REPORT OF INDOOR AIR QUALITY ASSESSMENT

ATHERTON MILL PROPERTY

2000, 2100, 2130 & 2140 SOUTH BOULEVARD
CHARLOTTE, MECKLENBURG COUNTY, NORTH CAROLINA

Prepared for:

ATHERTON MILL (E&A), LLC

1221 MAIN STREET, SUITE 1000
COLUMBIA, SOUTH CAROLINA 29201

Prepared By:

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.
2801 YORKMONT ROAD, SUITE 100
CHARLOTTE, NORTH CAROLINA 28208

JULY 29, 2014

AMEC PROJECT: 6228-12-0051

amec

July 29, 2014

Ms. Carolyn Minnich, Brownfields Project Manager
North Carolina Department of Environment and Natural Resources
Division of Waste Management
Brownfields Program
1646 Mail Service Center
Raleigh, North Carolina 27699-1646

Subject: Transmittal Letter
Report of Indoor Air Quality (IAQ) Assessment
Atherton Mill Property
2000, 2100, 2130 & 2140 South Boulevard
Charlotte, Mecklenburg County, North Carolina
Brownfields Project Number: 10047-06-60
AMEC Project: 6228-12-0051

Dear Ms. Minnich:

On behalf of Atherton Mill (E&A), LLC, AMEC Environment & Infrastructure, Inc. (AMEC) is pleased to present this report for the Atherton Mill Property located in Charlotte, North Carolina (subject property) to the North Carolina Department of Environment and Natural Resources (NCDENR) relating to the activities proposed in AMEC's Work Plan (dated May 7, 2014, revised on May 19, 2014) and approved by NCDENR on May 20, 2014. Atherton Mill (E&A), LLC approved the scope of work on May 7, 2014. Documents reflecting these approvals are provided as Attachment A.

We appreciate your review of this report. Please contact the undersigned at (704) 357-8600 if you have questions.

Sincerely,

AMEC Environment & Infrastructure, Inc.

Andrew J. Frantz, AEP
Project Scientist

Robert C. Foster, LG
Associate Geologist

Enclosures

July 29, 2014

Mr. Jude Peck, CCIM, ERM, LEED Green Associate
Environmental Risk Manager
Atherton Mill (E&A), LLC
1221 Main Street, Suite 1000
Columbia, South Carolina 29201

Subject: **Report of Indoor Air Quality Assessment**
Atherton Mill Property
2000, 2100, 2130 & 2140 South Boulevard
Charlotte, Mecklenburg County, North Carolina
Brownfields Project Number: 10047-06-60
AMEC Project: 6228-12-0051

Dear Mr. Peck:

As authorized by your acceptance of our Proposal (Prop14chltev81, dated May 7, 2014), AMEC Environment & Infrastructure, Inc. (AMEC) is pleased to submit this *Report of Indoor Air Quality Assessment*. This report includes a description of the field activities, the results obtained, and AMEC's conclusions.

AMEC appreciates the continued opportunity to provide our environmental consulting services. If you have questions concerning this report or this project, please contact us at 704-357-8600.

Sincerely,

AMEC Environment & Infrastructure, Inc.

Andrew J. Frantz, AEP
Project Scientist

Robert C. Foster, LG
Associate Geologist

Cc: Ms. Amanda Short, McGuireWoods, LLP

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LIST OF ATTACHMENTS

1. SITE HISTORY AND CHARACTERIZATION

The 9.78-acre subject property (subject property) is located at 2000 (Building 1), 2100 (Building 2), 2130 (Building 3) & 2140 (Building 4) South Boulevard in Charlotte, North Carolina and consists of Mecklenburg County Tax Parcel 121-031-09. A site layout is depicted on **Figure 1.** The subject property contains four commercial buildings. According to the Mecklenburg County Property Ownership and Land Records Information System (POLARIS), an approximately 58,959-square foot commercial building (Building 1) constructed in 1908 at 2000 South Boulevard, an approximately 41,166-square foot commercial building (Building 2) constructed in 1940 at 2100 South Boulevard, an approximately 12,422-square foot commercial building (Building 3) constructed in 1962 at 2130 South Boulevard and an approximately 6,255-square foot commercial building (Building 4) constructed in 1932 at 2140 South Boulevard occupy the site (**Figure 1**). Remaining portions of the site consist of asphalt-paved driveway and parking areas and grass covered areas. The site is currently occupied by office retail and restaurant space.

According to the draft Brownfields Agreement for the subject property, in the early 1900's, the Parks-Cramer Company initially developed 4.5-acres of the subject property at the corner of South Boulevard and West Tremont Avenue (2000 South Boulevard). The Parks-Cramer Company manufactured products that included humidity control equipment for textile mills. Later, the Parks-Cramer Company manufactured and restored air handling equipment and hoisting systems for the textile industry.

The Parks-Cramer Company expanded its holdings to the southern portion of the subject property in the 1960's and 1970's. In 1962, it commenced operation of a vapor degreasing unit for cleaning and preparation of metal parts prior to paint application at the northern portion of the subject property. Initially, trichloroethene was used as the solvent in the degreasing process, with 1,1,1-trichloroethane replacing it in 1976.

In 1988, the Parks-Cramer Company sold its manufacturing operation to Flakt, Inc. The property operated under a lease until December 1992, when South Boulevard Properties, Inc. became the owner of the subject property. In 1993, Building 1 was renovated for use of office, restaurant and retail space. Atherton Mills (E&A), LLC purchased the subject property on September 7, 2006.

The most recent groundwater sampling at the subject property reportedly occurred in June 2004. The highest concentrations of the Volatile Organic Compounds (VOCs) reported in June 2004 were: 1,1-dichloroethene - 26,000 µg/L, 1,1-dichloroethane – 840 µg/L, cis-1,2-dichloroethene – 1,200 µg/L, 1,1,1-trichloroethane – 16,000 µg/L, trichloroethene (TCE) – 250,000 µg/L and tetrachloroethene (PCE) – 10,000 µg/L. Information used to formulate a Conceptual Site Model (CSM) is included as **Attachment A**.

AMEC performed sub-slab vapor sampling and analysis at 12 selected locations in October 2012. The results of that work suggested that Indoor Air Quality (IAQ) sampling and analysis was warranted based on exceedance of the acceptable soil-gas concentrations established prior to 2012. Since that time, AMEC performed IAQ sampling events in April and July 2013 and January 2014. Six indoor and one outdoor locations were sampled during these events. Elevated concentrations of VOCs were identified in each of the three events, with the highest concentrations in July 2013. Most notably, the VOCs identified included naphthalene and TCE.

In May 2014, representatives of the property owner, NCDENR Brownfields Program (BP) and AMEC met at the site to select additional sampling locations (10 indoor and two outdoor) for the summer 2014 sampling event. Following the meeting, AMEC prepared a brief Work Plan for submittal to the BP. Ms. Carolyn Minnich of NCDENR approved the Work Plan on May 20, 2014 (**Attachment B**).

2. INDOOR AIR QUALITY SAMPLING ACTIVITIES

For this fourth IAQ monitoring event (June 2014), AMEC collected the indoor air quality samples in general accordance with the previously selected six locations from the January 2014 sampling event and selected six additional sampling locations for a total of 12 IAQ sample locations. The sample identification designations for the fourth event were IA-A through IA-L. These were collected over an 8-hour time period on June 3, 2014. The DWM Indoor Air Building Survey and Sampling Form along with photographs of materials identified at the site on the sampling date are included as **Attachment C**. The locations of the 12 IAQ sample locations are depicted on **Figure 1**. A summary of each of the locations is as follows:

- IA-A – Unit 40, occupied by IceHouse Southend Bar & Grill, sample location located in dry food storage area in the kitchen;
- IA-B – Unit 45, occupied by Luna's Living Kitchen storage, sample location located in the front lobby area of unit;
- IA-C – Unit 50, occupied by Pure Body Fitness Studio, sample location located in vacant conference room;
- IA-D – Unit 60, occupied by Atherton Mill Market, sample location located in empty market stall;
- IA-E – Unit 75, occupied by Pinot's Palette, sample location located along eastern wall of unit;
- IA-F – Unit 80, vacant at time of sampling, sample location located near the eastern corner of unit;
- IA-G – Hallway between units 80 and 85, sample location located near the electrical closet;
- IA-H – Unit 170, occupied by Kimley Horn & Associates, sample location located near receptionist desk;
- IA-I – Hallway between units 170 and 160, sample location located near janitors' closet;
- IA-J – Unit 140, occupied by EDENS, sample location located near eastern corner of unit;
- IA-K – Outdoor background sample, downwind of building, sample location located north of buildings near pad-mounted transformer; and

- IA-L – Outdoor background sample, upwind of building, sample location located southwest of buildings near solid waste dumpster.

During sample collection, units were occupied, with the exception of unit 80, and businesses located in the units operated normally. Normal operating conditions were observed with the HVAC systems operational in each unit; with the exception of unit 80 were the HVAC system was not functional. The sampling scope included the following items:

- Each sample was collected from the normal breathing level above the floor;
- The samples were collected over an 8-hour time period on June 3, 2014;
- Each sample was collected into a Summa canister at a flow rate of approximately 12.5 mL/min (8-hour sample time) and submitted to a North Carolina certified laboratory for analysis; and
- The Summa canisters were submitted to a laboratory for analysis of VOCs via EPA Method TO-15.

3. INDOOR AIR QUALITY SAMPLING RESULTS

The results of the IAQ analysis for the June 2014 sampling events are summarized on **Table 1**. A copy of the laboratory report is included as **Attachment D**. The analysis identified VOCs in several of the indoor air samples collected as well as the "Background" samples. Most notably:

- Benzene was identified in sample IA-A (6.0 μg/m^3) at a concentration which exceeded the Division of Waste Management (DWM) Non-Residential Indoor Air Screening Level (IASL) for benzene of 1.57 μg/m^3. Benzene was also identified in sample IA-D (0.63 μg/m^3). Although benzene was identified in IA-D, the concentration (0.63μg/M^3) did not exceed the DWM Non-Residential IASL for benzene.

- Chloroform was identified in sample IA-A (3.4 μg/m^3) at a concentration which exceeded the DWM Non-Residential IASL for chloroform of 0.533 μg/m^3.

- 1,4-Dichlorobenzene was identified in samples IA-A (3.2 μg/m^3) and IA-D (16.3 μg/m^3) at concentrations which exceeded the DWM Non-Residential IASL for 1,4-dichlorobenzene of 1.11 μg/m^3.

- Ethylbenzene was identified in sample IA-A (6.2 μg/m^3) at a concentration which exceeded the DWM Non-Residential IASL for ethylbenzene of 4.91 μg/m^3.

- Naphthalene was identified in samples IA-E (164 μg/m^3), IA-F (112 μg/m^3), IA-G (67.8 μg/m^3), IA-H (41.9 μg/m^3), IA-I (50.0 μg/m^3) and IA-J (8.1 μg/m^3) at concentrations which exceeded the DWM Non-Residential IASL for naphthalene of 0.361 μg/m^3.

- Tetrachloroethene (PCE) was identified in sample IA-E (240 μg/m^3) at a concentration which exceeded the DWM Non-Residential IASL for PCE of 35 μg/m^3. PCE was also identified in samples IA-A (3.2 μg/m^3), IA-F (19.3 μg/m^3) and IA-I (μg/m^3). However, the concentrations in samples IA-A, IA-F and IA-I did not exceed the DWM Non-Residential IASL for PCE.

- Trichloroethene (TCE) was identified in samples IA-A (3.1 μg/m^3), IA-F (1.8 μg/m^3), IA-G (11.1 μg/m^3), IA-H (17.6 μg/m^3), IA-I (14.4 μg/m^3) and IA-J (5.2 μg/m^3) at concentrations which exceeded the DWM Non-Residential IASL for TCE of 1.75 μg/m^3.

- 1,2,4-Trimethylbenzene (1,2,4-TMB) was identified in samples IA-E (14.7 μg/m^3) and IA-F (11.6 μg/m^3) at concentrations which exceeded the DWM Non-Residential IASL for 1,2,4-TMB of 6.13 μg/m^3. 1,2,4-TMB was also identified in samples IA-A (2.9 μg/m^3), IA-H (1.9 μg/m^3), IA-I (3.1 μg/m^3) and IA-J (1.8 μg/m^3) However, the concentrations in samples IA-A, IA-H, IA-I and IA-J did not exceed the DWM Non-Residential IASL for 1,2,4-TMB.

- Dilution of some of the samples was necessary during analysis. This resulted in reporting limits for diluted samples that exceeded the applicable IASL.

4. CONCLUSIONS

The results of AMEC's June 2014 IAQ sampling event are as follows:

- Analysis of the sample IA-A from the IceHouse Southend Bar & Grill (Unit 40) identified elevated concentrations of benzene, chloroform, 1,4-dichlorobenzene, ethylbenzene and TCE.

- Analysis of the sample IA-D from the Atherton Mill Market (Unit 60) identified an elevated concentration of 1,4-dichlorobenzene.

- Analysis of the sample from IA-E from Pinot's Palette (Unit 75) identified elevated concentrations of naphthalene, PCE and 1,2,4-TMB. Appendix E includes the Material Safety Data Sheets (MSDS) for the water-based paints and other liquids stored at Unit 75. No VOCs are represented on the MSDS.

- Analysis of the sample IA-F from the vacant space (Unit 80) identified elevated concentrations of naphthalene, TCE and 1,2,4-TMB.

- Analysis of the samples IA-G and IA-I from the hallways identified elevated concentrations of naphthalene and TCE.

- Analysis of the samples IA-H from Kimley-Horn Associates (Unit 170) and IA-J from EDENS (Unit 140) identified elevated concentrations of naphthalene and TCE.

- Analysis of the samples IA-B from Luna's Living Kitchen storage (Unit 45), IA-C from Pure Body Fitness Studio (Unit 50), IA-K and IA-L (background, outdoor air samples) did not identify concentrations of analytes that exceeded the IASLs.

Based on this and previous IAQ data, AMEC concludes the following:

- The June 2014 results identified comparable levels of VOCs as the July 2013 results. The highest levels of VOCs (naphthalene, PCE, TCE and 1,2,4-TMB) have been identified in sampling events performed during the warm season months (June and July).

- Previous IAQ events were performed with the HVAC system(s) off. This event was performed with the HVAC system(s) operational, with the exception of Unit 80. Based on our review of the data, operation of the HVAC system(s) did not result in lower concentrations of VOCs.

FIGURE

Background Air Sampling Location (June 3, 2014)

Indoor Air Sampling Location (June 3, 2014)

Areas in which more than one CoC was identified at concentrations exceeding the IASLs

APPROXIMATE SCALE IN FEET

100 50 0 100

REFERENCE: Atherton Mill (2378) Site Layout Plan, by Edens. Updated 04-21-14.

amec

IAQ SAMPLING LOCATIONS
ATHERTON MILL PROPPERTY
2000, 2100, 2130 & 2140 SOUTH BOULEVARD
CHARLOTTE, NORTH CAROLINA

PREPARED BY:	DATE:	CHECKED BY:	DATE:	JOB NUMBER:	FIGURE:
AJF	7/17/2014	RCF	7/17/2014	6228-12-0051	1

P:\6228 Environmental\jobs\2012\6228-12-0051 – Atherton Mill\IAQ\IAQ Sampling Figure.dwg – Figure – Aug. 01, 2014 12:57pm – dewayne.dunn

TABLE

Table 1: Summary of Indoor Air Constituents of Concern Analytical Results
Atherton Mill Property
Charlotte, North Carolina
AMEC Project: 6228-12-0051

Constituent of Concern	Building 2				Building 1						Outdoors		Division of Waste Management Non-Residential Indoor Air Screening Levels
	IA-A	IA-B	IA-C	IA-D	IA-E	IA-F	IA-G	IA-H	IA-I	IA-J	IA-K	IA-L	
Units	40	45	50	60	75	80	Hallway by Electrical Closet	170	Hallway by Janitorial Closet	140	Downwind	Upwind	
Benzene	**6.0**	<3.3	0.38 J	0.63	<2.3	0.34 J	<2.5	0.30 J	<0.68	0.25 J	<2.3	<0.48	1.57
Chloroform	**3.4**	<9.9	<1.9	<1.5	<7.1	<1.5	<7.7	<1.4	<2.1	<1.3	<6.9	0.40 J	0.533
1,4-Dichlorobenzene	**3.2**	<12.2	<2.4	**16.3**	<8.8	<1.9	<9.5	<1.8	<2.5	<1.6	<8.5	<1.8	1.11
1,1-Dichloroethane	2.1	<8.2	<1.6	<1.2	<5.9	<1.3	<6.4	<1.2	<1.7	<1.1	<5.7	<1.2	7.67
Ethylbenzene	**6.2**	<8.8	1.8	<1.3	<6.3	1.0 J	4.7 J	0.96 J	2.4	1.5	<6.1	<1.3	4.91
n-Hexane	18.6	143	122	<1.1	32.7	3.4	3.1 J	<1.0	<1.5	<0.96	21.6	2.0	613
Naphthalene	**3.0 J**	<26.6	**1.1 J**	<4.0	**164**	**112**	**67.8**	**41.9**	**50.0**	**8.1**	<18.5	<4.0	0.361
Tetrachloroethene (PCE)	3.2	<13.8	<2.7	<2.1	**240**	19.3	10.1 J	1.3 J	3.7	0.92 J	<9.6	0.56 J	35
Trichloroethene (TCE)	**3.1**	<10.9	0.97 J	1.1 J	**4.3 J**	**1.8**	**11.1**	**17.6**	**14.4**	**5.2**	**5.1 J**	1.0 J	1.75
1,2,4-Trimethylbenzene	2.9	<10.0	1.5 J	<1.5	**14.7**	**11.6**	**6.3 J**	1.9	3.1	1.8	3.8 J	1.0 J	6.13

Notes:

1. Concentrations shown in $\mu g/m^3$
2. Shaded values indicate a concentration exceeding the Division of Waste Management Non-Residential Indoor Air Screening Levels (dated June 2014).
3. Samples IA-K and IA-L collected as upwind and downwind, outdoor background samples.
4. Samples collected on June 3, 2014 over an 8-hour sampling period.
5. J-Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

Prepared By/Date: AJF 7/11/14

Checked By/Date: RCF 7/24/14

ATTACHMENT A

ITRC CONCEPTUAL SITE MODEL (CSM) INFORMATION

CONCEPTUAL SITE MODEL

Utilities

See attached reports for details.

Buildings

Building 1 – Constructed in 1908. Encompasses approximately 58,959-square feet. Foundation is slab on grade and is constructed from brick. Use is commercial/office. The building is 2-story with a partial basement. An elevator is present in the building. HVAC system is forced air and equipment is located on the roof. Floor construction is concrete with wood brick placed on surface.

Building 2 – Constructed in 1940. Encompasses approximately 40,962-square feet. Foundation is slab on grand and is constructed from brick and concrete. Use is commercial. The building is 2-story with no basement. An elevator is present in the building. HVAC system is forced air and equipment is located on the roof.

Source Area

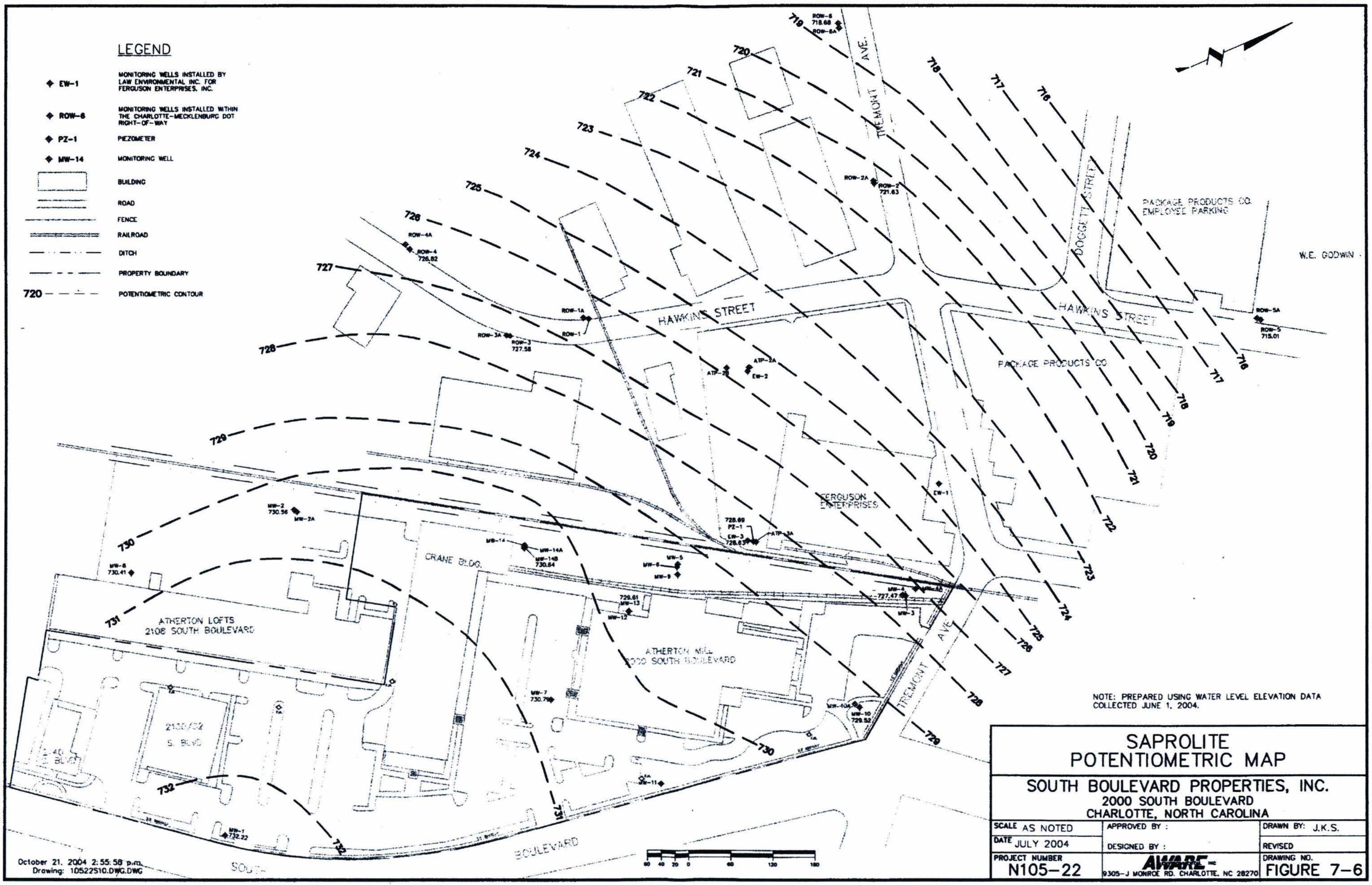
Source area based on previous reports appears to be located near the northeastern corner of Building 2. See attached reports for details.

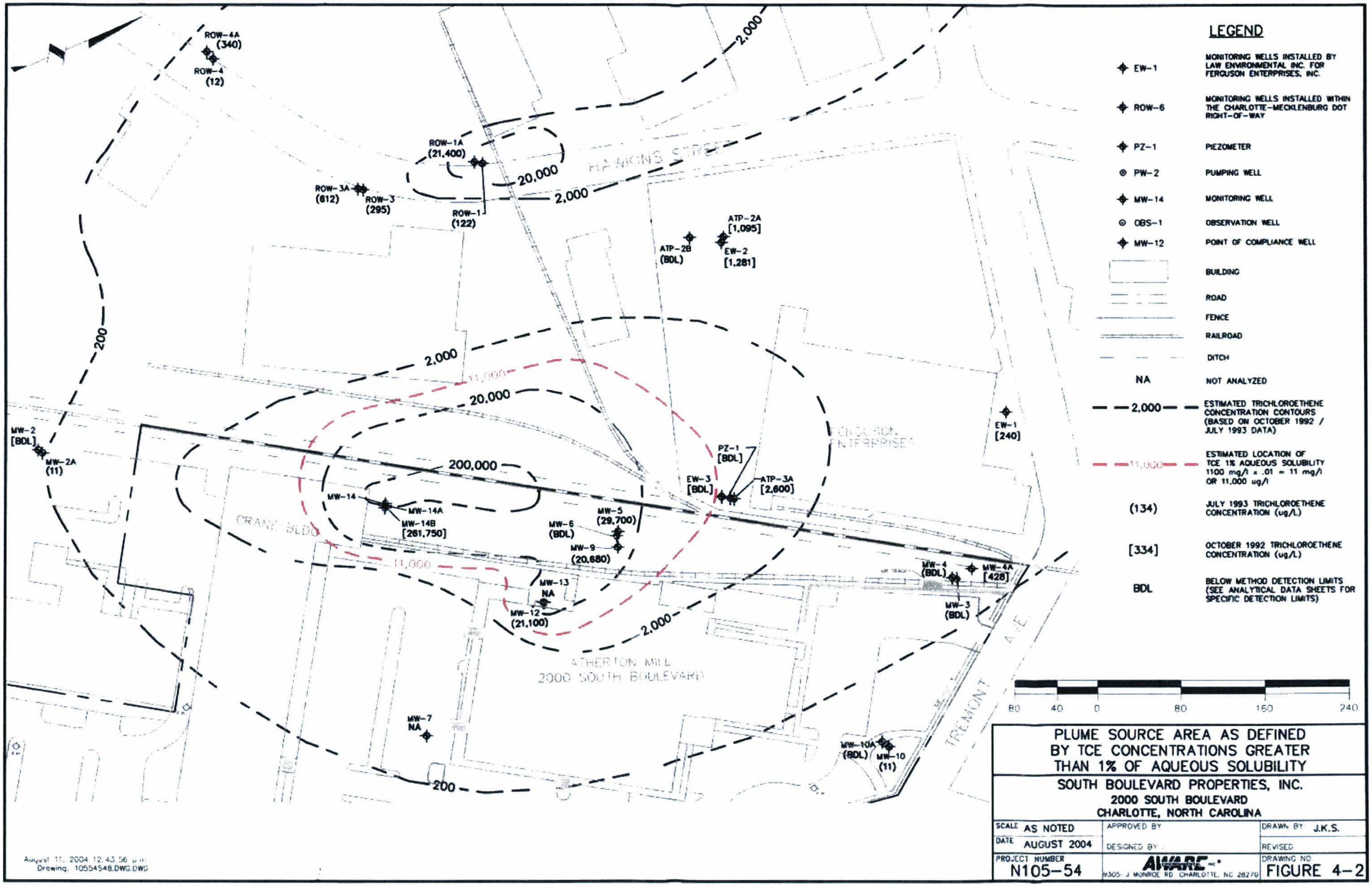
Geology/Hydrogeology

Groundwater flow is toward the north and northwest. See attached reports for details.

Site Characteristics

Surface cover between the source area and buildings consist of grass-covered areas, concrete sidewalks and asphalt-paved parking areas. The groundwater contaminate plume appears to be located under portions of both buildings. See attached reports for details.


LEGEND
EW-1 MONITORING WELLS INSTALLED BY LAW ENVIRONMENTAL INC. FOR FERGUSON ENTERPRISES, INC.
ROW-6 MONITORING WELLS INSTALLED WITHIN THE CHARLOTTE-MECKLENBURG DOT RIGHT-OF-WAY
PZ-1 PIEZOMETER
MW-14 MONITORING WELL
BUILDING
ROAD
FENCE
RAILROAD
DITCH
PROPERTY BOUNDARY
720 POTENTIOMETRIC CONTOUR
HAWKINS STREET
TREMONT AVE.
DOGGETT STREET
PACKAGE PRODUCTS CO. EMPLOYEE PARKING
W.E. GODWIN
PACKAGE PRODUCTS CO.
FERGUSON ENTERPRISES
CRANE BLDG.
ATHERTON LOFTS 2108 SOUTH BOULEVARD
ATHERTON MILL 2000 SOUTH BOULEVARD
SOUTH BOULEVARD
NOTE: PREPARED USING WATER LEVEL ELEVATION DATA COLLECTED JUNE 1, 2004.
SAPROLITE POTENTIOMETRIC MAP
SOUTH BOULEVARD PROPERTIES, INC.
2000 SOUTH BOULEVARD
CHARLOTTE, NORTH CAROLINA
SCALE AS NOTED
DATE JULY 2004
PROJECT NUMBER N105-22
APPROVED BY :
DESIGNED BY :
AWARE ENVIRONMENTAL INC
9305-J MONROE RD. CHARLOTTE, NC 28270
DRAWN BY: J.K.S.
REVISED
DRAWING NO. FIGURE 7-6
October 21, 2004 2:55:58 p.m.
Drawing: 10522S10.DWG.DWG


LEGEND
EW-1 MONITORING WELLS INSTALLED BY LAW ENVIRONMENTAL INC. FOR FERGUSON ENTERPRISES, INC.
ROW-6 MONITORING WELLS INSTALLED WITHIN THE CHARLOTTE-MECKLENBURG DOT RIGHT-OF-WAY
PZ-1 PIEZOMETER
PW-2 PUMPING WELL
MW-14 MONITORING WELL
OBS-1 OBSERVATION WELL
MW-12 POINT OF COMPLIANCE WELL
BUILDING
ROAD
FENCE
RAILROAD
DITCH
NA NOT ANALYZED
2,000 ESTIMATED TRICHLOROETHENE CONCENTRATION CONTOURS (BASED ON OCTOBER 1992 / JULY 1993 DATA)
11,000 ESTIMATED LOCATION OF TCE 1% AQUEOUS SOLUBILITY 1100 mg/l x .01 = 11 mg/l OR 11,000 ug/l
(134) JULY 1993 TRICHLOROETHENE CONCENTRATION (ug/L)
[334] OCTOBER 1992 TRICHLOROETHENE CONCENTRATION (ug/L)
BDL BELOW METHOD DETECTION LIMITS (SEE ANALYTICAL DATA SHEETS FOR SPECIFIC DETECTION LIMITS)
ROW-4A (340)
ROW-4 (12)
ROW-1A (21,400)
ROW-1 (122)
ROW-3A (612)
ROW-3 (295)
HAWKINS STREET
20,000
2,000
200
ATP-2A [1,095]
ATP-2B (BDL)
EW-2 [1,281]
11,000
200,000
MW-2 [BDL]
MW-2A (11)
MW-14
MW-14A
MW-14B [261,750]
CRANE BLDG
MW-6 (BDL)
MW-5 (29,700)
MW-9 (20,680)
PZ-1 [BDL]
EW-3 [BDL]
ATP-3A [2,600]
FERGUSON ENTERPRISES
EW-1 [240]
MW-13 NA
MW-12 (21,100)
MW-4 (BDL)
MW-4A [428]
MW-3 (BDL)
ATHERTON MILL
2000 SOUTH BOULEVARD
MW-7 NA
MW-10A (BDL)
MW-10 (11)
TREMONT AVE.
80 40 0 80 160 240
PLUME SOURCE AREA AS DEFINED BY TCE CONCENTRATIONS GREATER THAN 1% OF AQUEOUS SOLUBILITY
SOUTH BOULEVARD PROPERTIES, INC.
2000 SOUTH BOULEVARD
CHARLOTTE, NORTH CAROLINA
SCALE AS NOTED
DATE AUGUST 2004
PROJECT NUMBER N105-54
APPROVED BY
DESIGNED BY
AWARE INC.
9305-J MONROE RD CHARLOTTE, NC 28270
DRAWN BY J.K.S.
REVISED
DRAWING NO FIGURE 4-2
August 11, 2004 12:43:56 p.m.
Drawing: 10554548.DWG.DWG

BASELINE RISK ASSESSMENT SOUTH BOULEVARD PROPERTIES, INC.

2000 SOUTH BOULEVARD
CHARLOTTE, NORTH CAROLINA
EPA ID NO. NCD 053 010 732

Prepared for:

South Boulevard Properties, Inc.
Charlotte, North Carolina

Prepared by:

AWARE Environmental Inc.®
9305 Monroe Road, Suite J
Charlotte, North Carolina 28270

AEI Project Number N105-54

Revised May 2001
Revised March 2000
Revised June 1999
Revised July 1998
July 1997

SECTION 1.0
INTRODUCTION

1.1 PURPOSE AND GOAL STATEMENT

On behalf of South Boulevard Properties, Inc. (SBP), AWARE Environmental Inc.® (AEI) has prepared a baseline risk assessment to address potential exposure risks from remaining impacted soil and groundwater following remediation activities at the SBP facility located at 2000 South Boulevard, Charlotte, North Carolina. The SBP facility, assigned EPA Identification number NCD053010732, is classified as an inactive, interim-status treatment/storage/disposal facility. The risk assessment was prepared as an addendum to a Part-B Post Closure Permit Application filed in May 1996 with the Hazardous Waste Section (HWS) of the North Carolina Department of Environment, Health and Natural Resources (currently the Department of Environment and Natural Resources (DENR)).

The primary objective of conducting site risk assessment is to evaluate site-specific contaminant fate and transport data and/or model predictions with regard to potential exposure risk to human health and sensitive environmental receptors. The approach to providing the risk-based analysis is essentially three-fold involving: 1) contaminant fate and transport predictions (i.e., computed target constituent concentrations at points of potential exposure); 2) an evaluation of potential exposure routes/pathways; and 3) an evaluation of toxicological data.

Another objective of the risk assessment is to develop a technical basis to evaluate the necessity of continued remedial activities based upon potential risk of exposure to constituents remaining in various environmental media (i.e., air, sediment, soil, surface water, and groundwater) at the site. Contaminant fate and transport evaluation is an integral part of the site-specific risk assessment to make technology based predictive estimations of constituent concentrations in the various environmental media at identified current and future potential exposure points. In turn, these estimated constituent concentrations are used to characterize the potential exposure hazard for a particular exposure pathway (i.e., partitioning of vapors into indoor air, direct soil and surface water contact, drinking water, etc.) as based on known toxicological data. Conservative parameter values were used where actual data was not available.

The goal of the site-specific risk assessment for SBP is to evaluate whether significant potential risk exposure currently exists or is likely to occur in the future for the identified potential exposure pathways as a result of remaining impacted soils and groundwater at the facility.

1.2 SITE DESCRIPTION

The SBP site is located in the southwest corner of West Tremont Avenue and South Boulevard in Charlotte, North Carolina and consists of an approximately ten-acre land parcel with five (5) distinct building structures. Site boundaries include West Tremont Avenue to the north, South Boulevard to the east, an office/loft condominium building to the south, and a Norfolk Southern rail line to the west. The site location relative to area transportation routes is depicted in the Site Location Map (Figure 1-1). The property boundary, building locations and other physical details are shown on the Site Map (Figure 1-2).

The SBP site is located in a mature, urban, industrialized area that is heavily developed with buildings and other impervious surfaces. Manufacturing operations in the area date to the late 1800s while development at the SBP site began in 1918. Prior site manufacturing operations were typically related to the textile industry. Industrial activities at this site have most recently included the manufacture of air handling equipment and hoisting systems for the textile industry. These manufacturing operations ceased at the subject site in late 1992. In 1993, the main manufacturing building was partially renovated for office and retail sales use. This structure is now referred to as "Atherton Mill". Renovation of other site structures has continued as the building space is leased. The Schoenith Building, which resides on an approximately 2.3-acre tract to the south of the facility boundary, was recently subdivided from the SBP site. The building and surrounding property has been sold for an office/loft condominium development project.

Stormwater runoff is generally to the rear of the site (westward). Building roof drains and parking area catch basins direct rainwater into subgrade storm drains that discharge to an open ditch in the railroad right-of way. Surface water flow in the ditch is toward the north where it is captured by the city stormwater collection system for eventual discharge into Irwin Creek located approximately 1 mile northwest of the site (Figure 1-1). Site utilities are provided by the Charlotte-Mecklenburg Utility Department (water and sewer), Duke Power Company (electricity) and Piedmont Natural Gas Company (natural gas). Site utilities are discussed in more detail in Section 3.1.7.

There are no water supply wells or irrigation wells at the site. Currently, there are no septic tanks or leach fields at the site. A small "dry well" consisting of a fifty-five (55) gallon drum filled with stone was discovered in the course of grading work associated with the 1993 site renovation. The dry well was reportedly attached to a sink inside a previously demolished building that had served as a welding shop. The stone and the soil surrounding and beneath the dry well area were scanned in the field at the time of discovery with an organic vapor analyzer. No instrument response was noted. The drum and stone were removed and the excavated area backfilled with soil cut from another part of the site.

Locations of identified solid waste management units and existing groundwater monitoring wells are shown on Figure 1-2. There are no current manufacturing operations at the site that generate hazardous waste.

1.3 SITE HISTORY

Development at the SBP site was initiated in 1918 by the Parks-Cramer Company, a newly formed business based on a merger of Stuart Cramer's Charlotte-based humidifier company and the G.M. Parks Company of Fitchburg, Massachusetts. Construction of the main plant building on a $4^1/_2$-acre parcel at the corner of South Boulevard and West Tremont Avenue was completed in 1919. Originally manufactured products included humidity control equipment for textile mills. After further development of the original site, land and building holdings expanded to the south in the 1960s and 1970s to yield a site of approximately 12 acres with nine structures. In 1988, Parks-Cramer Company sold its Charlotte manufacturing operation to Flakt, Inc. which was purchased by Luwa Bahnson, Inc. Luwa Bahnson, Inc. occupied the Charlotte site under a lease until December 1992. After the sale of the manufacturing business, South Boulevard Properties, Inc. was created as owner and manager of the real estate replacing the former Parks-Cramer Company.

In 1993, a significant renovation effort was begun at the site with the demolition of three (3) small warehouse buildings and conversion of the former manufacturing buildings into office, restaurant, and retail space. In 1996, approximately 2 acres of property at the southern end of the site, including the structure formerly known as the Schoenith Building, was sold to the Atherton Lofts Condominium Association after the former textile plant building was renovated and developed into office/loft condominium units. The change in the subject site boundary resulting from this sale was noted in a revised Hazardous Waste Permit Application - Part A filed by SBP in the spring of 1996 (Part B Post-Closure Permit Application, Module A, Attachment 1).

1.4 WASTE MANAGEMENT HISTORY

The use and storage of petroleum and/or hazardous substances at the SBP site has been addressed in a RCRA Facility Assessment Report (RFA) prepared by an independent contractor for USEPA, Region IV. The RFA, dated May 1992, was based upon a November 1991 Visual Site Inspection. A summary hazardous substance use by the Parks-Cramer Company, the RFA findings, plus waste management activities since the RFA report preparation is described below. For detailed information see Part B Post-Closure Permit Application, Module L, Information Requirements for Solid Waste Management Units.

1.4.1 Hazardous Substance Use / Storage History

In 1962, Parks-Cramer Company initiated operation of a vapor degreasing unit for cleaning and preparation of metal parts prior to paint application. Initially trichloroethene (TCE) was used as the solvent in the degreasing process. TCE was replaced with 1,1,1-trichloroethane (TCA) in 1976 as the solvent used in the degreaser unit. The degreaser unit included an above-ground 500-gallon steel product tank which was located on a paved outdoor surface adjacent to the indoor concrete floor vault in which the degreaser was mounted (Figure 1-2). Solvents are thought to have been purchased in 55-gallon drums. A drum storage area was located behind the main building, at the north end of the G Building (Figure 1-2). Solvent use has previously been estimated to range from 1,000 to 2,000 gallons per year.

During the 1962 to 1979 period, some spent solvents were reportedly applied for weed control during summer months to the earthen bank along the fence adjacent to the railroad at the western boundary of the site and some spent solvents were reportedly returned to solvent suppliers. Beginning in 1979, spent solvents were collected by a contractor for off-site recycling and/or disposal. The degreaser was taken out of service in 1988 thus ending the generation of spent solvents.

Historical material usage included cutting oils, hydraulic oil, transmission fluid, gasoline, paint reducer(s), and toluene. Material storage in drums of 55-gallons or less was noted in an outdoor storage area west of the main building (Figure 1-2). Generation of additional waste products in the form of spent cutting oils, paint reducer, toluene, paint booth filters, and paint sludge was noted.

Hazardous substance / waste management practices prior to 1962 are unknown. Other than the degreaser product tank, no known bulk storage of petroleum or hazardous substances occurred at the SBP site. SBP has not operated on-site wastewater treatment equipment or held permit(s) for off-site discharge(s).

Generation of regulated wastes by Parks-Cramer Company from manufacturing processes was terminated in 1988 with the sale of the manufacturing operation to Luwa Bahnson, Inc. Subsequent waste generation by SBP has been restricted to environmental assessment and remediation-related materials. In 1990, SBP commenced on-site treatment of groundwater impacted by solvents. The treated water is discharged under permit to the local POTW as a non-hazardous material. SBP is currently listed as a conditionally exempt small quantity generator and an interim status disposal facility. EPA identification number NCD053010732 has been assigned to the site.

1.4.2 RCRA Facility Assessment / Release History

The RFA identified three (3) solid waste management units (SWMU) and one (1) area of concern (AOC) at the SBP site.

Solid Waste Management Unit I

SWMU I, located at the rear of the Atherton Mill building along the rail spur loading dock, consisted of residual surface soil impacts (TCE) thought to be related to an isolated spill incident. The contamination was discovered during a 1988 site environmental audit. The extent of the soil impacts was assessed through sample collection/analysis to be approximately 38 feet long, 9 to 10 feet wide and 2 feet deep. The date of the release is unknown.

Under Compliance Order, Docket #89-172, SBP conducted corrective action at SWMU I in June and July of 1991. Railroad cross ties and underlying soil were excavated and transported off-site for incineration. On August 10, 1999, SBP requested a determination that the 1991 corrective action of closure by removal met the applicable closure standards and that no further action is required for SWMU I. A determination of "no further action" for SWMU I would be in agreement with recommendations presented in the RFA. The DENR Hazardous Waste Section granted the request for no further action by letter dated August 18, 1999. For detailed information see Part B Post-Closure Permit Application, Module L, Information Requirements for Solid Waste Management Units.

Solid Waste Management Unit II

SWMU II consists of impacted soil along a drainage ditch at the railroad right-of-way bordering the rear of the SBP site (Figure 1-2). A topographic cross-section of the railroad ditch is included as Figure 1-1R. The slope that extends from the SBP property into the drainage ditch is steep, with a slope of approximately 80 to 90%. Both the G Building and the Crane Building are located immediately adjacent to this slope, approximately six (6) feet above the drainage ditch. The railroad tracks are located approximately seven (7) feet from the center of the drainage ditch, with approximately eleven (11) feet from the center of the tracks to the center of the drainage ditch.

Primary waste constituents at SWMU II are TCE and TCA, which are suspected to have been released from the site through a storm drain line to the ditch and from a drum storage area above the ditch. Additional releases reportedly may have occurred through the application of waste solvent material to the bank above the ditch for control of unwanted vegetation. This weed control reportedly took place between 1962 and 1979; otherwise dates of operation for SWMU II are unknown.

In August 1992, SBP began voluntary corrective action at SWMU II using a vacuum extraction system for contaminant removal by soil vapor extraction. Continuing assessment work, performed at SWMU II in May 1994, indicates that the lateral extent of impacted soils at SWMU II has been reduced to two (2) isolated areas, one each in the vicinity of the storm drain outfall and the former drum storage area. The vacuum extraction system remains in operation pending further assessment. Further assessment was conducted at these areas in May 1997, February 1998, October 1998 and January/February 1999 as discussed in Section 1.5. In November 1999, SBP conducted additional voluntary remedial activities near the storm drain outfall in general accordance with the "Remedial Action Plan" submitted to the DENR in July 1999 and revised in August 1999. This remedial action is also discussed in Section 1.5.

Waste Management Unit I

WMU I (referred to as SWMU III in the RFA) was defined to consist of a vapor degreaser with associated piping and product tank, the enclosing concrete vault, and contaminated soil underlying the vault. The degreaser was reportedly installed in 1962 and taken out of service in 1988. TCE and TCA were used in the degreaser and subsequently released to the underlying soils through the concrete vault. Eight (8) soil borings (A-1, A-2, A-5, A-7, A-

8, A-9, A-10 and SA-C) were advanced in this area in June and November 1988 (Figure 1-8R) and select soil samples were collected for analysis. Soil analytical data from these soil borings is summarized in Table 1-6R.

On January 8, 1991 formal closure of WMU I was completed. Closure consisted of removal and decontamination of the degreaser and associated equipment plus filling and sealing the top of the concrete vault. The vault and underlying soil remain as components of WMU I. Soil remediation by vapor extraction was initiated in January 1991 in the WMU I area. Analysis of confirmatory soil samples in January 1993 indicated that the remediation had been effective in removal of the volatile organic compounds detected in the 1988 site assessment. Soil boring locations are indicated on Figure 1-8R and analytical data for the 1993 confirmatory soil samples are summarized in Table 1-6R. See Module L of the Post-Closure Permit Application for further details.

Following the submittal of the June 1999 Baseline Risk Assessment, DENR indicated that the level of soil contamination remaining beneath the building at WMU I (Atherton Mill) needed to be addressed. Specifically, DENR raised concerns that a 1993 confirmatory sample was not collected in the same location as sample A-8D. To address this concern, AEI conducted a review of the 1988 assessment data, the soil vapor extraction system (VES) layout, and 1993 post-remedial confirmatory sampling data. Trichloroethene was detected in sample A-8D at a level of 8.974 mg/kg. Following the soil quality assessment conducted in the area of WMU I, two pilot VES wells were installed in the area and a pilot study conducted to design a full-scale VES system to treat the impacted soils (Figure 1-8R). One pilot well (A-14) was located within approximately four (4) feet of abandoned soil boring A-8. This pilot well was converted to a vent well and a new extraction well (VES-4) was installed within 7.5 feet of previous boring A-8. The new well was connected to the full-scale VES system that was activated in January 1991 and operated for approximately two (2) years. Analysis of post-remedial confirmatory soil samples collected in January 1993 in the treatment area indicated that the VES had been effective in the removal of VOCs detected in the 1988 assessment. Two (2) samples were collected in 1993. Sample

AB-7 was collected in approximately the same location as 1988 sample A-7B. Sample AB-9 was collected in approximately the same location as 1988 sample A-9C. Levels of TCE detected at the A-7 sampling location were reduced from 2.061 mg/kg in 1988 to <0.0068 mg/kg in 1993. Levels of TCE detected in the A-9 location were reduced from 8.683 mg/kg in 1988 to <0.0067 mg/kg in 1993. A confirmatory sample was not specifically collected in the vicinity of previous soil boring A-8D. However, due to its immediate proximity to the SVE wells, it is expected that VOC removal in this area was enhanced. Consequently, SBP believes that the impact to unsaturated soils in the WMU I area has been adequately reduced.

Area of Concern I

AOC I is described in the RFA as an isolated spill area located at the rear of the former Boat and Motor Center (BMC) on the southwest portion of the SBP site. The BMC building is referred to as 2130/32 South Boulevard in Figure 1-2. AOC I consisted of stained soils noted in a site environmental assessment in which preliminary sample analysis indicated the presence of acetone and 2-butanone. No dimensions were specified for AOC I.

