic Date Completed 2-27-69

6. Rig type or method Air-Rotary Total Depth 232'

7. Casing: Depth Diam. Type  
From 0 to 125 ft. 6 1/2 in. Galv.

8. Grout: Depth Material Method  
From \_\_\_\_\_ to \_\_\_\_\_ ft. \_\_\_\_\_

9. Screen: Depth Diam. Type and opening  
From \_\_\_\_\_ to \_\_\_\_\_ ft. \_\_\_\_\_ in. \_\_\_\_\_

10. Water Zones (depth) 228'

11. Static Water Level: \_\_\_\_\_ ft. above  
below top of casing  
which is \_\_\_\_\_ ft. above land surface.  
Date \_\_\_\_\_

12. Yield (gpm) 10 Method of testing Air

13. Pumping Water Level: \_\_\_\_\_ ft. after \_\_\_\_\_ hrs.  
at \_\_\_\_\_ gpm.

14. Water Quality \_\_\_\_\_ Temperature (°F) \_\_\_\_\_

15. Well sterilization method HTH Tablets

16. Permanent Pump: \_\_\_\_\_ Type \_\_\_\_\_ Make \_\_\_\_\_

Installed- Date \_\_\_\_\_ By \_\_\_\_\_

Capacity \_\_\_\_\_ (gpm) Hp. \_\_\_\_\_

Intake depth \_\_\_\_\_ Airline depth \_\_\_\_\_

17. Remarks: \_\_\_\_\_

I do hereby certify that this well  
record is true and exact.

SIGNATURE OF CONTRACTOR OR AGENT

Depth		Formation
From	To	
0	125'	Dirt
125'	232'	Rock
		...
		354852
		805340
		topo elev 990'
		yd
		17 - 125'
		18 - HB DG
		19 -















DRILLING CONTRACTOR Air Drilling Co. REG. NO. 211 WELL CONSTRUCTION PERMIT NO. \_\_\_\_\_

1. WELL LOCATION: (Show sketch of the location below)

Nearest Town: Statesville, N.C. County: Tredell  
Quadrangle No. K6 (PB)  
(Road, Community or Subdivision and Lot No.) \_\_\_\_\_ 03-07-06

2. OWNER: Davis Oil Co. of Statesville

DRILLING LOG

3. ADDRESS: P.O. Box 5560, Statesville, N.C.

DEPTH FROM TO FORMATION DESCRIPTION

4. TOPOGRAPHY: draw, valley, slope, hilltop, flat (circle one)

5. USE OF WELL: Commercial DATE: 8-23-79

0 40' Dirt

6. DOES THIS WELL REPLACE AN EXISTING WELL? NO

40 50' Rock

7. TOTAL DEPTH: 50' RIG TYPE OR METHOD: air

8. FORMATION SAMPLES COLLECTED: YES NO

9. CASING: Depth Inside Dia. Wall thick. type or weight/ft.

0 - 50' 4" Galv.  
50 - 52' 52"

From 0 to 50 ft 4"

10. GROUT: Depth Material Method

From 0 to 20 ft Grout Poured

If additional space is needed, use back of form

11. SCREEN: Depth Dia. Type & Opening

From \_\_\_\_\_ to \_\_\_\_\_ ft \_\_\_\_\_

LOCATION SKETCH (Show distance to numbered roads, or other map reference points)

12. GRAVEL: Depth Size Material

From \_\_\_\_\_ to \_\_\_\_\_ ft \_\_\_\_\_

13. WATER ZONES (depth): 500'

14. STATIC WATER LEVEL: \_\_\_\_\_ ft. above/below top of casing

Casing is \_\_\_\_\_ ft. above land surface ELEV: \_\_\_\_\_

15. YIELD (gpm): 8 METHOD OF TESTING: air

16. PUMPING WATER LEVEL: \_\_\_\_\_ ft.

after \_\_\_\_\_ hours at \_\_\_\_\_ gpm.

17. CHLORINATION: Type HTH Amount \_\_\_\_\_

18. WATER QUALITY: \_\_\_\_\_ TEMPERATURE (°F) \_\_\_\_\_

19. PERMANENT PUMP: Date Installed \_\_\_\_\_

Type \_\_\_\_\_ Capacity \_\_\_\_\_ (gpm) HP \_\_\_\_\_

Make \_\_\_\_\_ Intake Depth \_\_\_\_\_

Airline Depth \_\_\_\_\_

20. HAS THE OWNER BEEN PROVIDED A COPY OF THIS RECORD AND INFORMED OF THE DEPARTMENTS REQUIREMENTS AND RECOMMENDATIONS? YES

21. REMARKS W/in. 9/16/83 WAC

I do hereby certify that this well was constructed in accordance with N.C. Well Construction Regulations and Standards and that this well record is true and exact.

SIGNATURE OF CONTRACTOR OR AGENT \_\_\_\_\_ DATE \_\_\_\_\_