BMC reportedly operated at the referenced building from 1957 to 1991. The operation was not identified as a RCRA generator of hazardous waste; however, use of lubricants, solvents/cleaners, and paints was assumed in the RFA based upon an assumption of the type of business (motor boat sales and associated service/repair). Stains on the ground were interpreted as evidence of a release to the soil. Follow-up assessment in the area of the noted stains indicated that contamination from hazardous constituents (SW 846 Method 8240 target analyte list) was no longer detectable. Based upon these results, SBP requested by letter dated August 10, 1999 that a determination of "no further action" be made for AOC I. The DENR Hazardous Waste Section granted this request by letter dated August 18, 1999.

1.5 NATURE AND EXTENT OF CONTAMINATION

Past releases of degreasing solvents have migrated into the soil and groundwater at the SBP site. These releases have been assigned EPA waste code F002, spent halogenated solvents from non-specified sources. As discussed in Section 1.4, three (3) Solid Waste Management Units (SWMUs) and one (1) area of concern (AOC) were identified at the SBP site (Figure 1-2). Historically, TCE, TCA and their degradation products are the predominant parameters of concern.

1.5.1 Soil

As reported in the *Part B Post-Closure Permit Application* for SBP submitted in May 1996, soils in SWMU I, WMU I and AOC areas have been effectively remediated based on confirmatory samples collected in 1990, 1993 and 1994. In June 1993 and May 1994, confirmatory soil samples were collected from the SWMU II area to determine the effectiveness of the corrective action. Based on data collected in May 1994, the lateral extent of impact, initially assessed over a distance of approximately 440 feet, has been significantly reduced . Additional confirmatory soil samples were collected in May 1997, February 1998, October 1998, January/February 1999, November 1999 and January 2000 to further document the remediation progress. Laboratory analytical reports for these sampling events are included in Appendices 1-A and 1-B.

In May 1997, additional soil samples and one (1) surface water sample were collected in the railroad ditch area to evaluate the status of the soil remediation effort (Figure 1-3, and Table 1-1). Three (3) soil borings were advanced in the storm drain outfall area and two (2) soil borings were advanced at or downgradient from the former drum storage area. Up to two (2) soil samples were collected from each soil boring. In addition, one (1) surface soil sample was collected from the storm drain located on the south side of the Crane Building. The surface water sample was collected from standing water beneath the storm drain outfall. Samples were analyzed for volatile organic compounds (VOCs) by EPA Method 8240 (Table 1-1). 1,1-Dichloroethane, TCA, TCE, tetrachloroethene and toluene were detected at low levels in surface soil samples collected from the railroad ditch. 1,1-Dichloroethane, cis-1,2-dichloroethene, TCA, TCE, tetrachloroethene, chloroethane, and acetone were detected in the surface water sample. TCA, TCE, tetrachloroethene, toluene, ethylbenzene, and xylenes were detected in deeper soil samples collected from the railroad ditch. The laboratory analytical report is included in Appendix 1A.

The four (4) surface soil sample results were compared to the EPA Region III Risk-Based Concentration (RBC) Table for residential ingestion. These sampling results were lower than the RBC residential ingestion levels.

The May 1997 surficial and deeper soil sample results were also compared to the soil screening levels for transfers from soil to groundwater found in the EPA Region III RBC Table dated January - June 1996 (Table 1-1). Reported VOC concentrations were below these screening levels with the exception of those detected in sample RA-15 (10') collected from a small area at the storm drain outfall at the south end of the G Building at a depth of ten (10) feet below grade. The following compounds were detected in sample RA-15 (10'): TCE at 810 mg/kg; TCA at 580 mg/kg; toluene at 29 mg/kg; and ethylbenzene at 6.3 mg/kg above their respective screening levels of 0.9 mg/kg; 0.02 mg/kg; 0.04 mg/kg; 0.5 mg/kg and 0.5 mg/kg. Total VOC concentrations have been significantly reduced since 1994; and the total impacted area has been reduced to only the area beneath the storm drain outfall at the south end of the G Building.

On February 13, 1998, two (2) soil samples were collected from a boring located in the boring A-15 area (outfall north of the Crane Building). Samples 0213-SB-5' and 0213-SB-10' were collected from 5 and 10 feet below grade, respectively. Based on the analytical data, summarized in Table 1-1R, VOC levels in this outfall area had continued to decrease since the samples collected in May 1997.

On October 28 and 29, 1998, sixteen (16) hand auger borings (RR-98A through RR-98P) spaced approximately 25 feet apart were advanced in the railroad drainage ditch to characterize the current soil quality (Figure 1-2R). Two (2) samples were collected from each boring from depths of 5 and 10 feet below grade using the Encore™ sampling method.

Samples were analyzed for VOCs by EPA Method 8260. Laboratory analytical results are summarized in Table 1-2R.

The maximum VOC levels were compared to: 1) the October 1999 EPA Region III Risk-Based Concentration Table levels for residential ingestion; 2) North Carolina Soil Screening Levels (SSLs) for soil contaminant migration to groundwater from the draft FMB Guidance dated 12/99; 3) to SSLs for soil contaminant migration to groundwater provided by the EPA, Office of Solid Waste and Emergency Response (OSWER); and 4) levels calculated using the soil-to-groundwater transport equation and proposed Alternate Concentration Levels (ACLs) discussed further in Section 7.5 (Table 1-3R). The OSWER SSLs are calculated using the same soil-to-groundwater transport equation employing generic input parameters as used in the FMB Guidance, but OSWER uses applicable EPA Maximum Concentration Levels (MCLs) instead of 2L groundwater standards to determine soil cleanup goals.

No constituents were detected above cleanup levels calculated using proposed ACLs, with the exception of ethylbenzene. 1,2-dichloroethene (trans) was not detected in any of the samples collected but the detection level for this constituent was greater than the cleanup level calculated using proposed ACLs. Ethylbenzene is not expected to pose a significant threat to groundwater since it was only detected in one sample out of 28 samples. PCE and TCE are the main constituents of concern detected above both FMB Guidance Levels and OSWER SSLs. Using the FMB Guidance, PCE and TCE levels detected in soil samples exceed the standards for a distance of approximately 290 feet. Using OSWER SSLs, PCE and TCE levels detected in soil samples exceed the standards along the ditch for a distance of approximately 150 feet.

Additional unsaturated soil samples were collected from the railroad ditch in January/February 1999 to further delineate the extent of impacted soils. One (1) surficial and eight (8) deeper soil samples were collected from four (4) locations in January 1999 (Figure 1-3R). Six (6) additional surface soil samples were collected in February 1999

(Figure 1-3R). Samples were analyzed for VOCs. Analytical results were compared to the October 1999 EPA Region III, RBC table levels for residential ingestion (Tables 1-4R and 1-5R).

Analytical results from the October 1998 and the January/February 1999 sampling activities were used to produce PCE and TCE isoconcentration maps of the railroad drainage ditch (Figures 1-4R and 1-5R) and isoconcentration cross-sections A-A' and B-B' (Figures 1-6R and 1-7R). Based on the analytical data, approximately 73 cubic yards of surficial (defined as 0 to 12" below grade) soils in the eastern ditch and beneath the railroad tracks are impacted at levels above the EPA Region III, RBC table levels (Tables 1-4R and 1-5R). It was estimated that approximately 17 cubic yards could be excavated without impact to the railroad tracks.

SBP voluntarily remediated accessible surficial soils in the drainage ditch area in November 1999 in general accordance with the Remedial Action Plan submitted to the DENR in July 1999 and revised in August 1999. Accessible surficial soils in the drainage ditch area containing elevated levels of VOCs were excavated and disposed of off-site (Figure 1-9R). Confirmatory surficial soil samples were collected from the northern and southern ends of the excavation (Figure 1-9R and Table 1-7R). Analytical results were less than the EPA Region III Risk Based Concentration Table levels for residential ingestion (dated October 1999). These analytical results are used in the risk assessment as the exposure concentration for trespassing children (Section 4.0). A surface water sample was collected from the outfall area once the area was backfilled with clean soil (Table 1-7R). Analytical results were less than the applicable North Carolina surface water standards. The analytical results from this surface water sample were used as the exposure concentration in surface water for this area (Section 4.0). Three (3) soil samples were collected from the bottom of the excavation (Figure 1-9R and Table 1-8R). The various constituent levels detected in samples from the bottom of the excavation were greater than the North Carolina soil-to-groundwater levels. The analytical results from these deeper soil samples were used as the potential exposure concentration for workers that may be involved in excavation activities in this area. The details of this voluntary remedial action are included in the "Report on Voluntary Remedial Action at Solid Waste Management Unit II" submitted to the DENR in March 2000.

In January 2000, AEI conducted additional soil and shallow groundwater sampling in unsaturated and shallow saturated soils in proximity to the stormwater outfall in the railroad drainage ditch. Samples were collected to evaluate the potential for soil-to-groundwater migration of leachate from remaining impacted soils in the outfall area, and to determine whether additional soil remediation is warranted. On January 9, 2000, three (3) soil borings (SB, CB and NB) were advanced in the outfall area (Figure 1-10R). The borings were placed within and parallel to the drainage ditch just to the west of the rip rap apron at the stormwater outfall. The three sampling locations were spaced at a separation distance of approximately five feet.

Within each boring, soil cores were continuously obtained by hydraulically pushing a four-foot-long stainless steel core sampler lined with an acetate sleeve. Core segments from pre-selected intervals were cut from the larger core sleeves and the ends capped for later sample processing. The acetate sleeves were removed from the selected core segments and five-gram samples were obtained from the respective cores with En Core™ samplers. The En Core™ samples were analyzed for volatile organic compounds (VOCs) by EPA Method 8260.

A summary of the January 2000 soil sampling analytical results is presented in Table 1-9R and a summary of the November 1999 post-excavation confirmatory sampling data are summarized in Table 1-8R. The analysis of sample CB-7 (collected in boring CB at a depth of 7 feet below grade) compared to the Excavation Center sample indicates that the elevated soil VOC concentrations previously detected at the base of the recently excavated area diminish significantly within a very short vertical distance. The soil data show that remaining soil VOC concentrations generally decrease by an order of magnitude within a vertical interval of 20 feet. There are exceptions to this general trend of decreasing soil

VOC concentrations with depth. In sample SB-20 collected from boring SB at a depth of 20 feet, elevated soil VOC concentrations were detected that suggest possible preferred vertical migration pathways through the unsaturated and saturated soil horizons. This trend was again observed in sample NB-31 for TCE for which concentrations were somewhat elevated above the levels detected in sample NB-28 from the preceding sampling depth.

Most importantly, the observed soil VOC levels do not suggest a significant solvent residual in either the unsaturated or shallow saturated soils. Remaining soil VOC levels detected in the analyzed samples were compared with estimated saturated concentrations (C_{SAT}) that indicates a concentration above which non-aqueous phase liquids may be suspected in site soils. Only the recent post-excavation confirmatory samples representative of near surface unsaturated soils (at four to six feet below grade) were found to possess soil VOC levels suspected to be saturated with solvent residual. No samples obtained below the non-pumping water table were found to have soil VOC levels suspected to be saturated with solvent residuals. C_{sat} calculations are presented in Appendix 1-C.

1.5.2 Groundwater

Three (3) distinct sources of groundwater degradation have been identified at SBP: 1) the vapor degreaser (WMU I); 2) a storm drain outfall to the railroad ditch located north of the Crane Building (part of SWMU II); and 3) a former drum storage area located near well cluster MW-5, MW-6 and MW-9 (part of SWMU II). This well cluster is located approximately 100 feet north/northwest of the former vapor degreaser location. The groundwater plume associated with WMU I has migrated downgradient and commingled with the groundwater plume emanating from SWMU II. The most elevated total VOC concentrations were detected in groundwater collected from the partially weathered bedrock (PWR)/bedrock interface at a depth of approximately 50 feet below the ground surface.

Groundwater quality data obtained from on- and off-site monitoring wells in sampling events conducted in October 1992/July 1993, January 1995 and January/February 1998 were used to generate total VOC isoconcentration maps in saprolite and PWR aquifer horizons (Figures 4-2R through 4-7R). Twenty-eight (28) on- and off-site groundwater monitoring wells were sampled for VOCs in January 1995 (Table 1-2). TCE concentrations range from below the detection limit (BDL) to 389 mg/l near the stormwater outfall. TCA concentrations range from BDL to 93.4 mg/l. Total VOC isoconcentration cross-sections A-A' and B-B' were generated using the January 1995 data (Figures 4-8R and 4-9R).

Contaminant concentrations in groundwater in the vicinity of the outfall source area were characterized by well sampling data acquired in January and February 2000. A grab shallow groundwater sample was collected from boring/temporary well CB from the railroad ditch adjacent to the stormwater outfall (Figure 1-9R). The well screen was installed partially within the shallow saturated zone at a depth interval 23 to 28 feet below grade. A water column of approximately two feet was measured in the temporary well. A summary of the analytical results for groundwater sample CB-W is presented in Table 1-10R. TCE and TCA were both detected at concentrations of 120 mg/l. PCE was detected at a concentration of 3.1 mg/l. These analyte concentrations detected in sample CB-W do not suggest solute levels for which non-aqueous phase liquids would be suspected in the shallow groundwater in the outfall source area.

Monitoring well MW-14 is a bedrock well that typically exhibited the most elevated levels of constituents detected at the SBP site and is located slightly upgradient of the outfall source area (Figure 1-10R). Table 1-11R provides a summary of analytical data collected from well MW-14. On February 16, 2000, a nested well pair was installed in the unconsolidated weathered zone adjacent to well MW-14 (Figure 1-10R). These two wells were added to provide on-site groundwater monitoring points near the outfall source area, and to provide additional calibration parameters for the solute transport model used in the risk assessment. Well MW-14A was screened in the PWR horizon at a depth interval of 65 to 75 feet below grade. Well MW-14B was screened in the saprolite horizon at a depth interval of 25 to 35 feet below grade.

The new nested wells were sampled on February 17, 2000. A summary of the analytical results is presented in Table 1-10R. The analysis of deeper PWR well sample MW-14A detected 217.1 mg/l total VOCs. The sample detection limits were elevated due to a required sample dilution. Shallow well sample MW-14B contained 7.41 mg/l total VOCs.

Solute transport modeling was also performed and the modeling results were submitted to the NCDENR on March 3, 1995 to provide further support for the delineation of the VOC groundwater plume emanating from the SBP site. The distribution of TCE and TCA, the primary indicator compounds, were evaluated using a two-dimensional random-walk solute transport model simulation. The simulated TCE and TCA plumes exhibit slightly asymmetrical shapes with their longitudinal axis parallel to the predominant groundwater flow direction. The simulated TCE plume front occurs approximately 750 feet hydraulically downgradient of source #1, 575 feet hydraulically downgradient of the storm drain outfall (SWMU II) and 670 feet hydraulically downgradient of the former drum storage area (SWMU II). The simulated TCA plume front is situated approximately 480 feet hydraulically downgradient of WMU I and approximately 350 feet downgradient of SWMU II.

1.6 GROUNDWATER ASSESSMENT DATA FROM NEARBY PROPERTIES

The area surrounding the SBP facility has been historically industrialized, beginning in the late 1800s and extending through the 1990s. The SBP facility and the predicted extent of the SBP groundwater plume are located within the Southend-Wilmore Brownfield Pilot area. A Federal, State and local environmental/regulatory agency file search was conducted on properties located in the area to provide a generalized overview of local groundwater quality. The following representative properties were identified as having impacted groundwater (Figure 1-4).

- Mitchell & Becker, 1928 South Boulevard
- Terrell Machine Company, 3000 South Boulevard
- Dynatech Industries, 2213 Toomey Avenue
- Dynatech Industries, 2187 Hawkins Street
- Charlotte Coal Gas Plant No. 2, 1412 South Boulevard
- Package Products Company, 1930 Camden Road

1.6.1 Mitchell & Becker Site

The Mitchell & Becker facility is located at 1928 South Boulevard, adjacent and northwest of the SBP property. The Mecklenburg County Health Department reported that it had investigated the Mitchell & Becker premises in July 1970 and found industrial waste being discharged into a stream. The discharge was described as "paint and some type of waste". No additional information is available on this incident.

A report entitled "Voluntary Remedial Closure Report" was submitted by Mitchell & Becker to the NCDENR in December 1996. According to the report, chromium contamination was detected in soil and low levels (2.7 mg/l) of TCE were detected in one groundwater sample at the site. The voluntary remedial action was performed to address the chromium impacted soils. Prior to excavation, chromium was detected at 13,600 mg/kg and lead was detected at 2,150 mg/kg. Chromium concentrations were reduced to below 390 mg/kg based on confirmatory soil samples collected following the last phase of excavation activities conducted at the site.

1.6.2 Terrell Machine Company

Terrell Machine Company is located at 3000 South Boulevard, approximately 3,600 feet to the southwest of the SBP site. Organic and inorganic constituents suspected to have originated from site activities were detected during groundwater sampling and analyses conducted at this site in 1988. In addition, benzene, toluene, ethylbenzene and xylenes (BTEX), suspected to have originated from a neighboring service station, were detected in the site groundwater. Organic compounds detected include: 1,1-dichloroethene (460 to 670 ppb); 1,1-dichloroethane (390 to 460 ppb); 1,2-dichloroethene (72 to 1,700 ppb); TCA (2 to 790 ppb); TCE (34 to 2,200 ppb); tetrachloroethene (22 to 11,000 ppb); vinyl chloride (170 ppb); benzene (4.5 ppm); toluene (0.22 to 16 ppm); ethylbenzene (0.13 to 3.6 ppm); and xylenes (0.34 to 1.1 ppm).

A groundwater remediation system was installed at the Terrell Machine Company site and became operable in August 1994. Based on the 1996 Semi-Annual Monitoring Status

Report, the following constituents were detected in the site groundwater: 1,1-dichloroethene (21.3 to 2,150 ppb); 1,1-dichloroethane (6.22 to 2,100 ppb); 1,2-dichloroethene (13.4 ppb); TCA (32.8 to 515 ppb); TCE (256 to 1,350 ppb); tetrachloroethene (398 to 10,200 ppb); and vinyl chloride (1.42 to 159 ppb).

1.6.3 Dynatech Industries Inc.

Dynatech Industries Inc. (Dynatech) operated at two facilities near the SBP property: 1) 2213 Toomey Avenue and 2) 2187 Hawkins Street. The 2213 Toomey Avenue facility is located approximately 2,200 feet northwest of the SBP site. Dynatech operated at the 2213 Toomey Avenue site from 1985 until 1990. In 1985, there was evidence that a malfunctioning industrial waste septic tank on the 2213 Toomey Avenue property may have contaminated a neighboring property. Dynatech ceased operations at this site in 1990. According to the NC Superfund Section Preliminary Assessment of the Toomey Avenue facility in May 1993, analytical data collected during the closure activities by Dynatech indicated elevated levels of hexavalent chromium in the soil and groundwater beneath the former chrome-plating area.

Subsequently, the EPA Region IV Emergency Response and Removal Branch excavated and disposed of approximately 100 cubic yards of contaminated soil with a chromium concentration above 300 ppm. According to the Site Assessment Report, residual chromium soil contamination remains in the chrome-plating area, a low-lying area in the parking lot along an overland drainage path and a seep adjacent to the septic tank area.

The 2187 Hawkins Street site is situated approximately 600 feet southwest of the SBP site. Dynatech operated a chrome electroplating business at this location from 1973 until late 1984. An Administrative Order on Consent (Order) was issued by NCDENR, Hazardous Waste Section to Industrial Crankshaft & Engineering Company d/b/a Dynatech Industries, C.D. Spangler Construction Company and Durham Life Insurance Company on November 5, 1991. According to the Order,

- Reportedly, a fire at the facility in 1974 melted a vat containing chromic acid;

- On December 12, 1984, the Mecklenburg County Department of Environmental Health collected and analyzed a sample of water discharged to the storm drain from the facility. The sample had a pH of 1.45 and contained 22,500 ppm of hexavalent chromium; and
- Based on groundwater sampling at and in the vicinity of the 2187 Hawkins Street facility, it was determined that a discharge from the Dynatech facility resulted in chromium impacted groundwater.

The Order required additional groundwater sampling at the site. The following constituents were detected in the November 1991 groundwater sampling event: chromium (0.011 to 240 mg/l); TCE (8 to 2,100 μg/l); tetrachloroethene (330 μg/l); 1,1-dichloroethene (16 μg/l); 1,2,4-trichlorobenzene (23 μg/l); and 1,2-dichlorobenzene (11 μg/l). In response to demands by the NCDENR, a remedial action plan was developed. Groundwater remediation was initiated in June 1992 and a Ground Water Sampling and Analysis Plan was submitted on May 31, 1994.

Based on the Groundwater Sampling Report prepared by Delta Environmental Consultants, Inc. (Delta) on April 27, 1995, groundwater samples continue to be collected from the site monitoring wells (MW-1, MW-2, MW-4, MW-8B, MW-9A, and MW-11) and are analyzed for chromium, VOCs and semi-volatile organic compounds (SVOCs). The most elevated levels of chlorinated organic compounds have been detected in saprolite monitoring wells MW-2 and MW-10, located on the southwest corner of the reversed L-shaped building (Figure 1-5). Chlorinated organic compounds have not been detected in saprolite monitoring wells MW-1, MW-4 or MW-11 located downgradient (southwest) from the SBP properties (Figure 1-5).

A TCE isoconcentration map was drawn by AEI based on the November 1991 groundwater analytical data provided in the March 1995 Delta report (Figure 1-5). The most elevated levels of chlorinated organic constituents were detected on the 2187 Hawkins Street site near wells MW-2 and MW-10. Lesser concentrations of the same compounds were detected in a downgradient groundwater flow direction (west/southwest). Sample analyses indicated that concentrations of these compounds were below the method quantitation limit in the hydraulically upgradient direction (MW-1) and in the cross-gradient directions (MW-4 and MW-11). Groundwater analytical data appear to provide evidence for an on-site source of chlorinated organic constituents, which would not be incompatible with the nature of the electroplating activities conducted at this site.

1.6.4 Charlotte Coal Gas Plant No. 2

The Charlotte Coal Gas Plant No. 2 formerly located at 1412 South Boulevard is situated approximately 2,600 feet northeast of the SBP site. This former plant was used to gasify coal from approximately 1900 until 1951. In 1990, several areas of soil and groundwater contamination were identified at the former plant site during UST removal activities. Soil and groundwater contaminants included a number of polycyclic aromatic hydrocarbons (PAHs), metals and cyanide. BTEX constituents were detected in the groundwater and are suspected to have originated from a former gasoline underground storage tank removed from the site in 1990. The highest constituent concentrations reported in the site groundwater are as follows: benzene (9,700 ppb); ethylbenzene (1,000 ppb); toluene (1,900 ppb); xylenes (1,100 ppb); 4-methylphenol (40 ppb); 2,4-dimethylphenol (595 ppb); benzoic acid (30 ppb); naphthalene (4,856 ppb); 2-methylnaphthalene (2,732 ppb); acenaphthalene (215 ppb); dibenzofuran (11 ppb); fluorene (94 ppb); phenanthrene (69 ppb); anthracene (42 ppb); fluoranthene (81 ppb); pyrene (174 ppb); crysene (56 ppb); benzo(b)fluoranthene (62 ppb); and benzo(a)pyrene (29 ppb).

1.6.5 Package Products Company, 1930 Camden Road

The Package Products Company, Flexible Packaging (Package Products) located at 1930 Camden Road is situated adjacent and north of the SBP facility. This facility was built in 1946. According to the September 28, 1982 RCRA Inspection Report, the facility printed ink onto flexible food package film and laminated film prior to printing. This inspection report stated that solvents used for printing and laminating equipment wash-ups included 1,1,1-trichloroethylene (*sic*). Since 1,1,1-trichloroethylene is not a known chemical, it is likely to be a typographic error in the inspection report but it is not known whether they were referring to TCA or to TCE.

Four (4) monitoring wells (MW-1, MW-2, MW-3 and EMW-1) were installed at the 1930 Camden Road facility between 1989 and 1991 as part of UST and AST closure activities and a prior real estate transaction. Chlorinated organic compounds, including elevated concentrations of TCE, have been detected in site wells MW-1 (790 μg/l) and MW-3 (2,700 μg/l). Other constituents detected include: 1,1-dichloroethane (80 μg/l); 1,1-dichloroethene (1,200 μg/l); 1,2-dichloroethene (150 μg/l); tetrachloroethene (250 μg/l); TCA (350 μg/l); and 1,1,2-trichloroethane (21 μg/l). The Package Products property is located hydraulically downgradient from the SBP property, though the Package Products property is not located directly downgradient from identified source areas at the SBP facility.

SBP periodically monitors the groundwater from wells located hydraulically upgradient (MW-4 and EW-1) and downgradient (ROW-5/5A) from the Package Products facility. In January 1995, TCE was detected in well EW-1 (installed by SBP) situated upgradient of the Package Products site at a concentration of 261 μg/l, one tenth of the level detected in the Package Product's well MW-3. During the same sampling event, TCE was not detected in SBP monitoring well MW-4; and TCE was detected in wells ROW-5/ROW-5A (installed by SBP) downgradient from the Package Products facility at concentrations an order of magnitude more elevated (25,000 μg/l) than the level detected in the Package Product wells. Based on groundwater monitoring data collected from SBP monitoring wells, an unidentified groundwater contamination source is believed to be located between EW-1 and ROW-5/5A.

Groundwater quality in the general area surrounding the SBP facility has been impacted by multiple industrial sources. Based on current groundwater quality, local groundwater is unlikely to be used as a source of potable water.

SECTION 3.0
EXPOSURE PATHWAYS AND RECEPTORS

As part of development of the Risk Assessment for the SBP facility, an evaluation of potential exposure pathways and receptors has been prepared. This section includes a discussion of the local physical setting and population, as well as identification of potential human exposure pathways and receptors that will be further evaluated in Section 4.0.

Soils in SWMU I, WMU I and AOC areas have been effectively remediated based on interim and post-remedial confirmatory samples collected in 1991, 1993 and 1994, and the lateral extent of VOC impacted soils in SWMU II has been significantly reduced (Section 1.5). Therefore, based on the results of extensive assessment and remedial activities, the critical exposure pathway of concern at the SBP site is groundwater. A groundwater plume containing dissolved VOCs occurs approximately 10 to 22 feet below grade, with the most impacted groundwater occurring within the partially weathered bedrock at a depth of approximately 50 feet below the ground surface. The predicted future groundwater VOC plume distribution assuming that the current plume containment is terminated is discussed in Section 4.0. This pathway was evaluated for the potential to affect populations through the direct use of groundwater and through potential discharge to surface water, through subsequent use of surface water, and through ingestion of food from surface water. Based on the depth of the groundwater plume below grade, inhalation of compounds via volatilization from the groundwater is not expected to be a significant concern. Groundwater and other potential exposure pathways are discussed in more detail in Section 3.2

3.1 PHYSICAL SETTING AND POPULATION CHARACTERIZATION

3.1.1 Site Hydrogeologic Characteristics

General site geology can be described as consisting of three (3) geologic horizons: saprolite; partially weathered rock (PWR); and bedrock. Lithologic boring logs completed during on- and off-site monitoring well installation were used to construct cross-sections A-A' and B-B' (Figures 3-1 and 3-2). Saprolite ranges in thickness locally from approximately 22 to 81 feet. PWR ranges in thickness locally from approximately 4 to 98 feet. The bedrock surface, defined as auger refusal, was typically encountered between 50 and 100 feet below grade.

The aquifer underlying the SBP site is typical of the composite weathered residuum-crystalline fractured rock aquifers that occur in the Piedmont region of North Carolina. The local aquifer is unconfined. Groundwater occurs in the pore spaces of the saprolite and PWR; and in fractures of the PWR and bedrock. The water table is encountered in the weathered zone at relatively shallow depths ranging from 3 to 35 feet below grade.

Well water level elevations monitored since July 1988 indicate that shallow groundwater flow beneath the site under non-pumping conditions is generally to the northwest with an average hydraulic gradient of 0.01 feet/feet. Vertical hydraulic gradients were calculated based on water levels measured on August 2, 1993 at twelve (12) monitoring well clusters located across the study area following a nine-day period when the site recovery well was not operating (Table 3-1).

Single-well slug tests were conducted on nine (9) on-site monitoring wells. Hydraulic conductivities estimated for five (5) wells installed within the saprolite horizon (MW-3 through MW-7) ranged from 0.24 to 0.55 ft/day. Hydraulic conductivities estimated for three (3) wells installed within bedrock (MW-9, MW-10A and MW-11) ranged from 0.31 to 0.90 ft/day. The hydraulic conductivity estimated for well MW-12, screened within PWR, is 0.72 ft/day.

A 72-hour aquifer pumping test was conducted in May 1990. Test data were evaluated by a variety of analytical methods to provide hydrogeologic parameter estimates of the underlying aquifer including horizontal hydraulic conductivity (K_h); vertical hydraulic conductivity (K_v); specific yield (S_y); and approximate aquifer thickness (D). Estimates of these parameters (Table 3-2) and the measured site-specific hydraulic gradients (dh/dl) were used to calculate groundwater flow velocities (v) which in turn were used to estimate contaminant migration rates (v_c). Horizontal hydraulic conductivities (K_h) were reported to range from 0.55 to 1.86 ft/day. Average K_h values were calculated for wells screened in 1) saprolite; 2) PWR; and 3) fractured rock (Table 3-3). The geometric mean hydraulic conductivities are 1.40 ft/day for saprolite, 1.6 ft/day for PWR, and 0.59 ft/day for fractured bedrock. Vertical hydraulic conductivities (K_v) were reported to range from 0.05 to 0.98 ft/day. Specific yield (S_y) was estimated to be 0.12 for the saprolite and 0.05 for PWR. Based on additional site specific data and literature values, total porosity values for the site are approximately 0.45 for saprolite and 0.3 for PWR. The average horizontal hydraulic gradient at the site is 0.012 feet/foot based on the well water level elevations measured in October 1992. Vertical gradients measured in October 1992 ranged from 0.0036 to 0.381 (Table 3-4). Based on the average hydraulic conductivities and hydraulic gradients, the horizontal component of groundwater pore velocity is estimated to be 0.04 ft/day and 0.14 ft/day for saprolite and PWR, respectively. The vertical component of groundwater pore velocity ranges from 0.12 ft/day upward at the MW-10/MW-10A cluster to 0.31 ft/day downward at the ROW-3/ROW-3A cluster.

Based on drawdown measurements collected July 9, 1993, the lateral influence of pumping extends as much as 400 feet east, west and north of the recovery well (Figure 3-3). Vertical hydraulic gradients were calculated based on well water levels measured at thirteen (13) monitoring well clusters located across the study area (Table 3-5). Based on the calculated vertical gradients, groundwater from both the saprolite and bedrock horizons recharge the PWR horizon during pumping conditions. Vertical gradients are generally lower under non-pumping conditions than under pumping conditions. When the interim groundwater remediation system (recovery wells PW-1A and PW-2) is in operation, a significant cone of depression forms around the pumping well PW-1A and a lesser cone of depression forms around well PW-2.

To evaluate the potential for preferential flow directions, site geologic, geophysical, and geomorphic data were analyzed with regard to fracture trends. The identified fracture orientations have been approximated based on 1) rock cores; 2) oriented split-spoon samples of PWR; 3) an electromagnetic survey; and 4) a fracture or lineament trace analysis. Based on the fracture trend information evaluated for the SBP site, three (3) predominant fracture trends are inferred: 1) N30 to 45°E; 2) approximately E-W; and 3) approximately N25°W. Not all fracture trends were identified in all techniques. This is likely due to the scale biases of each technique. Direct fracture observations or measurements were not possible as no outcrop exposures were found in the immediate area.

3.1.2 Surface Water Features

Surface water runoff from most of the SBP site flows westward and is collected in a series of storm drains and discharged to a drainage ditch along the east side of the railroad tracks. This drainage ditch is generally dry except during precipitation events. A riprap apron, approximately 3 feet long by 2 feet wide by 0.5 feet deep, is situated beneath the storm drain outfall located north of the Crane Building. Storm water is routinely trapped within the depressed area of the apron. Access to this drainage ditch is limited, as there are fences along most of the railroad line in this immediate area.

The northern two-thirds of the railroad drainage ditch discharges into a stormwater drain which crosses Tremont Avenue and is directed in a northwesterly direction eventually discharging into an unnamed tributary of Irwin Creek near the intersection of West Boulevard and Wilmore Drive. The southern portion of the railroad drainage ditch flows southward, discharges into a culvert drain which crosses the railroad tracks and is directed in a southwesterly direction, eventually discharging to another unnamed tributary of Irwin Creek near the intersection of Remount Road and Baltimore Avenue. Surface water runoff from the eastern portion of the site flows into a stormwater drain that crosses South Boulevard and is directed in an easterly direction.

Maps that indicate which segments of the area drainage ditches, creeks and streams are piped and which are open are available from the City of Charlotte Engineering Division at a scale of 1" = 200′. These maps were used to prepare a smaller scale map of the unnamed Irwin Creek tributaries included in the groundwater flow and solute transport model that has been included in this report as Figure 3-1R. Based on the City of Charlotte maps, much of the unnamed tributary system to Irwin Creek is currently piped. Based on field observations, the segments that are still open are generally narrow (~2-3 feet wide), shallow (less than ½ foot deep) and somewhat inaccessible due to steep slopes and the presence of large riprap.

The nearest non-intermittent surface water feature is a pond located approximately 2,200 feet southwest of the site. Based on the groundwater flow and solute transport models used to predict the movement of the groundwater plume, the pond is not in a downgradient flow direction from the SBP site and will not be impacted by the groundwater plume.

Irwin Creek is located approximately 4,000 feet northwest of the SBP facility.Irwin Creek discharges into Sugar Creek approximately three (3) miles downstream from where the subject tributary system discharges into Irwin Creek (Figure 3-2R). Sugar Creek discharges into the Catawba River approximately 24 miles downstream beyond its juncture with Irwin Creek (Figures 3-2R and 3-3R). One of the CMUD wastewater treatment plants (WWTPs) discharges into Irwin Creek approximately 2.2 miles downstream from where the subject tributary system discharges into Irwin Creek. This WWTP is permited to discharge up to 15 million gallons per day. There are no public water supply surface water intakes on Irwin Creek or Sugar Creek based on information provided by the NCDENR Public Water Supply Division.

3.1.3 Meteorology

Charlotte is located in a temperate climate characterized by cool winters and relatively warm to hot summers. Temperatures average near 60°F annually, near 79°F for the month of July, and near 41°F for the month January. Precipitation totals average approximately 43 inches per year. The highest monthly precipitation rate typically occurs in March and the lowest monthly precipitation rate typically occurs in October. Snowfall averages less than two (2) events per year with ice and snow accumulations greater than one (1) inch. Annual wind speed averages 7.4 miles per hour, and the prevailing wind direction is from the southwest.

3.1.4 Local Population Characterization

The subject site is located within the city limits of Charlotte, North Carolina. A general land use map for the area surrounding the SBP facility was developed based on Charlotte-Mecklenburg County zoning maps using simplified land use categories (industrial, commercial and residential) (Figure 3-4). The majority of the properties located adjacent and to the north, to the west and to the south of the SBP facility are industrial or commercial. The residential population within 1/4-mile radius of the site was estimated at 520 using the 1990 Mecklenburg County Census Tracts - Origin & Destination Zones Map. Residential areas are located approximately 500 feet to the south and east, approximately 1,300 feet to the northeast and 1,400 feet to the northwest, with the majority of the population located hydraulically upgradient from the site. Smaller residential populations, including Atherton Mill Lofts, are located closer to the site. A fence separates the Atherton Mill Lofts from the SBP facility and the railroad ditch.

Sensitive or susceptible populations include the portion of the population that will exhibit an enhanced or different response to a chemical, and therefore, are at a greater potential risk than the general population. Sensitive populations such as daycare centers, schools, rest homes and hospitals within a one-mile radius were identified using the 1996/1997 Bell South Yellow Pages and the 1996 Mecklenburg Street Map (Table 3-6 and Appendix 3A). There are a total of six (6) day care centers and five (5) schools within a one-mile radius of the site. Only one of these facilities, the Charlotte Montessori day care center and school, is located within 1/4 mile of the site. This facility is located approximately 1,240 feet northeast and hydraulically upgradient from the SBP facility. No rest homes or hospitals were identified within a one-mile radius. In addition, the Wilmore Neighborhood Association located at 501 West Boulevard in Charlotte, is located approximately 2,800 feet northwest of the SBP facility (Table 3-6). This facility offers after-school programs for children.

3.1.5 Critical and Sensitive Environments

Environmentally sensitive areas (i.e., wetlands; national and state parks; wilderness areas, etc.) were identified by contacting appropriate agencies, such as the National Heritage

Program, the Wildlife Resources Commission, the Division of Water Quality, etc. (Table 3-7 and Appendix 3A). No known environmentally sensitive areas were identified within a 1/4 mile radius of the site with the exception of a few National Historical Sites located northeast of the SBP facility in the Dilworth Community (i.e., Dilworth National Historical Site, etc.). The Dilworth National Historical Site is located on the east side of South Boulevard hydraulically upgradient from the SBP facility.

3.1.6 Current and Planned Land Use

The 2000 South Boulevard facility is situated in the South End redevelopment area within the city limits of Charlotte, North Carolina. Historically, land use in the area can be generally described as commercial and industrial. More recent development has consisted of the conversion of old industrial facilities for use as offices, entertainment complexes, restaurants, retail shops and residences (e.g. condominiums). A residential area is situated to the north approximately 1200 feet from the site, and a business area located approximately 100 feet from the site to the east. Planned land use is expected to be more retail and office oriented in the future.

3.1.7 Utilities

Potable water service to the SBP site is provided by the Charlotte-Mecklenburg Utility Department (CMUD) through a number of laterals off of a 12-inch diameter main located on the west side of South Boulevard in the Charlotte Department of Transportation right-of-way. The design depth of cover over water mains is 3 feet. The equilibrium depth to groundwater as measured in June 1996 monitoring wells MW-1 and MW-11 is approximately 25 feet. For the 12-inch diameter line along South Boulevard the distance from the bottom of the line to the groundwater surface is approximately 21 feet.

Sanitary sewer service to the SBP site is also provided by CMUD. Wastes flow by gravity to an 8-inch collection line located along the west side of South Boulevard. Manhole inverts along South Boulevard range from 6 feet below grade at the north end of the site to 8 1/2 feet below grade at the south end of the site. The corresponding depths to groundwater at the north and south ends are 20 feet (MW-10 & 10A) and 25 feet (MW-

1), respectively. The resulting distance from the groundwater table to the sewer lines ranges from 11 1/2 feet to 19 feet. There is no sanitary sewer service for the G Building.

Precipitation runoff at the SBP site is primarily by surface sheet flow; however, several catch basins in the asphalt-paved parking areas direct runoff into stormwater drains (Figure 3-5). Catch basin inverts range from 2 1/2 feet to 4 1/2 feet below grade. With a starting depth of 2 1/4 feet and a pipe slope of 1/4-inch per foot the calculated depth below surface grade for the downslope end of the stormwater drain serving the Atherton Mill parking lot would be approximately 6 1/2 feet. Depth to groundwater at the drain outfall is approximately 20 feet (measured at soil vapor well VES-26). The elevations of invert catch basins in the parking area in front of the Atherton Lofts building are 3 feet to 4 feet below grade. Depth to groundwater in this area is approximately 25 feet (MW-1).

Electric service to the SBP site is supplied by Duke Power Company through overhead lines to several at-grade transformers (Figure 3-5). Service to the individual buildings is through below-grade lines emanating from the transformers. The design depth of cover for below-grade electrical service lines is 3 feet.

Natural gas service is supplied to the SBP site by Piedmont Natural Gas (PNG). PNG does not maintain "as-built" drawings for horizontal and vertical locations of its service lines however company policy calls for 3 feet of cover over newly installed lines. Cut or fill over line locations after installation is considered to be beyond the control of PNG. Natural gas line locations at the SBP site are shown on Figure 3-5.

The depth of cover over the treated groundwater discharge line from the air stripper to the manhole tie-in (Figure 3-5) varies from no cover where it enters the ground to 5 feet at the tie-in to the sanitary sewer manhole. At the manhole connection, the distance from the line to the water table is approximately 21.6 feet based upon a June 1996 well water level elevation measurement from MW-11 taken during non-pumping conditions.

3.2 EXPOSURE PATHWAYS

3.2.1 Groundwater

The site is located in the metropolitan area of Charlotte, North Carolina. Potable water for this area is available from the CMUD, which uses surface water from the Catawba River reservoir system. City utilities such as water and sewer have been available to this area for many years.

Based on information provided by the NCDENR Public Water Supply Department, there are no public water supply wells within two (2) miles of the defined extent of the impacted groundwater plume and there are no state-approved wellhead protection areas in Mecklenburg County.

The Groundwater Section of the Mecklenburg County Department of Environmental Protection (MCDEP) was contacted for information concerning the possible presence of private wells near the SBP site. A permit is not required to install a private water supply well in Mecklenburg County; therefore, MCDEP does not maintain records on private wells. According to MCDEP personnel, they will occasionally conduct well surveys in areas surrounding sites with contaminated groundwater. AEI reviewed the files of nearby properties with known groundwater contamination to determine if either these facilities or MCDEP had identified any private wells (Appendix 3B). No private wells were identified in the reviewed files.

In addition, AEI performed a groundwater supply well survey of properties located within a 1,500-foot radius of the subject site on April 2, 1997. This survey included the identification of businesses, such as garden nurseries and car wash facilities, that potentially use groundwater in addition to city water. Prior to conducting the survey, AEI obtained a CMUD City Sewer and Water Connections map to assist in locating potential properties that are not connected to city water. During the survey, properties that were previously identified on the CMUD map as not having a city water connection were evaluated to determine their current status and were found to be either vacant or to have a city water meter indicating water service. No other evidence of groundwater supply wells or groundwater usage, such as well houses, irrigation systems, etc. was observed within 1,500 feet of the SBP facility. These findings were further substantiated by an interview with a CMUD water meter reader that AEI personnel encountered while conducting the survey. According to this CMUD employee, he had been reading water meters in the area for approximately eight (8) years and was not aware of any structure that was not connected to city water. Campbell's Greenhouses is located approximately 180 feet east of the SBP property boundary at 209 McDonald Avenue with an outlet at 2000 South Boulevard (Atherton Mill). AEI contacted this business and was informed that the facility uses city water and no private groundwater supply well is located on-site. Based on a review of MCDEP files and a drive-by area reconnaissance, there are no known private water supply wells within 1,500 feet of the subject site.

As part of the Exposure Information Report (EIR) submitted in July 1998, the groundwater supply well survey was expanded to cover a ½-mile radius from the SBP site. This survey was conducted using CMUD City Sewer and Water Connection maps to assist in locating potential properties not connected to city water. During the survey, properties previously identified on the CMUD maps to not have a city water connection were evaluated to determine their current status. These properties were found either to be undeveloped or to have a city water meter box indicating available water service.

No evidence of groundwater supply wells, such as well houses and irrigation systems, were observed during the drive-by reconnaissance. The Wilmore Community Center located on West Boulevard was contacted to determine if the facility uses a groundwater supply well to water their gardens. According to the Wilmore Community Center personnel, the facility uses city water and there are no wells at this site.

In November 1999, the groundwater well survey was expanded to encompass the predicted extent of the groundwater plume area from SBP to Irwin Creek. The same methods were used as were employed for the earlier surveys. During the survey, properties previously identified on the CMUD maps to not have a city water connection were evaluated to determine their current status. These properties were found either to be undeveloped or to have a city water meter box indicating available water service. No evidence of groundwater supply wells, such as well houses and irrigation systems, were observed during the drive-by reconnaissance. The Revolution Golf Course was contacted to determine if the facility uses a groundwater supply well. According to site personnel, the golf course greens are irrigated using city water and there are no wells on the property.

The potential for the future installation of domestic groundwater wells in the impacted area is limited by North Carolina Administrative Code. The North Carolina Well Construction Standard 15A NCAC 2C.0107 prohibits well construction of a well intended for domestic use in or within 100 feet of a known contaminated water bearing zone or aquifer. Penalties and enforcement mechanisms are provided for violations of the Standard. According to personnel at the Mooresville Regional Office of the DENR, the DENR responds to complaints regarding violations of the well construction standards. The DENR will initially request that the well driller abandon the well. If the well driller is uncooperative, the DENR will proceed to impose civil penalties and/or apply to the superior court for an injunction order to abandon the well. According to personnel at the Mooresville Regional Office, most reputable drillers will call to inquire if the site where drilling is proposed is registered as contaminated with the DENR.

CMUD was contacted for information regarding formalized plans for future groundwater use in the area surrounding the SBP site. According to CMUD, they have not formulated a plan for future groundwater usage in the area as of March 12, 1997 (Appendix 3B). Based on the available information and drive-by area reconnaissance, the risk of exposure by groundwater ingestion, dermal contact or inhalation of vapor partitioning from groundwater due to water supply well withdrawal and use appears to be minimal.

Based on the defined extent of the impacted groundwater plume, a VOC plume discharge to surface waters has not been identified to currently exist. A groundwater flow and transport model, described in Section 4.2, is being used to evaluate the potential for future groundwater discharge to surface waters. Based on the model simulation results, the groundwater plume will discharge into a tributary of Irwin Creek located west of the intersection of Hawkins Street and South Tryon Street at concentrations of approximately 1 µg/l in approximately 30 years. Exposure pathways for surface water are discussed in Section 3.2.3.

Dermal exposure to impacted groundwater could potentially occur as a result of intrusive activities such as installation or sampling of monitoring wells or construction excavation activities conducted more than ten feet below grade. The probability of dermal exposure through the installation or sampling of wells is significantly reduced since these activities are typically conducted in accordance with OSHA Hazardous site worker operations guidance and personal protective equipment is employed by the workers. The defined impacted groundwater plume is located approximately 10 to 22 feet below grade under non-pumping conditions. Groundwater in the source area with the most elevated concentrations of chemicals of concern occurs approximately 13.5 feet to 22 feet below grade under non-pumping conditions. Utilities, with the exception of sanitary sewer lines, are generally located less than 4 feet below grade. The sanitary sewer lines in the area are typically located approximately 6 feet to 8 feet below grade with an overall range of 4 feet to 12 feet in the SBP groundwater plume area. Subsurface utilities in the present plume area are not expected to intersect the local water table. Other shallow excavations, such as those for building footings, would be expected to result in low, short-term exposures.

Inhalation of compounds volatilizing from the groundwater could potentially occur as a result of construction excavation or other intrusive activities such as installation or sampling of monitoring wells. Should significant concentrations of VOCs be vaporizing from groundwater into the overlying unsaturated soils, these vapors would be expected to partition into the soil pores or soil moisture and be detected in the soils. Soil samples have been collected from unsaturated soils not directly impacted by VOCs, yet occur immediately above groundwater that is impacted with VOCs at or near the most elevated site concentrations. Soil sample TB-3 was collected in May 1988 approximately 20 feet northeast of well cluster MW-5 and MW-6 at a depth of 10-12 feet below grade and soil sample G-1 was collected in April 1997 approximately 190 feet southwest of this well cluster at a depth of 9.5 feet below grade (Figure 3-6). These soil samples were analyzed for

VOCs by EPA Method 8240. No VOCs were detected in either sample (Appendix 3C). Based on this soil analytical data, inhalation of compounds volatilizing from the groundwater is not expected to be an exposure pathway now or in the future.

3.2.2 Soils

As previously discussed in Section 1.5, soils in SWMU I, WMU I and AOC areas have been effectively remediated. Remaining impacted soils occur along the drainage ditch in the railroad right-of-way bordering the west side of the SBP site.

Concentrations in the surface soil are well below the EPA Region III soil residential ingestion levels (Sections 1.5 and 3.2.4). SBP remediated the accessible surficial soils in the storm drain outfall area in November 1999. Therefore, the primary soil exposure pathway of concern is the potential that impacted surficial soils in the railroad ditch may be impacting intermittent surface water in this area.

Samples were collected of surface water that had accumulated in a riprap apron beneath the storm drain outfall in the railroad ditch area in May 1997 (Table 1-1) and in November 1999 (Table 1-7R). Sample results indicated that surface water beneath the storm drain outfall was impacted by low levels of VOCs. Therefore, this surface water pathway is further evaluated in Section 3.2.3. Potential soil exposure pathways for the surface soils are soil VOC transfer to surface water and incidental ingestion.

Given the depth of impacted soils, exposure to deeper impacted soil would only occur as a result of intrusive activities such as construction excavation and the expected receptor would be a worker as opposed to a resident. Should excavation in this area occur, possible soil exposure pathways include the potential for:

- dermal exposure;
- incidental ingestion;
- inhalation of airborne chemicals; and
- soil as a source to groundwater.

Potential receptors of the VOCs in deeper soils are workers that may potentially conduct excavation activities in the immediate area of the storm drain outfall. There currently are no known existing utilities beneath the railroad ditch area. Should excavation activities occur, chemical intakes for the exposure pathways identified in Section 3.2.2 were calculated for dermal exposure; incidental ingestion; inhalation of airborne chemicals; and soil as a source to groundwater.

Dermal exposure has not been found to be a significant route of exposure for most compounds. Exposure would likely be short term and at this depth heavy equipment would be used to move soil so that actual skin to soil contact would be limited. Therefore, a dermal exposure pathway is not thought to be significant for soils and an absorbed dose will not be calculated for this pathway.

1997 soil VOC levels were originally compared with the EPA RBC Table soil screening levels for transfer of constituents from soil to groundwater dated January - June 1996 which indicated May 1997 TCA, TCE and PCE concentrations in the soil exceed the SSLs for transfer of constituents from soil to groundwater (Table 1-1). These data suggest that soil in this area has the potential to impact groundwater.

In April 1998, the DENR, Facility Management Branch (FMB) revised their draft guidance "Establishing Risk-Based Clean-Up Levels at Hazardous Waste Sites". This guidance was revised again in September 1998 and most recently in December 1999. The revised guidance specifies that the highest remaining concentration for each soil contaminant be compared to the October 1999 EPA Region III RBC Table for residential ingestion and to soil-to-groundwater cleanup levels as calculated in the revised December 1999 guidance. The soil-to-groundwater clean-up level for each constituent is calculated using a soil-to-groundwater transport equation employing generic input parameters and the 2L groundwater standards and in some cases, proposed 2L standards.

On October 28 and 29, 1998, sixteen (16) hand auger borings (RR-98A through RR-98P) spaced approximately 25 feet apart were advanced in the railroad drainage ditch to characterize the current soil quality (Figure 1-2R). Two (2) samples were collected from each boring from depths of 5 and

10 feet below grade using the Encore™ sampling method. Samples were analyzed for VOCs by EPA Method 8260. Laboratory analytical results are summarized in Table 1-2R.

The maximum VOC levels were compared to: 1) the October 1999 EPA Risk-Based Concentration Table levels for residential ingestion; 2) clean-up levels from the draft FMB Guidance dated 9/99; 3) to Generic Soil Screening Levels (SSLs) for soil contaminant migration to groundwater provided by the EPA, Office of Solid Waste and Emergency Response (OSWER); and 4) levels calculated using the soil-to-groundwater transport equation and proposed Alternate Concentration Levels (ACLs) discussed further in Section 7.5 (Table 1-3R). The OSWER SSLs are calculated using the same soil-to-groundwater transport equation employing generic input parameters as used in the FMB Guidance, but OSWER uses applicable EPA Maximum Concentration Levels (MCLs) instead of 2L groundwater standards to determine soil cleanup goals.

No constituents were detected above cleanup levels calculated using proposed ACLs, with the exception of ethylbenzene. 1,2-Dichloroethene (trans) was not detected but the maximum detection quantitation limit was greater than the cleanup level calculated using the proposed ACLs. Ethylbenzene is not expected to pose a significant threat to groundwater since it was only detected in one sample out of 28 samples. PCE and TCE are the main constituents of concern detected above both FMB Guidance Levels and OSWER SSLs. Using the FMB Guidance, PCE and TCE levels detected in soil samples exceed the standards for a distance of approximately 290 feet. Using OSWER SSLs, PCE and TCE levels detected in soil samples exceed the standards along the ditch for a distance of approximately 150 feet.

Additional unsaturated soil samples were collected from the railroad ditch in January/February 1999 to further delineate the extent of impacted soils. One (1) surficial and eight (8) deeper soil samples were collected from four (4) locations in January 1999 (Figure 1-3R). Six (6) additional surface soil samples were collected in February 1999 (Figure 1-3R). Samples were analyzed for VOCs. Analytical results were compared to the October 1999 EPA Region III, RBC table levels for residential ingestion (Tables 1-4R and 1-5R).

Analytical results from the October 1998 and the January/February 1999 sampling activities were used to produce PCE and TCE isoconcentration maps of the railroad drainage ditch (Figures 1-4R and 1-5R) and isoconcentration cross-sections A-A' and B-B' (Figures 1-6R and 1-7R). Based on the analytical data, approximately 73 cubic yards of surficial (defined as 0" to 12" below grade) soils in the eastern ditch and beneath the railroad tracks are impacted at levels above the EPA Region III, RBC table levels (Tables 1-4R and 1-5R). It was estimated that approximately 17 cubic yards could be excavated without impact to the railroad tracks.

SBP voluntarily remediated accessible surficial soils in the drainage ditch area in November 1999 in general accordance with the "Remedial Action Plan" submitted to the DENR in July 1999 and revised in August 1999. Accessible surficial soils in the drainage ditch area containing elevated levels of VOCs were excavated and disposed of off-site. Confirmatory surficial soil samples were collected from the northern and southern ends of the excavation (Table 1-7R). Analytical results were less than the EPA Region III Risk Based Concentration Table levels for residential ingestion (dated October 1999). These analytical results are used in the risk assessment as the exposure concentration for trespassing children (Section 4.0). Soil samples collected from the bottom of the excavation were compared to the North Carolina Soil Screening Limits based on the potential for transfer from soil to groundwater (Table 1-8R). Levels greater than these limits were detected in these samples. The analytical results from these deeper soil samples were used as the potential exposure concentration for workers that may be involved in excavation activities in this area.

In January 2000, AEI conducted additional soil and shallow groundwater sampling in unsaturated and shallow saturated soils in proximity to the stormwater outfall in the railroad drainage ditch. Samples were collected to evaluate the potential for soil-to-groundwater migration of leachate from remaining impacted soils in the outfall area, and to determine whether additional soil remediation is warranted. On January 9, 2000, three (3) soil borings (SB, CB and NB) were advanced in the outfall area (Figure 1-10R). A summary of the soil sampling analytical results is presented in the attached Table 1-9R. The analysis of sample CB-7 (collected in boring CB at a depth of 7 feet below grade) indicates that the elevated soil VOC concentrations previously detected at the base of the recently excavated area diminish significantly within a very short vertical distance. Previous recent post-excavation confirmatory sampling data are summarized in Table 1-8R. The latest soil data show that remaining soil VOC concentrations generally decrease by an order of magnitude within a vertical interval of 20 feet. There are exceptions to this general trend of decreasing soil VOC concentrations with depth. In sample SB-20 collected from boring SB at a depth of 20 feet, elevated soil VOC concentrations were detected that suggest possible preferred vertical migration pathways through the unsaturated and saturated soil horizons. This trend was again observed in sample NB-31 for trichloroethene for which concentrations were somewhat elevated above the levels detected in sample NB-28 from the preceding sampling depth.

Based on the most recent soil sample data, deeper soils in the railroad drainage ditch contain levels of VOCs above the North Carolina soil-to-groundwater standards. Deeper soils in the immediate area surrounding the outfall located on the south end of the G-Building exceed soil-to-groundwater standards based on the proposed ACLs. The potential for soil-to-groundwater transfer is addressed by applying constant loading in the source area in the solute transport model (Section 4.0).

Most importantly, the observed soil VOC levels do not suggest a significant solvent residual in either the unsaturated or shallow saturated soils. Remaining soil VOC levels detected in the analyzed samples were compared with an estimated C_{SAT} that indicates a concentration above which non-aqueous phase liquids may be suspected in site soils. Only the recent post-excavation confirmatory samples representative of near surface unsaturated soils (at four to six feet below grade) were found to possess soil VOC levels suspected to be saturated with solvent residual. No samples obtained below the non-pumping water table were found to have soil VOC levels suspected to be saturated with solvent residuals. C_{sat} calculations are presented in Appendix 1-B.

The groundwater pathway is addressed further in Sections 3.2.1, 4.2 and 4.3. Sections 4.2 and 4.3 specifically discuss the groundwater flow and solute transport modeling results. Upon approval of the ACLs proposed in the Part B Post-Closure Application and discussed further in Section 7.5, SBP proposes to monitor groundwater quality for two (2) years to demonstrate compliance with the approved standards.

3.2.3 Surface Water

There is a small (approximately 3 feet long by 2 feet wide by 0.5 feet deep) riprap apron situated beneath the outfall on the north side of the Crane Building. The ground surface beneath the riprap apron has been scoured by running water exiting the outfall pipe and storm water tends to accumulate in the depressed area. In May 1997, VOCs were detected in a surface water sample collected from standing water beneath the storm drain outfall in the railroad ditch (SWMU II).

Following the removal and off-site disposal of impacted surface soils in November 1999, another surface water sample was collected from the storm drain outfall apron in the railroad drainage ditch (Table 1-7R). The VOC levels in the surface water had decreased compared to the 1997 surface water sample.

Since the surficial impacted soils were removed from this area, the presence of low VOC levels in the surface water sample suggests that it is possible some residual contamination exists inside the storm drain. Soil borings were advanced along the site storm water drains in 1988, 1989 and most recently in 1997 (Figure 3-4R). Low levels of VOCs were detected in these samples indicating only minimal releases from the site storm water drains. These analytical results are summarized in Table 3-1R. Based on the low VOC levels detected in soil samples collected near the storm drains and the low VOC levels detected in the surface water sample, it is believed that any remaining residual contamination is not extensive. Therefore, it is anticipated that the surface water concentrations will continue to decrease and the 1999 sample results represent a current maximum exposure concentration.

Potential exposure to the surface water that accumulates in the apron below the outfall will be evaluated using the 1999 sample results. Potential exposure pathways will include incidental dermal contact, incidental ingestion, and inhalation of vapors emitted from the surface water.

In addition to the surface water occurring in the railroad drainage ditch, the groundwater flow and solute transport model, described in Section 4.2, predicts that groundwater impacted with low levels of VOCs will be discharged into surface water in the future. The nearest surface water intake for public water supply is located more than ten (10) miles away from the SBP site as identified by the NCDENR Public Water Supply Division. Therefore, potential exposure pathways will not include ingestion or frequent dermal contact. Potential exposure pathways considered for the surface waters include dermal contact with the water, incidental ingestion, and inhalation of vapors emitted from the surface water.

Since the amount of surface water in the ditch is minimal and the VOC concentrations are relatively low, the probability of exposure through dermal contact and inhalation pathways is also expected to be low and will not be evaluated further for this pathway. Surface water ingestion, though not likely, would be expected to result in the greatest potential for exposure. Potential receptors to surface water in the railroad ditch area are expected to be limited to transient foot traffic along the railroad right-of-way.

3.2.4 Air

Potential for Impacted Soil-to-Air Exposure

Potential air exposure pathways from the possible volatilization of chlorinated organic compounds from remaining impacted soils were evaluated. These pathways were evaluated based on the approximate depth of impacted materials, soil analytical data and direct air quality sample data.

Air samples were collected within the main building at the Atherton Mill facility in August 1993 at the request of tenants due to questions regarding the original wood block flooring. Samples were collected from three (3) locations inside the building and one location outside. The indoor locations corresponded to the former tool crib area (unoccupied space), the former paint booth/vapor degreaser area (restaurant), and the former manufacturing area (retail space). The outdoor sample was collected from below the roof eave, adjacent to the former paint booth exhaust vent. Air samples were analyzed for 1,1,1-trichloroethane and trichloroethene by NIOSH Method 1003. All concentrations were reported below the method detection limit with the exception of the retail space sample (Int Mkt Tube #8). This sample was reported to contain 0.12 milligrams per cubic meter or 22 parts per billion of TCA. For comparison, the table below lists relative TCA concentrations reported for various sources, its odor threshold and recommended allowable work exposure.

DESCRIPTION	CONCENTRATION (PPB)
Ambient conditions in urban USA	0.4 (2)
Int Mkt Tube #8 sample	22
New office building before/after occupancy	90/11 (2)
Odor threshold	180,000 (1)
Allowable time-weighted average concentration for regular exposure in a forty hour work week	350,000 (3)

Notes: (1) Taken from "Handbook of Environmental Data on Organic Chemicals, 2nd Edition. Karel Verschueren, ed. Van Nostrand Reinhold Company. Inc., 1983.

(2) Taken from "Handbook of Environmental Fate and Exposure Data for Organic Chemicals. Philip Howard, ed. Lewis Publishers. 1990.

(3) Taken from "NIOSH Pocket Guide to Chemical Hazards. US Department of Health and Human Services, National Institute for Occupational Safety and Health. June 1997.

TCA detected within office buildings has been attributed to wallpaper glue and paint (Howard, P., ed., 1990), both of which had been freshly applied in the retail space at SBP prior to sample collection.

Potential for Impacted Groundwater-to-Indoor Air Exposure

SBP addressed the potential for inhalation exposure to contaminated vapors that may partition from the VOC plume migrating off-site under buildings and residences into indoor air spaces. Buildings situated on the SBP property were also included in this analysis.

The Johnson and Ettinger (1991) model for subsurface vapor intrusion into buildings was used to address this potential inhalation exposure pathway. Default values or site-specific values for vapor permeability, bulk density and porosity can be used as input for the model. Model output can be "acceptable" soil or groundwater concentrations given a target risk level or an incremental cancer risk or hazard quotient based on given soil or groundwater concentrations. The Johnson and Ettinger (1991) model makes the following conservative assumptions.

1. Vapor and aqueous-phase diffusion is lumped together to estimate the effective diffusion coefficient. The result is typically a higher effective diffusion coefficient relative to separate solutions for aqueous diffusion across the capillary fringe and both vapor and aqueous diffusion across the unsaturated portion of the vadose zone.

2. The model also assumes that all vapors from underlying soils will enter the building through gaps and openings in the foundation. This implies that a constant pressure field is generated between interior spaces and the soil surface and that the vapors are intercepted within the pressure field and are transported into the building. This assumption is inherently conservative in that it neglects periods of near zero pressure differential (e.g. during mild weather or operations when windows are left open).

3. The Johnson and Ettinger model treats the entire building as a single chamber with instantaneous and homogeneous vapor dispersion. It therefore neglects contaminant sinks and the room-to-room variation in vapor concentration due to unbalanced mechanical and/or natural ventilation.

4. Convective vapor flow from the soil matrix into the building is represented as an idealized cylinder buried below grade. This cylinder represents the total area of the structure below the soil surface (walls and floor). The total crack or gap area is assumed to be a fixed fraction of this area. Because of the presence of basement walls, the actual vapor entry rate is expected to be 50 to 100 percent of that provided by the idealized geometry (Johnson and Ettinger, 1991).

Off-Site Industrial Groundwater-to-Indoor Air Calculations

Off-site buildings situated hydraulically downgradient and in relatively close proximity to the plume source areas are occupied by Grice Showcase & Display Manufacturing, Inc., 2151 Hawkins Street; Ferguson Enterprises, Inc., 101 W. Tremont Avenue; and a smaller one-story building situated at 2127 Hawkins Street. These structures are situated adjacent to and west of the railroad right-of-way. The VOC plume lies beneath these structures. Based upon the most recent non-pumping, static well water level measurements taken in July 1994 (following a site groundwater pumping hiatus of two months), the ground floor elevations of these off-site buildings are situated at separation distances in the vicinity of 15 feet from the underlying water table.

AEI evaluated the total VOC isoconcentrations predicted by the groundwater solute transport model from 0 to 300 years at 10-year intervals to determine the approximate maximum downgradient exposure in the current industrial areas represented by the above structures. Based on the model prediction, the maximum expansion of the highest concentrations within the groundwater plume is reached at approximately 100 years. Therefore, the most elevated off plume concentrations can be predicted based on the 100-year isoconcentration map. At 100 years, the 20-ppm contour intersects one corner of the building at 2151 Hawkins Street and the majority of the building at 2127 Hawkins Street (Figure 3-5R). Therefore, 20 ppm was assumed to be the maximum future VOC concentration of groundwater beneath the downgradient buildings and was used to calculate the industrial incremental risk of predicted groundwater-to-indoor air concentrations. Isoconcentration plots discussed in this section and model print outs discussed below were forwarded to the DENR-HWS as part of an August 2000 memo. They are not included in this report due to space limitations.

The Johnson-Ettinger model was used to calculate "acceptable" soil or groundwater concentrations given a target risk level of $1x10^{-6}$ and was also used to calculate an incremental cancer risk or hazard quotient based on the estimated maximum total VOC level of 20 ppm in the groundwater. Individual target compound concentrations were estimated as a proportion of the 20 ppm total VOC level using the ratios that were calculated to approximate individual constituent levels from total VOCs as discussed in Section 4.4.2 (Table 3-3R). An exposure time of 250 days (5 days/wk x 50 wks/year) was used in both calculation methods for the industrial area. Given the quantity of data collected at the SBP site, site specific values for vapor permeability, bulk density and porosity were used in the model.

The Johnson-Ettinger model results are summarized in Tables 3-4R and 3-5R. The estimated future maximum individual VOC concentrations in groundwater beneath downgradient industrial structures are less than the modeled $1x10^{-6}$ risk-based groundwater concentrations, with the exception of 1,1-DCE and TCE (Tables 3-4R and 3-5R). The model incremental risk calculations based on the estimated future maximum individual VOC concentrations are $8.20x10^{-5}$ for 1,1-DCE and $7.7x10^{-6}$ for TCE with a total additive risk of $9.07x10^{-5}$ for carcinogenic effects and a total hazard index of less than one for non-carcinogenic effects (Table 3-5R).

EPA guidance documents indicate that action is generally warranted at a site when the cumulative carcinogenic risk is greater than 10^{-4} or the cumulative non-carcinogenic hazard index is greater than 1. When the cumulative current or future baseline cancer risk for a medium is within the range of 10^{-6} to 10^{-4}, a site-specific determination must be made. A cumulative cancer risk of less than 10^{-6} and a cumulative non-carcinogenic risk of less than or equal to 1 are generally considered to be acceptable without any additional actions.

The Johnson and Ettinger model was run using default input values and using a combination of default and site specific values to determine model sensitivity to these parameters (Table 3-4R). The following observations were made based on the model results:

- Using the lower site specific vapor permeability value of $3x10^{-10}$ cm instead of the default value of $1x10^{-8}$ cm increases the resulting allowable groundwater concentration slightly;
- There was no discernible difference when using the site specific bulk density value of 1.45g/cm^3 compared to using the default bulk density value of 1.5 g/cm^3;
- Using the slightly higher site specific porosity value of 0.45 cm^3/cm^3 instead of the default value of 0.43 cm^3/cm^3 decreases the resulting allowable groundwater concentrations.

The models appear to be conservative considering that the off-site buildings most likely to be at risk of indoor air exposure have a minimum separation distance of 12 to 13 feet between the ground floor and the water table. The upgradient portions of these structures likely have 15 feet or greater separation distance between the ground floor elevation and the underlying water table. Further, soils in the general area are silty clays to clayey silts with low vapor permeability. In the case of less permeable soils, soil gas flow rates are so low that vapor intrusion is governed entirely by the relative rates of diffusion through the soil and foundation (Johnson and Ettinger, 1991). The greater the separation distance between the contaminated groundwater and the foundation, vapor diffusion through soil becomes the limiting transport mechanism. Given an overestimation by the Johnson and Ettinger model of the effective diffusion coefficient and convective vapor flow rate into a building, and its assumption of instantaneous and homogeneous vapor diffusion within a building, this model evaluation is very conservative. Based on this evaluation, it is anticipated that the predicted contaminant concentrations in the shallow groundwater will not result in adverse indoor air exposure levels within off-site buildings.

Off-Site Residential Groundwater-to-Indoor Air Calculations

To evaluate the risk of indoor air exposure from vapors diffusing from groundwater in the nearest downgradient residential area, AEI selected three points along the current boundary between the industrial and residential areas that were directly downgradient of the maximum isoconcentration contours (Figure 3-6R). The total VOC concentrations at these points were then plotted for 300 years (Figures 3-7R, 3-8R and 3-9R).

The maximum predicted total VOC concentration at these points over 300 years was approximately 5.22 ppm at 170 years. Therefore, 5.5 ppm total VOCs was used to calculate residential incremental risk from exposure to predicted groundwater to indoor air concentrations. Individual target compound concentrations were estimated as a proportion of the 5.5 ppm total VOC level to calculate approximate levels of individual constituents from total VOCs as discussed in Section 4.4.2. An exposure time of 350 days and site specific variables were used in the model. Using site specific values, the total additive risk is 3.43×10^{-5} for carcinogenic effects and the total hazard index is less than one (Table 3-5R). For comparison, the model was also run using all default values (Table 3-5R). Using default values, the total additive risk is 2.12×10^{-4} for carcinogenic effects and the total hazard index is less than one (Table 3-5R).

On-Site Groundwater-to-Indoor Air Calculations

Based upon the aforementioned non-pumping water level measurements taken in July 1994, the ground floor elevations of buildings situated on the SBP property reside at separation distances greater than 15 feet from the underlying water table. One subsurface structure, a boiler room, is located within the main Atherton Mill building (see Figure 1-2). The thickness of the unsaturated soils beneath the boiler room is less than 15 feet. The boiler is no longer in use. However, an air compressor has been placed in the boiler room that is used in conjunction with the building's sprinkler system. According to the site property manager, the compressor has required maintenance on two occasions in the past six years. Entry to the boiler room is by a locked door within the interior of the Atherton Mill building. Only authorized personnel have access to the room. Assuming that the maximum duration of a worker's exposure to contaminated vapors in the boiler room would be eight hours in any given day, the TWAs for the constituents of concern were compared to the estimated constituent vapor levels (Table 3-2R). A maximum total VOC plume concentration of 5 mg/l was predicted to occur beneath the substructure. Individual constituent concentrations in the plume area were estimated by their respective ratios to total VOCs (Table 3-2R). Comparing the estimated maximum groundwater to vapor constituent concentrations to their respective TWAs, it is anticipated that the predicted contaminant concentrations in the shallow groundwater will not result in adverse indoor air exposure levels within the identified on-site substructure.

WMU I Soil-to-Indoor Air Calculations

To address concerns raised by DENR regarding the level of soil contamination under the Atherton Mill building in the WMU I area, AEI reviewed 1988 assessment data, the soil vapor extraction system layout, and 1993 post-remedial confirmatory sampling data. The concerns appear to focus on an area in the vicinity of previous soil boring A-8. An assessment soil sample (A-8D) was collected from boring A-8 at a depth of 10 feet below the floor elevation. TCE was detected in this sample at a level of 8,974 µg/kg. Following the soil quality assessment conducted in the area of WMU I, two pilot SVE wells were installed in the area and a pilot study conducted to design a full-scale SVE system to treat the impacted soils (Figure 1-8R). One pilot well (A-14) was located within approximately four feet of abandoned soil boring A-8. This pilot well was later converted to a vent well and a new extraction well (VES-4) was installed within 7.5 feet of previous boring A-8. The new well was connected to the full-scale SVE system that was activated in January 1991 and operated for approximately two years. Analysis of post-remedial confirmatory soil samples collected in January 1993 in the treatment area indicated that SVE had been effective in the removal of VOCs detected in the 1988 assessment. (A more detailed summary of the January 1993 sampling results is presented in Section 1.4.2). A confirmatory sample was not specifically collected in the vicinity of previous soil boring A-8D. However, due to its immediate proximity to the SVE wells, it is expected that VOC removal in this area was enhanced. Consequently, SBP believes that the impact to unsaturated soils in the WMU I area has been significantly removed.

Summary

Based on the available information, volatilization of chlorinated organic compounds from soils or groundwater is not likely to be contributing significantly to ambient VOC levels in indoor air within the main building. At off-site locations, groundwater concentrations are much lower and are not anticipated to contribute significantly to ambient VOC levels in indoor air. In addition, as discussed in more detail in Section 3.2.1, soil analytical data are available that suggest that significant VOC concentrations are not partitioning from groundwater into the overlying soils. Based on these data, inhalation of compounds via volatilization from impacted groundwater is not expected to be an exposure pathway of concern.

Should future excavation activities occur in the immediate area surrounding the railroad ditch stormwater outfall south of the G Building, there may be a potential for inhalation of airborne chemicals volatilizing from the deeper soils. The potential for this exposure pathway to occur is considered low since VOC levels are expected to continue to decrease over time; and the impacted area is small. This pathway was evaluated further in Section 4.0.

3.2.5 Food Pathways

Potential food pathways include surface waters currently or potentially used in the future for recreational fishing, crayfish harvesting, etc., and groundwater or surface water currently or potentially used in the future for irrigation of private gardens. The nearest large surface water body, Irwin Creek, that is likely to support a consistent supply of fish is situated approximately three-quarters of a mile from the site. Impacted groundwater from the SBP site is not currently discharging into Irwin Creek or into other surface water features. Based on available information, groundwater and surface water occurring within two (2) miles of the SBP site are not used as sources of potable water, and no water supply wells for other uses such as irrigation are known to exist. Therefore, there are no currently identified food pathways from the SBP site.

Based on groundwater flow and solute transport modeling, the impacted VOC plume emanating from the SBP site is predicted to discharge into Irwin Creek in the future. Since Irwin Creek is used for recreational fishing, it is evaluated in Section 4.0 for future potential for human exposure by ingestion of fish.

3.3 RECEPTORS.

3.3.1 Human Receptors

Identified exposure pathways to potential receptors are limited. The following potential human receptors have been identified based on current site conditions and projected future conditions.

Based on confirmatory soil sampling conducted in May 1997, low levels of VOCs were detected in surface samples at concentrations much lower than the EPA Region III Risk-Based Table residential soil ingestion standards. Transient foot traffic (pedestrians) along the railroad track may be potentially exposed to surface soils in the railroad ditch, yet based on low surface soil VOC concentrations, this pathway is not believed to be of significant concern.

The deeper soils occurring in a limited area beneath the storm outfall drain are presently impacted with VOCs. Given the depth of these impacted soils, exposure may potentially occur as a result of intrusive activities such as excavation, and the expected human receptor would likely be a construction or utility worker.

Groundwater users in the area have not been identified, and based on the depth (~10-25 feet below grade) of the impacted VOC plume, typical dermal and inhalation exposure is not expected. Utility workers periodically replacing or repairing local utilities may potentially be exposed to impacted groundwater or vapors emitted from impacted groundwater.

The May 1997 analytical data indicate that impacted surficial soils in the railroad ditch area are impacting intermittent surface waters in the ditch. Currently, the area surrounding the SBP facility is generally industrial and commercial. The Atherton Mills Lofts (condominiums) are separated from the railroad ditch by a chain link fence. Therefore, it is expected that the potential receptors of exposure from this pathway are limited to transient foot traffic along the railroad tracks and workers conducting maintenance activities. In addition, once SBP remediate the surface soils in the railroad ditch outfall area, this potential pathway is expected to be eliminated.

The groundwater flow and solute transport modeling predicts that surface water may be impacted in the future should present groundwater extraction be stopped. Should this occur, recreational users of the drain/tributary system of Irwin Creek and/or Irwin Creek would be potential human receptors for exposure through dermal contact with impacted surface water, incidental ingestion of impacted surface water, inhalation of vapors emitted from impacted surface water, and ingestion of fish caught from impacted surface water.

3.3.2 Environmentally Sensitive Areas

As stated in Section 3.1.5, there are no known environmentally sensitive areas within 1/4 mile radius of the site with the exception of a few National Historic Sites, such as the Dilworth National Historical Site. The Dilworth National Historical Site is located on the east side of South Boulevard, is situated hydraulically upgradient from the SBP facility, and is not expected to be impacted by the SBP facility given the relative location of the historic site and the impacted media. Based on available information, this area is serviced by CMUD which obtains its water supply from the Catawba River. Therefore there are no known environmentally sensitive receptors within 1/4-radius of the SBP site.

SECTION 6.0
RISK CHARACTERIZATION

This section discusses the identified risk of impacted media from the SBP facility and provides a summary of the major assumptions and data uncertainties associated with the overall risk assessment.

Carcinogenic risks were estimated as the incremental probability of an individual developing cancer over a lifetime as the result of exposure to a potential carcinogen. For low level risks, the slope factor for the chemical is expected to be constant and the risk is expected to be directly related to the intake of the chemical (i.e., risk = chronic daily intake averaged over a lifetime x slope factor). Cancer risk is expressed as a probability that an individual will develop cancer. The EPA RAGS (Part A) (1989) references site remediation goals ranging from one chance in 10,000 ($1x10^{-4}$) to one chance in 10,000,000 ($1x10^{-7}$). The EPA RAGS (Part B) (1991) indicates that action is generally warranted at a site when the cumulative carcinogenic risk is greater than 10^{-4}. When the cumulative current or future baseline cancer risk for a medium is within the range of 10^{-6} to 10^{-4}, a site-specific determination must be made. A cumulative cancer risk of less than 10^{-6} is generally considered to be acceptable without any additional actions.

The potential for chronic non-carcinogenic effects were evaluated by comparing the exposure level over a specified time period to the chemical specific reference dose derived for a similar exposure time period. This ratio of exposure is called a hazard quotient (HQ) (i.e., HQ = intake/ reference dose). Hazard quotients are not probabilities; a hazard quotient of less than 1 indicates that it is unlikely for even sensitive populations to experience adverse health effects. The EPA RAGS (Part B) (1991) indicates that action is generally warranted at a site when the cumulative non-carcinogenic hazard index is greater than 1. A cumulative non-carcinogenic risk of less than or equal to 1 is generally considered to be acceptable without any additional actions.

6.1 CURRENT EXPOSURE PATHWAYS AND RISK EVALUATION

Under current site conditions, potential exposure to impacted media is expected to be limited to the impacted soils and surface waters in the railroad ditch. The exposure pathways assessed for the railroad ditch are by incidental oral ingestion of surface water and soil for workers and children and by inhalation of airborne chemicals for workers. This section quantifies the risks associated with simultaneous exposures to the five identified primary constituents of concern (TCA, TCE, PCE, 1,1-DCE and 1,2-DCE) in this area. Three of these constituents (TCE, PCE, and 1,1-DCE) are thought to be carcinogenic and have EPA derived slope factors. Both potential receptor populations, worker and residential child, were evaluated.

6.1.1 Individual Substances

6.1.1.1 Carcinogenic Risk

The carcinogenic risk for exposure to the three potential carcinogenic constituents of concern (TCE, PCE and 1,1-DCE) in railroad ditch surface water and soil were calculated using the chemical intake values calculated in Section 4.0 and the oral slope factor for each compound (Table 6-1 and 6-2). The estimated carcinogenic risk for workers from individual VOCs ranged from $1x10^{-11}$ to $1x10^{-7}$ for incidental water ingestion and for incidental soil ingestion of VOCs in deeper soils. The estimated carcinogenic risk for workers from individual VOCs is greater than $1x10^{-6}$ for inhalation of airborne chemicals in the deeper soils. The potential for exposure to deeper soils is considered low, since extensive construction is not likely to occur within the railroad easement; VOC levels are expected to continue to decrease over time; and the impacted area is small. The estimated carcinogenic risk for children from individual VOCs ranged from $7x10^{-11}$to $5x10^{-9}$ for incidental water ingestion and for incidental ingestion of VOCs in the surface soils.

6.1.1.2 Chronic Hazard Quotient Calculation

The hazard quotients for non-carcinogenic effects due to exposure to the five primary constituents of potential concern were calculated using the chemical intake values calculated in Section 4.0 and the oral reference dose factor for each compound (Table 6-1 and 6-2). The worker's hazard quotient for individual VOCs for incidental water ingestion and for incidental ingestion of VOCs in the deeper soils ranged from $7x10^{-7}$ to $7x10^{-3}$. The worker's hazard quotients for individual VOCs for inhalation of airborne chemicals in the deeper soils were greater than one. The potential for exposure to deeper soils is considered low, since extensive construction is not likely to occur within the railroad easement; VOC levels are expected to continue to decrease over time; and the impacted area is small. The child's hazard quotient for individual VOCs ranged from $1x10^{-5}$ to $3x10^{-4}$ for incidental water ingestion and for incidental ingestion of VOCs in the surficial soils.

6.1.2 Multiple Substances

6.1.2.1 Carcinogenic Risk

The carcinogenic risks for each of the primary constituents of potential concern were added together for the incidental surface water and soil ingestion pathways for both workers and children (Table 6-1 and 6-2). The total pathway estimated cancer risk for workers in the railroad ditch is $7x10^{-10}$ for the surface water ingestion pathway; $3x10^{-7}$ for the incidental ingestion of VOCs in soil pathway; and greater than $1x10^{-6}$ for the inhalation of airborne chemical pathway. The potential for exposure to deeper soils is considered low, since extensive construction is not likely to occur within the railroad easement; VOC levels are expected to continue to decrease over time; and the impacted area is small. The total pathway estimated cancer risk for children in the railroad ditch is $5x10^{-9}$ for the surface water ingestion pathway and $7x10^{-9}$ for the incidental ingestion of VOCs in soil pathway.

6.1.2.2 Chronic Hazard Quotient Calculation

The hazard quotients for non-carcinogenic effects due to exposure to the primary constituents of potential concern were added together for the incidental surface water ingestion pathway and for the incidental ingestion pathway of constituents in the railroad ditch soils for both workers and children (Table 6-1 and 6-2). For workers, the total pathway estimated hazard quotient in the railroad ditch is $9x10^{-6}$ for the surface water ingestion pathway; $1x10^{-2}$ for the incidental ingestion of VOCs in soil pathway; and greater than one for the inhalation of airborne VOCs pathway. The potential for exposure to deeper soils is considered low, since extensive construction is not likely to occur within the railroad easement; VOC levels are expected to continue to decrease over time; and the impacted area is small. For children, the total pathway estimated hazard quotient in the railroad ditch is $2x10^{-4}$ for the surface water ingestion pathway and $4x10^{-4}$ for the incidental ingestion of VOCs in the surface soil pathway.

6.1.3 Pathway Risk Calculations

The carcinogenic risks and the hazard quotients for each railroad ditch pathway were added together to provide a total cancer risk and a overall potential for non-carcinogenic effects for this area (Table 6-1 and 6-2). The total child cancer risk for the impacted surface media in the railroad ditch is $1x10^{-8}$ and the total child estimated hazard quotient for the impacted surface media in the railroad ditch is $6x10^{-4}$. For workers exposed to deeper soils in the railroad ditch, the total estimated cancer risk is greater than $1x10^{-6}$ and the total estimated hazard quotient is greater than one. The potential for exposure to deeper soils is considered low, since extensive construction is not likely to occur within the railroad easement; VOC levels are expected to continue to decrease over time; and the impacted area is small.

6.2 FUTURE EXPOSURE PATHWAYS AND RISK EVALUATION

Based on flow and transport modeling and assuming no further plume containment, impacted groundwater migration from the SBP site may in the future discharge into a drain tributary system and to Irwin Creek. If such impacted groundwater discharge occurs, then a population may be exposed through incidental surface water ingestion of the impacted stream waters, ingestion of fish from impacted waters, and inhalation of ambient air near impacted surface waters. This section quantifies the risks to children and to adults associated with simultaneous exposures to the primary groundwater constituents of concern (TCA, TCE, PCE, 1,1-DCE,1,2-DCE, 1,2-DCA, 1,1,2-TCA and vinyl chloride) through these three pathways. Five of these constituents (TCE, PCE, 1,1-DCE, 1,2-DCA, 1,1,2-TCA and vinyl chloride) are thought to be carcinogenic and have EPA derived slope factors.

6.2.1 Individual Substances

6.2.1.1 Carcinogenic Risk

The carcinogenic risk for exposure to the potential carcinogenic constituents of concern (TCE, PCE, 1,1-DCE, 1,2-DCA, 1,1,2-TCA and vinyl chloride) in the tributary system and Irwin Creek surface water were calculated using the first and second scenarios chemical intake values determined in Section 4.0 and the oral slope factor for each chemical (Tables 6-3a, 6-3b, 6-4a and 6-4b). Under the first scenario, the estimated carcinogenic risk for both children and adults from individual VOCs ranged from $4x10^{-10}$ to $3x10^{-6}$ for incidental water ingestion. Under the second scenario, the estimated carcinogenic risk for both children and adults from individual VOCs ranged from $3x10^{-9}$ to $4x10^{-5}$ for incidental water ingestion. Under the first scenario, the estimated carcinogenic risk for both children and adults ranged from $2x10^{-10}$ to $4x10^{-7}$ for the ingestion of fish from Irwin Creek. Under the second scenario, the estimated carcinogenic risk for both children and adults ranged from $3x10^{-9}$ to $5x10^{-6}$ for the ingestion of fish from Irwin Creek. Under the first scenario, the estimated carcinogenic risk for both children and adults from individual VOCs ranged from $3x10^{-11}$ to $5x10^{-8}$ for inhalation of ambient air volatilizing from the stream. Under the second scenario, the estimated carcinogenic risk for both children and adults from individual VOCs ranged from $3x10^{-11}$ to $6x10^{-7}$ for inhalation of ambient air volatilizing from the stream.

6.2.1.2 Chronic Hazard Quotient Calculation

The hazard quotients for non-carcinogenic effects due to exposure to the primary constituents of concern for the potential stream exposure population subsets were calculated using the chemical intake values determined in Section 4.0 and the oral reference dose factor for each constituent (Tables 6-3a, 6-3b, 6-4a, and 6-4b). Under the first scenario, the adult's hazard quotient for individual VOC exposure among the three pathways ranged from $3x10^{-7}$ to $5x10^{-3}$. Under the second scenario, the adult's hazard quotient for individual VOC exposure among the three pathways ranged from $2x10^{-6}$ to $1x10^{-3}$. Under the first scenario, the child's hazard quotient for individual VOC exposure among the three pathways ranged from $8x10^{-7}$ to $9x10^{-2}$. Under the second scenario, the child's hazard quotient for individual VOC exposure among the three pathways ranged from $4x10^{-5}$ to $1x10^{-1}$.

6.2.2 Multiple Substances

6.2.2.1 Carcinogenic Risk

The carcinogenic risks for each of the primary constituents of concern were added together for the three exposure pathways for both adults and children under both scenarios (Tables 6-3a, 6-3b, 6-4a and 6-4b). Under the first scenario, the total pathway estimated cancer risks for children are $4x10^{-6}$, $4x10^{-7}$ and $7x10^{-8}$ for the incidental surface water ingestion pathway, the ingestion of Irwin Creek fish pathway and the inhalation of ambient air near stream pathway, respectively. Under the second scenario, the total pathway estimated cancer risks for children are $6x10^{-5}$ $4x10^{-6}$ and $8x10^{-6}$ for the incidental surface water ingestion pathway, the ingestion of Irwin Creek fish pathway and the inhalation of ambient air near stream pathway, respectively. Under the first scenario, the total pathway estimated cancer risks for adults are $1x10^{-7}$, $5x10^{-7}$ and $1x10^{-8}$ for the incidental water ingestion pathway, the ingestion of Irwin Creek fish pathway and the inhalation of ambient air near stream pathway, respectively. Under the second scenario, the total pathway estimated cancer risks for adults are $3x10^{-6}$, $6x10^{-6}$ and $2x10^{-6}$ for the incidental water ingestion pathway, the ingestion of Irwin Creek fish pathway and the inhalation of ambient air near stream pathway, respectively.

6.2.2.2 Chronic Hazard Quotient Calculation

The hazard quotients for non-carcinogenic effects due to exposure to the primary constituents of concern were added together for each of the three pathways for both adults and children under both scenarios (Tables 6-3a, 6-3b, 6-4a and 6-4b). Under the first scenario, the total pathway estimated hazard quotients for children are $1x10^{-1}$, $1x10^{-2}$ and $4x10^{-3}$ for the incidental water ingestion pathway, the ingestion of Irwin Creek fish pathway and the inhalation of ambient air near stream pathway, respectively. Under the second scenario, the total pathway estimated hazard quotients for children are $3x10^{-1}$, $2x10^{-2}$ and $3x10^{-2}$ for the incidental water ingestion pathway, the ingestion of Irwin Creek fish pathway and the inhalation of ambient air near stream pathway, respectively. Under the first scenario, the total pathway estimated hazard quotients for adults are $1x10^{-3}$, $6x10^{-3}$ and $3x10^{-4}$ for the incidental water ingestion pathway, the ingestion of Irwin Creek fish pathway and the inhalation of ambient air near stream pathway, respectively. Under the second scenario, the total pathway estimated hazard quotients for adults are $3x10^{-3}$, $9x10^{-3}$ and $2x10^{-3}$ for the incidental water ingestion pathway, the ingestion of Irwin Creek fish pathway and the inhalation of ambient air near stream pathway, respectively.

6.2.3 PATHWAY RISK CALCULATIONS

The carcinogenic risks and the hazard quotients for each surface water exposure pathway were added together to provide a total cancer risk and a overall potential for non-carcinogenic effects under both scenarios (Tables 6-3a, 6-3b, 6-4a and 6-4b). Under the first scenario, the total estimated cancer risk for exposure to impacted surface water in the tributary system and Irwin Creek is $4x10^{-6}$ for children and $6x10^{-7}$ for adults. Under the second scenario, the total estimated cancer risk for exposure to impacted surface water in the tributary system and Irwin Creek is $7x10^{-5}$ for children and $1x10^{-5}$ for adults. Under the first scenario, the total estimated hazard quotient for exposure to impacted surface water in the tributary system and Irwin Creek is $1x10^{-1}$ for children and $7x10^{-3}$ for adults. Under the second scenario, the total estimated hazard quotient for exposure to impacted surface water in the tributary system and Irwin Creek is $4x10^{-1}$ for children and $1x10^{-2}$ for adults.

6.3 UNCERTAINTIES AND ASSUMPTIONS

6.3.1 Site-Specific Uncertainties

6.3.1.1 Definition of Physical Setting

The following physical setting uncertainties were identified:

- The estimated risk for the railroad ditch area may be overestimated since extensive construction is not likely to occur within the railroad easement; the VOC levels are expected to continue to decrease over time; the impacted area is small (beneath the outfall area); and children are not expected to play in the railroad ditch.
- There is a low potential that the estimated risk for the Irwin Creek area exposure may be over or underestimated since these surface water bodies may be moved or modified in the future and that these changes may invalidate the assumptions used to calculate the in-stream concentrations.
- Carcinogenic slope factors were not available for TCA as of April 1997. Cis- and trans-1,2-DCE are not suspected human or animal carcinogens.
- TCA or 1,2-DCE are not currently considered carcinogenic and were not included in the carcinogenic risk calculations.
- Reference dose factors are not currently available for vinyl chloride, therefore vinyl chloride was not included in the non-carcinogenic risk calculations.
- Dermal exposure was not addressed in this assessment. Based on conversations with EPA Region IV risk assessors and the NCDENR Superfund risk assessors, dermal exposure is not generally taken into consideration for soil and surface water exposure since there is not much evidence for toxicity through the dermal route for most chemicals. The dermal route is considered important when evaluating exposure to potable water.
- There is a high probability that the soil to air exposure risk in the railroad ditch was overestimated since: 1) it is likely that the excavation ventilation

rate would exceed the assumed value; 2) the maximum soil concentrations used in the soil-to-air calculations are located in a small area, soil concentrations in most of this area are much lower; 3) the model assumes homogeneous vapor distribution. As the exposed soil levels are volatilized, exposed soil concentrations will decrease and air concentrations will decrease; and 4) it is not considered likely that an excavation would occur in the near future in this area.

- As discussed in Section 4.4, the second scenario assumes that 100% of the parent constituent degrades into the target degradation constituent and that there is no target constituent degradation or mineralization accompanying the transformation. This results in an unrealistic overestimation of the resulting in-take concentrations.

6.3.1.2 Model Applicability and Assumptions

The applicability of the groundwater flow and solute transport model is discussed in Section 4.2.7 and Section 4.3.4, respectively. Flow and solute transport model assumptions and limitations are discussed in Section 4.2.11.1 and Section 4.3.8.1, respectively. The modeling approach was generally conservative so that it is expected that the estimated risk for the Irwin Creek area may be overestimated.

6.3.1.3 Parameter Values for Exposure Calculations

The parameters used for the exposure calculations were either EPA default values or were estimated based on currently available physical setting characterization information summarized in Section 3.0. The estimated parameter values and their justifications are included in Section 4.5.

6.3.2 Toxicity Assessment Uncertainties

EPA derived toxicity data was used to calculate the estimated risk for the SBP impacted media. These data are generally expected to be conservative values.

SECTION 7.0
SUMMARY

7.1 CHEMICALS OF POTENTIAL CONCERN

Analytical data generated during site assessment and remediation activities were evaluated using RAGS guidance to identify from the extensive data set an abridged list of constituents to consider in the exposure assessment. Results from samples of groundwater, surface water, surface soil, and subsurface soil were reviewed with regard to quantitation limits and chemical occurrences, concentrations, and toxicity reference values.

By ranking confirmed groundwater constituents and their transformation products in a concentration-toxicity screen, five (5) constituents were found to account for over 99% of the relative groundwater exposure risk. TCA, TCE, PCE, 1,1-DCE, and 1,2-DCE were designated as groundwater compounds of potential concern. These five (5) compounds were then used as the baseline list for other media. Due to extreme spatial and temporal variations in analytical results for the surface and subsurface soil media, environmental sample data generated in May 1997, October 1998, January 1999, February 1999, November 1999, and January 2000 from the SWMU II area were selected for comparison with appropriate reference standards (RBC, SSL, etc) to determine if additional compounds should be considered. None were identified for SWMU II.

In addition, a groundwater sample was collected from well MW-14 in April 1997 and analyzed using low detection limits for the EPA Method 8260 constituents. These data were compared to the North Carolina 15A NCAC 2L groundwater standards (Table 2-22). Constituents detected above the 2L standards and the RBC tap water values or that were not detected with detection levels above these values were evaluated relative to total VOCs simulated by solute transport modeling predictive simulations discussed in Section 4.0. Average in-stream constituent concentrations were estimated by first determining the ratios of individual constituent levels to the total VOCs detected in sample MW-14 in the April 1997 sampling event, then by multiplying each ratio by the maximum model-predicted average in-stream tributary concentration of 2,137.105 μg/l (Table 2-23). The resulting average in-stream concentrations were compared to the North Carolina surface water standards and 2L standards (Table 2-23). Most in-stream VOC levels were below these criteria, with the exception of 1,1-DCE, PCE, TCE, 1,2-DCA, 1,1,2-TCA and vinyl chloride. Based on the analysis of the April 1997 data from well MW-14, 1,2-DCA, 1,1,2-TCA and vinyl chloride were added as groundwater CPCs and evaluated as part of the future potential exposure pathway for the SBP groundwater plume discharging into Irwin Creek and one of its tributary systems.

7.2 EXPOSURE ASSESSMENT

Two primary potential exposure sources were identified through the evaluation of physical setting, population, and resource usage. The remaining impacted soils and intermittent surface waters in the railroad ditch were considered a potential current exposure source that will likely diminish with time. The potential for impacted groundwater discharging into Irwin Creek and one of its tributary systems is considered a possible future exposure source. Each of these sources was further evaluated to determine potential exposure pathways and receptors for each source area.

Potential receptors and pathways for the railroad ditch include children or vagrants being exposed to impacted surface soils and puddles by incidental ingestion and workers being exposed to impacted surface puddles by incidental ingestion and to deeper impacted soil by incidental ingestion and inhalation of airborne chemicals. Exposure by dermal contact with surface soils has not been determined to be a major pathway for most chemicals. Inhalation of chemicals volatilizing from surface soils were not evaluated further since concentrations in the surface soils were below the January-June 1996 EPA Region III Risk-Based soil screening levels for transfers from soils to air.

Potential receptors and pathways for the tributary and Irwin Creek include children and adults playing, wading, or fishing and potentially being exposed to surface water by incidental ingestion, inhalation of VOCs vaporizing from the surface water stream, and ingestion of fish caught in impacted surface waters.

7.3 TOXICITY ASSESSMENT

The five (5) primary constituents of potential concern identified for the SBP facility include TCA, TCE, PCE, 1,1-DCE and 1,2-DCE. 1,2-DCA, 1,1,2-TCA, and vinyl chloride were identified as additional groundwater constituents of potential concern. These compounds are man-made solvents or, in the case of 1,2-DCE, degradation products of these solvents. Toxicological profiles have been prepared for these constituents by the DHHS, TSDR which provide a compilation of the available toxicity information. Of the five (5) primary constituents of potential concern, PCE and 1,1-DCE have the lowest available No-Observed-Adverse-Effect levels for inhalation and ingestion, the lowest time-weighted average threshold limit values (TWA-TLV), and are considered possible carcinogens. TCA and 1,2-DCE have relatively high TWA-TLVs and the cancer data are considered incomplete. 1,2-DCA is considered a probable carcinogen. 1,1,2-TCA is considered a possible carcinogen. Vinyl chloride is classified as a known carcinogen of medium carcinogenic hazard.

7.4 RISK CHARACTERIZATION

Cancer risk is expressed as a probability that an individual will develop cancer. The EPA RAGS (1989) references site remediation goals ranging from one chance in 10,000 ($1x10^{-4}$) to one chance in 10,000,000 ($1x10^{-7}$). The EPA RAGS (Part B) (1991) indicates that action is generally warranted at a site when the cumulative carcinogenic risk is greater than 10^{-4}. When the cumulative current or future baseline cancer risk for a medium is within the range of 10^{-6} to 10^{-4}, a site-specific determination must be made. A cumulative cancer risk of less than 10^{-6} is generally considered to be acceptable without any additional actions. Hazard quotients are not probabilities; a hazard quotient of less than 1 indicates that it is unlikely for even sensitive populations to experience adverse health effects. The EPA RAGS (Part B) (1991) indicates that action is generally warranted at a site when the cumulative non-carcinogenic hazard index is greater than 1. A cumulative non-carcinogenic risk of less than or equal to 1 is generally considered to be acceptable without any additional actions.

In accordance with RAGS, the carcinogenic risks and the hazard quotients for each constituent were totaled for the railroad ditch pathway and the tributary/Irwin Creek surface water pathway to provide the total cancer risk and overall potential for non-carcinogenic effects for each area. This was done for two scenarios described in Section 4.4. For children exposed to the railroad ditch area, the total estimated cancer risk is $1x10^{-8}$ and the total estimated hazard quotient is $6x10^{-4}$. In the tributary and Irwin Creek area, the total estimated cancer risk for children is $4x10^{-6}$ and $7x10^{-5}$ for Scenario 1 and Scenario 2, respectively. The total estimated cancer risk for adults in the tributary and Irwin Creek area is $6x10^{-7}$ to $1x10^{-5}$ for Scenario 1 and Scenario 2, respectively. The total estimated hazard quotient for both children and adults in the tributary and Irwin Creek area is less than 1. Based on the risk estimates, exposure to the railroad ditch area for children and other pedestrians and to the tributary/Irwin Creek area under Scenario 1 results in acceptable cancer risk levels and hazard quotients. Exposure to the tributary/Irwin Creek area for children and other pedestrians under Scenario 2, which likely overestimates potential future concentrations in the surface water, results in a cancer risk within the range that generally is evaluated on a site specific basis and an acceptable hazard quotient.

For workers potentially exposed to the deeper soils in the railroad ditch, the total estimated cancer risk is greater than $1x10^{-6}$ and the total estimated hazard quotient is greater than one. There is a high probability that the soil to air exposure risk in the railroad ditch was over estimated for the following reasons.

1) It is likely that the excavation ventilation rate would exceed the assumed value.
2) The maximum soil concentration used in the soil-to-air model is located in a relatively small area.
3) Soil concentrations in most of this area are much lower and the model assumes homogeneous vapor distribution. As the exposed soil levels are volatilized, the exposed soil concentrations will decrease and air concentrations will also decrease.
4) It is not considered likely that an excavation or extensive construction would occur in the near future within the railroad right-of-way and easement.
5) VOC levels are expected to continue to decrease over time.
6) The impacted area is small.

Based on the most probable exposure pathways (i.e., exposure to surface waters in the railroad ditch and in the tributary/Irwin Creek) and the more realistic predicted future surface water concentrations (i.e., Scenario 1), the potential for non-carcinogenic and carcinogenic effects are within EPA-based acceptable limits. Given the results of this risk assessment, SBP wishes to pursue termination of interim remedial activities for the facility located at 2000 South Boulevard, Charlotte, North Carolina.

7.5 PROPOSED ALTERNATE CONCENTRATION LEVELS

Maximum groundwater concentrations of individual VOCs detected in on- and off-site monitoring wells during the October 1992/July 1993, January 1995 and January/February 1998 sampling events are summarized in Table 2-22. These data indicate that voluntary corrective action efforts initiated in 1990 have reduced on-site contaminant levels by approximately 80%.

The most elevated on-site concentrations of VOCs have been detected in well cluster MW-14/MW-14A/MW-14B situated slightly upgradient of the outfall source area (Tables 1-10R and 1-11R). A sample was collected from well MW-14 in 1997 and analyzed using the lowest possible detection levels. That sample data is believed to best provide an estimate of the ratios of individual constituent concentrations (not typically detected due to elevated detection levels) to total VOC concentration in the outfall source area.

Samples were collected from wells MW-14A (PWR) and MW-14B (saprolite) in February 2000. Outfall source loading in the solute transport model was assigned based on a calibration to the 1998 and late 1999 (MW-14)/early 2000 (MW-14A/MW-14B) sampling data for wells MW-14, MW-14A and MW-14B. Outfall source loading in the predictive solute transport model, input as layer total VOC concentrations, is believed to represent the maximum total VOC concentrations anticipated once the groundwater remediation system is no longer in use. Whereas existing monitoring well cluster MW-14/MW-14A/MW-14B is proximal to the outfall source, this well cluster is proposed as an on-site monitoring point to evaluate Alternate Concentration Limit (ACL) compliance.

The most probable exposure pathway for the SBP groundwater plume is groundwater discharge to surface water. Based on a predictive solute transport model and using the more realistic predicted future surface water concentrations (i.e., Scenario 1), the potential for non-carcinogenic and carcinogenic effects for children and adults that may be exposed to contaminants in the tributaries and Irwin Creek are within the EPA-based acceptable limits. Therefore, SBP proposes to assign the maximum analyte concentrations detected in well cluster MW-14/MW-14A/MW-14B that were used to calibrate the solute transport model as the proposed ACLs. Table 7-1 includes a summary of the 1997 MW-14 sample with low detection limits, the maximum 1998 SBP groundwater plume levels, and the 2000 MW-14A levels for constituents historically detected in the SBP groundwater. The table also includes a list of the current, interim or recommended North Carolina 2L groundwater standards. The proposed ACLs are

1) the maximum level of a constituent detected in 1997, 1998 or 2000;
2) the detection level of the constituent for the 1997 MW-14 sample if the constituent was not detected in 1997, 1998, or 2000; or
3) the current, interim or proposed 2L groundwater standard if the constituent was detected at levels below the 2L standard or if the 1997 detection level was below the 2L standard (Table 7-1).

These proposed ACLs will be specific to the proposed compliance monitoring point.

Also, in consideration of the potential for some contaminant attenuation as shown by the detection of degradation products in groundwater samples, a second risk evaluation criterion based on allowable exposure levels (AELs) is proposed for the area downgradient of the plume source areas. Proposed monitoring criteria are based on both ACLs for the source areas and AELs for the downgradient monitoring points. Dual criteria are proposed because plume attenuation mechanisms are not thoroughly understood and the model cannot reasonably predict the potential for biodegradation. The proposed ACLs are listed in Table 7-1. These ACLs are proposed to evaluate compliance and the applicability of the predictive model. Proposed ACLs would be appropriately applied to and monitored in the vicinity of the plume source areas. Compliance monitoring can be conducted in existing on-site monitoring wells MW-14B (saprolite horizon), MW-14A (PWR horizon) and MW-14 (fractured rock horizon) that are situated proximal to the outfall source areas.

Minor excursions of the ACLs may be tolerated in the plume source areas provided that AELs are established to monitor plume migration hydraulically downgradient of the source areas. It is reasonable to assume that such proposed monitoring can be evaluated using AELs based upon model-predicted constituent concentrations in this portion of the plume.

The monitoring of VOC levels will be conducted following cessation of active remediation to evaluate the applicability of the solute transport model. It is anticipated that VOC levels in the source areas will diminish with time. However, since the groundwater plume is migrating through a fixed point, downgradient wells are predicted to reach maximum levels at varying times. Therefore, time-specific criteria is proposed to determine monitoring compliance. Model predicted total VOC concentrations in the short term will be compared with actual monitoring data from designated monitoring wells situated within the contaminant plume to evaluate the model prediction. Following confirmation of model predicted concentrations with actual monitoring data, monitoring will be discontinued.

To establish a short term monitoring criteria, a maximum total VOC concentration predicted by the solute transport model at a selected monitoring point for simulation years one through five would be assigned as the monitoring compliance limit. Designated plume monitoring points are proposed herein for which allowable limits have been determined (Table 7-2). It should be noted that the assigned concentration limits do not generally reflect the maximum model predicted plume concentrations passing through the selected monitoring points. It is proposed that AELs be based on model-predicted total VOC concentrations for existing off-site monitoring well cluster PZ-1/EW-3/ATP-3A and well cluster ROW-1 and ROW-1A. SBP attempted to negotiate with the City of Charlotte and the property owner adjacent to the railroad tracks to install two (2) additional monitoring wells that would have been located closer to the railroad drainage ditch outfall source area. An agreement could not be reached, therefore, SBP is proposing to monitor downgradient well cluster ROW-1 and ROW-1A. SBP proposes the AELs listed in Table 7-2 that are based on model predicted total VOC levels for these wells in years 1-5 after the groundwater remediation system is turned off.

This dual criteria approach will allow for the evaluation of contaminant attenuation and the validity of groundwater model predictions. Both ACLs from on-site source area wells and AELs from off-site plume wells will be evaluated to determine compliance. Whereas, fluctuations in the constituent concentrations of source area samples would be anticipated, minor excursions above ACLs may be acceptable provided that AELs are not exceeded. Other existing monitoring wells can be monitored as needed to provide supporting data.

Contaminant travel time is primarily dependent on advective groundwater flow velocity (average linear groundwater velocity), contaminant dispersion and retardardation. Model input to mathematically represent these hydraulic parameters is summarized in Table 4-3a. Advective groundwater velocities were calculated using equation:

$$V_{gw} = \frac{K_h \times dh/dl}{\eta}$$

GROUNDWATER AND CONTAMINANT VELOCITIES

Parameter	**Saprolite**		**PWR**		**Fractured Bedrock**	
	Source Area	**Beyond Existing Plume**	**Source Area**	**Beyond Existing Plume**	**Source Area**	**Beyond Existing Plume**
Horizontal Hydraulic Gradient (dh/dl) (feet/foot)	0.012	0.028[1]	0.012	0.028[1]	0.012	0.028[1]
Estimated Advective Groundwater Velocity (V_{gw}) (feet/day)	0.04	0.09	0.06	0.14	0.07	0.15
Estimated Contaminant Travel Distance (ft) Per Year	14.60	32.85	21.90	51.10	25.55	54.75
Estimated Contaminant Travel Distance (ft) Over 3 years	43.8	98.55	65.7	153.3	76.65	164.25

Note: 1–Horizontal hydraulic gradient is estimated based on surface topography and model results.

Contaminant dispersion and adsorption (retardation) also effect contaminant travel time. The effect of dispersion is to produce a groundwater pore velocity that is greater than the average linear groundwater velocity and retardation results in a contaminant velocity that is less than the average linear groundwater velocity. The modeling results indicate that dispersion and retardation appear to effectively cancel each other. Thus, the net effect is that the contaminant plume is migrating at a rate roughly equal to the advective groundwater velocity. Estimated contaminant travel distances calculated for a period of one year and three years are summarized above.

7.6 SUMMARY AND CONCLUSIONS

The risk of potential human exposure to chemical constituents of concern identified at the SBP site was evaluated for pathways within groundwater, soil, surface water, air, and food. The likelihood that sensitive populations such as children would experience adverse health effects and the likelihood that individuals would develop cancer were evaluated for each pathway.

Public or private groundwater wells were not identified within a radius of ¼ mile of the SBP site. City-supplied potable water withdrawn from a surface water source outside the impacted area is available to industrial, commercial and residential users in the general area.

Contaminant residuals remain in subsurface soils within an identified source area at the SBP site. The potential for direct exposure to these soils is limited to workers who may conduct deep excavation activities in this particular area and can be safely managed by using appropriate worker protection. Remaining soil contaminants are likely to leach into the groundwater. To account for this, the solute transport model provides continual loading in the outfall area. SBP proposes to monitor groundwater quality for three (3) years on a semi-annual after active plume containment has been terminated to demonstrate compliance with the approved standards. If the HWS requires an additional two (2) years of monitoring, SBP may petition for a reduction in monitoring frequency to annually.

The most probable potential for exposure to constituents of concern from the SBP facility is by two (2) pathways: 1) the storm drain outfall area in the railroad ditch west of the SBP site; and 2) groundwater discharge to Irwin Creek and/or its tributary streams/drains were evaluated in this risk assessment. Whereas the SBP plume does not currently reach Irwin Creek and/or its tributary streams/drains, a computer code was used to model plume movement away from the SBP source areas. Plume transport model parameters and assumptions were developed for the groundwater-to-surface water discharge evaluation of Irwin Creek and its tributaries. Current total VOC levels were input into the contaminant transport model and were allowed to migrate without plume containment by groundwater pumping wells. In addition, the solute transport model provides continual loading in the outfall area to represent the potential leaching of VOCs from the railroad drainage ditch soils. The chances that children would experience adverse health effects or an individual would develop cancer are within USEPA-based acceptable limits based upon the risk evaluation of these surface water pathways assuming the more realistic predicted future surface water concentrations (i.e., Scenario 1).

Based upon the risk assessment findings, there is a low potential for inhalation of airborne contaminants emanating from impacted soils and groundwater at the SBP site. The ingestion of fish from Irwin Creek or one of its tributaries is the most probable food pathway. Exposure to fish ingestion, based on plume transport modeling, has a low probability for the development of cancer or other adverse human health effects.

In conclusion, the SBP facility is located in a historically industrialized area of Charlotte, North Carolina. Specific locations within this area have applied for and have been granted Brownfield designations from the NCDENR. SBP has voluntarily been conducting soil and groundwater remediation activities at the site since 1990. These remediation activities have resulted in a significant reduction in both soil and groundwater contamination. In conjunction with the preparation of the Post-Closure Permit Application for submittal to the NCDENR and USEPA, SBP prepared a Baseline Risk Assessment to evaluate the necessity of continued remedial activities based on the potential risk of exposure to constituents remaining in soil and groundwater at the site. Results from the risk assessment indicate that there is a low probability for adverse health effects or for an individual to develop cancer resulting from exposure to constituents of concern from the SBP site using current maximum concentrations and reasonable predictive future maximum concentrations.

To protect human health from potential exposure to plume constituents, groundwater monitoring criteria are proposed based on both ACLs for the source areas and AELs for the portion of the contaminant plume downgradient of the plume source. Dual criteria are proposed because plume attenuation mechanisms are not thoroughly understood and the model cannot reasonably predict the potential for biodegradation. SBP proposes to use the maximum constituent concentrations detected in existing on-site well cluster MW-14/MW-14A/MW-14B as the proposed ACLs. Minor excursions of the ACLs may be tolerated in the plume source areas by establishing AELs to monitor plume migration hydraulically downgradient of the source areas. It is reasonable to assume that such proposed monitoring will be evaluated using AELs based upon time-specific model predicted constituent concentrations in this portion of the plume. Whereas, early detection of potential exposure is desired, AELs will be based on model-predicted concentrations for well cluster PZ-1/EW-3/ATP-3A and well cluster ROW-1 and ROW-1A.

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Table	Description
1-1	SWMU II Soil Sample Analytical Summary - May 1997
1-2	Groundwater Sample Analytical Summary - January 1995
1-1R	SWMU II Soil Sample Analytical Summary - February 1998
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1-3R	Soil Cleanup Levels for the Outfall Area
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1-9R	SWMU II Soil Sample Analytical Summary – January 2000
1-10R	SWMU II Groundwater Analytical Summary – January/February 2000
1-11R	Monitoring Well MW-14 Analytical Summary

Table 1-11R
Monitoring Well MW-14 Analytical Summary
South Boulevard Properties, Inc.
Charlotte, North Carolina

Sample Date: / Concentration Unit: / Constituent	MW-14 1/23/90 (ug/l)	10/15/92 (ug/l)	1/18/95 (ug/l)	4/23/97 (ug/l)	7/10/98 (ug/l)	7/30/98 (ug/l)	1/11/99 (ug/l)	7/1/99 (ug/l)
Acetone	3,320 B	4,150	< 5,000	<600	< 25,000	< 2,500	< 600	< 2,500
Benzene	< 250	< 50	< 2,500	< 25	< 1,000	< 1,000	< 25	< 100
2-Butanone	< 500	< 100	< 5,000	1,100	< 10,000	< 10,000	< 250	< 1,000
Chloroethane	< 500	< 100	< 5,000	< 25	< 1,000	< 1,000	< 25	< 100
Chloroform	< 250	< 50	< 2,500	< 25	< 1,000	< 1,000	< 25	< 100
Chloromethane	< 500	< 100	< 5,000	< 25	< 1,000	< 1,000	< 25	< 100
1,1-Dichloroethane	< 250	2,800	7,360	700	< 1,000	< 1,000	260	130
1,1-Dichloroethene	85 J	44,700	74,500	5,400	1,400	1,100	910	920
1,2-Dichloroethane	< 250	350	< 2,500	110	< 1,000	< 1,000	< 25	< 100
cis-1,2-Dichloroethene [1]	295	4,400	5,080	530	< 1,000	< 1,000	510	370
trans-1,2-Dichloroethene [1]	NR	NR	NR	< 25	< 1,000	< 1,000	< 25	< 100
Ethylbenzene	< 250	56	< 2,500	54	< 1,000	< 1,000	< 25	< 100
Methylene Chloride	130	101 B	< 2,500	< 120	< 5,000	< 5,000	< 120	< 500
4-Methyl-2-Pentanone	< 500	< 100	< 5,000	< 250	< 10,000	< 10,000	< 250	< 1,000
Tetrachloroethene	250	4,100	8,290	1,300	< 1,000	< 1,000	600	480
Toluene	< 250	1,774	5,040	630	< 1,000	< 1,000	< 25	< 100
1,1,1-Trichloroethane	165 J	51,900	93,400	19,000	< 1,100	5,200	7,600	4,100
1,1,2-Trichloroethane	< 250	< 50	< 2,500	730	< 1,000	< 1,000	120	< 100
Trichloroethene	6,055	261,750	389,000	43,000	19,000	25,000	32,000	18,000
Xylene, total	< 250	60	< 2,500	240	< 2,000	< 2,000	< 50	< 200
Vinyl Chloride	< 500	163	< 5,000	< 25	< 1,000	< 1,000	< 25	< 100

Note: [1] - cis-1,2-dichloroethene and trans-1,2-dichloroethene reported together as total 1,2-dichloroethene prior to December 1996.

Table 1-5R
SWMU II Soil Sample Analytical Summary - February 1999
South Boulevard Properties, Inc., Charlotte, NC

Parameter	Sample Identification						Residential
	OF-1	0F-2	OF-3	OF-4	OF-5	OF-6	Ingestion Std.
Carbon Tetrachloride	7.6	<2,100	<2,300	12	5,500	16	4,900
cis-1,2-Dichloroethene	<7.4	<2,100	<2,300	<6.0	<2,800	16	780,000
Tetrachloroethene	14	3,500	<2,300	54	40,000	52	12,000
1,1,1-Trichloroethane	61	9,500	<2,300	100	46,000	130	1,600,000
1,1,2-Trichloroethane	<7.4	<2,100	<2,300	8.6	<2,800	<7.2	11,000
Trichloroethene	16	14,000	70,000	100	11,000	<7.2	58,000

Notes: Units are $\mu g/kg$
Samples collected from 0-6" below grade.
Taken from the EPA Region III Risk Based Concentration Table, October 27
☐ - Result is above the October 27, 1999 Region III Risk-Based Concentrati levels for residential ingestion.

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Table 1-6R
WMU I Soil Sample Analytical Summary
South Boulevard Properties, Inc.
Charlotte, North Carolina

Parameter	Sample Identification (~depth/date of collection)														
	A-1B (8.5') Jun-88	A-2E (7.75') Jun-88	A-5A (3-4') Jun-88	A-5D (5.5') Jun-88	A-7B (10.3') Nov-88	A-7A (10') Jun-91	AB-7 (10') Jan-93	A-7C (14.8') Nov-88	A-8D (10') Nov-88	A-8F (15') Nov-88	A-9C (13') Nov-88	AB-9 (13') Jan-93	A-10C (10') Nov-88	A-10D (15') Nov-88	SA-C (10') Nov-88
Methylene Chloride	10	1,049	15	47	<630	14 B	<6.8	<630	659	<630	<630	<6.7	41 B	<6,300	76 B
Acetone	129	9,349	59	133	<1,300	43 B	67 TF	<1,300	<1,300	<1,300	<1,300	83 BT	57	13,00	229
2-Butanone	272	<10	<10	<10	<1,300	5 J	<14	<1,300	<1,300	<1,300	<1,300	<13	<50	13,00	<50
1,1,1-Trichloroethane	<5	159	10	128	<630	<6.8	<6.8	<630	<630	<630	<630	<6.7	<25	<6,300	74
Trichloroethene	<5	5,007	40	68	2,061	<6.8	<6.8	11,036	8,974	10,714	8,683	<6.7	938	149,495	4,107
1,1,2-Trichloroethane	7	<5	<5	<5	<630	<6.8	<6.8	<630	<630	<630	<630	<6.7	<25	<6,300	882

Notes:

Units are μg/kg

Only constituents detected in at least one sample are included in this table.

B= Detected in the method blank

J= Estimated value. Detected at a level below the method quantitation limit

T= Detected in the trip blank

F= Detected in field blank

<10= Detected below the method quantitation limit specified

Table 1-7R

SWMU II Post-Excavation Surface Soil and Surface Water Analytical Summary – Nov. 1999
South Boulevard Properties, Inc., Charlotte, NC

Surface Soil Samples

Parameter	South Background (µg/kg)	North Background (µg/kg)	North Background Duplicate (µg/kg)	Ingestion Standard[2] (µg/kg)	North Carolina SSL[3] (µg/kg)
Tetrachloroethene	<240	<310	350	12,000	7.42
1,1,1-Trichloroethane	370	2,600	3,300	1,600,000	1,670
Trichloroethene	6,000	<310	< 320	58,000	18.3

Notes:

1. Only those compounds detected in at least one sample are listed.
2. Residential Ingestion Levels from EPA Region III Risk-Based Concentration Table, October 1999.
3. North Carolina Soil Screening Level concentration for contaminant transfer from soil to groundwater, revised December 1999.

Surface Water Sample

Parameter	SWMU II Outfall (µg/l)	NC Provisional Surface Water Standard (µg/l)
1, 1 - Dichloroethane	2.1	42
cis-1,2-Dichloroethene	4.4	6,740
1,1,1-Trichloroethane	40	555
Tetrachloroethene	2.3	8.85

Notes:

1. Only those compounds detected in at least one sample are listed.
2. North Carolina Provisional Surface Water Standards per Diane Reed, Water Quality Division, Dept. of Environment and Natural Resources.

Table 1-8R
SWMU II Subsurface Soil Analytical Summary – November 1999
South Boulevard Properties, Inc., Charlotte, NC

Parameter	Excavation South (µg/kg)	Excavation Center (µg/kg)	Excavation North (µg/kg)	Ingestion Standard [2] (µg/kg)	North Carolina SSL[3] (µg/kg)
Carbon tetrachloride	560	<23,000	<28,000	4,900	2.74
1,1-Dichloroethane	360	73,000	< 28,000	7,800,000	3,820
cis-1,2-Dichloroethene	1,300	< 23,000	< 28,000	780,000	350
4-Methyl-2-pentanone	64,000	< 120,000	< 140,000	6,300,000	2,280
Tetrachloroethene	2,600	140,000	280,000	12,000	7.42
Toluene	< 290	26,000	< 28,000	16,000,000	7,270
1,1,1-Trichloroethane	3,200	6,500,000	1,300,000	1,600,000	1,670
Trichloroethene	7,900	830,000	110,000	58,000	18.3

Notes:
1. Only those compounds detected in at least one sample are listed.
2. Residential Ingestion Levels from EPA Region III Risk-Based Concentration Table, October 1999.
3. North Carolina Soil Screening Level concentration for contaminant transfer from soil to groundwater, revised December 1999.

Table 1-9R
SWMU II Soil Sample Analytical Summary - January 2000
South Boulevard Properties, Inc.
Charlotte, North Carolina

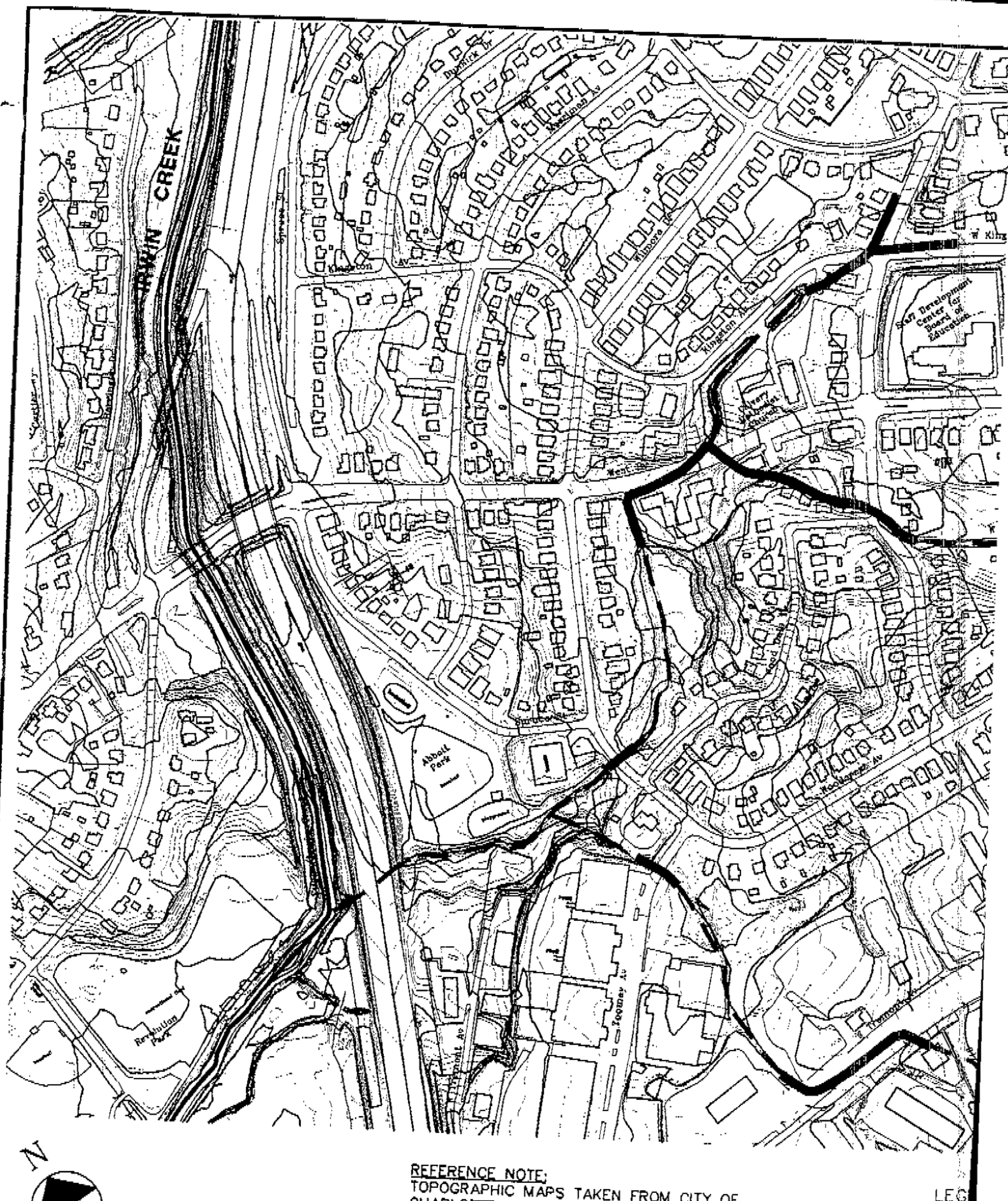
Parameter	Sample Identification (Boring-Depth)																NC HWS SSLs	ACL SSLs
	SB-7	SB-11	SB-15	SB-20	SB-24	CB-7	CB-11	CB-15	CB-22	CB-28	NB-7	NB-11	NB-15	NB-22	NB-28	NB-31		
1,1,1-Trichloroethane	290	17	31	460	27	410	210	52	56	22	150	30	15	39	14	40	1.67	183.516
Trichloroethene	390	160	40	480	80	160	220	81	120	67	41	14	23	74	38	100	0.0183	980.119
Tetrachloroethene	340	100	17	380	<2.8	77	67	30	<5.1	<3.4	12	6	16	4.7	4.9	4.2	0.00742	73.188
1,1,2-Trichloroethane	16	8.5	<3.3	<20	<2.8	<17	<6.1	<3.3	<5.1	<3.4	<8.0	0.65	<1.3	<3.0	<2.7	<2.9	0.00334	6.678
Toluene	89	26	<3.3	82	<2.8	20	<6.1	<3.3	<5.1	<3.4	<8.0	<.62	<1.3	<3.0	<2.7	<2.9	7.27	15.277
Ethylbenzene	40	<6.3	<3.3	29	<2.8	<17	<6.1	<3.3	<5.1	<3.4	<8.0	<.62	<1.3	<3.0	<2.7	<2.9	0.241	0.449
Xylenes	170	17	4.8	120	<2.8	46	<6.1	<3.3	<5.1	<3.4	<8.0	0.67	<1.3	<3.0	<2.7	<2.9	4.96	4.958

Notes:
Units are mg/kg.
Samples collected on January 9, 2000.
Samples analyzed for volatile organic compounds (VOCs) by EPA Method 8260.
Only those compounds detected in at least one sample are listed in Table 1-9R.
NC HSW SSLs = Taken from "Guidelines for Determining Soil and Groundwater Clean-up Levels at RCRA Hazardous Waste Sites" Revised Draft 12/99.
Values based on 2L groundwater standards.
ACL SSLs = Values calculated using equation from above reference and the proposed Alternative Concentration Levels (ACLs).

Table 1-10R
SWMU II Groundwater Analytical Summary - January/February 2000
South Boulevard Properties, Inc.
Charlotte, North Carolina

Parameter	Units	Sample Identification		
		CB-W	MW-14A	MW-14B
1,1-Dichloroethane	ug/l	<2,500	1,900	<25
1,1-Dichloroethene	ug/l	<2,500	34,000	650
1,2-Dichloroethene (cis)	ug/l	<2,500	3,000	<25
Tetrachloroethene	ug/l	3,100	6,900	160
Toluene	ug/l	<2,500	2,100	<25
1,1,1-Trichloroethane	ug/l	120,00	18,000	3,000
1,1,2-Trichloroethane	ug/l	<2,500	1,200	<25
Trichloroethene	ug/l	120,000	150,000	3,600

Notes:
Sample CB-W was a grab sample collected on January 14, 2000 collected on January 9, 2000 from a shallow temporary well installed in the outfall area.
Sample MW-14A was collected from the newly installed PWR well on February 17, 2000
Sample MW-14B was collected from the newly installed saprolite well on February 17, 2000
Samples analyzed for volatile organic compounds (VOCs) by EPA Method 8260.
Only those compounds detected in at least one sample are listed in Table 1-9R.



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REFERENCE NOTE:
TOPOGRAPHIC MAPS TAKEN FROM CITY OF CHARLOTTE, NORTH CAROLINA ENGINEERING DEPARTMENT DRAWINGS: SHEET No. 14, DATED 1981 AND SHEET No. 15, DATED 1980, STORM DRAINS 1982.

SCALE: 1"= 400'

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LEG

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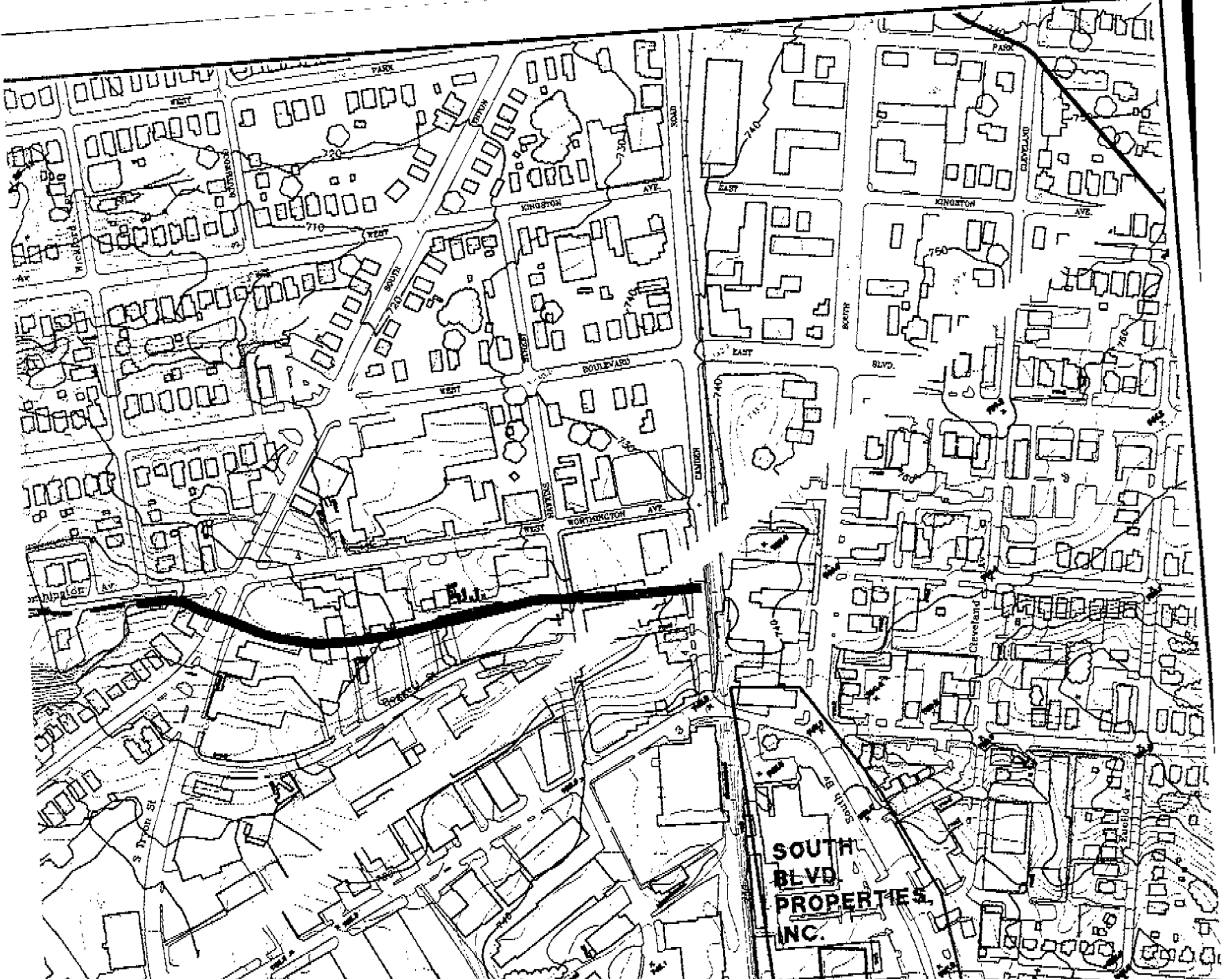
Xrefs. 105TOPO14.DWG 105TOPO3.DWG



END

APPROXIMATE LOCATION OF OPEN INTERMITTENT STREAM/ENGINEERED STORM DRAINS

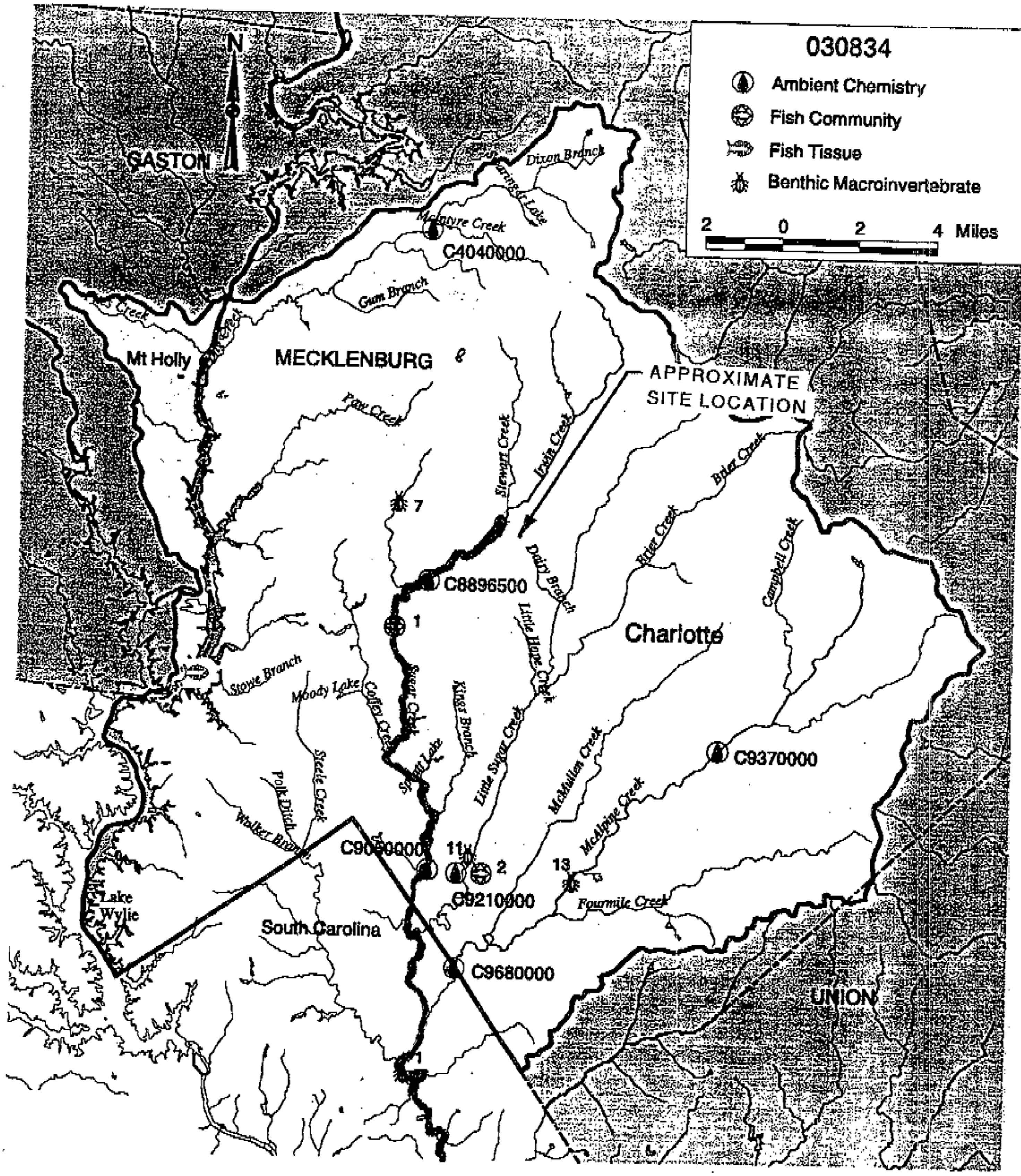
APPROXIMATE LOCATION OF PIPED INTERMITTENT STREAM ENGINEERED STORM DRAIN

SITE BOUNDARIES

MAP OF IRWIN CREEK'S OPEN/PIPED TRIBUTARY USED IN THE GROUNDWATER FLOW/SOLUTE TRANSPORT

SOUTH BOULEVARD PROPERTIES, INC.
2000 SOUTH BOULEVARD
CHARLOTTE, NORTH CAROLINA

SCALE AS NOTED	APPROVED BY :	DRAWN BY: J.K.S.
DATE JANUARY 2000	DESIGNED BY :	REVISED
PROJECT NUMBER N105–54	AWARE INC 9305-J MONROE RD. CHARLOTTE, NC 28270	DRAWING NO. FIGURE 3-



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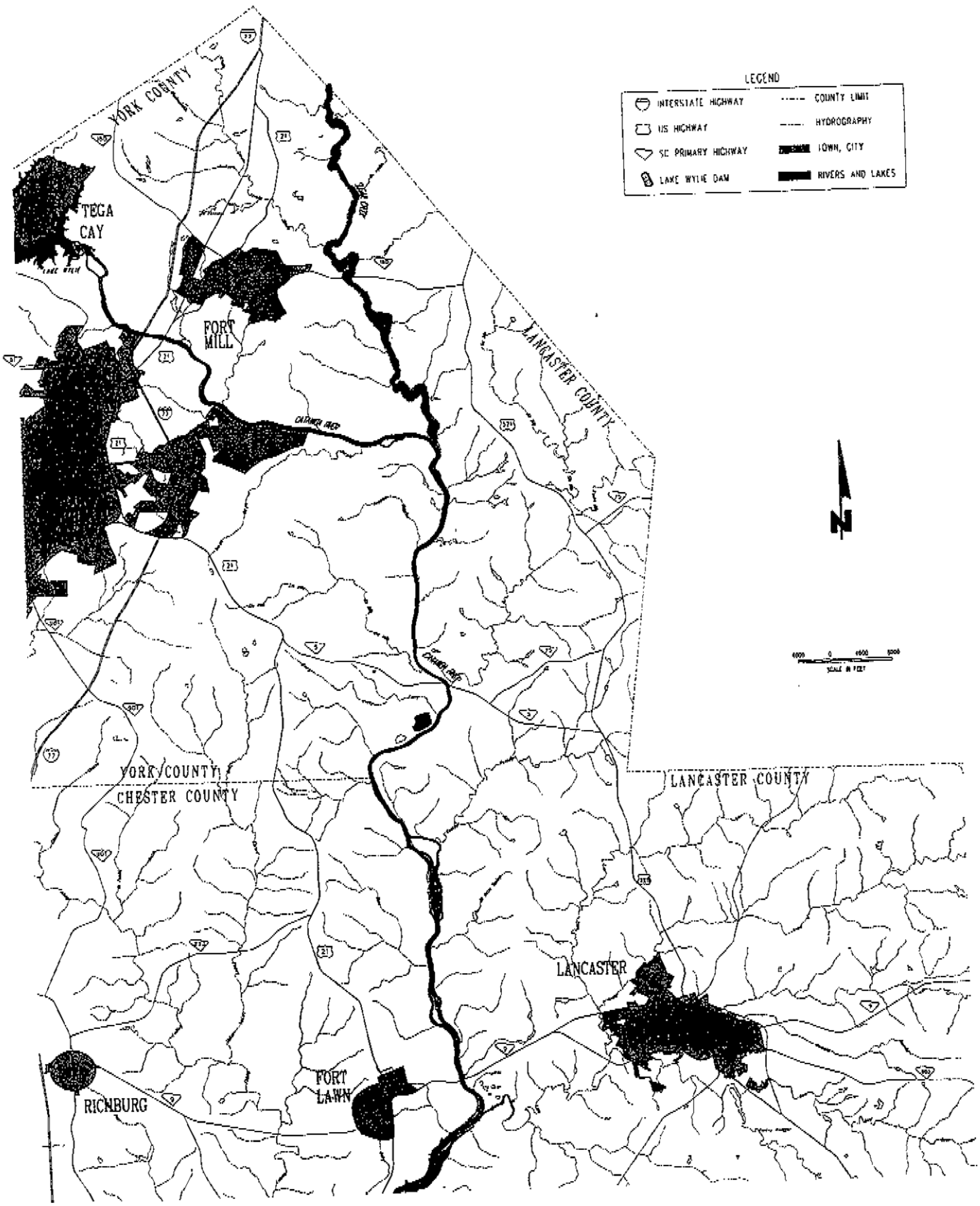
REFERENCE:
MAP TAKEN FROM ENVIRONMENTAL SCIENCES BRANCH BASINWIDE ASSESSMENT REPORT. CATAWBA RIVER BASIN, AUGUST 1998. NCDENR DIVISION OF WATER QUALITY. WATER QUALITY SECTION, PAGE 75.

FIGURE 3-2R
FLOW PATHWAY OF IRWIN CREEK AND SUGAR CREEK IN NORTH CAROLINA

AWARE ENVIRONMENTAL INC

AEI PROJECT No. N105-54



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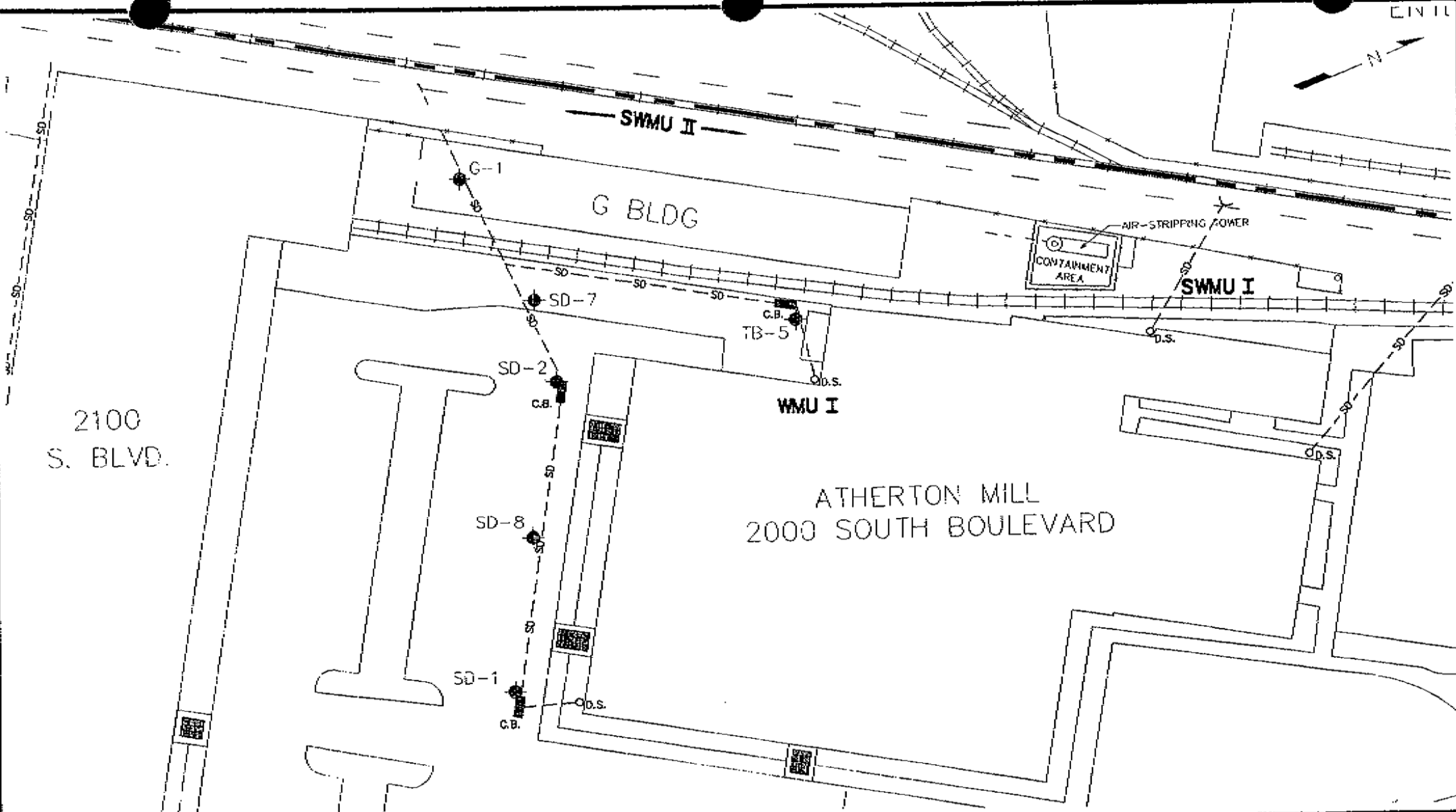
REFERENCE:
MAP TAKEN FROM THE SOUTH CAROLINA CATAWBA RIVER CORRIDOR PLAN, SOUTH CAROLINA DEPARTMENT OF NATURAL RESOURCES, SOUTH CAROLINA DEPARTMENT OF PARKS, RECREATION AND TOURISM, CATAWBA REGULATORY PLANNING COUNCIL, SOUTH CAROLINA CATAWBA RIVER TASK FORCE. DATED SEPTEMBER 1994, REP. No. 2, PAGE 7, FIGURE 1.

FIGURE 3-3R
FLOW PATH OF SUGAR CREEK IN SOUTH CAROLINA

AWARE ENVIRONMENTAL INC

AEI PROJECT No. N105-54



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APPROXIMATE SOIL BORING LOCATION

— SD — SD — STORM DRAIN

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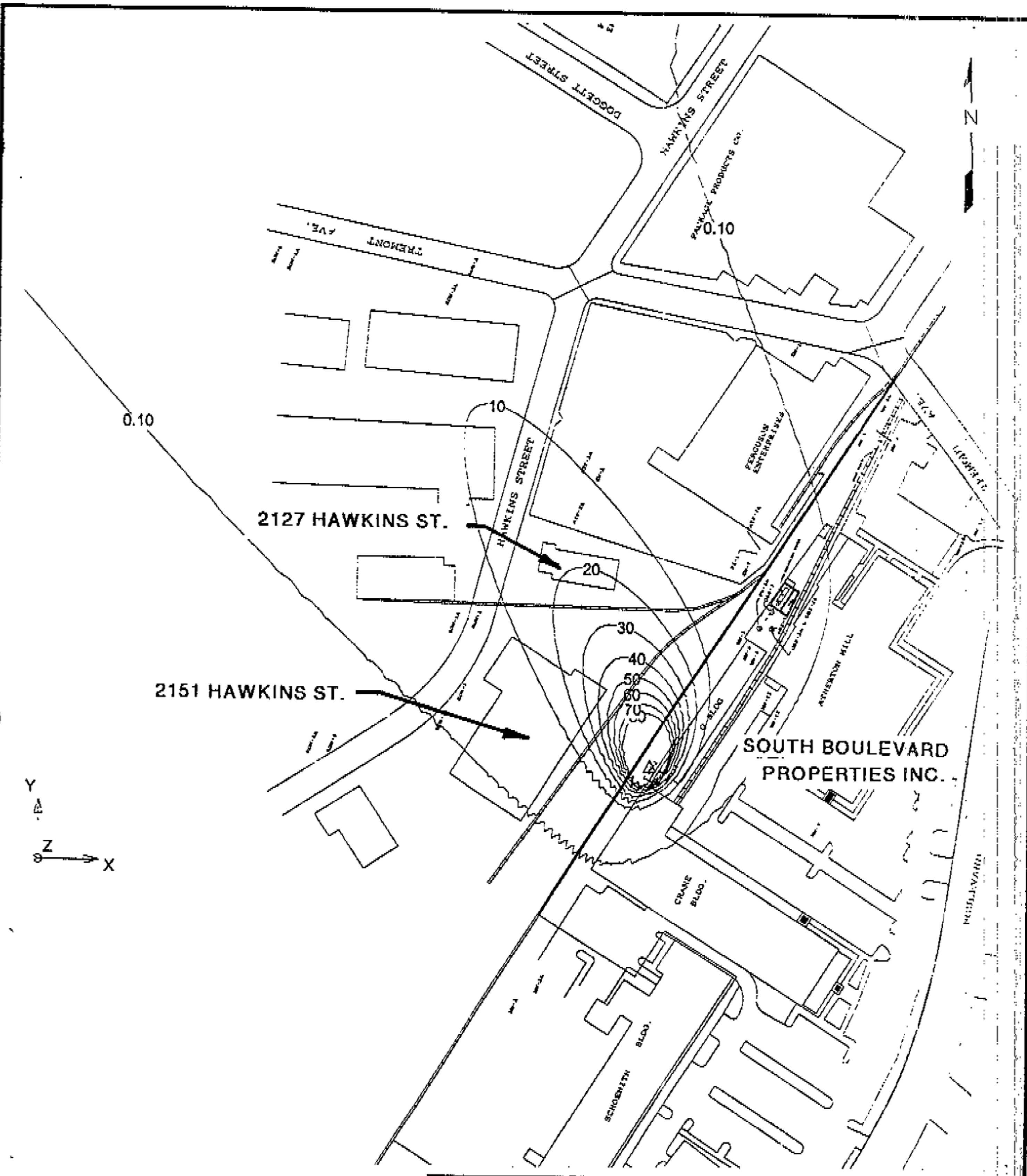
January 18, 2000 9:53:17 a.m.
Drawing V:\N105\105545\38.DWG

STORM DRAIN SOIL BORING LOCATION MAP		
SOUTH BOULEVARD PROPERTIES 2000 SOUTH BOULEVARD CHARLOTTE, NORTH CAROLINA		
SCALE AS NOTED	APPROVED BY :	DRAWN BY: J.K.S.
DATE JANUARY 2000	DESIGNED BY	REVISED
PROJECT NUMBER N105-54	AWARE INC 9305-J MONROE RD. CHARLOTTE, NC 28270	DRAWING NO. FIGURE 3-4R



MODELED TOTAL VOC ISOCONCENTRATION MAP AT 100 YEARS IN SAPROLITE

SOUTH BOULEVARD PROPERTIES INC.
CHARLOTTE, NORTH CAROLINA

SCALE NOT TO SCALE	APPROVED BY :	DRAWN BY: J.K.S.
DATE JANUARY 2001	DESIGNED BY :	REVISED
PROJECT NUMBER N105-54	AWARE ENVIRONMENTAL INC. 9305-J MONROE RD. CHARLOTTE, NC 28270	DRAWING NO. FIGURE 3-5R

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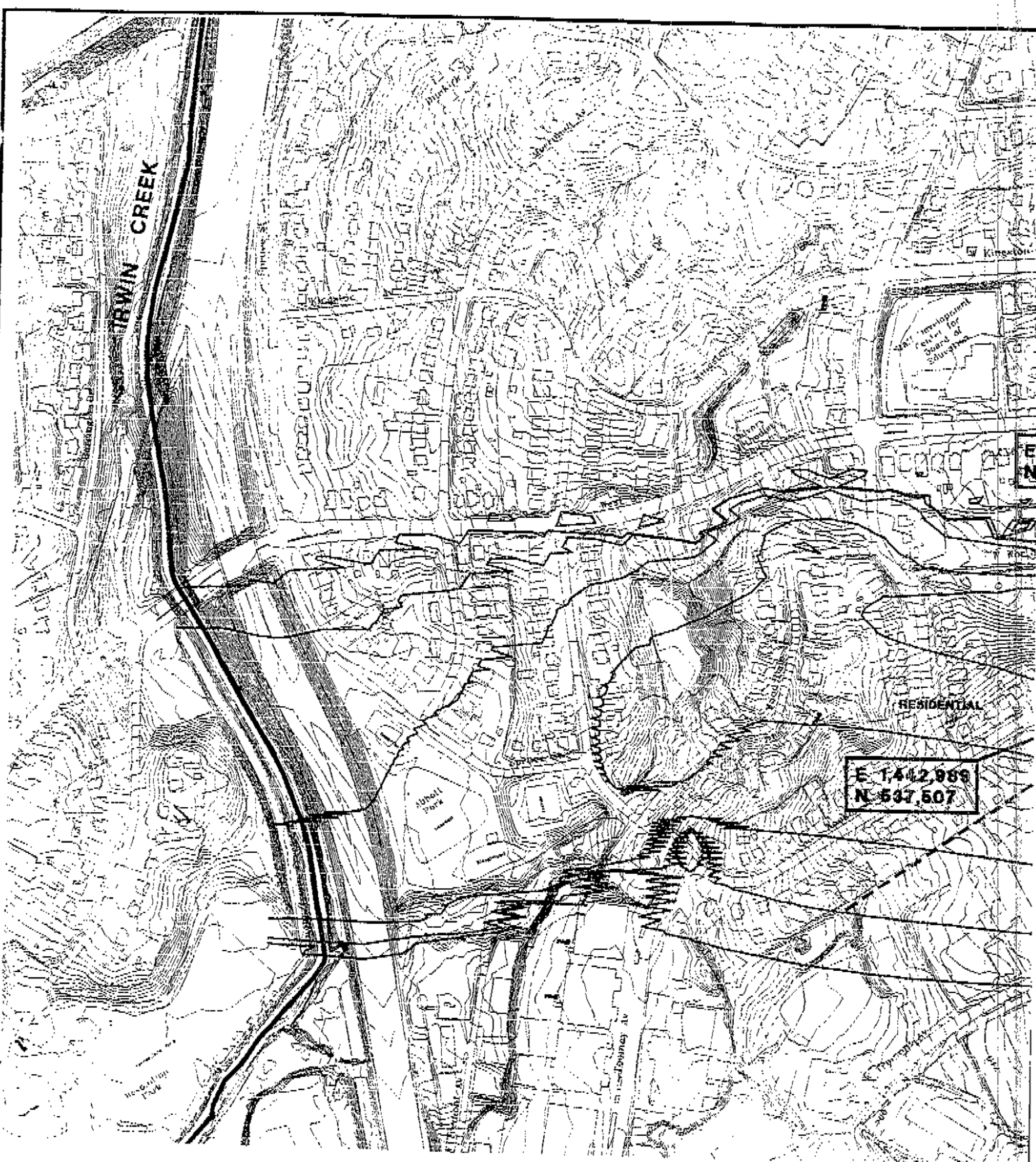


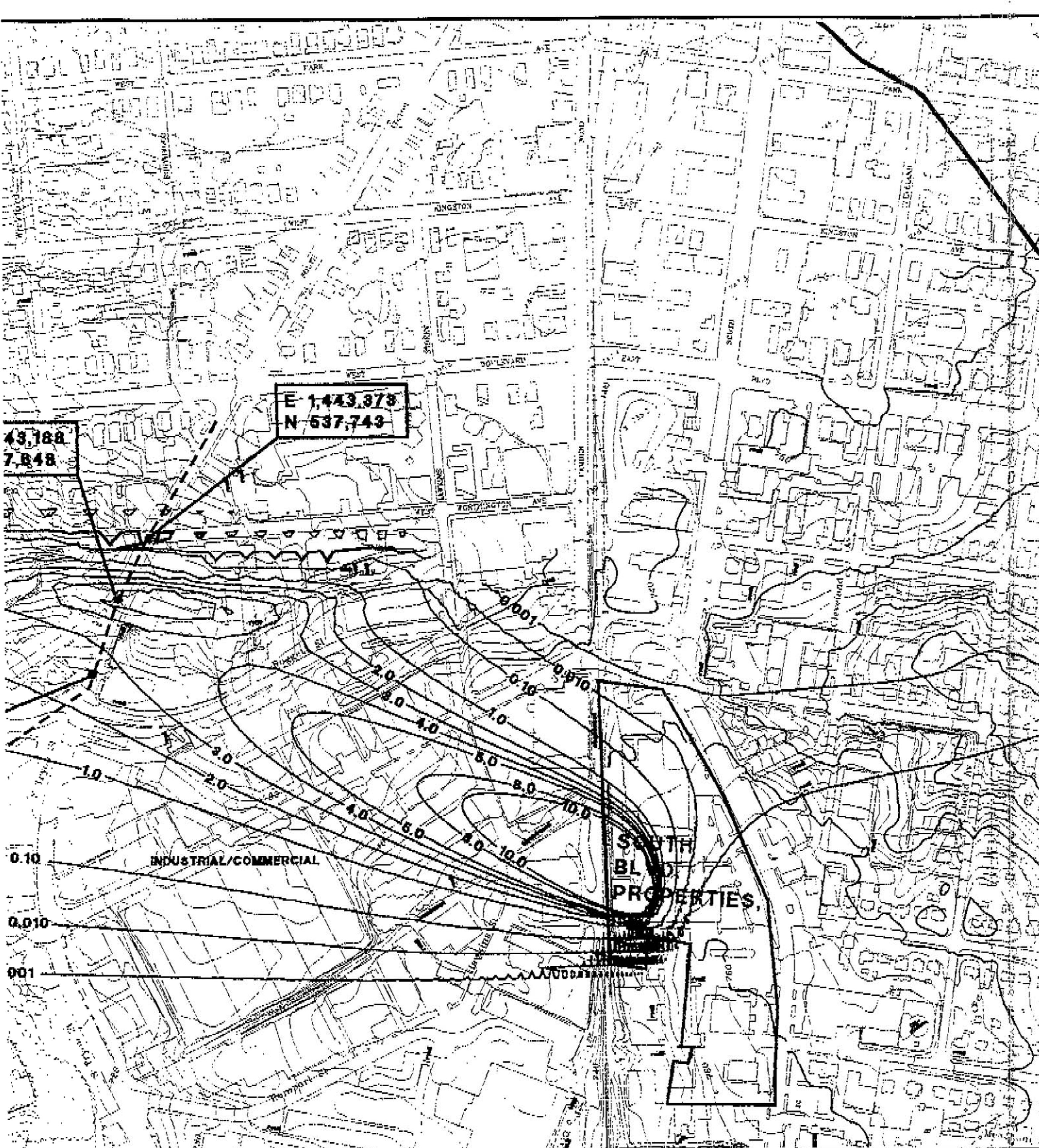
REFERENCE NOTE:
TOPOGRAPHIC MAPS TAKEN FROM CITY OF CHARLOTTE, NORTH CAROLINA ENGINEERING DEPARTMENT DRAWINGS: SHEET No. 14, DATED 1981 AND SHEET No. 15, DATED 1980. STORM DRAINS 1982.

SCALE: 1"= 400'

400 200 0 400 800

LEGEND

5



— SITE BOUNDARIES

> TOTAL VOC ISOCONCENTRATION CONTOUR

·– APPROXIMATE LANDUSE TYPE BOUNDARY

MODELED TOTAL VOC ISOCONCENTRATION MAP AT 170 YEARS – SAPROLITE LAYER		
SOUTH BOULEVARD PROPERTIES, INC. 2000 SOUTH BOULEVARD CHARLOTTE, NORTH CAROLINA		
SCALE AS NOTED	APPROVED BY :	DRAWN BY: J.K.S.
DATE AUGUST 2000	DESIGNED BY :	REVISED
PROJECT NUMBER N105–54	AWARE ENVIRONMENTAL INC. 9305-J MONROE RD. CHARLOTTE NC 28270	DRAWING NO.: FIGURE 3–6R

Figure 3-7R
Concentration vs. Time Plot for Coordinate E1,443,188, N537,648

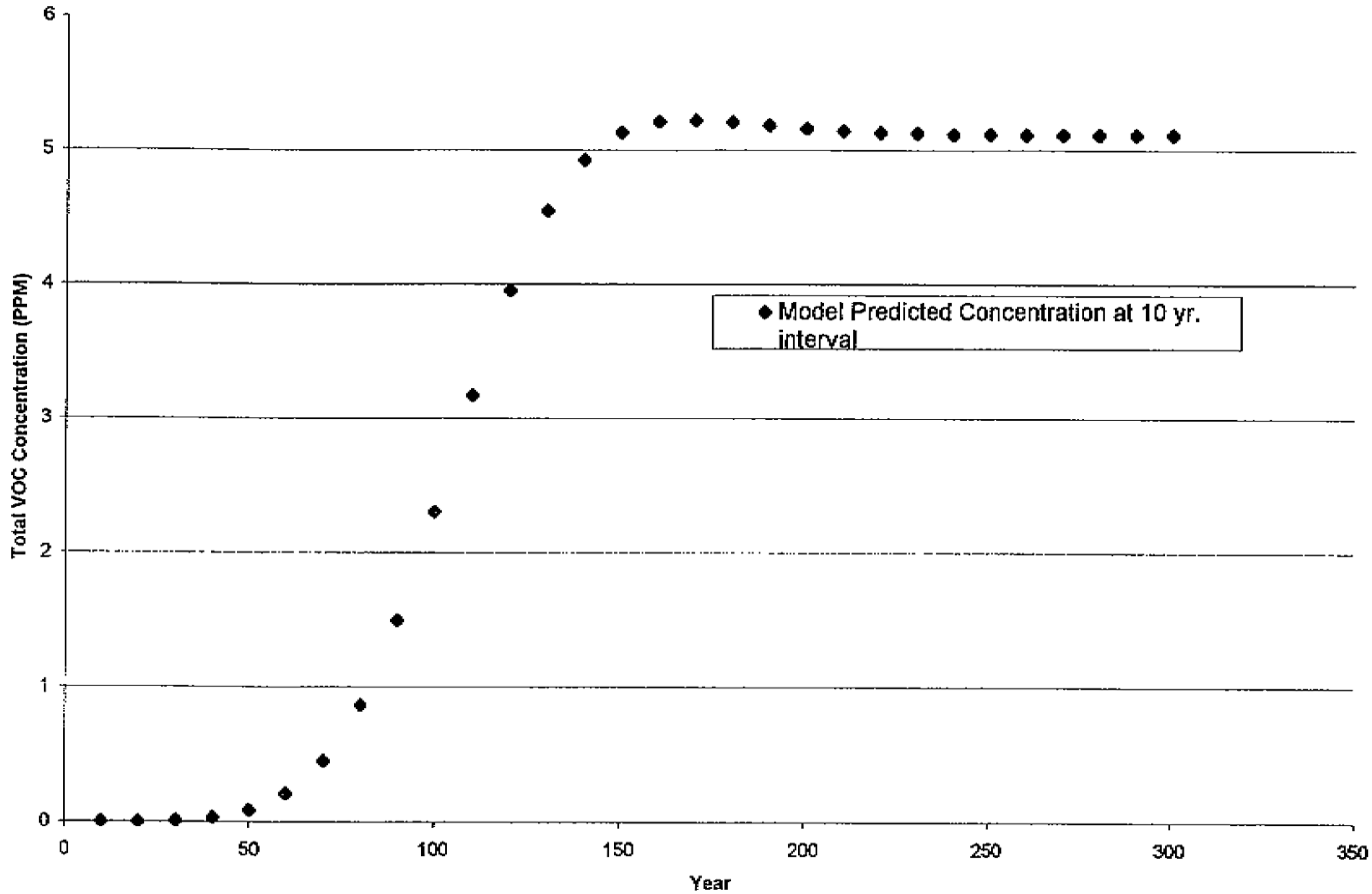
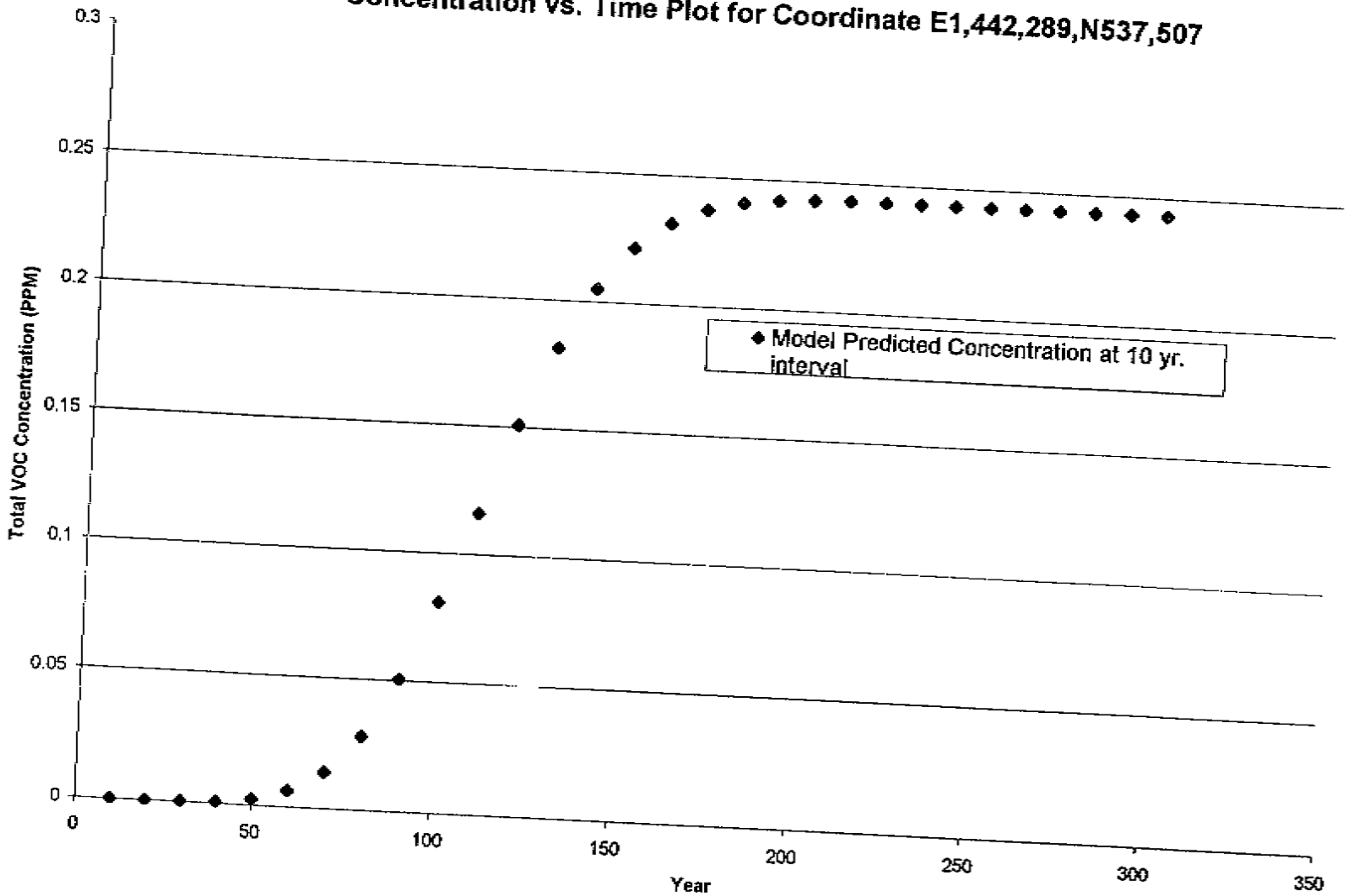
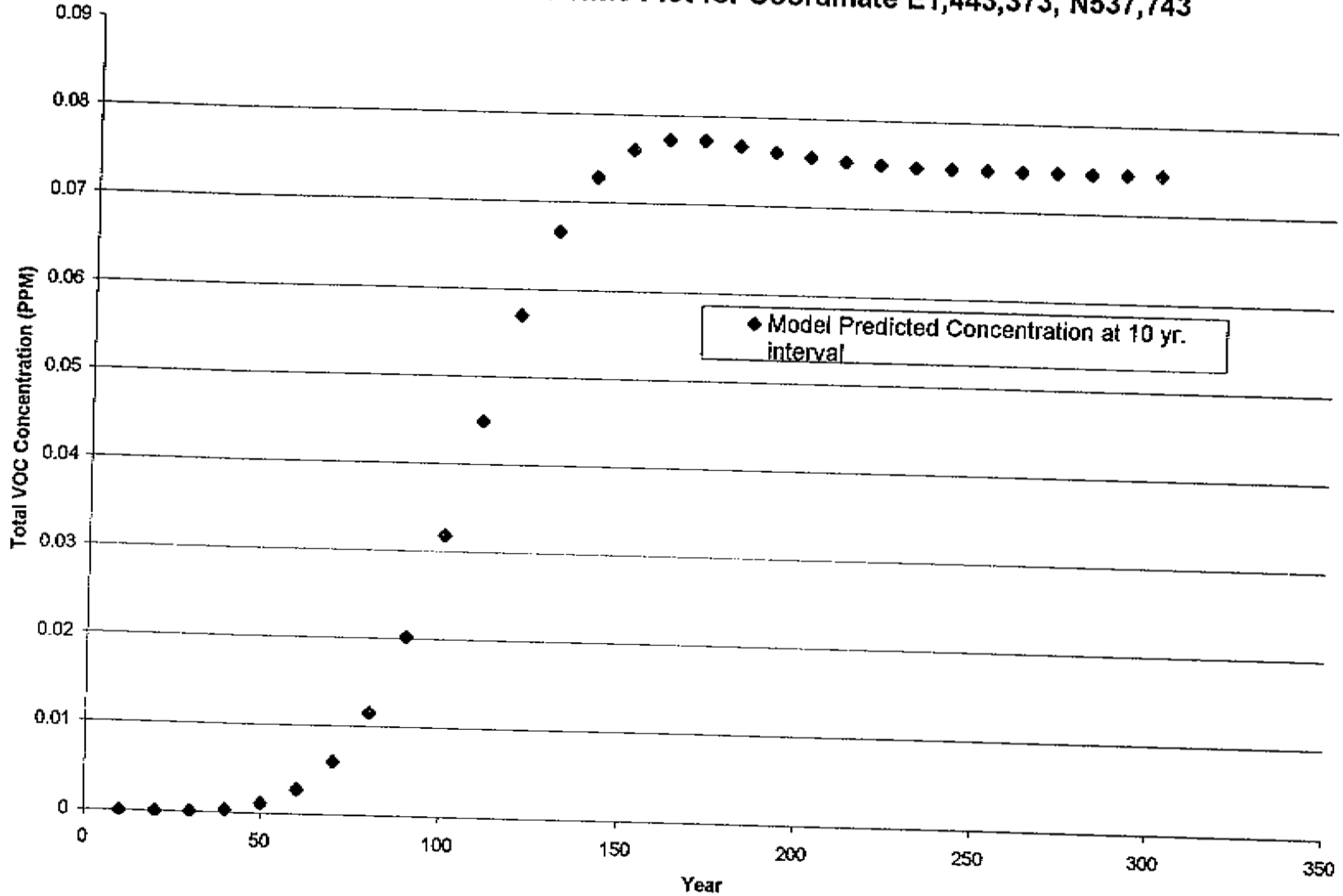


Figure 3-8R
Concentration vs. Time Plot for Coordinate E1,442,289,N537,507



P:\105\air model\figure 3-8R.xls

Figure 3-9R
Concentration vs. Time Plot for Coordinate E1,443,373, N537,743



P:\105\air model\figure3-9R.xls

TABLE 3-7
ENVIRONMENTALLY SENSITIVE AREAS
SOUTH BOULEVARD PROPERTIES, INC.
CHARLOTTE, NORTH CAROLINA

Description of the Natural Resource Area	Reference [1]
Surface waters including wetland, vernal pools, ponds, lakes, streams, rivers and reservoirs	USGS Map and Wetland Inventory Map review
All surface water intakes used for public supplies and public water supply wells	Communication with NCDEHNR
All private water supply wells and irrigation wells	Communication with NCDEHNR
All environmentally sensitive areas listed below	
Marine Sanctuaries	Reasonable Judgment
National and State Parks	Communication with NHP
Designated and proposed Federal and State Wilderness and Natural Areas	Communication with NHP
Areas of Environmental Concerns as identified by the WRC	Communication with NHP
Endangered or Threatened Species Habitat as Identified by the WRC and the Department of Agriculture	Communication with NHP
Water Supply Watersheds as identified by the DWQ	Communication with DWQ
National Monuments	Reasonable Judgment
National and State Historical Sites: Dilworth National Historical Site, Atherton Mill, Parks- Cramer Company, Hipp House	Correspondence from NCDCR
National and State Seashore, Lakeshore, and River Recreation Areas	Communication with NHP
Federally designated or proposed endanger or threatened species or species under review as to their endangered or threatened status	Communication with NHP
High Quality Waters, Outstanding Resource Waters, and Shellfishing Waters as identified by the DWQ	Communication with DWQ
Natural Heritage Priority Areas as identified by the Division of Parks and Recreation Natural Heritage Program	Communication with NHP
National and State Preserves and Forests	Communication with NHP
National State Wildlife Refuges	Communication with NHP
Coastal Barriers and Units of a Coastal Barrier Resources System	Communication with NCDCM
Federal land designated for protection of natural ecosystems	Communication with NHP
Spawning areas critical for the maintenance of fish/shellfish species within river, lake or coastal tidal waters as identified by the DMF and the WRC	Communication with NHP
Migratory pathways and feeding areas critical for maintenance of androgynous fish species within river reaches or areas in lakes or coastal tidal waters in which such fish spend extended periods of time as identified by the DMF and the WRC	Communication with NHP
Terrestrial areas utilized for breeding by large or dense aggregations of animals	Communication with NHP
State or Federally designated Scenic or Wild Rivers	Communication with NHP
State Lands designated for wildlife or game management	Communication with NHP
Wetlands	Wetland Inventory Map review

References are included in Appendix 3A and 3B.
No Natural Resource Areas were identified with the exception of National and State Historic Sites
USGS - United States Geologic Society
NCDEHNR - North Carolina Department of the Environment, Health & Natural Resources
NHP - National Heritage Program
WRC - Wildlife Resources Commission
DWQ - Division of Water Quality
NCDCR - North Carolina Department of Cultural Resources
NCDCM - North Carolina Department of Coastal Management
DMF - Division of Marine Fisheries

Table 3-1R
Storm Drain Soil Sample Analytical Summary
South Boulevard Properties, Inc., Charlotte, North Carolina

Parameter	Sample Identification (~depth/date of collection)					
	TB-5B (6-8') Jun-88	SD-1 (5-7') Dec-89	SD-2 (5-7') Dec-89	SD-7 (6-8') Dec-89	SD-8 (5-7') Dec-89	G-1 (9.5') Apr-97
Methylene Chloride	21B	8B	10B	7B	6B	<6.7
Acetone	64B	<10	<10	<10	<10	<67
Chloroform	<5.0	<5.0	<5.0	<5.0	<5.0	<6.7
1,1-Dichloroethane	<5.0	<5.0	<5.0	<5.0	<5.0	<6.7
1,1-Dichloroethene	<5.0	<5.0	<5.0	<5.0	<5.0	<6.7
1,2-Dichloroethane	<5.0	<5.0	<5.0	<5.0	<5.0	<6.7
1,2-Dichloroethene (total)	<5.0	<5.0	<5.0	<5.0	<5.0	<6.7
Tetrachloroethene	<5.0	<5.0	4	<5.0	<5.0	<6.7
Toluene	<5.0	<5.0	<5.0	<5.0	<5.0	<6.7
1,1,1-Trichloroethane	<5.0	10B	26 B	23B	16	<6.7
1,1,2-Trichloroethane	26	<5.0	<5.0	<5.0	<5.0	<6.7
Trichloroethene	30	2J	8	3BJ	<5.0	<6.7

Notes:

Units are $\mu g/kg$

Only constituents detected in at least one sample are included in this table.

B = Detected in the method blank.

J = Detected at a level below the method quantitation limit, estimated value.

<10 = Detected below the method quantitation limit specified.

Table 3-4R

Summary of Subsurface Vapor Intrusion Model Risk-Based Maximum Allowable Groundwater Concentrations
South Boulevard Properties, Inc., Charlotte, North Carolina
N105-54

Constituent	Level Using Site Specific Values[1]	Level Using Default Values[2]	Level Using Site Specific Vapor Permeability[3]	Level Using Site Specific Bulk Density[3]	Level Using Site Specific Porosity[3]
1,1,1-Trichloroethane	652,000	119,000	682,000	119,000	89,000
cis-1,2-Dichloroethene	96,300	18,200	101,000	18,200	13,000
1,1-Dichloroethene	18.4	3.03	19.2	3.03	2.28
Trichloroethene	1,540	279	1,610	279	208
Tetrachloroethene	2,680	521	2,820	521	387
Vinyl Chloride	9.70	1.42	10	1.42	1.08
1,1,2-Trichloroethane	1,940	340	2,020	340	259
1,2-Dichloroethane	1,030	148	1,060	1.48	114

Units are µg/l.
Concentrations were calculated based on a 1×10^{-6} carcinogenic risk basis.
1 – Site-specific values of vapor permeability (3×10^{-10} cm), bulk density (1.45 g/cm^3) and porosity (0.45cm^3/cm^3) were used in the calculation.
2 - Default values of vapor permeability (1×10^{-8} cm), bulk density (1.5 g/cm^3) and porosity (0.43cm^3/cm^3) were used in the calculation.
3 – The site-specific parameter specified and the remaining default values were used in the calculation.

Table 3-5R

Summary of Air Model Incremental Risk Calculations

South Boulevard Properties, Inc., Charlotte, North Carolina

N105-54

Parameter	Industrial[1]		Residential[2]		Industrial[3]		Residential[4]	
	Carcinogenic	Non-Carcinogenic	Carcinogenic	Non-Carcinogenic	Carcinogenic	Non-Carcinogenic	Carcinogenic	Non-Carcinogenic
1,1,1 Trichloroethane	NA	8.00E-03	NA	3.10E-03	NA	4.40E-02	NA	1.70E-02
cis-1,2-Dichloroethene	NA	1.50E-03	NA	5.80E-04	NA	8.00E-03	NA	3.10E-03
1,1-Dichloroethene	8.20E-05	NA	3.10E-05	NA	4.90E-04	NA	1.94E-04	NA
Trichloroethene	7.70E-06	NA	2.90E-06	NA	4.20E-05	NA	1.60E-05	NA
Tetrachloroethene	1.30E-07	NA	5.20E-08	NA	6.90E-07	NA	2.70E-07	NA
Vinyl Chloride	7.20E-07	NA	2.80E-07	NA	4.90E-06	NA	1.90E-06	NA
1,1,2-Trichloroethane	1.00E-07	NA	4.80E-08	NA	5.90E-05	NA	2.30E-07	NA
1,1-Dichloroethane	2.90E-08	NA	1.10E-08	NA	2.00E-07	NA	7.80E-08	NA
Total Additive Risk	9.07E-05	9.50E-03	3.43E-05	3.68E-03	5.97E-04	5.20E-02	2.12E-04	2.01E-02

Notes: 1- Calculated using 20 ppm total VOCs, all site specific variables and 250 days.

2- Calculated using 5.5 ppm total VOCs, all site specific variables and 350 days.

3- Calculated using 20 ppm total VOCs, all default variables and 250 days.

4- Calculated using 5.5 ppm total VOCs, all default variables and 350 days.

NA - Data not available in the model to calculate these values.

Table 3-2R
Maximum Predicted Groundwater to Indoor Air Concentration for On-site Substructure
South Boulevard Properties, Inc.
Charlotte, NC

Constituent	Maximum Concentration of Total VOCs[1] (mg/L)	Ratio of Individual Concentration to total VOC Concentration[2]	Maximum Groundwater Concentration of Constituent[3] (mg/L)	Molecular Weight (g/mol)	Henry's Law Constant (atm x m^3/mol)	Maximum Vapor Concentration[4] (ppm)	ACGIH TWA[5] (ppm)	OSHA TWA (ppm)
Benzene	5.00	0.0004	0.0018	78.11	0.0055	1.2674E-07	0.5	1
Chloroethane	5.00	0.0004	0.0018	64.52	0.0111	3.0967E-07	100	1000
Chloroform	5.00	0.0004	0.0018	119.40	0.0034	5.1256E-08	10	50
Chloromethane	5.00	0.0004	0.0018	50.48	0.0100	3.5658E-07	50	100
1,1-Dichloroethene	5.00	0.0770	0.3850	96.95	0.0149	5.9170E-05	5	NS
1,2-Dichloroethane	5.00	0.0016	0.0080	98.96	0.0011	8.8925E-08	10	50
cis-1,2-Dichloroethene	5.00	0.0075	0.0375	96.94	0.0041	1.5860E-06	200	200
trans-1,2-Dichloroethene	5.00	0.0004	0.0018	96.94	0.0094	1.7454E-07	200	200
Methylene chloride	5.00	0.0017	0.0085	84.90	0.0032	3.2038E-07	50	25
Tetrachloroethene	5.00	0.0180	0.0900	165.80	0.0184	9.9879E-06	25	100
1,1,1-Trichloroethane	5.00	0.2700	1.3500	133.42	0.0231	2.3374E-04	350	350
1,1,2-Trichloroethane	5.00	0.0100	0.0500	133.42	0.0009	3.3728E-07	10	10
Trichloroethene	5.00	0.6100	3.0500	131.40	0.0091	2.1123E-04	50	100
Vinyl Chloride	5.00	0.0004	0.0018	62.50	0.0278	8.0064E-07	1	1

1 - The maximum total VOC concentration in groundwater beneath the on-site substructure as predicted by the model (Figure 4-25).

2 - Ratio of individual concentration to total VOC concentration from Table 2-23.

3 - The maximum total VOC concentration in groundwater as predicted by the model was multiplied by the ratio of the individual compounds to provide an estimate of the maximum individual compound concentration present in groundwater.

4 - The maximum vapor concentration as found by uding the formula $C_{vapor} = [(H \times C_{gw})/MW]/ATM$ where H is Henry's Law Constant, C_{gw} is the groundwater concentration, MW is the molecular weight, and ATM is atmosphere at equilibrium. Henry's Law Constant taken from the North Carolina Hazardous Waste Section's "Guidelines for Determining Soil and Groundwater Clean-Up Levels at RCRA Hazardous Waste Sites"-Table 1. MW taken from Table 5-1 if listed, otherwise taken from Groundwater Chemicals Desk Reference (1990) and Handbook of Envrironmental Fate and Exposure Data for Organic Chemicals, Volume II Solvents (1990).

5 - TWA is the recommended time weighted average concentrations that must not be exceeded during any 8-hour workshift of a 40-hour week.

Table 3-3R
Predicted Maximum Downgradient Industrial and Residential Groundwater VOC Levels
South Boulevard Properties, Inc.
Charlotte, North Carolina

Constituent	1997 MW-14 Conc. (μg/l)	Ratio of individual conc. to total VOCs	Predicted Maximum Industrial GW Level (μg/l)	Predicted Maximum Residential GW Level ((μg/l)
Benzene	<25	0.00035	7.00	1.93
2-Butonone	1,100	0.015	300.00	82.50
Chloroethane	<25	0.00035	7.00	1.93
Chloroform	<25	0.00035	7.00	1.93
Chloromethane	<25	0.00035	7.00	1.93
1,1-Dichloroethane	700	0.0097	194.00	53.35
1,1-Dichloroethene	5,400	0.075	1500.00	412.50
1,2-Dichloroethane	110	0.0015	30.00	8.25
cis-1,2-Dichloroethene	530	0.0073	146.00	40.15
trans-1,2-Dichloroethene	<25	0.00035	7.00	1.93
Ethylbenzene	54	0.0007	14.00	3.85
Methylene Chloride	120	0.0017	34.00	9.35
Tetrachloroethene	1,300	0.018	360.00	99.00
Toluene	<250	0.0034	68.00	18.70
1,1,1-Trichloroethane	19,000	0.26	5200.00	1430.00
1,1,2-Trichloroethane	730	0.010	200.00	55.00
Trichloroethene	43,000	0.59	11800.00	3245.00
Vinyl Chloride	<25	0.00035	7.00	1.93
Total VOCs *	72,444		20,000	5,500

* - Detection levels were used as concentrations for constituents not detected above the method detection levels.

Table 7-1
Proposed Alternate Concentration Levels
South Boulevard Properties, Inc.
Charlotte, North Carolina

Constituent	CAS Number	1997 MW-14 Conc. (µg/l)	[1]1998 Max. Conc. (µg/l)	2000 MW-14A (µg/l)	Proposed ACLs (µg/l)	2L Standard (µg/l)	RBC Tap Water Value (µg/l)
VOCs (µg/l)							
Acetone	67-64-1	<600	<25-<62,000	<25,000	700	700	610
Benzene	71-43-2	<25	150	<1,000	150	1.0	0.36
2-Butanone	78-93-3	1,100	<10-<25,000	<10,000	1,100	170	1,900
Chloroethane	75-00-3	<25	<1-<2,500	<1,000	2,800	2800 (I)	3.6
Chloroform	67-66-3	<25	2.4	<1,000	2.4	0.19	0.15
Chloromethane	74-87-3	<25	<1-<2,500	<1,000	25	2.6 (I)	2.1
1,1-Dichloroethane	75-34-3	700	14	1,900	1,900	700	800
1,1-Dichloroethene	75-35-4	5,400	6,600	34,000	34,000	7	0.044
1,2-Dichloroethane	107-06-2	110	<1-<2,500	<1,000	110	0.38	0.12
cis-1,2-Dichloroethene	156-59-2	530	640	3,000	3,000	70	61
trans-1,2-Dichloroethene	156-60-5	<25	130	<1,000	130	70	120
Ethylbenzene	100-41-4	54	<1-<2,500	<1,000	54	29	1300
Methylene Chloride	75-09-2	<120	<5-<12,000	<5,000	120	5	4.1
4-Methyl-2-Pentanone	108-10-1	<250	<10-<25,000	<10,000	560	560 (R)	140
Tetrachloroethene	127-18-4	1,300	3,400	6,900	6,900	0.7	1.1
Toluene	108-88-3	<250	<1-<2,500	2,100	2,100	1,000	750
1,1,1-Trichloroethane	71-55-6	19,000	22,000	18,000	22,000	200	540
1,1,2-Trichloroethane	79-00-5	730	1.3	1,200	1,200	0.6 (R)	0.190
Trichloroethene	79-01-6	43,000	74,000	150,000	150,000	2.8	1.6
Xylene, total	1330-20-7	240	<2-<5,000	<2,000	530	530	12,000
Vinyl Chloride	75-01-4	<25	<1-<2,500	<1,000	25	0.015	0.019

NOTES:

1. Maximum concentrations detected in samples collected in January and February 1998 from wells within SBP groundwater plume

I = Interim 2L Standard

R = Recommended 2L Standard

Table 7-2
Proposed Allowable Exposure Levels (AELs) for Downgradient Monitoring Wells
South Boulevard Properties, Inc.
Charlotte, North Carolina

Monitoring Well	Aquifer Horizon	Distance (Ft) From Source Monitored	Total VOC Concentration 1992/1995/1998/2001 Data	Modeled Total VOC Concentration @ 1 Year [1]	Modeled Total VOC Concentration @ 2 Years [2]	Modeled Total VOC Concentration @ 3 Years [3]	Modeled Total VOC Concentration @ 4 Years [4]	Modeled Total VOC Concentration @ 5 Years [5]	Max. Modeled Total VOC/Year Max. Occurs	Proposed AEL[6] (Total VOC Concentration)
PZ-1	Saprolite	110	0.0 / NS / NS/ NS	2.62	2.54	2.47	2.40	2.34	2.62/1 yr	2.60
EW-3	PWR	100	0.008 / 0.014 / NS / 0.011	5.08	5.27	5.50	5.74	5.94	8.48/30 yrs	6.50
ATP-3A	Fractured Rock	112	5.92 / 2.96 / 8.14 / 6.68	9.67	9.83	10.00	10.17	10.38	21.95/33 yrs	11.00
ROW-1	Saprolite	315	0.19 / 0.23 / 0.006 / NS	0.215	0.225	0.235	0.246	0.26	4.4/12 yrs	0.30
ROW-1A	PWR	315	40.0 / 14.5 / 7.73 / 0.992	0.589	0.63	0.672	0.715	0.759	11.7/12 yrs	1.00

Table Notes:
Concentration units are mg/l.
1 Total VOC concentration predicted by the solute transport model in the respective aquifer horizon at 1 year.
2 Total VOC concentration predicted by the solute transport model in the respective aquifer horizon at 2 years.
3 Total VOC concentration predicted by the solute transport model in the respective aquifer horizon at 3 years.
4 Total VOC concentration predicted by the solute transport model in the respective aquifer horizon at 4 years.
5 Total VOC concentration predicted by the solute transport model in the respective aquifer horizon at 5 years.
6 Proposed AEL valid for monitoring during the first five years.

AWARE ENVIRONMENTAL®

GW

(12)

January 22, 2002

Ms. Jill Pafford
Hazardous Waste Section Chief
North Carolina Department of Environment and Natural Resources
Mail Service Center 1646
Raleigh, NC 27699-1646

JAN 2002
Received
Hazardous Waste
Section

RE: November Post-Closure Groundwater Quality Monitoring
South Boulevard Properties, Inc., Charlotte, NC
2000 South Boulevard, Charlotte, North Carolina 28203
EPA ID No. NCD 053 010 732
AEI Job No. N105-22

Dear Ms. Pafford:

On behalf of facility owner South Boulevard Properties, Inc. (SBP), AWARE Environmental® Inc. (AEI) is submitting results from November 2001 groundwater sample collection and analyses associated with semi-annual post-closure groundwater quality monitoring activities for the above-referenced facility. This work was performed as specified in the Section-approved Modified Post-Closure Plan for Monitoring Associated with Validation of the Groundwater Solute Transport Model as revised September 2001 (Plan).

Sample Collection and Analysis

Field work was performed by AEI personnel and laboratory analysis conducted by STL Tallahassee, a division of Severn Trent Laboratories, Inc. Water level measurements were collected and monitoring well purge was initiated on October 31, 2001. Monitoring well purge was completed and sample collection was performed on November 1, 2001. Procedures and results are summarized below.

Work began with collection of depth to water measurements at the eight (8) monitoring wells designated in the Plan (ROW-1, ROW-1A, EW-3, ATP-3A, PZ-1, MW-14, MW-14A, MW-14B). See Figure 1 for well locations. A Sample Pro Water Level Indicator Model 6000 was used to collect the measurements. The indicator probe was cleaned as specified in the Plan

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before each use. Measurements proceeded from wells having lessor to greater amounts of contamination, as determined from previous monitoring events. Results are presented in the attached Table 1.

Well purge began October 31, 2001 after completion of all depth to water measurements and was completed on November 1, 2001. Dedicated Teflon bailers suspended on nylon cord were used to remove well purge water. Well purge volume was to dryness, to stable field parameters (temperature, pH, conductivity), or to three (3) times the static volume, whichever occurred first. The purge water was transferred to 55-gallon steel drums for storage pending later on-site treatment. Storage and treatment details are discussed below. Calculated static well volumes and actual purge volumes are presented in Table 1.

Groundwater samples were collected from each of the designated wells proceeding from wells having lessor to those having greater contamination levels, as determined from previous monitoring events.

Groundwater samples were analyzed for volatile organic compounds (VOCs) using EPA SW 846 Method 8260. Sample containers (3-40 ml vials with septa caps) preserved with hydrochloric acid were supplied by the analytical laboratory. Field measurements for temperature, pH, and specific conductivity were taken at the time of sample collection. Immediately following collection, the sample containers were stored on ice in an insulated cooler for later transport to the laboratory.

One (1) field blank was prepared and analyzed as a check against the possible impact of ambient conditions on the sample collection effort. No compounds were detected in the field blank.

Samples and the blank were analyzed as specified in the Plan. Chain-of-custody protocol was followed during the transfer of samples to the contract laboratory; documentation is attached. Field measurements are summarized in Table 2, analytical results are summarized in Table 3. A complete photocopy of the laboratory report including chain-of-custody record is attached.

Storage and Treatment of Purge Water

Monitoring well purge water and decontamination fluids were drummed at the time of generation. In accordance with October 24, 2001 Section correspondence, the drums (2) were labeled as containing hazardous waste with an accumulation start date to match the date of initial use (October 31, 2001). The drums were stored inside a locked building with a 24-hour contact telephone number posted beside the door.

On November 6th and 15th the water was pumped from the storage drums through an activated carbon treatment unit into other drums. The drums containing the untreated water were rinsed with tap water. The tap water was captured and put through the treatment unit. The pump and hoses, dedicated to this job, are stored in a bucket for future use.

Two samples of treated water were collected to test the effectiveness of the treatment process. The first was an instantaneous grab sample from the treatment unit effluent hose during the treatment of the MW-14 well series purge water. This was intended to represent the highest loading to the treatment unit and thereby demonstrate treatment effectiveness under the worst case conditions. The second sample was taken from a drum of treated water. This sample was intended to represent the composite characteristics of the treated water.

Sample analysis by SW 846 Method 8260 was performed by STL Tallahassee with a sample quantitation limit of 1 ug/L. A photocopy of the report is attached. Only one parameter was reported above the sample quantitation limit. Trichloroethene was detected at 2.5 ug/L in the grab sample from the effluent hose. As the North Carolina 2L standard for this compound is 2.8 ug/L, the treatment was deemed complete and the purge water was disposed by distributing it over a grassy area (see Figure 1) at the rear of the site.

Groundwater Analytical Results

A comparison of the November 2001 analytical results with the proposed Alternate Concentration Limit (ACL) values indicates that constituent concentrations in groundwater from well MW-14A exceeded the respective proposed ACL values for vinyl chloride, chloroform, ethylbenzene, and xylenes (Table 3). The trichloroethene concentration in the sample from MW-14A equaled the ACL as did the benzene concentration in the sample from ROW-1A.

Table 4 presents historical data by well generated since inception of the solute transport validation monitoring program. This monitoring program began in May 2001 with samples from the MW-14 series wells plus off-site wells ROW-1A, ATP-3A, EW-3 (ROW-1 and PZ-1 were dry in May). Confirmatory sampling was subsequently performed in June 2001 for the MW-14 series wells. All wells were sampled during the November 2001 monitoring event. A review of Table 4 shows that with regard to the proposed ACLs, both the number and magnitude of exceedances are decreasing in comparison to the initial May 2001 results. The reported concentrations for primary contaminants trichloroethene and 1,1,1-trichloroethane in MW-14 series wells equaled or exceeded by 2 to 3 times the proposed ACL in May. No exceedances were reported in June and in November only one well, MW-14A, was reported as having trichloroethene at a concentration equal to the proposed ACL value. Ethylbenzene, xylene, chloroform, and vinyl chloride concentrations were observed in MW-14A at levels above their respective proposed ACLs. All remaining measured constituent concentrations observed in the November sample from MW-14A were less than their respective proposed ACL.

In addition to proposing ACL values for individual parameters, SBP has proposed a set of Alternate Exposure Level (AEL) values for water quality in specified down gradient wells. The AEL values are based upon the solute transport model results and have been evaluated for protection of human health assuming the contaminant plume eventually reaches surface water. The AEL values represent the total VOC concentration at a given well rather than individual parameter concentrations.

A comparison of total VOCs, calculated by summing the concentrations of all detected parameters for a given well with the proposed AEL values, indicates that contaminant levels in groundwater at all the designated off-site wells are below the respective AEL values (Table 3). A summary of historical data for the off-site wells in comparison to solute transport model results and the proposed AEL values is presented in Table 5. No increase in the reported total VOC concentration is apparent since termination of the remedial activities.

Summary

November 2001 represents the second monitoring event performed under the Modified Post Closure Plan for Monitoring Associated with Validation of the Groundwater Solute Transport Model. The first event was in May 2001, approximately one month after termination of soil and groundwater remediation activities. While concentrations of selected parameters were reported to currently exceed the proposed ACL values, the amount of the exceedance is relatively small, typically on the order of 20 ug/L. For each of the five (5) off-site wells, the sum of all reported concentrations is a third or less than the proposed AEL value. Overall, November 2001 results suggest a downward trend in concentration levels when compared to similar data from May and June 2001.

As outlined in the Plan, collection of additional data by continuing the semi-annual monitoring events over the next 2 years is proposed to allow for further evaluation. The next monitoring event is scheduled for May 2002. Should you have any questions or comments about procedures or the data presented, please do not hesitate to call.

Sincerely,
AWARE Environmental® Inc.

Michael O. Smith

Michael O. Smith, P.E.
Facility Contact

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026882 MICHAEL O. SMITH

Michael O. Smith
1/22/02

Attachments

cc: File
D. Ford, SBP
J. Hopcroft
M. Justice, Esq.
D. Love, AEI
Site

Table 1 - Field Data Sheet
Post-Closure Groundwater Quality Monitoring Plan, November 2001 Sample Event
South Boulevard Properties, Inc.
Charlotte, North Carolina

Well ID:	ROW-1	ROW-1A	PZ-1	EW-3
Well Diameter (inches)	2	2	2	2
Well Depth (feet below top of casing)	25.0	59.0	19.5	32.0
Depth to Water (feet below top of casing)	23.29	23.48	18.56	18.54
Static Volume (gallons)	0.3	5.8	0.2	2.2
Actual Purge Volume (gallons)	1 (dry)	16	< 1 (dry)	7
Purge Time	11:10	11:40	13:20	14:20
Purge Date	10/31/01	10/31/01	10/31/01	10/31/01
Sample Time	9:55	10:00	9:30	9:40
Sample Date	11/01/01	11/01/01	11/01/01	11/01/01

Well ID:	ATP-3A	MW-14	MW-14A	MW-14B
Well Diameter (inches)	2	2	2	2
Well Depth (feet below top of casing)	81.0	138.0	75.0	35.0
Depth to Water (feet below top of casing)	18.76	25.68	26.49	24.36
Static Volume (gallons)	10.2	18.3	7.9	1.7
Actual Purge Volume (gallons)	25	23	24	6
Purge Time	14:10	12:20	15:47	15:14
Purge Date	10/31/01	11/01/01	10/31/01	10/31/01
Sample Time	10:15	13:35	13:45	13:20
Sample Date	11/01/01	11/01/01	11/01/01	11/01/01

Notes: Well depths from Table E-2 *Monitoring Well Construction Summary*, Part B Post-Closure Permit Application, South Boulevard Properties, Inc., May 1996 - Revised April 2000

Table 2 - Field Measurement Summary
Post-Closure Groundwater Quality Monitoring Plan, November 2001 Sample Event
South Boulevard Properties, Inc.
Charlotte, North Carolina

Well I.D. Screen Interval (ft above MSL)	ROW-1 730.2-720.2	ROW-1A 696.4-686.4	PZ-1 727.4-722.4	EW-3 719.9-709.9
FIELD MEASUREMENTS				
Water Level (feet above MSL)	721.51	721.46	722.88	722.92
pH (pH units)	4.3	5.3	5.0	5.6
Conductivity (umhos/cm)	340	200	85	130
Temperature (Celsius)	20.5	20.0	18.0	18.0
Well I.D. Screen Interval (ft above MSL)	ATP-3A 670.8-660.8	MW-14 621.0-611.0	MW-14A 684.1-674.1	MW-14B 724.1-714.1
FIELD MEASUREMENTS				
Water Level (feet above MSL)	722.66	723.13	722.15	724.30
pH (pH units)	5.3	6.8	6.4	4.8
Conductivity (umhos/cm)	165	450	640	230
Temperature (Celsius)	19.0	19.0	19.0	19.5

Table 3 - Analytical Summary
Post-Closure Groundwater Quality Monitoring Plan, November 2001 Sample Event
South Boulevard Properties, Inc.
Charlotte, North Carolina

Well I.D. Screen Interval	Proposed ACL	ROW-1 730.2-720.2	ROW-1A 696.4-686.4	PZ-1 727.4-722.4	EW-3 719.9-709.9	ATP-3A 670.8-660.8
PARAMETER (ug/L)						
Chloromethane	25	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	25	< 1.0	< 1.0	< 1.0	< 1.0	1.3
Chloroethene	2,800	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride	120	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acetone	700	< 25	< 25	< 25	< 25	< 25
1,1-Dichloroethene	34,000	< 1.0	8.2	3.0	< 1.0	64
1,1-Dichloroethane	1,900	< 1.0	< 1.0	< 1.0	< 1.0	47
cis-1,2-Dichloroethene	3,000	< 1.0	62	< 1.0	< 1.0	97
trans-1,2-Dichloroethene	130	1.2	< 1.0	< 1.0	< 1.0	4.0
Chloroform	2.4	< 1.0	< 1.0	< 1.0	< 1.0	2.0
1,2-Dichloroethane	110	< 1.0	< 1.0	< 1.0	< 1.0	2.5
2-Butanone	1,100	< 10	< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	22,000	< 1.0	< 1.0	< 1.0	< 1.0	380*
Trichloroethene	150,000	11	91	< 1.0	< 1.0	3,000*
1,1,2-Trichloroethane	1,200	< 1.0	< 1.0	< 1.0	< 1.0	15
Benzene	150	< 1.0	150*	< 1.0	< 1.0	3.4
4-Methyl-2-Pentanone	560	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene	6,900	< 1.0	16	< 1.0	< 1.0	250
Toluene	2,100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	54	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylenes	530	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Total VOC Concentration. (ug/L)		12	327	3	Below Detect.	3,866
Proposed AEL (ug/L)		300	1,000	2,600	6,500	11,000

Notes:
Screen interval measured in feet from mean sea level
* - Target compounds quantitated from a secondary dilution due to analyte abundance in the sample.

Table 3 - Analytical Summary (continued)
Post-Closure Groundwater Quality Monitoring Plan, November 2001 Sample Event
South Boulevard Properties, Inc.
Charlotte, North Carolina

Well I.D. Screen Interval	Proposed ACL	MW-14 621.0-611.0	MW-14A 684.1-674.1	MW-14B 724.1-714.1	Field Blank
PARAMETER (ug/L)					
Chloromethane	25	< 25	< 25	< 25	< 1.0
Vinyl Chloride	25	< 25	38	< 25	< 1.0
Chloroethene	2,800	< 25	< 25	< 25	< 1.0
Methylene Chloride	120	< 120	< 120	< 120	< 5.0
Acetone	700	< 620	< 620	< 620	< 25
1,1-Dichloroethene	34,000	1,100	8,100*	520	< 1.0
1,1-Dichloroethane	1,900	130	1,200	28	< 1.0
cis-1,2-Dichloroethene	3,000	1,900	1,600	61	< 1.0
trans-1,2-Dichloroethene	130	< 25	44	< 25	< 1.0
Chloroform	2.4	< 25	39	< 25	< 1.0
1,2-Dichloroethane	110	< 25	< 25	< 25	< 1.0
2-Butanone	1,100	< 250	< 250	< 250	< 10
1,1,1-Trichloroethane	22,000	2,300	17,000*	2,100	< 1.0
Trichloroethene	150,000	7,700*	150,000*	6,500*	< 1.0
1,1,2-Trichloroethane	1,200	< 25	740	< 25	< 1.0
Benzene	150	< 25	< 25	< 25	< 1.0
4-Methyl-2-Pentanone	560	< 250	< 250	< 250	< 10
Tetrachloroethene	6,900	520	1,400	210	< 1.0
Toluene	2,100	< 25	640	< 25	< 1.0
Ethylbenzene	54	< 25	71	< 25	< 1.0
Xylenes	530	< 50	560	< 50	< 2.0

Notes:
Screen interval measured in feet from mean sea level
* - Target compounds quantitated from a secondary dilution due to analyte abundance in the sample.
- Shading indicates reported concentration above the proposed ACL value

Table 4 – Historical Data Comparison
Post-Closure Groundwater Quality Monitoring Plan, November 2001 Sample Event
South Boulevard Properties, Inc.
Charlotte, North Carolina

	Proposed ACL	MW-14 5/22/01	5/22/01 (DUP)	6/18/01	11/1/01
PARAMETER (ug/L)					
Chloromethane	25	< 25	< 25	< 25	< 25
Vinyl Chloride	25	< 25	< 25	< 25	< 25
Chloroethene	2,800	< 25	< 25	< 25	< 25
Methylene Chloride	120	< 120	< 120	< 120	< 120
Acetone	700	< 620	< 620	< 620	< 620
1,1-Dichloroethene	34,000	35,000*	1,400	580	1,100
1,1-Dichloroethane	1,900	480	350	100	130
cis-1,2-Dichloroethene	3,000	2,200	1,700	460	1,900
trans-1,2-Dichloroethene	130	< 25	< 25	< 25	< 25
Chloroform	2.4	< 25	< 25	< 25	< 25
1,2-Dichloroethane	110	< 25	< 25	< 25	< 25
2-Butanone	1,100	< 250	< 250	< 250	< 250
1,1,1-Trichloroethane	22,000	62,000*	9,200*	2,400	2,300
Trichloroethene	150,000	300,000*	45,000*	7,900	7,700*
1,1,2-Trichloroethane	1,200	230	230	41	< 25
Benzene	150	< 25	< 25	< 25	< 25
4-Methyl-2-Pentanone	560	< 250	< 250	< 250	< 250
Tetrachloroethene	6,900	1,200	780	330	520
Toluene	2,100	130	98	< 25	< 25
Ethylbenzene	54	< 25	< 25	< 25	< 25
Xylenes	530	< 50	< 50	< 50	< 50

Notes:
* - Target compounds quantitated from a secondary dilution due to analyte abundance in the sample.
[shading] - Shading indicates reported concentration above the proposed ACL value

Table 4 – Historical Data Comparison (continued)
Post-Closure Groundwater Quality Monitoring Plan, November 2001 Sample Event
South Boulevard Properties, Inc.
Charlotte, North Carolina

Well I.D. Screen Interval	Proposed ACL	MW-14A 5/22/01	6/18/01	Nov 1, 2001
PARAMETER (ug/L)				
Chloromethane	25	< 25	< 100	< 25
Vinyl Chloride	25	26	< 100	38
Chloroethene	2,800	< 25	< 100	< 25
Methylene Chloride	120	< 120	< 500	< 120
Acetone	700	< 620	< 2500	< 620
1,1-Dichloroethene	34,000	37,000*	21,000	8,100*
1,1-Dichloroethane	1,900	1,700	1,800	1,200
cis-1,2-Dichloroethene	3,000	2,100	2,200	1,600
trans-1,2-Dichloroethene	130	< 25	< 100	44
Chloroform	2.4	49	< 100	39
1,2-Dichloroethane	110	< 25	150	< 25
2-Butanone	1,100	< 250	< 1,000	< 250
1,1,1-Trichloroethane	22,000	22,000*	11,000	17,000*
Trichloroethene	150,000	260,000*	100,000	150,000*
1,1,2-Trichloroethane	1,200	1,200	1,100	740
Benzene	150	< 25	< 100	< 25
4-Methyl-2-Pentanone	560	< 250	< 1,000	< 250
Tetrachloroethene	6,900	16,000*	6,700	1,400
Toluene	2,100	1,200	1,200	640
Ethylbenzene	54	110	100	71
Xylenes	530	820	750	560

Notes:
* - Target compounds quantitated from a secondary dilution due to analyte abundance in the sample.
- Shading indicates reported concentration above the proposed ACL value

Table 4 – Historical Data Comparison (continued)
Post-Closure Groundwater Quality Monitoring Plan, November 2001 Sample Event
South Boulevard Properties, Inc.
Charlotte, North Carolina

	Proposed ACL	MW-14B 5/22/01	6/18/01	Nov 1, 2001
PARAMETER (ug/L)				
Chloromethane	25	< 25	< 25	< 25
Vinyl Chloride	25	< 25	< 25	< 25
Chloroethene	2,800	< 25	< 25	< 25
Methylene Chloride	120	< 120	< 120	< 120
Acetone	700	< 620	< 620	< 620
1,1-Dichloroethene	34,000	1,100	770	520
1,1-Dichloroethane	1,900	72	43	28
cis-1,2-Dichloroethene	3,000	170	97	61
trans-1,2-Dichloroethene	130	< 25	< 25	< 25
Chloroform	2.4	< 25	< 25	< 25
1,2-Dichloroethane	110	< 25	< 25	< 25
2-Butanone	1,100	< 250	< 250	< 250
1,1,1-Trichloroethane	22,000	71,000*	2,700	2,100
Trichloroethene	150,000	200,000*	7,100	6,500*
1,1,2-Trichloroethane	1,200	83	36	< 25
Benzene	150	< 25	< 25	< 25
4-Methyl-2-Pentanone	560	< 250	< 250	< 250
Tetrachloroethene	6,900	440	300	210
Toluene	2,100	< 25	< 25	< 25
Ethylbenzene	54	< 25	< 25	< 25
Xylenes	530	< 50	< 50	< 50

Notes:
* - Target compounds quantitated from a secondary dilution due to analyte abundance in the sample.
- Shading indicates reported concentration above the proposed ACL value

Table 4 – Historical Data Comparison (continued)
Post-Closure Groundwater Quality Monitoring Plan, November 2001 Sample Event
South Boulevard Properties, Inc.
Charlotte, North Carolina

	Proposed	ROW-1		ROW-1A	
	ACL	5/22/01	11/01/01	5/22/01	11/01/01
PARAMETER (ug/L)					
Chloromethane	25	Well Dry	< 1.0	< 1.0	< 1.0
Vinyl Chloride	25	No Sample	< 1.0	< 1.0	< 1.0
Chloroethene	2,800		< 1.0	< 1.0	< 1.0
Methylene Chloride	120		< 5.0	< 5.0	< 5.0
Acetone	700		< 25	< 25	< 25
1,1-Dichloroethene	34,000		< 1.0	5.9	8.2
1,1-Dichloroethane	1,900		< 1.0	1.0	< 1.0
cis-1,2-Dichloroethene	3,000		< 1.0	56	62
trans-1,2-Dichloroethene	130		1.2	26	< 1.0
Chloroform	2.4		< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	110		< 1.0	< 1.0	< 1.0
2-Butanone	1,100		< 10	< 10	< 10
1,1,1-Trichloroethane	22,000		< 1.0	< 1.0	< 1.0
Trichloroethene	150,000		11	590*	91
1,1,2-Trichloroethane	1,200		< 1.0	< 1.0	< 1.0
Benzene	150		< 1.0	200*	150*
4-Methyl-2-Pentanone	560		< 10	< 10	< 10
Tetrachloroethene	6,900		< 1.0	12	16
Toluene	2,100		< 1.0	< 1.0	< 1.0
Ethylbenzene	54		< 1.0	< 1.0	< 1.0
Xylenes	530		< 2.0	< 2.0	< 2.0

Notes:
* - Target compounds quantitated from a secondary dilution due to analyte abundance in the sample.
- Shading indicates reported concentration above the proposed ACL value

Table 4 – Historical Data Comparison (continued)
Post-Closure Groundwater Quality Monitoring Plan, November 2001 Sample Event
South Boulevard Properties, Inc.
Charlotte, North Carolina

	Proposed ACL	ATP-3A 5/22/01	ATP-3A 11/01/01	EW-3 5/22/01	EW-3 11/01/01
PARAMETER (ug/L)					
Chloromethane	25	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	25	1.9	1.3	< 1.0	< 1.0
Chloroethene	2,800	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride	120	< 5.0	< 5.0	< 5.0	< 5.0
Acetone	700	< 25	< 25	< 25	< 25
1,1-Dichloroethene	34,000	1,100*	64	< 1.0	< 1.0
1,1-Dichloroethane	1,900	91	47	< 1.0	< 1.0
cis-1,2-Dichloroethene	3,000	160*	97	< 1.0	< 1.0
trans-1,2-Dichloroethene	130	< 1.0	4.0	< 1.0	< 1.0
Chloroform	2.4	2.8	2.0	< 1.0	< 1.0
1,2-Dichloroethane	110	< 1.0	2.5	< 1.0	< 1.0
2-Butanone	1,100	< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	22,000	120*	380*	< 1.0	< 1.0
Trichloroethene	150,000	4,500*	3,000*	1.1	< 1.0
1,1,2-Trichloroethane	1,200	24	15	< 1.0	< 1.0
Benzene	150	5.3	3.4	< 1.0	< 1.0
4-Methyl-2-Pentanone	560	< 10	< 10	< 10	< 10
Tetrachloroethene	6,900	280*	250	< 1.0	< 1.0
Toluene	2,100	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	54	< 1.0	< 1.0	< 1.0	< 1.0
Xylenes	530	< 2.0	< 2.0	< 2.0	< 2.0

Notes:
* - Target compounds quantitated from a secondary dilution due to analyte abundance in the sample.
- Shading indicates reported concentration above the proposed ACL value

Table 4 – Historical Data Comparison (continued)
Post-Closure Groundwater Quality Monitoring Plan, November 2001 Sample Event
South Boulevard Properties, Inc.
Charlotte, North Carolina

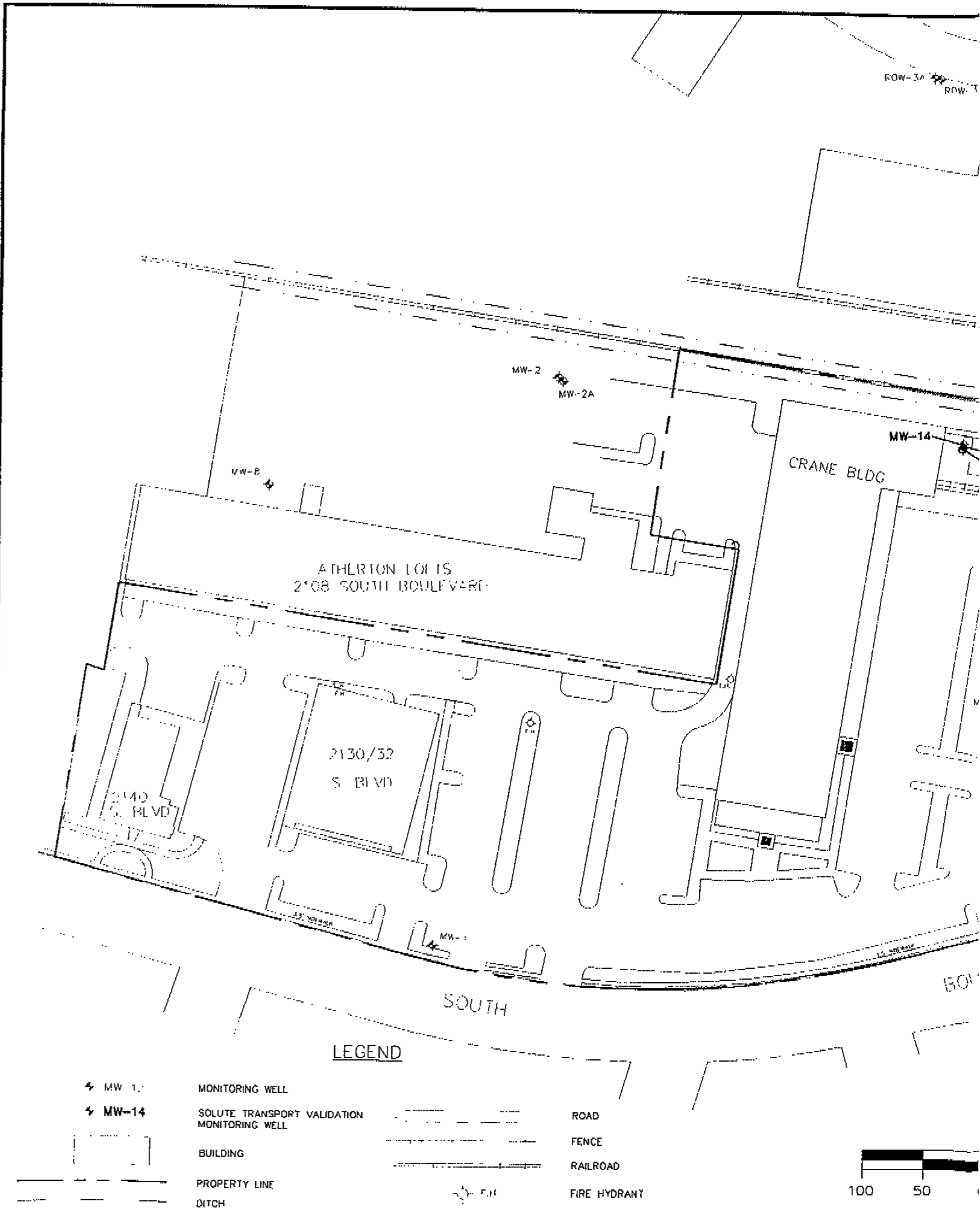
	Proposed ACL	PZ-1 5/22/01	PZ-1 11/01/01
PARAMETER (ug/L)			
Chloromethane	25	Well Dry	< 1.0
Vinyl Chloride	25	No Sample	< 1.0
Chloroethene	2,800		< 1.0
Methylene Chloride	120		< 5.0
Acetone	700		< 25
1,1-Dichloroethene	34,000		3.0
1,1-Dichloroethane	1,900		< 1.0
cis-1,2-Dichloroethene	3,000		< 1.0
trans-1,2-Dichloroethene	130		< 1.0
Chloroform	2.4		< 1.0
1,2-Dichloroethane	110		< 1.0
2-Butanone	1,100		< 10
1,1,1-Trichloroethane	22,000		< 1.0
Trichloroethene	150,000		< 1.0
1,1,2-Trichloroethane	1,200		< 1.0
Benzene	150		< 1.0
4-Methyl-2-Pentanone	560		< 10
Tetrachloroethene	6,900		< 1.0
Toluene	2,100		< 1.0
Ethylbenzene	54		< 1.0
Xylenes	530		< 2.0

Notes:
* - Target compounds quantitated from a secondary dilution due to analyte abundance in the sample.
- Shading indicates reported concentration above the proposed ACL value

Table 5 - Analytical Summary for Off-Site Wells and Alternate Exposure Levels
South Boulevard Properties, Inc.
Charlotte, North Carolina

Monitoring Well	Aquifer Horizon	Total VOC Concentration as Detected in Off-Site Groundwater Monitoring (mg/L)					Modeled Total VOC Concentration @ 1 Year (mg/L)	Modeled Total VOC Concentration @ 2 Years (mg/L)	Modeled Total VOC Concentration @ 3 Years (mg/L)	Max. Modeled Total VOC/Year Max. Occurs (mg/L-yr)	Proposed AEL (Total VOC Concentration, mg/L))
		1992	1995	1998	May 2001	Nov 2001					
PZ-1	Saprolite	0.0	NS	NS	NS	0.003	2.62	2.54	2.47	2.62 / 1 yr	2.60
EW-3	Partially Weathered Rock	0.008	0.014	NS	0.011	BDL	5.08	5.27	5.50	8.48 / 30 yr	6.50
ATP-3A	Fractured Rock	5.92	2.96	8.14	6.68	3.866	9.67	9.83	10.00	21.95 / 33 yr	11.00
ROW-1	Saprolite	0.190	0.23	0.006	NS	0.012	0.215	0.225	0.235	4.4 / 12 yr	0.30
ROW-1A	Partially Weathered Rock	40.0	14.5	7.73	0.992	0.327	0.589	0.63	0.672	11.7 / 12 yr	1.00

Notes:
Results for individual compounds from November 2001 sample event summarized in Table 3
VOC – Volatile Organic Compounds
AEL – Alternate Exposure Limit
NS - Not sampled
BDL – Below detection limit, concentrations for all individual compounds reported as less than sample-specific reporting limit, typically 0.001 mg/L.



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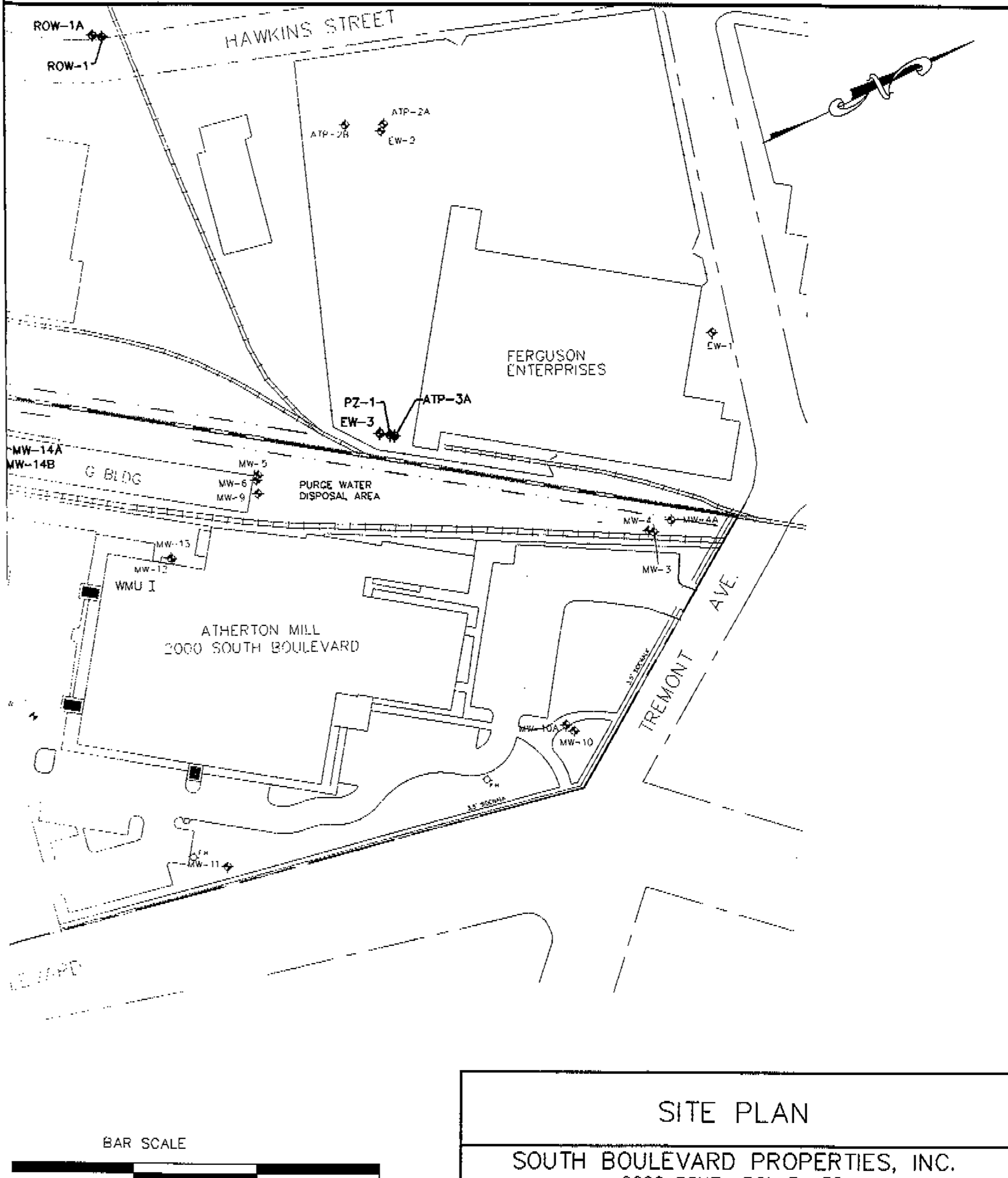
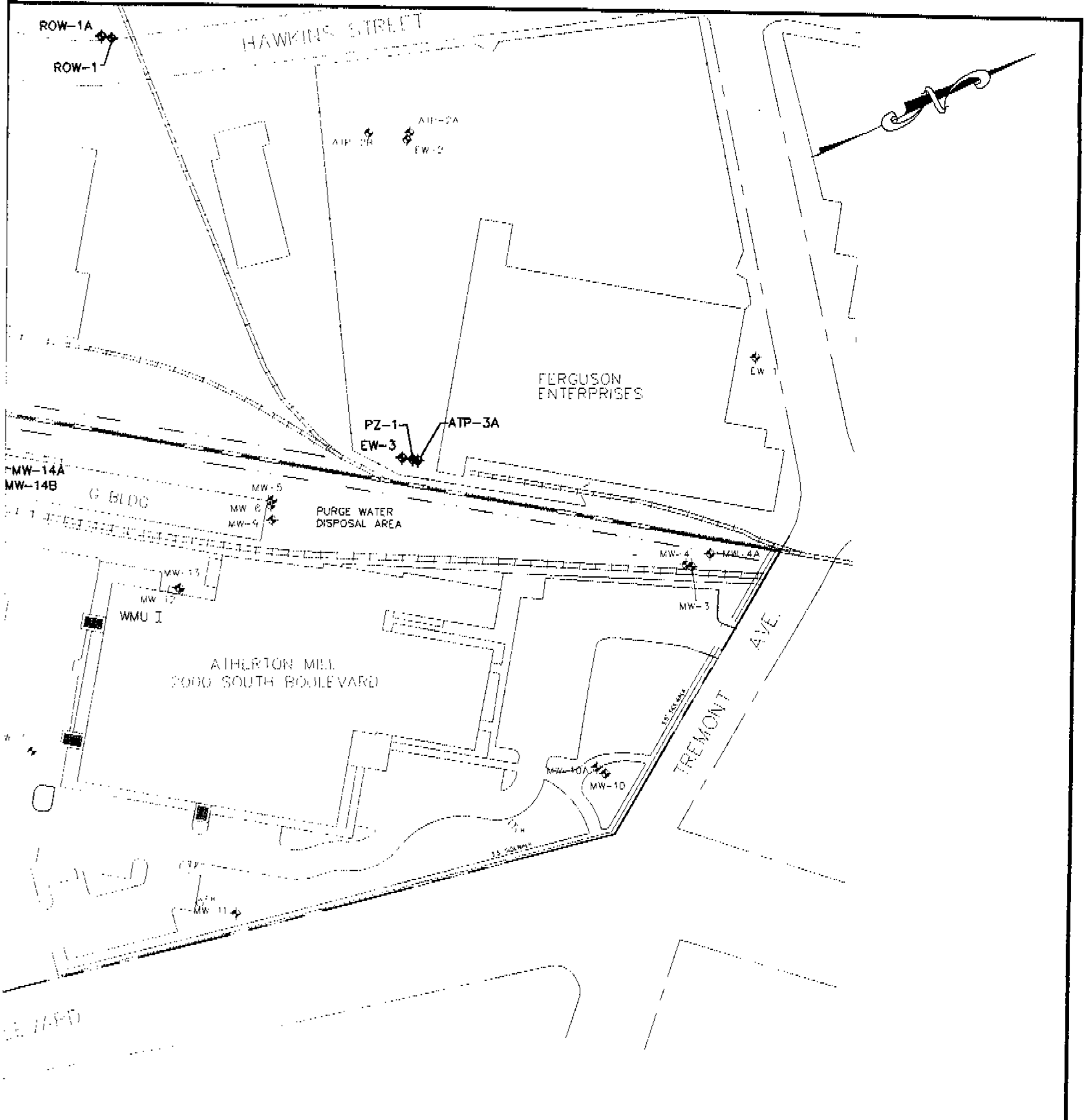


SITE PLAN

SOUTH BOULEVARD PROPERTIES, INC.

2000 SOUTH BOULEVARD
CHARLOTTE, NORTH CAROLINA

SCALE AS NOTED	APPROVED BY :	DRAWN BY: J.K.S.
DATE DECEMBER 2001	DESIGNED BY :	REVISED
PROJECT NUMBER N105-22	AWARE ENVIRONMENTAL INC 9305-J MONROE RD. CHARLOTTE, NC 28270	DRAWING NO. FIGURE 1



BAR SCALE

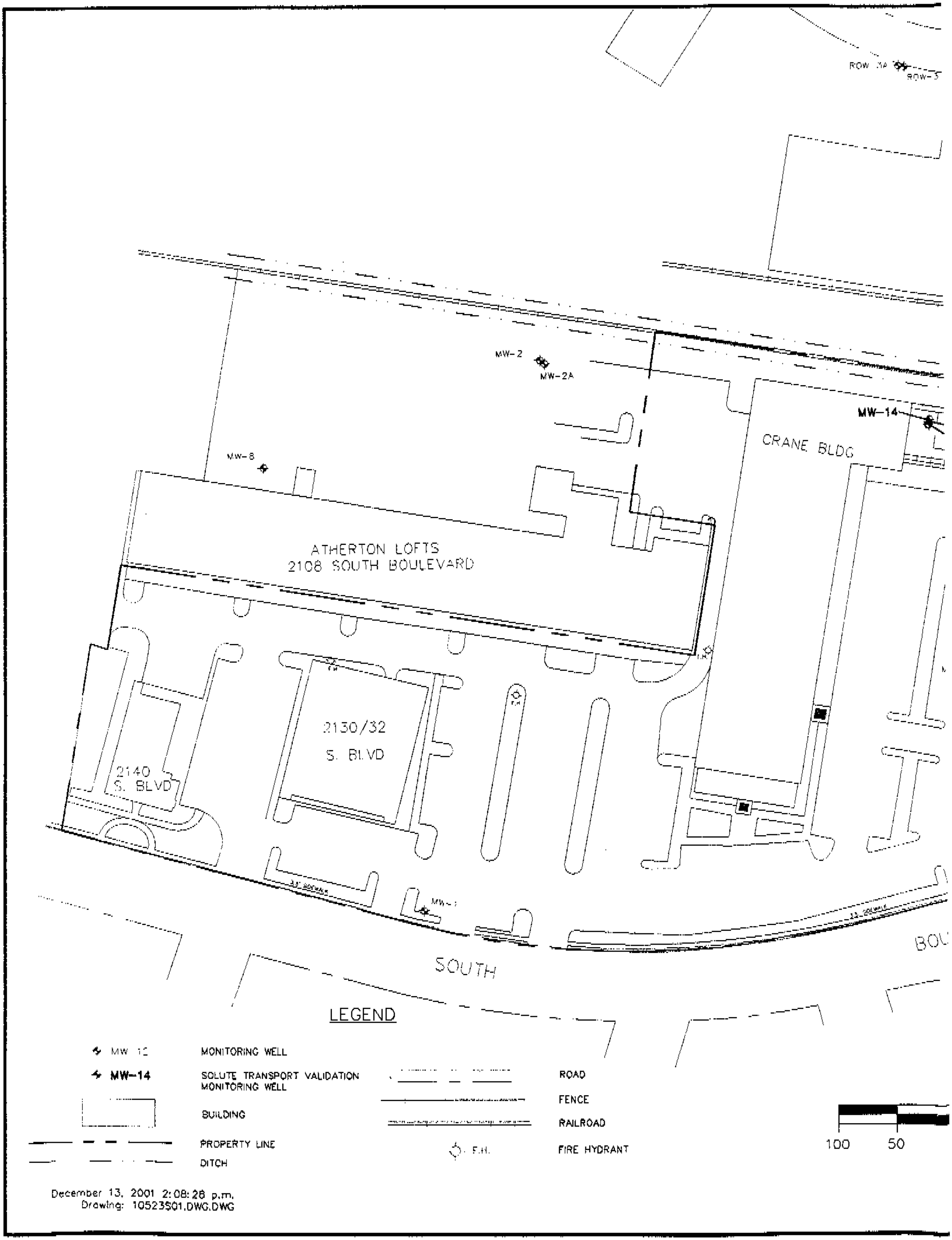
0 100 200 300

SITE PLAN

SOUTH BOULEVARD PROPERTIES, INC.

2000 SOUTH BOULEVARD
CHARLOTTE, NORTH CAROLINA

SCALE AS NOTED	APPROVED BY :	DRAWN BY: J.K.S.
DATE DECEMBER 2001	DESIGNED BY :	REVISED
PROJECT NUMBER N105-22	AWARE ENVIRONMENTAL INC 9305-J MONROE RD. CHARLOTTE, NC 28270	DRAWING NO. FIGURE 1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MW-2A
MW-14
CRANE BLDG
MW-8
ATHERTON LOFTS
2108 SOUTH BOULEVARD
2130/32
S. BLVD
2140
S. BLVD
SOUTH
LEGEND
MW-14
MONITORING WELL
SOLUTE TRANSPORT VALIDATION MONITORING WELL
BUILDING
PROPERTY LINE
DITCH
ROAD
FENCE
RAILROAD
F.H.
FIRE HYDRANT
100
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December 13, 2001 2:08:28 p.m.
Drawing: 10523S01.DWG.DWG

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AWARE ENVIRONMENTAL®

CERTIFIED MAIL – Return Receipt Requested
7099 3400 0011 6631 4079

JUL 2002
Received
Hazardous Waste
Section

July 8, 2002

Ms. Jill Pafford
Hazardous Waste Section Chief
North Carolina Department of Environment and Natural Resources
Mail Service Center 1646
Raleigh, NC 27699-1646

RE: May 2002 Post-Closure Groundwater Quality Monitoring
South Boulevard Properties, Inc., Charlotte, NC
2000 South Boulevard, Charlotte, North Carolina 28203
EPA ID No. NCD 053 010 732
AEI Job No. N105-22

Dear Ms. Pafford:

On behalf of facility owner South Boulevard Properties, Inc. (SBP), AWARE Environmental® Inc. (AEI) is submitting results from May 2002 groundwater sample collection and analyses associated with semi-annual post-closure groundwater quality monitoring activities for the above-referenced facility. This work was performed as specified in the Section-approved Modified Post-Closure Plan for Monitoring Associated with Validation of the Groundwater Solute Transport Model as revised September 2001 (Plan).

Sample Collection and Analysis

Field work was performed by AEI personnel and laboratory analysis conducted by STL Tallahassee, a division of Severn Trent Laboratories, Inc. Depth to water measurements at 17 on-site and 18 off-site monitoring wells were collected Wednesday May 1, 2002. In addition, total well depth was measured at the eight (8) wells to be sampled (ROW-1, ROW-1A, EW-3, ATP-3A, PZ-1, MW-14, MW-14A, and MW-14B). See Figure 1 for well locations. Monitoring well purge was initiated on May 1st and completed May 2nd. All sample collection was performed on May 2nd. Procedures and results are summarized below.

AWARE ENVIRONMENTAL® INC.
9305 MONROE ROAD
SUITE J
CHARLOTTE, N.C. 28270-1490
TELEPHONE (704) 845-1697
FAX (704) 845-1759
Federal ID 56-1694820

AWARE ENVIRONMENTAL® of FLORIDA, PLLC
2630 NW 41st STREET
SUITE D-1
GAINESVILLE, FLORIDA 32606
TELEPHONE (352) 335-1832
FAX (352) 335-0215
Federal ID 58-2599822

A Sample Pro Water Level Indicator Model 6000 was used to collect the depth to water measurements. The indicator probe was cleaned as specified in the Plan before each use. Measurements proceeded from wells having lessor to greater amounts of contamination, as determined from previous monitoring events. Results are presented in the attached Table 1. Well depths were measured with a weighted tape measure or, in the case of the deeper wells, a weighted nylon monofilament line. The weights and reusable tape measure were cleaned before each use. The nylon monofilament was disposed of after a single use.

Well purge began May 1, 2002 after completion of all depth to water measurements and was completed on May 2, 2002. Dedicated teflon bailers suspended on nylon cord were used to remove well purge water. Well purge volume was to dryness or to three (3) times the static volume, whichever occurred first. The purge water was transferred to 55-gallon steel drums for storage pending later on-site treatment. Storage and treatment details are discussed below. Calculated static well volumes and actual purge volumes are presented in Table 2.

Groundwater samples were collected from each of the designated wells proceeding from wells having lessor to those having greater contamination levels, as determined from previous monitoring events.

Groundwater samples were analyzed for volatile organic compounds (VOCs) using EPA SW 846 Method 8260. Sample containers (3 each 40 *ml* vials with septa caps and hydrochloric acid preservative) were supplied by the analytical laboratory. Field measurements for temperature, pH, and specific conductivity were taken at the time of sample collection. Immediately following collection, the sample containers were stored on ice in an insulated cooler for later transport to the laboratory.

One (1) field blank was prepared and analyzed as a check against the possible impact of ambient conditions on the sample collection effort. A trip blank, prepared by the laboratory, accompanied the sample kit throughout the sample event and return shipment. No compounds were detected in the field blank or trip blank.

Samples and the blanks were analyzed as specified in the Plan. Chain-of-custody protocol was followed during the transfer of samples to the contract laboratory; documentation is attached. Field measurements are summarized in Table 2; analytical results are summarized in Table 3. A complete photocopy of the laboratory report including chain-of-custody record is attached.

Storage and Treatment of Purge Water

Monitoring well purge water and decontamination fluids were drummed at the time of generation. In accordance with October 24, 2001 Section correspondence, the drums (2) were labeled as containing hazardous waste with an accumulation start date to match the date of initial use (May 1st or 2nd). The drums were stored inside a locked building with a 24-hour contact telephone number posted beside the door.

On May 3, 2002 the water was pumped from the storage drums through an activated carbon treatment unit. The drums used initially to store the untreated water were rinsed with tap water. The tap water was captured and put through the treatment unit. The pump and hoses, dedicated to this job, are stored in a bucket for future use. The two (2) drums containing the treated water were labeled as containing hazardous waste pending the outcome of treated water testing. One (1) sample of treated water was collected from each drum to test the effectiveness of the treatment process.

Analysis by SW 846 Method 8260 of the treated water samples was performed by STL Tallahassee with a typical sample quantitation limit of 1 ug/L. A photocopy of the report is attached. No parameters were reported above the sample quantitation limit therefore the treatment was deemed complete. The purge water was disposed May 16, 2002 by distributing it over a grassy area at the rear of the site.

Groundwater Analytical Results

A comparison of the May 2002 analytical results with the proposed Alternate Concentration Limit (ACL) values indicates that constituent concentrations in groundwater from well MW-14A exceeded the respective proposed ACL values for chloroform and ethylbenzene (Table 3). Sample analytical results from all other wells were below the proposed ACL values.

Table 4 presents historical data by well generated since inception of the solute transport validation monitoring program. The monitoring program began in May 2001 with samples from the MW-14 series wells plus off-site wells ROW-1A, ATP-3A, EW-3 (ROW-1 and PZ-1 were dry in May 2001). Confirmatory sampling was subsequently performed in June 2001 for the MW-14 series wells. All wells were sampled during the November 2001 and May 2002 monitoring events. A review of Table 4 shows that with regard to the proposed ACLs, both the number and magnitude of exceedances continue to decrease. No exceedances for the primary contaminants trichloroethene and 1,1,1-trichloroethane have been reported since May 2001 and the total number of exceedances is down from four (4) reported in November 2001 to two (2) reported in May 2002.

In addition to proposing ACL values for individual parameters, SBP has proposed a set of Alternate Exposure Level (AEL) values for water quality in specified down gradient wells. The AEL values are based upon the solute transport model results and have been evaluated for protection of human health assuming the contaminant plume eventually reaches surface water. The AEL values represent the total VOC concentration at a given well rather than individual parameter concentrations.

A comparison of total VOCs, calculated by summing the concentrations of all detected parameters for a given well with the proposed AEL values, indicates that contaminant levels in groundwater at all the designated off-site wells are below the respective AEL values (Table 3).

Off-site well historical data is compared to solute transport model results and the proposed AEL values in Table 5. The reported total VOC concentration for all off-site Plan wells is continuing to display an overall decreasing trend with only one increase in total VOC concentration apparent since termination of the remedial activities. Well ROW-1A results from May 2002 are higher than those reported in November 2001 but lower than similar data from prior monitoring events.

Summary

May 2002 represents the third monitoring event performed under the Modified Post Closure Plan for Monitoring Associated with Validation of the Groundwater Solute Transport Model. The first event was in May 2001, approximately one month after termination of soil and groundwater remediation activities. While concentrations of selected parameters were reported to currently exceed the proposed ACL values, the amount of the exceedance is relatively small, typically on the order of 20 ug/L or less. Overall, May 2002 results suggest a continuing downward trend in concentration levels when compared to similar data from previous monitoring events.

As outlined in the Plan, collection of additional data by continuing the semi-annual monitoring events over the next 2 years is proposed to allow for further evaluation. The next monitoring event is scheduled for November 2002. Should you have any questions or comments about procedures or the data presented, please do not hesitate to call.

Sincerely,
AWARE Environmental® Inc.

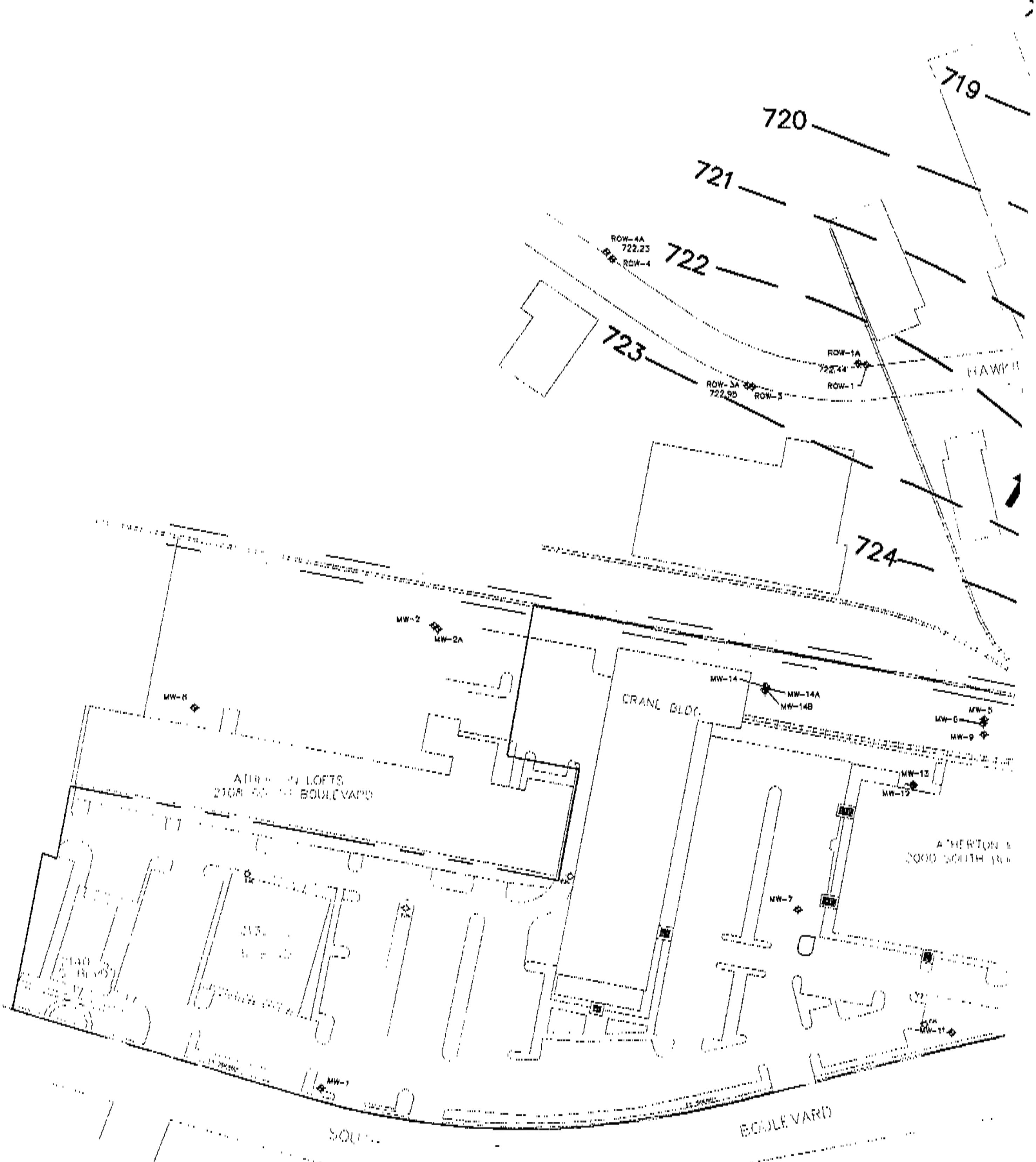
Michael O. Smith

Michael O. Smith, P.E.
Facility Contact

Attachments

cc: File
D. Ford, SBP
J. Hopcroft, SBP
M. Justice, Esq.
D. Love, AEI
Site

105221010



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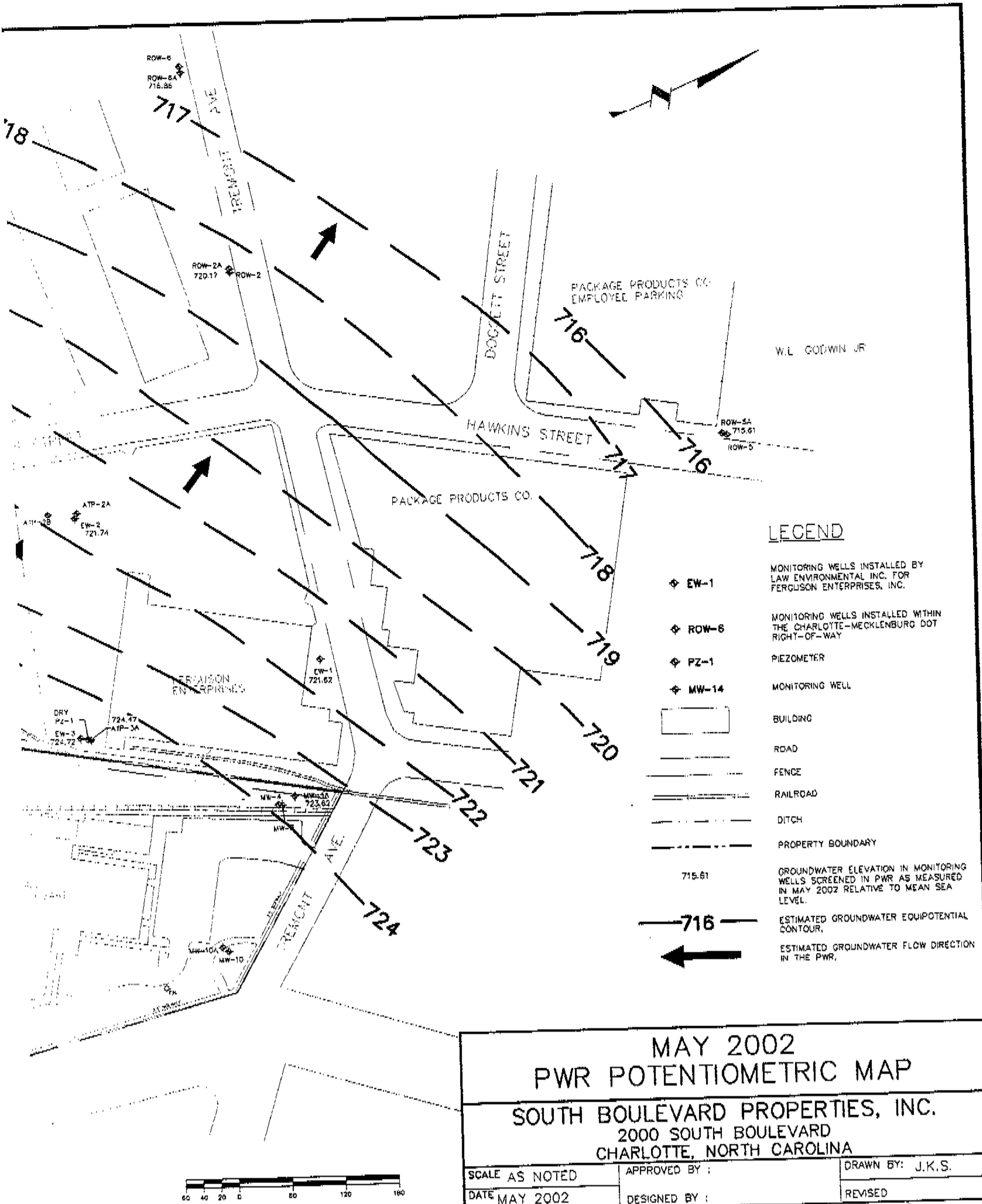
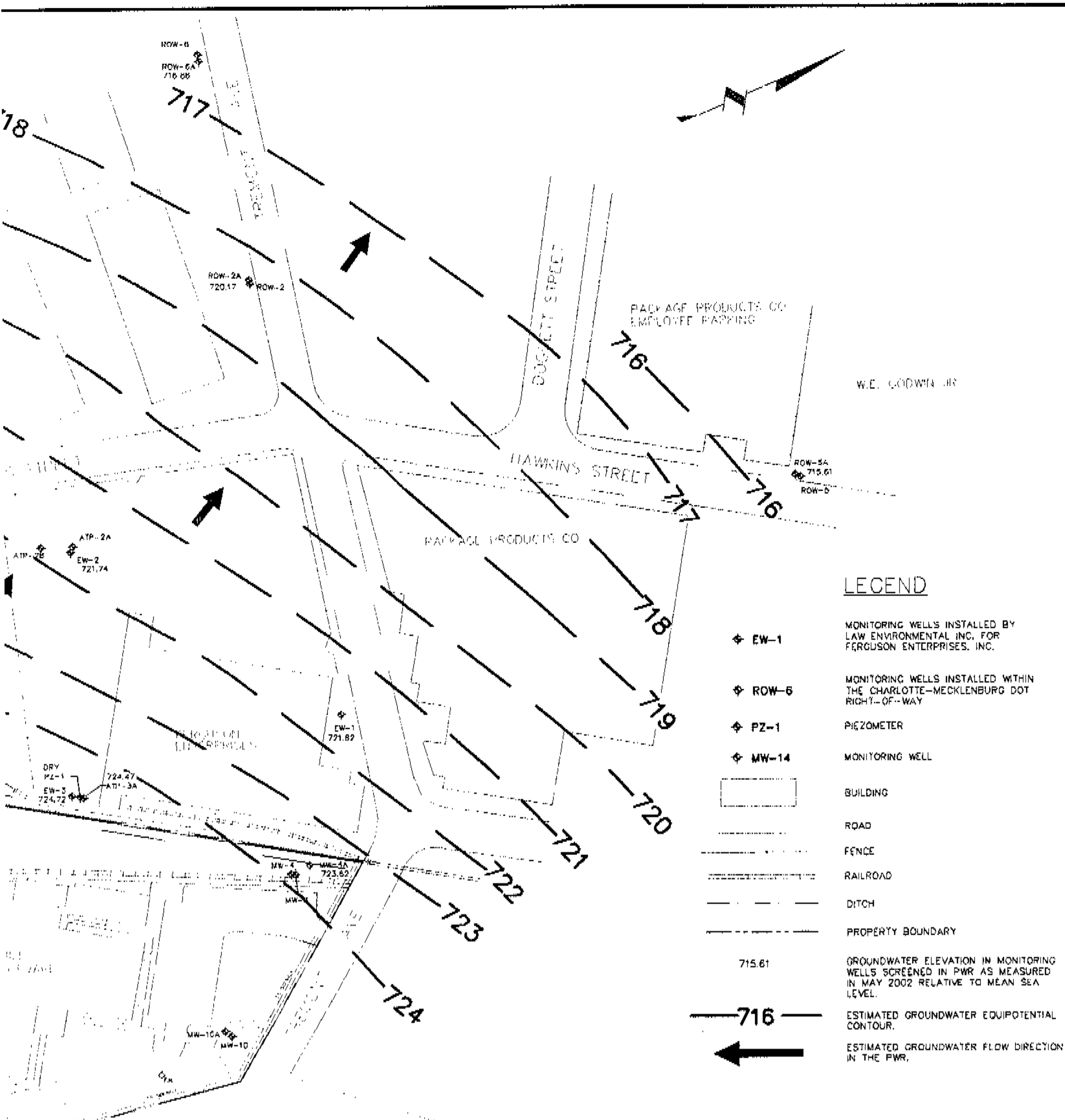


MAY 2002
PWR POTENTIOMETRIC MAP

SOUTH BOULEVARD PROPERTIES, INC.
2000 SOUTH BOULEVARD
CHARLOTTE, NORTH CAROLINA

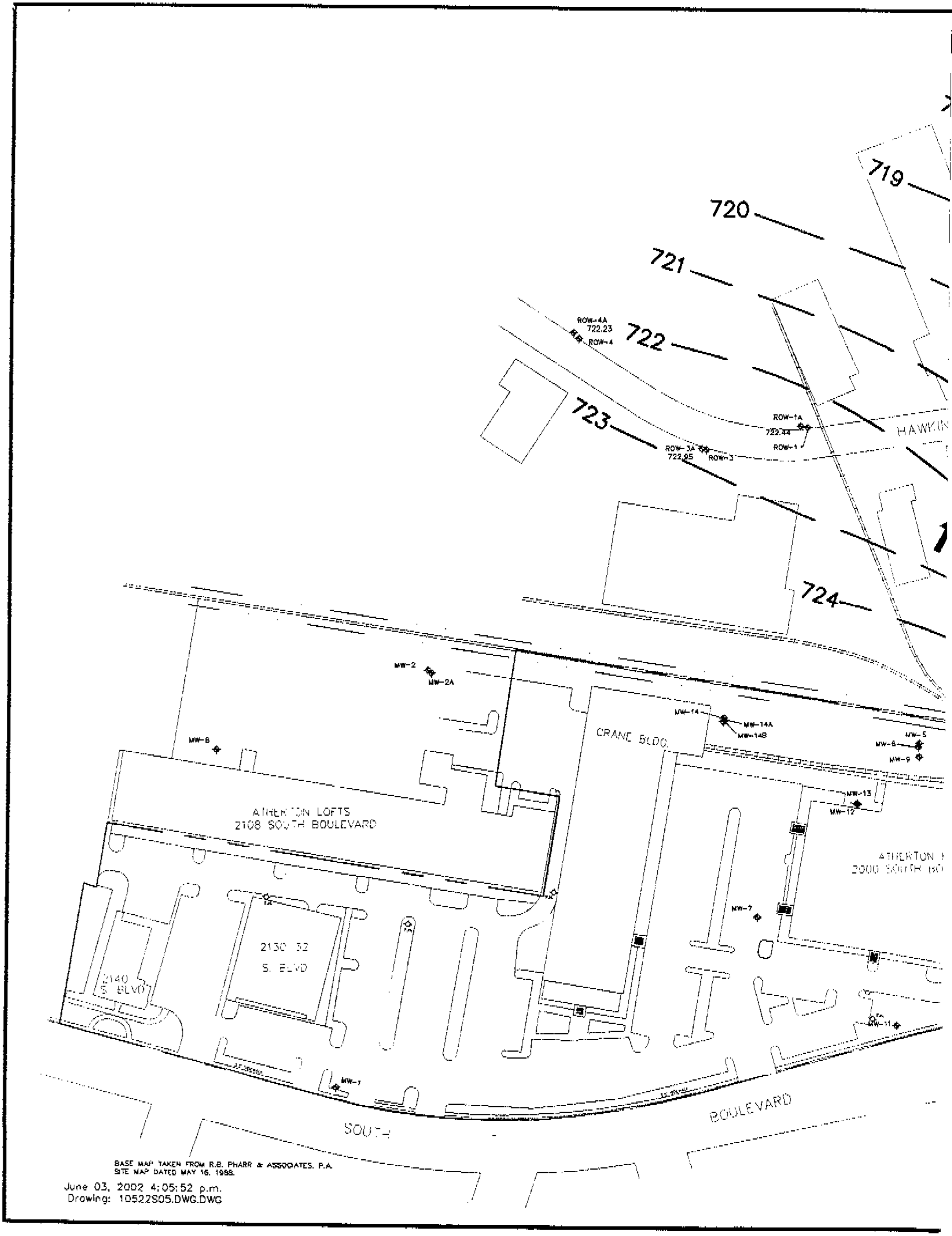
SCALE AS NOTED	APPROVED BY :	DRAWN BY: J.K.S.
DATE MAY 2002	DESIGNED BY :	REVISED
PROJECT NUMBER N105-22	AWARE ENVIRONMENTAL INC 9305-J MONROE RD. CHARLOTTE, NC 28270	DRAWING NO. FIGURE 2



MAY 2002
PWR POTENTIOMETRIC MAP

SOUTH BOULEVARD PROPERTIES, INC.
2000 SOUTH BOULEVARD
CHARLOTTE, NORTH CAROLINA

SCALE AS NOTED	APPROVED BY :	DRAWN BY: J.K.S.
DATE MAY 2002	DESIGNED BY :	REVISED
PROJECT NUMBER N105-22	AWARE ENVIRONMENTAL INC 9305-J MONROE RD. CHARLOTTE, NC 28270	DRAWING NO. FIGURE 2



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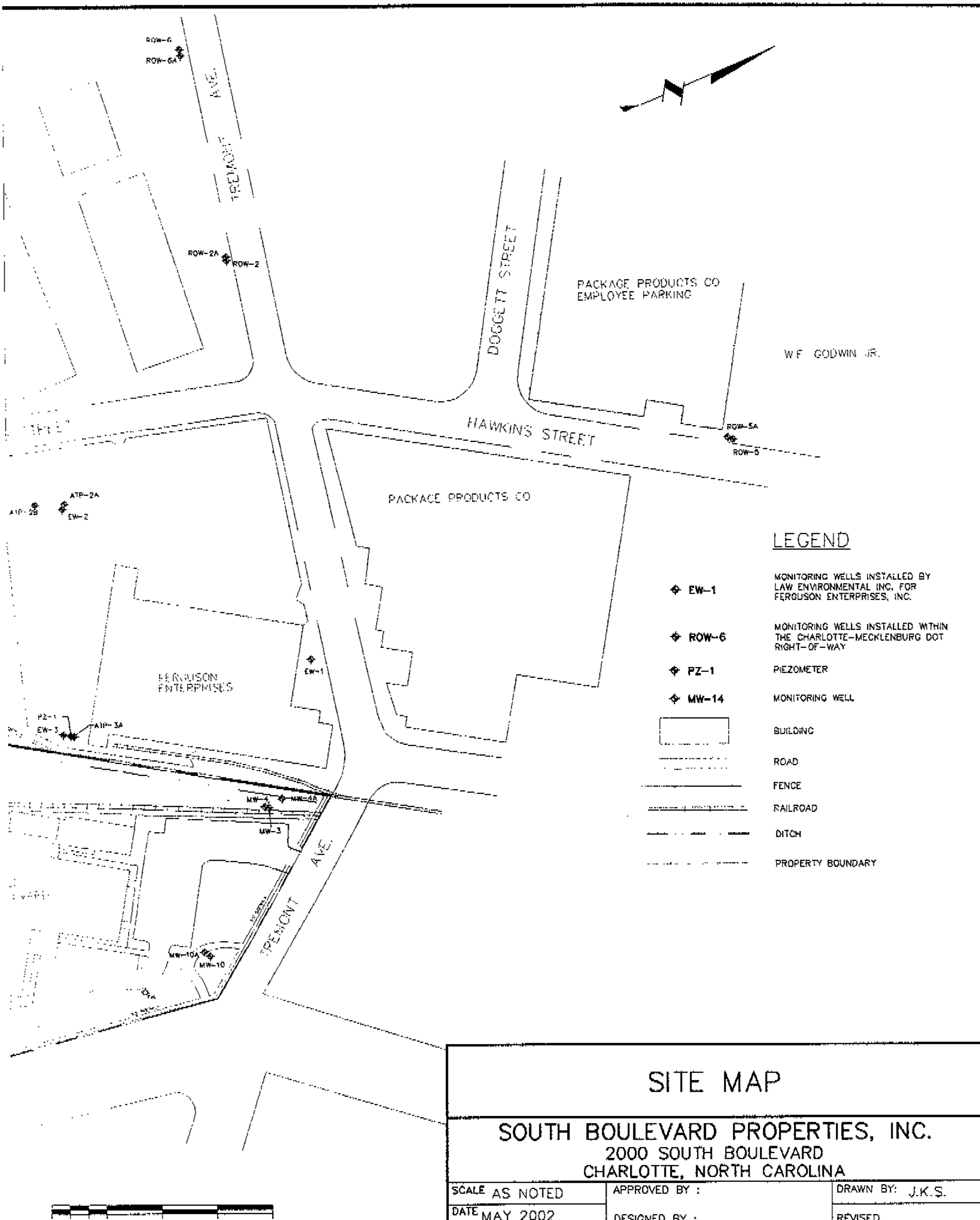
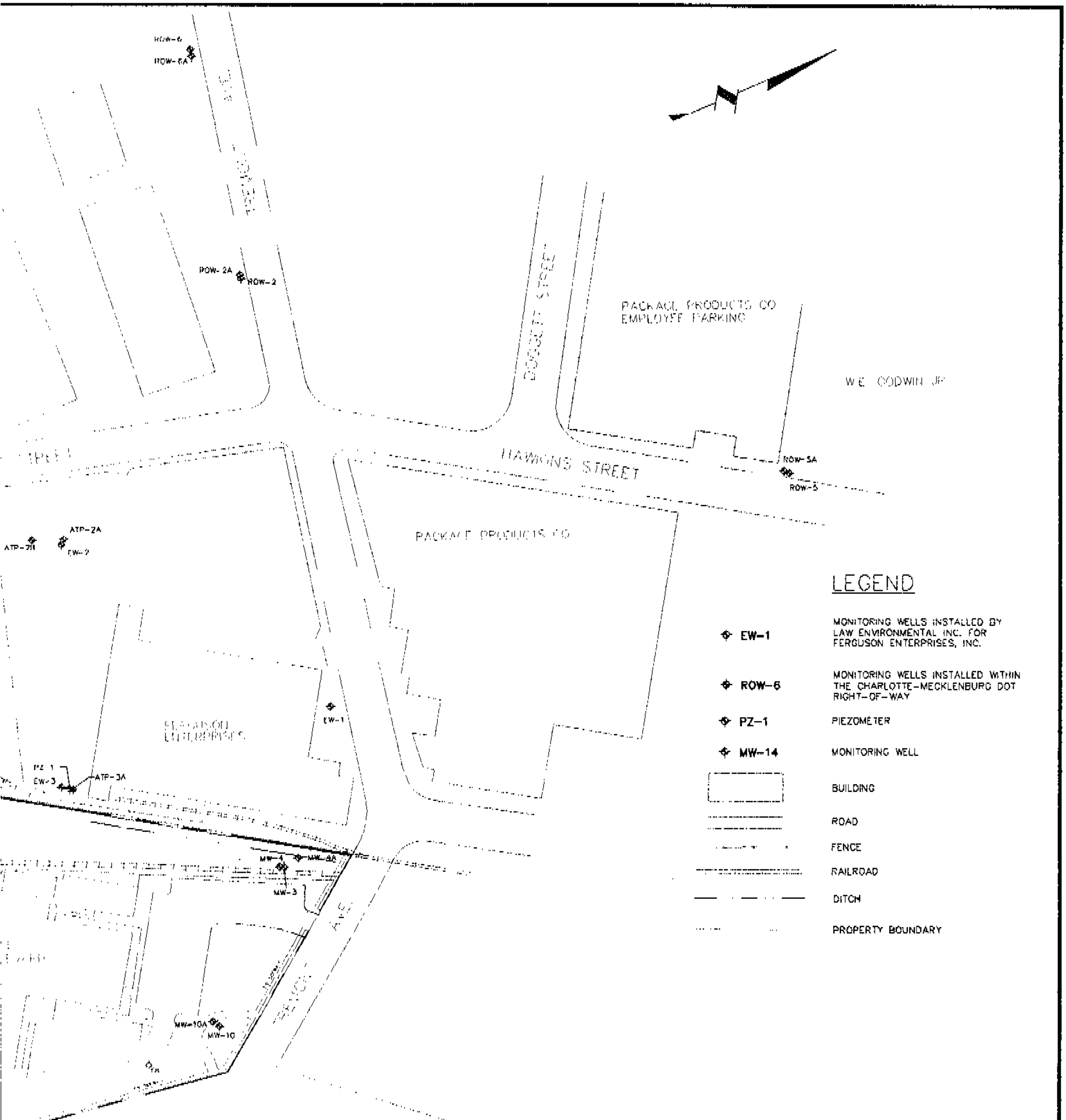


SITE MAP

SOUTH BOULEVARD PROPERTIES, INC.

2000 SOUTH BOULEVARD
CHARLOTTE, NORTH CAROLINA

SCALE AS NOTED	APPROVED BY :	DRAWN BY: J.K.S.
DATE MAY 2002	DESIGNED BY :	REVISED
PROJECT NUMBER N105-22	AWARE ENVIRONMENTAL INC 9305-J MONROE RD. CHARLOTTE, NC 28270	DRAWING NO. FIGURE 1

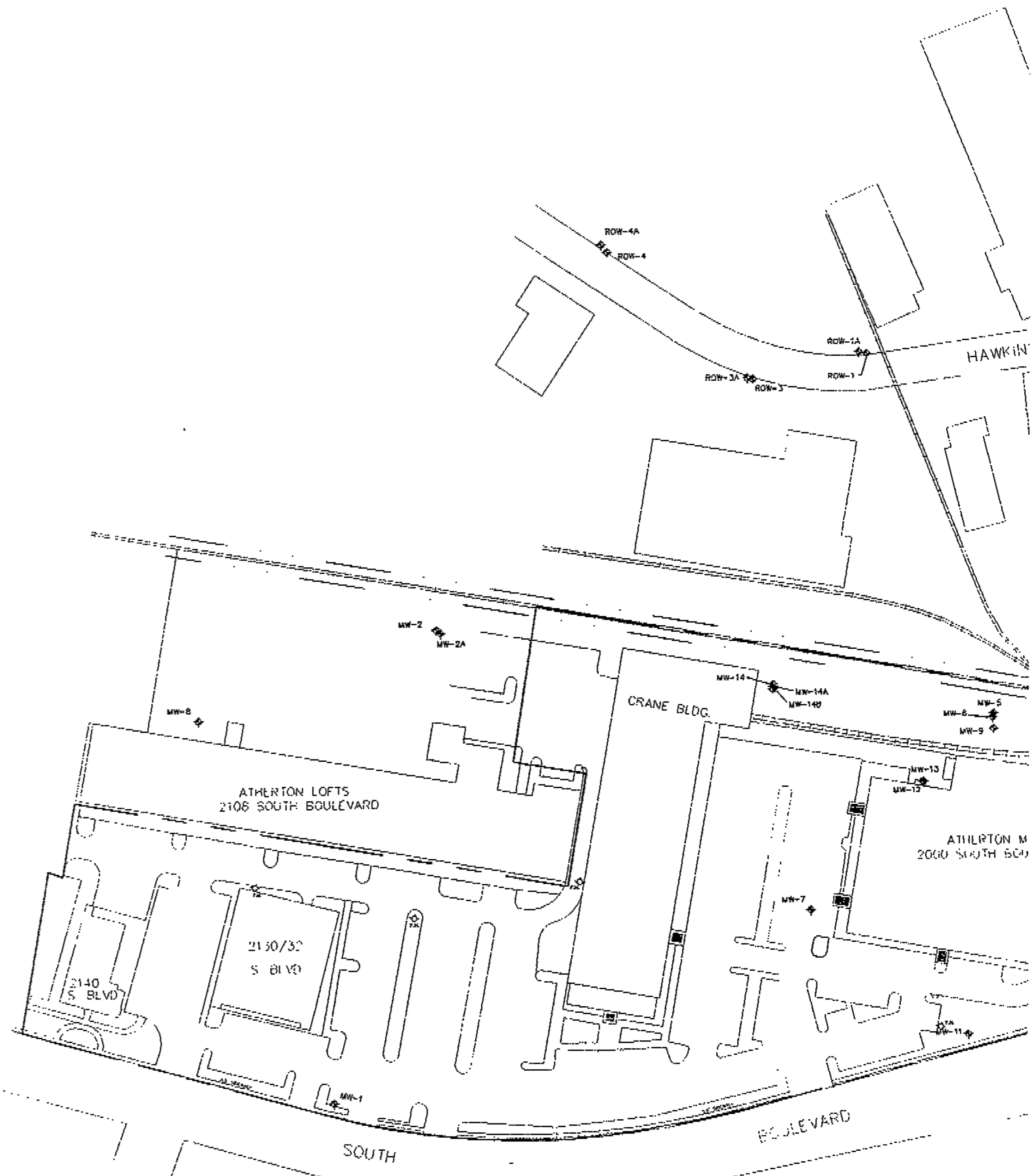


SITE MAP

SOUTH BOULEVARD PROPERTIES, INC.

2000 SOUTH BOULEVARD
CHARLOTTE, NORTH CAROLINA

SCALE AS NOTED	APPROVED BY :	DRAWN BY: J.K.S.
DATE MAY 2002	DESIGNED BY :	REVISED
PROJECT NUMBER N105-22	AWARE ENVIRONMENTAL INC 9305-J MONROE RD. CHARLOTTE, NC 28270	DRAWING NO. FIGURE 1



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SITE MAP DATED MAY 16, 1988.

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Table 1 - Water Level Measurements
Post-Closure Groundwater Quality Monitoring Plan, May 2002 Sample Event
South Boulevard Properties, Inc. Charlotte, North Carolina

Well ID	Top of Casing Elevation (ft – msl)	May 2002 Sample Event Depth to Water (ft.)	Groundwater Elevation (msl)
MW-1	756.47	29.85	726.62
MW-2	753.02	26.54	726.48
MW-2A	753.48	27.19	726.29
MW-3	742.00	18.00	724.00
MW-4	742.27	18.54	723.73
MW-4A	742.46	18.84	723.62
MW-5	748.46	23.60	724.86
MW-6	748.53	23.51	725.02
MW-7	749.59	24.00	725.59
MW-8	749.91	23.11	726.80
MW-9	749.16	24.36	724.80
MW-10	746.45	21.12	725.33
MW-10A	746.46	20.31	726.15
MW-11	751.49	25.87	725.62
MW-12	749.31	Not measured	Not available
MW-13	749.16	Not measured	Not available
MW-14	748.81	23.94	724.87
MW-14A	748.64	23.11	725.53
MW-14B	748.66	22.57	726.09
EW-1	740.92	19.30	721.62
EW-2	743.78	22.04	721.74
EW-3	741.46	16.74	724.72
ATP-2A	743.94	25.61	718.33
ATP-2B	744.47	Not measured	Not available
ATP-3A	741.42	16.95	724.47
PZ-1	741.44	16.82	724.62
ROW-1	744.80	22.17	722.63
ROW-1A	744.94	22.50	722.44
ROW-2	733.60	13.91	719.69
ROW-2A	733.75	13.58	720.17
ROW-3	744.37	22.27	722.10
ROW-3A	744.57	21.62	722.95
ROW-4	743.43	19.61	723.82
ROW-4A	743.73	21.50	722.23
ROW-5	718.41	4.56	713.85
ROW-5A	718.24	2.63	715.61
ROW-6	731.35	14.39	716.96
ROW-6A	731.44	14.58	716.86

Note: ATP-2B casing sealed at well head.
Wells MW-12 and MW-13 omitted from May 2002 field measurements.

Table 2 - Field Data Sheet
Post-Closure Groundwater Quality Monitoring Plan, May 2002 Sample Event
South Boulevard Properties, Inc. Charlotte, North Carolina

Well ID:	ROW-1	ROW-1A	PZ-1	EW-3
Well Depth from construction records (feet below top of casing)	25.0	59.0	19.5	32.0
Well Depth from field measurements (feet below top of casing)	24.96	57.31	19.75	29.92
Depth to Water (feet below top of casing)	22.17	22.50	16.82	16.74
Static Volume (gallons)	0.5	5.8	0.5	2.4
Actual Purge Volume (gallons)	1.5 (dry)	17	2.0	8
Purge Time	12:40	12:35	10:45	10:14
Purge Date	5/2/02	5/2/02	5/2/02	5/2/02
Sample Time	12:50	13:07	11:15	11:05
Sample Date	5/2/02	5/2/02	5/2/02	5/2/02
pH (standard units)	4.8	5.9	5.0	6.2
Conductivity (umhos)	400	195	85	118
Temperature (°C)	23	22	18	20

Well ID:	ATP-3A	MW-14	MW-14A	MW-14B
Well Depth from construction records (feet below top of casing)	81.0	138.0	75.0	35.0
Well Depth from field measurements (feet below top of casing)	79.71	138.67	75.00	35.25
Depth to Water (feet below top of casing)	16.95	23.94	23.11	22.57
Static Volume (gallons)	10.2	18.3	8.3	2.0
Actual Purge Volume (gallons)	32	25 (dry)	25	6.5
Purge Time	10:05	8:40	15:06	15:12
Purge Date	5/2/02	5/2/02	5/1/02	5/1/02
Sample Time	13:20	13:55	14:10	13:45
Sample Date	5/2/02	5/2/02	5/2/02	5/2/02
pH	5.9	7.2	6.4	4.7
Conductivity	165	495	680	210
Temperature	18	23	23	23

Table 3 - Analytical Summary
Post-Closure Groundwater Quality Monitoring Plan, May 2002 Sample Event
South Boulevard Properties, Inc. Charlotte, North Carolina

Well I.D.	Proposed ACL	ROW-1	ROW-1A	PZ-1	EW-3	ATP-3A
Screen Interval		730.2-720.2	696.4-686.4	727.4-722.4	719.9-709.9	670.8-660.8
PARAMETER (ug/L)						
Chloromethane	25	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	25	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	2,800	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Methylene Chloride	120	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Acetone	700	< 25	< 25	< 25	< 25	< 25
1,1-Dichloroethene	34,000	< 1.0	< 1.0	2.4	< 1.0	310*
1,1-Dichloroethane	1,900	< 1.0	< 1.0	< 1.0	< 1.0	31
cis-1,2-Dichloroethene	3,000	< 1.0	60*	< 1.0	< 1.0	58
trans-1,2-Dichloroethene	130	1.1	30	< 1.0	< 1.0	2.2
Chloroform	2.4	< 1.0	< 1.0	< 1.0	< 1.0	1.4
1,2-Dichloroethane	110	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Butanone	1,100	< 10	< 10	< 10	< 10	< 10
1,1,1-Trichloroethane	22,000	< 1.0	1.4	< 1.0	< 1.0	140*
Trichloroethene	150,000	9.9	740*	< 1.0	< 1.0	1300*
1,1,2-Trichloroethane	1,200	< 1.0	< 1.0	< 1.0	< 1.0	8.3
Benzene	150	< 1.0	82*	< 1.0	< 1.0	1.6
4-Methyl-2-Pentanone	560	< 10	< 10	< 10	< 10	< 10
Tetrachloroethene	6,900	< 1.0	32	< 1.0	< 1.0	130*
Toluene	2,100	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	54	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Xylenes	530	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
Total VOC Concentration. (ug/L)		11	945	2.4	Below Detect.	1,983
Proposed AEL (ug/L)		300	1,000	2,600	6,500	11,000

Notes:
Screen interval measured in feet from mean sea level
* - Target compounds quantitated from a secondary dilution due to analyte abundance in the sample.

Table 3 - Analytical Summary (continued)
Post-Closure Groundwater Quality Monitoring Plan, May 2002 Sample Event
South Boulevard Properties, Inc. Charlotte, North Carolina

Well I.D.	Proposed ACL	MW-14	MW-14A	MW-14B	Field Blank	Trip Blank
Screen Interval		621.0-611.0	684.1-674.1	724.1-714.1		
PARAMETER (ug/L)						
Chloromethane	25	< 25	< 25	< 25	< 1.0	< 1.0
Vinyl Chloride	25	< 25	< 25	< 25	< 1.0	< 1.0
Chloroethane	2,800	< 25	< 25	< 25	< 1.0	< 1.0
Methylene Chloride	120	< 120	< 120	< 120	< 5.0	< 5.0
Acetone	700	< 620	< 620	< 620	< 25	< 25
1,1-Dichloroethene	34,000	440	23,000*	400	< 1.0	< 1.0
1,1-Dichloroethane	1,900	62	990	< 25	< 1.0	< 1.0
cis-1,2-Dichloroethene	3,000	800	1,400	37	< 1.0	< 1.0
trans-1,2-Dichloroethene	130	< 25	< 25	< 25	< 1.0	< 1.0
Chloroform	2.4	< 25	26	< 25	< 1.0	< 1.0
1,2-Dichloroethane	110	< 25	< 25	< 25	< 1.0	< 1.0
2-Butanone	1,100	< 250	< 250	< 250	< 10	< 10
1,1,1-Trichloroethane	22,000	760	14,000*	1,400*	< 1.0	< 1.0
Trichloroethene	150,000	7,000*	130,000*	5,100*	< 1.0	< 1.0
1,1,2-Trichloroethane	1,200	< 25	630	< 25	< 1.0	< 1.0
Benzene	150	< 25	< 25	< 25	< 1.0	< 1.0
4-Methyl-2-Pentanone	560	< 250	< 250	< 250	< 10	< 10
Tetrachloroethene	6,900	170	6,700*	170	< 1.0	< 1.0
Toluene	2,100	< 25	530	< 25	< 1.0	< 1.0
Ethylbenzene	54	< 25	57	< 25	< 1.0	< 1.0
Xylenes	530	< 50	< 50	< 50	< 2.0	< 2.0

Notes:
Screen interval measured in feet from mean sea level
* - Target compounds quantitated from a secondary dilution due to analyte abundance in the sample.
- Shading indicates reported concentration above the proposed ACL value

Table 4 – Historical Data Comparison
Post-Closure Groundwater Quality Monitoring Plan, May 2002 Sample Event
South Boulevard Properties, Inc. Charlotte, North Carolina

	Proposed ACL	MW-14 5/22/01	5/22/01 (DUP)	6/18/01	11/1/01	5/2/02
PARAMETER (ug/L)						
Chloromethane	25	< 25	< 25	< 25	< 25	< 25
Vinyl Chloride	25	< 25	< 25	< 25	< 25	< 25
Chloroethane	2,800	< 25	< 25	< 25	< 25	< 25
Methylene Chloride	120	< 120	< 120	< 120	< 120	< 120
Acetone	700	< 620	< 620	< 620	< 620	< 620
1,1-Dichloroethene	34,000	35,000*	1,400	580	1,100	440
1,1-Dichloroethane	1,900	480	350	100	130	62
cis-1,2-Dichloroethene	3,000	2,200	1,700	460	1,900	800
trans-1,2-Dichloroethene	130	< 25	< 25	< 25	< 25	< 25
Chloroform	2.4	< 25	< 25	< 25	< 25	< 25
1,2-Dichloroethane	110	< 25	< 25	< 25	< 25	< 25
2-Butanone	1,100	< 250	< 250	< 250	< 250	< 250
1,1,1-Trichloroethane	22,000	62,000*	9,200*	2,400	2,300	760
Trichloroethene	150,000	300,000*	45,000*	7,900	7,700*	7,000*
1,1,2-Trichloroethane	1,200	230	230	41	< 25	< 25
Benzene	150	< 25	< 25	< 25	< 25	< 25
4-Methyl-2-Pentanone	560	< 250	< 250	< 250	< 250	< 250
Tetrachloroethene	6,900	1,200	780	330	520	170
Toluene	2,100	130	98	< 25	< 25	< 25
Ethylbenzene	54	< 25	< 25	< 25	< 25	< 25
Xylenes	530	< 50	< 50	< 50	< 50	< 50

Notes:
* - Target compounds quantitated from a secondary dilution due to analyte abundance in the sample.
- Shading indicates reported concentration above the proposed ACL value

Table 4 – Historical Data Comparison (continued)
Post-Closure Groundwater Quality Monitoring Plan, May 2002 Sample Event
South Boulevard Properties, Inc. Charlotte, North Carolina

Well I.D.	Proposed	MW-14A			
Screen Interval	ACL	5/22/01	6/18/01	11/1/01	5/2/02
PARAMETER (ug/L)					
Chloromethane	25	< 25	< 100	< 25	< 25
Vinyl Chloride	25	26	< 100	38	< 25
Chloroethane	2,800	< 25	< 100	< 25	< 25
Methylene Chloride	120	< 120	< 500	< 120	< 120
Acetone	700	< 620	< 2500	< 620	< 620
1,1-Dichloroethene	34,000	37,000*	21,000	8,100*	23,000*
1,1-Dichloroethane	1,900	1,700	1,800	1,200	990
cis-1,2-Dichloroethene	3,000	2,100	2,200	1,600	1,400
trans-1,2-Dichloroethene	130	< 25	< 100	44	< 25
Chloroform	2.4	49	< 100	39	26
1,2-Dichloroethane	110	< 25	150	< 25	< 25
2-Butanone	1,100	< 250	< 1,000	< 250	< 250
1,1,1-Trichloroethane	22,000	22,000*	11,000	17,000*	14,000*
Trichloroethene	150,000	260,000*	100,000	150,000*	130,000*
1,1,2-Trichloroethane	1,200	1,200	1,100	740	630
Benzene	150	< 25	< 100	< 25	< 25
4-Methyl-2-Pentanone	560	< 250	< 1,000	< 250	< 250
Tetrachloroethene	6,900	16,000*	6,700	1,400	6,700*
Toluene	2,100	1,200	1,200	640	530
Ethylbenzene	54	110	100	71	57
Xylenes	530	820	750	560	< 50

Notes:
* - Target compounds quantitated from a secondary dilution due to analyte abundance in the sample.
[shaded] - Shading indicates reported concentration above the proposed ACL value

Table 4 – Historical Data Comparison (continued)
Post-Closure Groundwater Quality Monitoring Plan, May 2002 Sample Event
South Boulevard Properties, Inc. Charlotte, North Carolina

	Proposed ACL	MW-14B 5/22/01	6/18/01	11/1/01	5/2/02
PARAMETER (ug/L)					
Chloromethane	25	< 25	< 25	< 25	< 25
Vinyl Chloride	25	< 25	< 25	< 25	< 25
Chloroethane	2,800	< 25	< 25	< 25	< 25
Methylene Chloride	120	< 120	< 120	< 120	< 120
Acetone	700	< 620	< 620	< 620	< 620
1,1-Dichloroethene	34,000	1,100	770	520	400
1,1-Dichloroethane	1,900	72	43	28	< 25
cis-1,2-Dichloroethene	3,000	170	97	61	37
trans-1,2-Dichloroethene	130	< 25	< 25	< 25	< 25
Chloroform	2.4	< 25	< 25	< 25	< 25
1,2-Dichloroethane	110	< 25	< 25	< 25	< 25
2-Butanone	1,100	< 250	< 250	< 250	< 250
1,1,1-Trichloroethane	22,000	71,000*	2,700	2,100	1,400*
Trichloroethene	150,000	200,000*	7,100	6,500*	5,100*
1,1,2-Trichloroethane	1,200	83	36	< 25	< 25
Benzene	150	< 25	< 25	< 25	< 25
4-Methyl-2-Pentanone	560	< 250	< 250	< 250	< 250
Tetrachloroethene	6,900	440	300	210	170
Toluene	2,100	< 25	< 25	< 25	< 25
Ethylbenzene	54	< 25	< 25	< 25	< 25
Xylenes	530	< 50	< 50	< 50	< 50

Notes:
* - Target compounds quantitated from a secondary dilution due to analyte abundance in the sample.
- Shading indicates reported concentration above the proposed ACL value

Table 4 – Historical Data Comparison (continued)
Post-Closure Groundwater Quality Monitoring Plan, May 2002 Sample Event
South Boulevard Properties, Inc. Charlotte, North Carolina

	Proposed		ROW-1	
	ACL	5/22/01	11/01/01	5/2/02
PARAMETER (ug/L)				
Chloromethane	25	Well Dry	< 1.0	< 1.0
Vinyl Chloride	25	No Sample	< 1.0	< 1.0
Chloroethane	2,800		< 1.0	< 1.0
Methylene Chloride	120		< 5.0	< 5.0
Acetone	700		< 25	< 25
1,1-Dichloroethene	34,000		< 1.0	< 1.0
1,1-Dichloroethane	1,900		< 1.0	< 1.0
cis-1,2-Dichloroethene	3,000		< 1.0	< 1.0
trans-1,2-Dichloroethene	130		1.2	1.1
Chloroform	2.4		< 1.0	< 1.0
1,2-Dichloroethane	110		< 1.0	< 1.0
2-Butanone	1,100		< 10	< 10
1,1,1-Trichloroethane	22,000		< 1.0	< 1.0
Trichloroethene	150,000		11	9.9
1,1,2-Trichloroethane	1,200		< 1.0	< 1.0
Benzene	150		< 1.0	< 1.0
4-Methyl-2-Pentanone	560		< 10	< 10
Tetrachloroethene	6,900		< 1.0	< 1.0
Toluene	2,100		< 1.0	< 1.0
Ethylbenzene	54		< 1.0	< 1.0
Xylenes	530		< 2.0	< 2.0

Table 4 – Historical Data Comparison (continued)
Post-Closure Groundwater Quality Monitoring Plan, May 2002 Sample Event
South Boulevard Properties, Inc. Charlotte, North Carolina

	Proposed ACL	ROW-1A 5/22/01	11/01/01	5/2/02
PARAMETER (ug/L)				
Chloromethane	25	< 1.0	< 1.0	< 1.0
Vinyl Chloride	25	< 1.0	< 1.0	< 1.0
Chloroethane	2,800	< 1.0	< 1.0	< 1.0
Methylene Chloride	120	< 5.0	< 5.0	< 5.0
Acetone	700	< 25	< 25	< 25
1,1-Dichloroethene	34,000	5.9	8.2	< 1.0
1,1-Dichloroethane	1,900	1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	3,000	56	62	60*
trans-1,2-Dichloroethene	130	26	< 1.0	30
Chloroform	2.4	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	110	< 1.0	< 1.0	< 1.0
2-Butanone	1,100	< 10	< 10	< 10
1,1,1-Trichloroethane	22,000	< 1.0	< 1.0	1.4
Trichloroethene	150,000	590*	91	740*
1,1,2-Trichloroethane	1,200	< 1.0	< 1.0	< 1.0
Benzene	150	200*	150*	82*
4-Methyl-2-Pentanone	560	< 10	< 10	< 10
Tetrachloroethene	6,900	12	16	32
Toluene	2,100	< 1.0	< 1.0	< 1.0
Ethylbenzene	54	< 1.0	< 1.0	< 1.0
Xylenes	530	< 2.0	< 2.0	< 2.0

Notes:
* - Target compounds quantitated from a secondary dilution due to analyte abundance in the sample.
- Shading indicates reported concentration above the proposed ACL value

Table 4 – Historical Data Comparison (continued)
Post-Closure Groundwater Quality Monitoring Plan, May 2002 Sample Event
South Boulevard Properties, Inc. Charlotte, North Carolina

	Proposed ACL	ATP-3A 5/22/01	11/01/01	5/2/02
PARAMETER (ug/L)				
Chloromethane	25	< 1.0	< 1.0	< 1.0
Vinyl Chloride	25	1.9	1.3	< 1.0
Chloroethane	2,800	< 1.0	< 1.0	< 1.0
Methylene Chloride	120	< 5.0	< 5.0	< 5.0
Acetone	700	< 25	< 25	< 25
1,1-Dichloroethene	34,000	1,100*	64	310*
1,1-Dichloroethane	1,900	91	47	31
cis-1,2-Dichloroethene	3,000	160*	97	58
trans-1,2-Dichloroethene	130	< 1.0	4.0	2.2
Chloroform	2.4	2.8	2.0	1.4
1,2-Dichloroethane	110	< 1.0	2.5	< 1.0
2-Butanone	1,100	< 10	< 10	< 10
1,1,1-Trichloroethane	22,000	120*	380*	140*
Trichloroethene	150,000	4,500*	3,000*	1300*
1,1,2-Trichloroethane	1,200	24	15	8.3
Benzene	150	5.3	3.4	1.6
4-Methyl-2-Pentanone	560	< 10	< 10	< 10
Tetrachloroethene	6,900	280*	250	130*
Toluene	2,100	< 1.0	< 1.0	< 1.0
Ethylbenzene	54	< 1.0	< 1.0	< 1.0
Xylenes	530	< 2.0	< 2.0	< 2.0

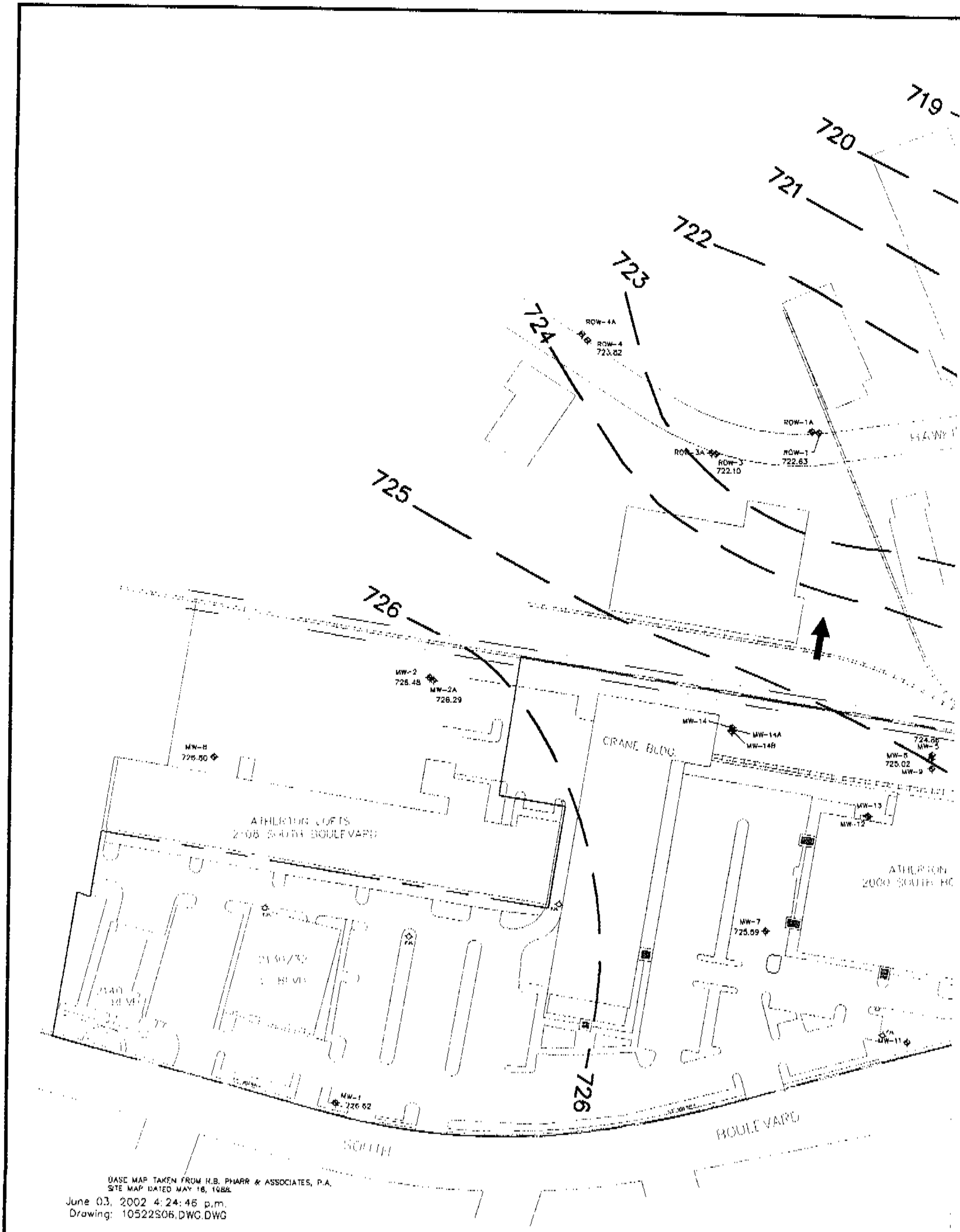
Notes:
* - Target compounds quantitated from a secondary dilution due to analyte abundance in the sample.
- Shading indicates reported concentration above the proposed ACL value

Table 4 – Historical Data Comparison (continued)
Post-Closure Groundwater Quality Monitoring Plan, May 2002 Sample Event
South Boulevard Properties, Inc. Charlotte, North Carolina

	Proposed ACL	EW-3 5/22/01	EW-3 11/01/01	EW-3 5/2/02
PARAMETER (ug/L)				
Chloromethane	25	< 1.0	< 1.0	< 1.0
Vinyl Chloride	25	< 1.0	< 1.0	< 1.0
Chloroethane	2,800	< 1.0	< 1.0	< 1.0
Methylene Chloride	120	< 5.0	< 5.0	< 5.0
Acetone	700	< 25	< 25	< 25
1,1-Dichloroethene	34,000	< 1.0	< 1.0	< 1.0
1,1-Dichloroethane	1,900	< 1.0	< 1.0	< 1.0
cis-1,2-Dichloroethene	3,000	< 1.0	< 1.0	< 1.0
trans-1,2-Dichloroethene	130	< 1.0	< 1.0	< 1.0
Chloroform	2.4	< 1.0	< 1.0	< 1.0
1,2-Dichloroethane	110	< 1.0	< 1.0	< 1.0
2-Butanone	1,100	< 10	< 10	< 10
1,1,1-Trichloroethane	22,000	< 1.0	< 1.0	< 1.0
Trichloroethene	150,000	1.1	< 1.0	< 1.0
1,1,2-Trichloroethane	1,200	< 1.0	< 1.0	< 1.0
Benzene	150	< 1.0	< 1.0	< 1.0
4-Methyl-2-Pentanone	560	< 10	< 10	< 10
Tetrachloroethene	6,900	< 1.0	< 1.0	< 1.0
Toluene	2,100	< 1.0	< 1.0	< 1.0
Ethylbenzene	54	< 1.0	< 1.0	< 1.0
Xylenes	530	< 2.0	< 2.0	< 2.0

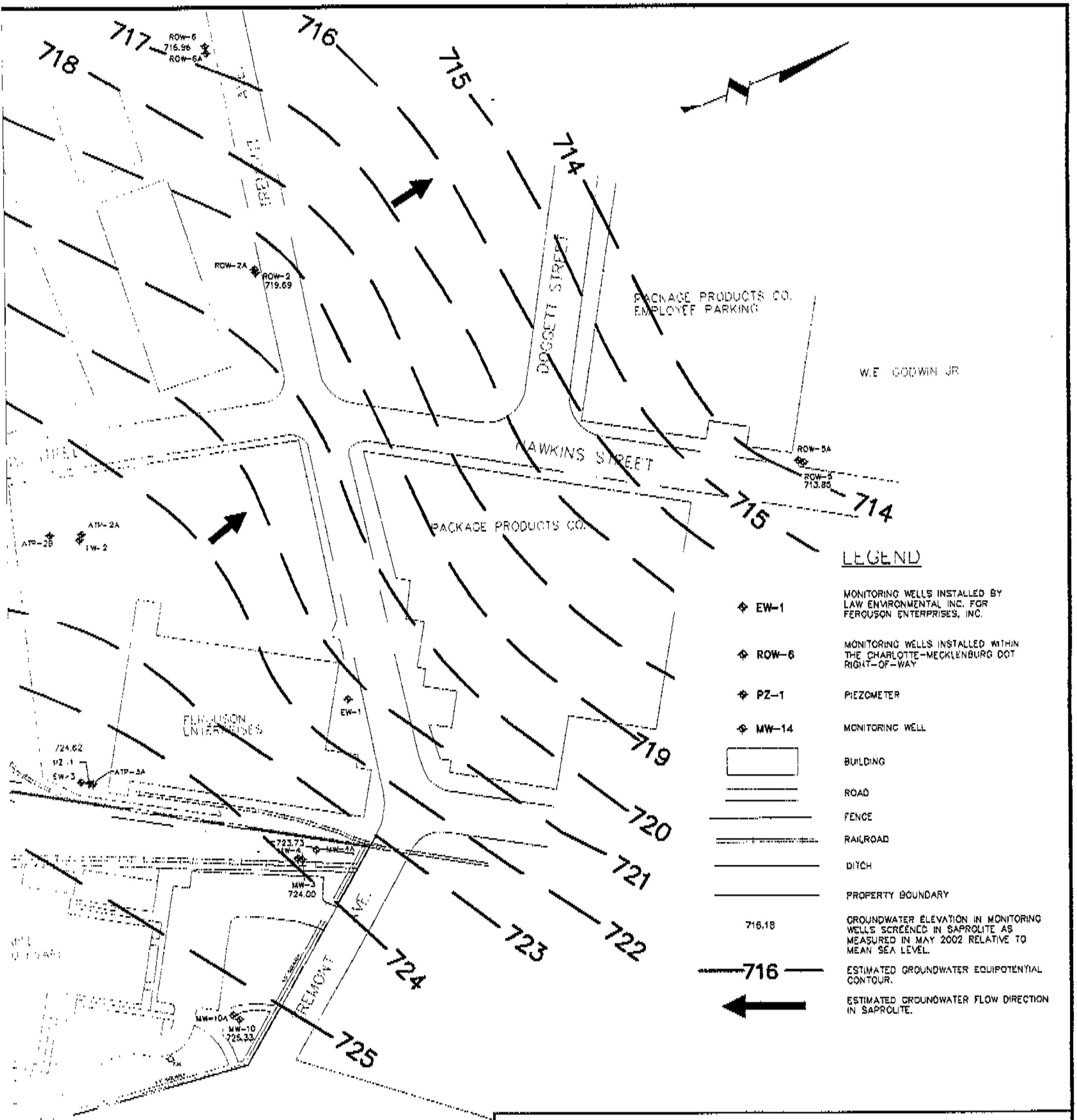
Table 4 – Historical Data Comparison (continued)
Post-Closure Groundwater Quality Monitoring Plan, May 2002 Sample Event
South Boulevard Properties, Inc. Charlotte, North Carolina

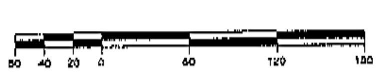
	Proposed ACL	PZ-1 5/22/01	11/01/01	5/2/02
PARAMETER (ug/L)				
Chloromethane	25	Well Dry	< 1.0	< 1.0
Vinyl Chloride	25	No Sample	< 1.0	< 1.0
Chloroethane	2,800		< 1.0	< 1.0
Methylene Chloride	120		< 5.0	< 5.0
Acetone	700		< 25	< 25
1,1-Dichloroethene	34,000		3.0	2.4
1,1-Dichloroethane	1,900		< 1.0	< 1.0
cis-1,2-Dichloroethene	3,000		< 1.0	< 1.0
trans-1,2-Dichloroethene	130		< 1.0	< 1.0
Chloroform	2.4		< 1.0	< 1.0
1,2-Dichloroethane	110		< 1.0	< 1.0
2-Butanone	1,100		< 10	< 10
1,1,1-Trichloroethane	22,000		< 1.0	< 1.0
Trichloroethene	150,000		< 1.0	< 1.0
1,1,2-Trichloroethane	1,200		< 1.0	< 1.0
Benzene	150		< 1.0	< 1.0
4-Methyl-2-Pentanone	560		< 10	< 10
Tetrachloroethene	6,900		< 1.0	< 1.0
Toluene	2,100		< 1.0	< 1.0
Ethylbenzene	54		< 1.0	< 1.0
Xylenes	530		< 2.0	< 2.0



BASE MAP TAKEN FROM R.B. PHARR & ASSOCIATES, P.A. SITE MAP DATED MAY 18, 1988.

June 03, 2002 4:24:46 p.m.
Drawing: 10522S06.DWG.DWG

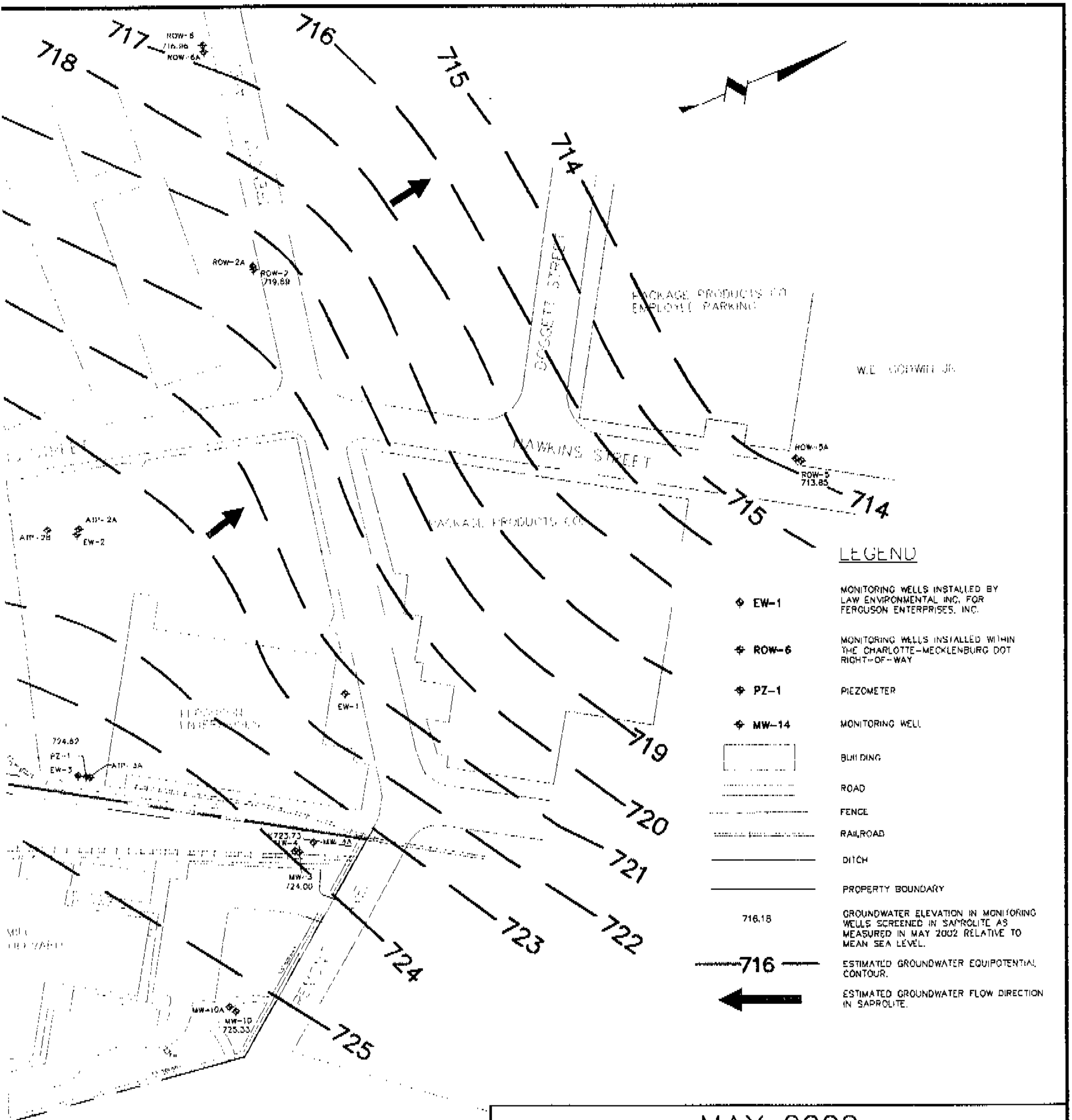




MAY 2002
SAPROLITE POTENTIOMETRIC MAP

SOUTH BOULEVARD PROPERTIES, INC.
2000 SOUTH BOULEVARD
CHARLOTTE, NORTH CAROLINA

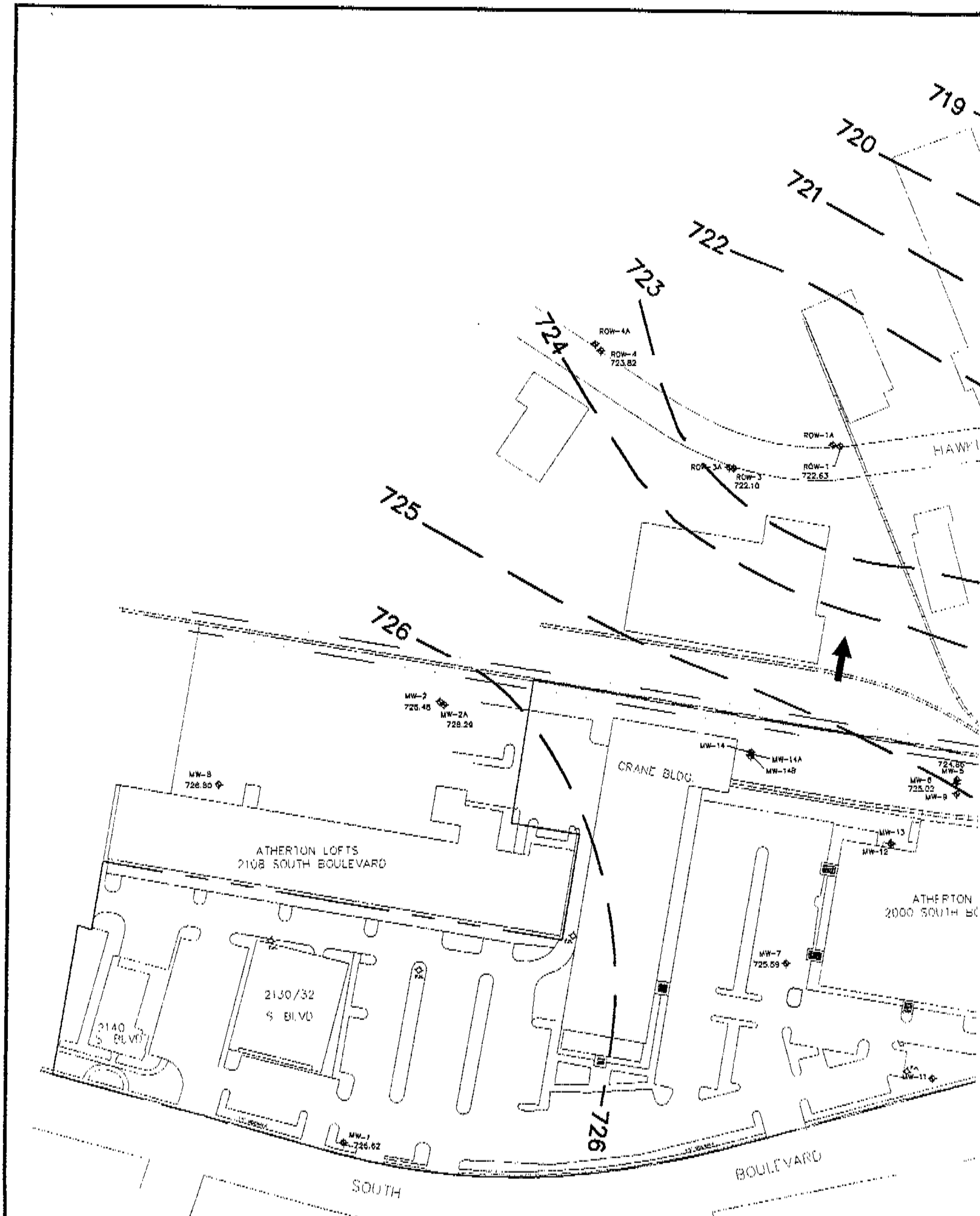
SCALE AS NOTED	APPROVED BY :	DRAWN BY: J.K.S.
DATE MAY 2002	DESIGNED BY :	REVISED
PROJECT NUMBER N105-22	AWARE ENVIRONMENTAL INC 9305-J MONROE RD. CHARLOTTE, NC 28270	DRAWING NO. FIGURE 3



MAY 2002
SAPROLITE POTENTIOMETRIC MAP

SOUTH BOULEVARD PROPERTIES, INC.
2000 SOUTH BOULEVARD
CHARLOTTE, NORTH CAROLINA

SCALE AS NOTED	APPROVED BY :	DRAWN BY: J.K.S.
DATE MAY 2002	DESIGNED BY :	REVISED
PROJECT NUMBER N105-22	AWARE ENVIRONMENTAL INC 9305-J MONROE RD. CHARLOTTE, NC 28270	DRAWING NO. FIGURE 3



BASE MAP TAKEN FROM R.B. PHARR & ASSOCIATES, P.A.
SITE MAP DATED MAY 16, 1988.

June 03, 2002 4:24:46 p.m.
Drawing: 10522S06.DWG.DWG

Table 5 - Analytical Summary for Off-Site Wells and Alternate Exposure Levels
Post-Closure Groundwater Quality Monitoring Plan, May 2002 Sample Event
South Boulevard Properties, Inc. Charlotte, North Carolina

Monitoring Well	Aquifer Horizon	Total VOC Concentration as Detected in Off-Site Groundwater Monitoring (mg/L)						Modeled Total VOC Concentration @ 1 Year (mg/L)	Modeled Total VOC Concentration @ 2 Years (mg/L)	Modeled Total VOC Concentration @ 3 Years (mg/L)	Max. Modeled Total VOC/Year Max. Occurs (mg/L-/ yr)	Proposed AEL (Total VOC Concentration, mg/L))
		1992	1995	1998	May 2001	Nov 2001	May 2002					
PZ-1	Saprolite	0.0	NS	NS	NS	0.003	0.002	2.62	2.54	2.47	2.62 / 1 yr	2.60
EW-3	Partially Weathered Rock	0.008	0.014	NS	0.011	BDL	BDL	5.08	5.27	5.50	8.48 / 30 yr	6.50
ATP-3A	Fractured Rock	5.92	2.96	8.14	6.68	3.866	1.983	9.67	9.83	10.00	21.95/33 yr	11.00
ROW-1	Saprolite	0.190	0.23	0.006	NS	0.012	0.011	0.215	0.225	0.235	4.4 / 12 yr	0.30
ROW-1A	Partially Weathered Rock	40.0	14.5	7.73	0.992	0.327	0.945	0.589	0.63	0.672	11.7 / 12 yr	1.00

Notes:
Results for individual compounds from May 2002 sample event summarized in Table 3
VOC – Volatile Organic Compounds
AEL – Alternate Exposure Limit
NS - Not sampled
BDL – Below detection limit, concentrations for all individual compounds reported as less than sample-specific reporting limit, typically 0.001 mg/L.

ATTACHMENT B

WORK PLAN/PROPOSAL/E-MAIL APPROVAL

Foster, Rob

From: Minnich, Carolyn [carolyn.minnich@ncdenr.gov]
Sent: Tuesday, May 20, 2014 8:34 AM
To: Frantz, Andrew J
Subject: Re: Atherton Mill IAQ

Great. This email is fine. Revised work plan us approved. Thanks.

CFM

Sent from my iPhone

On May 19, 2014, at 4:00 PM, "Frantz, Andrew J" <Andrew.Frantz@amec.com> wrote:

Carolyn,

We have updated the work plan to include your comments (our responses in red). Did you need us to send another PDF copy of the proposal/work plan?

1. Task 2: Chemical inventory should address questions in Appendix B- Indoor Air Building Survey – We have updated task 2 to include the Indoor Air Building Survey
2. Task 3: In previous sampling events, did you all include a duplicate and field blank for air sampling. What is your proposed sampling numbering or naming? The next sampling event has more sampling points, so the numbers likely won't line up. Let's keep it as simple as possible, maybe letters instead of numbers? We have not included duplicate or field blank samples for the previous sub-slab or indoor air sampling events. We will use letter designations instead of numbers for the sample names during the next sampling event (IA-A, IA-B, IA-C, etc.)
3. Task 4: include Appendix A Conceptual Site Model Checklist - We have updated task 4 to include the Conceptual Site Model Checklist.

Andrew J Frantz, AEP
Project Environmental Scientist
AMEC
Environment & Infrastructure
2801 Yorkmont Road, Charlotte, North Carolina 28208 USA
Direct: 704.357.5542 Cell: 704.519.9230
Fax: 704.357.8638
andrew.frantz@amec.com
amec.com

From: Minnich, Carolyn [mailto:carolyn.minnich@ncdenr.gov]
Sent: Wednesday, May 14, 2014 11:22 AM
To: Foster, Rob
Cc: Frantz, Andrew J
Subject: RE: Atherton Mill IAQ

Rob:

I reviewed the proposal/work plan. A few things you need to add:

4. Task 2: Chemical inventory should address questions in Appendix B- Indoor Air Building Survey
5. Task 3: In previous sampling events, did you all include a duplicate and field blank for air sampling. What is your proposed sampling numbering or naming? The next sampling event has

more sampling points, so the numbers likely won't line up. Let's keep it as simple as possible, maybe letters instead of numbers?

6. Task 4: include Appendix A Conceptual Site Model Checklist

If you have questions or comments, please contact me.

Carolyn Minnich

Brownfields Project Manager
NCDENR-DWM
704/661-0330
www.ncbrownfields.org
Come Clean Up With Us!

From: Foster, Rob [mailto:Rob.Foster@amec.com]
Sent: Thursday, May 08, 2014 2:22 PM
To: Minnich, Carolyn
Cc: Short, Amanda Kitchen; Jude Peck
Subject: Atherton Mill IAQ

Carolyn,

Please find attached our proposal/work plan for the next phase of IAQ work at the subject property. Edens authorized AMEC to proceed. If you have questions, please contact me.

Rob Foster

Robert C. Foster, LG
AMEC Environment & Infrastructure, Inc.

Associate Geologist
2801 Yorkmont Rd, Suite 100
Charlotte, North Carolina 28208
704-357-5530 (direct phone)
704-641-1141 (cell)
rob.foster@amec.com
www.amec.com

May 7, 2014

Mr. Jude Peck, CCIM, ERM, LEED Green Associate
Environmental Risk Manager
Edens Limited Partnership
1221 Main Street
Columbia, South Carolina 29201

Subject: **Proposal for Indoor Air Quality (IAQ) Testing**
Atherton Mill Property
2000, 2100, 2130 & 2140 South Boulevard
Charlotte, North Carolina
AMEC Proposal Prop14chltev81rev

Dear Mr. Peck:

AMEC Environment & Infrastructure, Inc. (AMEC) is pleased to present this revised *Proposal for Indoor Air Quality (IAQ) Testing* at the subject facilities in Charlotte, North Carolina (subject property). Per our meeting with yourself, Ms. Amanda Short of McGuireWoods and Ms. Carolyn Minnich of the North Carolina Department of Environment and Natural Resources (NCDENR) Brownfields Program at the subject property on April 28, 2014, additional IAQ sampling was requested by Ms. Minnich at the subject property as an alternative to implementing a remedial system. Included in this proposal is an outline of our understanding of the project information, our proposed scope of services, our proposed schedule, terms and conditions and fee.

PROJECT BACKGROUND

The site is located southwest of the intersection of South Boulevard and West Tremont Avenue in Charlotte, North Carolina. The site was developed in 1918 by Parks-Cramer Company (Parks-Cramer) as a factory for manufacturing textile-related products such as humidity control equipment. In 1988, ownership of the property was transferred to South Boulevard Properties, Inc. (SBP). Luwa Bahson, Inc. leased the property and continued manufacturing operations at the site from 1988 until 1992. Under SBP, the site was redeveloped for commercial use (e.g., Atherton Mills, Southend Brewery) in 1993. AMEC

Correspondence:
AMEC Environment & Infrastructure, Inc.
2801 Yorkmont Road, Suite 100
Charlotte, North Carolina 28208
Tel 704-357-8600
Fax 704-357-8638
Licensures: NC Engineering F-1253, Geology C-247
www.amec.com

previously collected indoor air samples at the subject facility in April and July 2013 and in January 2014.

SCOPE OF SERVICES

Task 1 – Work Plan Preparation

This written proposal will serve as a work plan documenting the proposed sample locations and sampling procedures. The attached figure depicts the proposed sampling locations. The work plan will be submitted to Ms. Minnich of the NCDENR Brownfields Program via electronic mail for approval. A copy of the work plan will be submitted to you and your legal counsel, Ms. Amanda Short prior to submittal to Ms. Minnich.

Task 2 – Chemical Inventory

AMEC personnel will mobilize to the subject property to document the chemical storage in areas where IAQ samples are proposed to be collected. Inventory activities will be conducted in areas where housekeeping supplies and/or renovation supplies are stored at the subject property. We will take photographs of the storage areas to aid in documenting the types and condition of chemicals stored in proposed sampling areas. In addition, we will attempt to obtain MSDSs for the chemicals located in the supply closets from the property manager.

Task 3 – Indoor Air Sampling and Analysis

AMEC proposes 12 IAQ samples (10 indoor and 2 outdoor, background) be collected at the subject property. The IAQ samples will be collected using the following procedures:

- Samples shall be collected during normal operating business hours, over an 8-hour time period;
- The Heating/Ventilation and Air Conditioning (HVAC) units shall remain under normal operational during the sampling period. Unoccupied spaces proposed for sampling shall have their HVAC systems activated a minimum of 24-hours prior to sample collection;
- Each sample shall be collected between two to five feet above the floor;
- Each sample shall be collected into a 6-liter Summa canister at a flow rate of approximately 12.5 mL/min (8-hour sample time);

- Each Summa canister will have a dedicated pressure gauge and Summa canisters and pressure gauges will be either "100% certified" or "batch certified";

- The vacuum reading of each Summa canister will be recorded prior to and after sample collection;

- Weather conditions (relative humidity, temperature, atmospheric pressure, wind speed/direction) will be recorded from a nearby, public weather station;

- An inventory of chemical storage will be conducted at the locations of the proposed IAQ samples (this inventory will be in addition to Task 2, described above);

- The indoor air samples shall be maintained under a chain-of-custody protocol and submitted to a North Carolina certified laboratory for analysis of constituents of concern via EPA Compendium Method TO-15.

The following Quality Assurance/Quality Control Procedures shall be implemented:

- Two outdoor background samples will be collected from two to five feet above the ground;

- The background sample shall be collected into a 6-liter Summa canister at a flow rate of approximately 12.5 mL/min (8-hour sample time);

- The background samples shall be initiated at least one hour prior to the initiation of the indoor air samples;

- The samples shall be maintained under a manually-prepared chain-of-custody record;

Task 4 – Reporting

AMEC will prepare a report describing our field activities and laboratory data. AMEC will prepare and provide a site plan with sample locations and current site structures. AMEC will provide summary analytical table for contaminants detected by the laboratory versus the state standards and include historical IAQ data.

FEE

AMEC will complete the above scope of services for a lump-sum fee of A breakdown of the fee is as follows:

TASK		FEE
Task 1 – Work Plan Preparation		$
Task 2 – Chemical Inventory		$
Task 3 – IAQ Sampling and Analysis		$
Task 4 – Reporting		$
	Total	**$**

AUTHORIZATION

To authorize this work, please sign below. The work will be performed in accordance with the terms and conditions of the Services Agreement between AMEC and Edens Limited Partnership (dated May 14, 2012).

CLOSING

We appreciate your consideration of AMEC to perform these services and look forward to working with you on this project. Please contact Rob Foster at (704) 357-5530 if you have questions concerning this proposal.

Sincerely,

AMEC ENVIRONMENT & INFRASTRUCTURE, INC.

Andrew J. Frantz, A.E.P.
Project Scientist

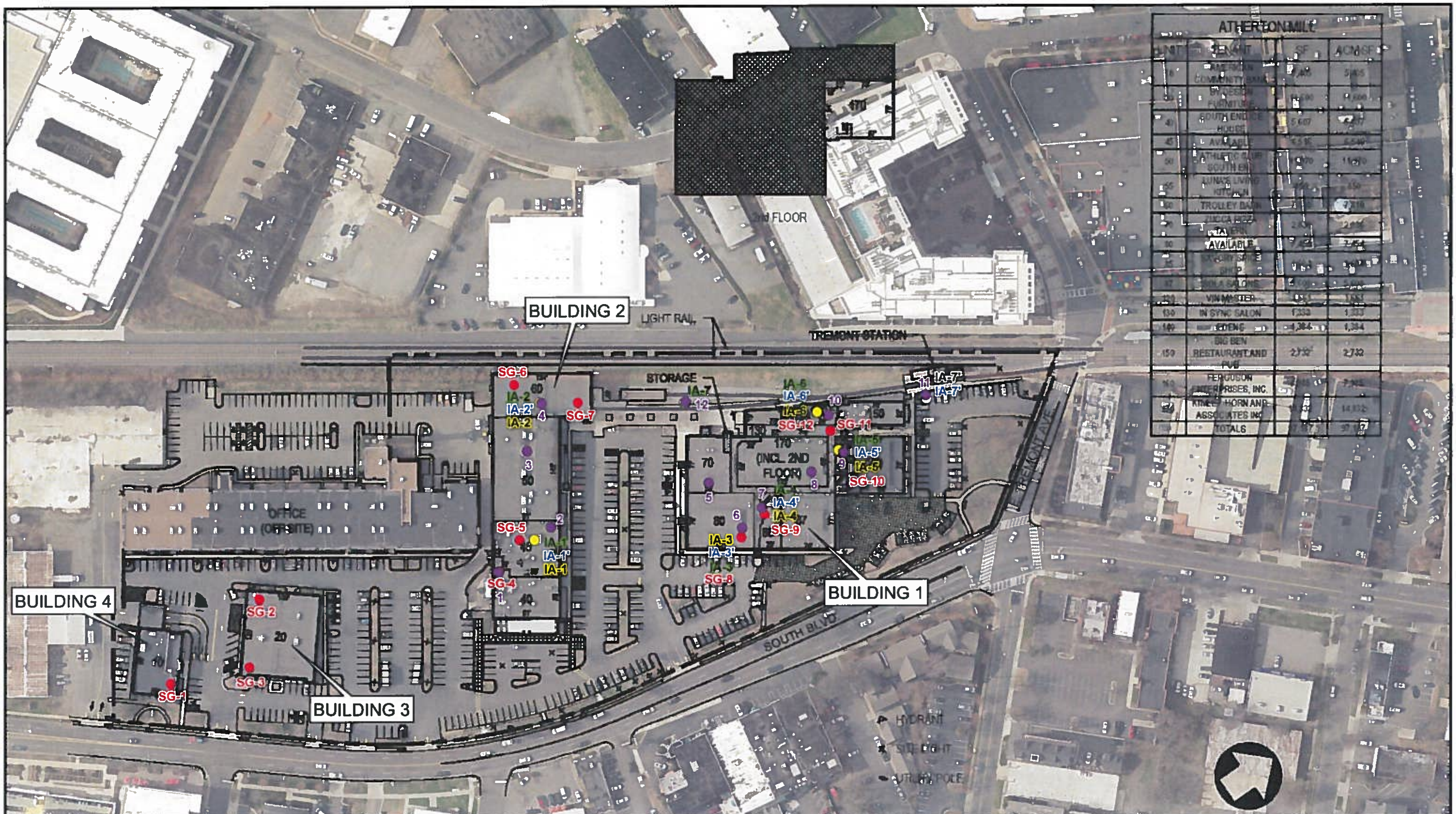
Robert C. Foster, L.G.
Associate Geologist

Andrew M. Clark, L.G.
Senior Associate/Environmental Branch Manager

Enclosures

Agreed on May 7, 2014

Authorized Signature



Source: Mecklenburg County Aerial Photography, dated 2012.

- SG-1 ● Sub-Slab Vapor Samples, October 10, 2012
- IA-2 ● Indoor Air Sampling Location, April 30, 2013
- IA-7' ○ Background Air Sample Location
- IA-2 ● Indoor Air Sampling Location, January 17-18, 2014
- IA-2' Indoor Air Sampling Location, July 16, 2013
- 1 Proposed Indoor Air Sample, May 2014

0 60 120 240 360 480 Feet

amec

IAQ SAMPLING LOCATIONS
ATHERTON MILL PROPERTY
2000, 2100, 2130 & 2140 SOUTH BOULEVARD
CHARLOTTE, NORTH CAROLINA

PREPARED BY	DATE	CHECKED BY	DATE	JOB NUMBER	FIGURE
SS	5/7/14	RCF	5/7/14	6228-12-0051	1

ATTACHMENT C

DWM INDOOR AIR BUILDING SURVEY AND SAMPLING FORM AND PHOTOGRAPHS

DWM INDOOR AIR BUILDING SURVEY
and SAMPLING FORM

Site Name: Atherton Mill

DSCAID#: ______

Preparer's name: Andrew Frantz

Date: 6/3/14

Preparer's affiliation: AMEC/Consultant

Phone #: 704-357-8600

Part I - Occupants

Building Address: 2000, 2100, 2130, 2140 South Boulevard, Charlotte, North Carolina

Property Contact: Jude Peck   Owner / Renter / other: Owner

Contact's Phone: home ( )______ work (803) 744-2474 cell ( )______

# of Building occupants: Children under age 13 _____ Children age 13-18 ______ Adults X

Part II – Building Characteristics

Building type: residential / multi-family residential / (office) / strip mall / (commercial) / industrial

Describe building: Building 1 and Building 2   Year constructed: 1-1908, 2-1940

Sensitive population: day care / nursing home / hospital / school / other (specify): N/A

Number of floors below grade: 1 ((full basement) / crawl space / slab on grade)

Number of floors at or above grade: 2

Depth of basement below grade surface: 5 ft.   Basement size: 1,600 ft^2

Basement floor construction: (concrete) / dirt / floating / stone / other (specify): ______

Foundation walls: (poured concrete) / cinder blocks / stone / other (specify) ______

Basement sump present? *Yes* / *(No)*   Sump pump? *Yes* / *No*   Water in sump? *Yes* / *No*

Type of heating system (circle all that apply):

(hot air circulation)	hot air radiation	wood	steam radiation
heat pump	hot water radiation	kerosene heater	electric baseboard

other (specify): ______

Type of ventilation system (circle all that apply):

(central air conditioning)	mechanical fans	bathroom ventilation fans
individual air conditioning units	kitchen range hood fan	outside air intake

other (specify): ______

Type of fuel utilized (circle all that apply):

(Natural gas) / (electric) / fuel oil / wood / coal / solar / kerosene

Are the basement walls or floor sealed with waterproof paint or epoxy coatings? *Yes* / *(No)*

Is there a whole house fan? *Yes* / *No* (circled: No)

Septic system? *Yes* / *Yes (but not used)* / *No* (circled: No)

Irrigation/private well? *Yes* / *Yes (but not used)* / *No* (circled: No)

Type of ground cover outside of building: grass / concrete / asphalt / other (specify) ______________ (circled: grass, asphalt)

Existing subsurface depressurization (radon) system in place? *Yes* / *No* (circled: No) *active / passive*

Sub-slab vapor/moisture barrier in place? *Yes* / *No* (circled: No)
Type of barrier: ______________________________

Part III - Outside Contaminant Sources

Other stationary sources nearby (gas stations, emission stacks, etc.): None

Heavy vehicular traffic nearby (or other mobile sources): South Boulevard is located along SE boundary

Part IV – Indoor Contaminant Sources

Identify all potential indoor sources found in the building (including attached garages), the location of the source (floor and room), and whether the item was removed from the building 48 hours prior to indoor air sampling event. Any ventilation implemented after removal of the items should be completed at least 24 hours prior to the commencement of the indoor air sampling event.

Potential Sources	Location(s)	Removed (Yes / No / NA)
Gasoline storage cans		
Gas-powered equipment		
Kerosene storage cans		
Paints / thinners / strippers	See attached photos	No
Cleaning solvents	See attached photos	No
Oven cleaners		
Carpet / upholstery cleaners	See attached photos	No
Other house cleaning products		
Moth balls		
Polishes / waxes		
Insecticides		
Furniture / floor polish		
Nail polish / polish remover		
Hairspray		
Cologne / perfume		
Air fresheners		
Fuel tank (inside building)		NA
Wood stove or fireplace		NA
New furniture / upholstery		
New carpeting / flooring		NA
Hobbies - glues, paints, etc.		

Part V – Miscellaneous Items

Do any occupants of the building smoke? *Yes* / *No* (circled: No) How often? ______________

Last time someone smoked in the building? ____________ hours / *days* *ago*

Does the building have an attached garage directly connected to living space? *Yes* / *No* (circled: No)

If so, is a car usually parked in the garage? *Yes* / *No*

Are gas-powered equipment or cans of gasoline/fuels stored in the garage? *Yes* / *No*

Do the occupants of the building have their clothes dry cleaned? *Yes* / *No* / Unknown (circled: Unknown)

If yes, how often? weekly / monthly / 3-4 times a year

Do any of the occupants use solvents in work? *Yes* / *No* (circled: Yes)

If yes, what types of solvents are used? See attached table

If yes, are their clothes washed at work? *Yes* / *No*

Have any pesticides/herbicides been applied around the building or in the yard? *Yes* / No (circled: Yes)

If so, when and which chemicals? Unknown

Has there ever been a fire in the building? *Yes* / *No* (circled: No) If yes, when? ____________

Has painting or staining been done in the building in the last 6 months? *Yes* / *No*

If yes, when __________________ and where? ____________________________

Part VI – Sampling Information

Sample Technician: Andrew Frantz / AMEC Phone number: (704) 357 - 8600

Sample Source: Indoor Air / Sub-Slab / Near Slab Soil Gas / Exterior Soil Gas (circled: Indoor Air)

Sampler Type: Tedlar bag / Sorbent / Stainless Steel Canister / Other (specify): ________________ (circled: Stainless Steel Canister)

Analytical Method: TO-15 / TO-17 / other: _________ (circled: TO-15) Cert. Laboratory: Pace Analytical Laboratories, Inc.

Sample locations (floor, room):

Field ID # _____ - See attached map Field ID # _____ - __________________________

Field ID # _____ - ________________________ Field ID # _____ - __________________________

Were "Instructions for Occupants" followed? *Yes* / *No* (circled: Yes)

If not, describe modifications: ____

Provide Drawing of Sample Location(s) in Building

See attached map

Part VII - Meteorological Conditions

Was there significant precipitation within 12 hours prior to (or during) the sampling event? *Yes* / *No* (circled: No)

Describe the general weather conditions: Average temp. during sampling was 82 degrees Fahrenheit, wind direction was southwesterly and and the average barometric pressure was 30.06 inHg.

Part VIII – General Observations

Provide any information that may be pertinent to the sampling event and may assist in the data interpretation process.

None

(Adapted from the NJDEP Vapor Intrusion Guidance, October 2005)

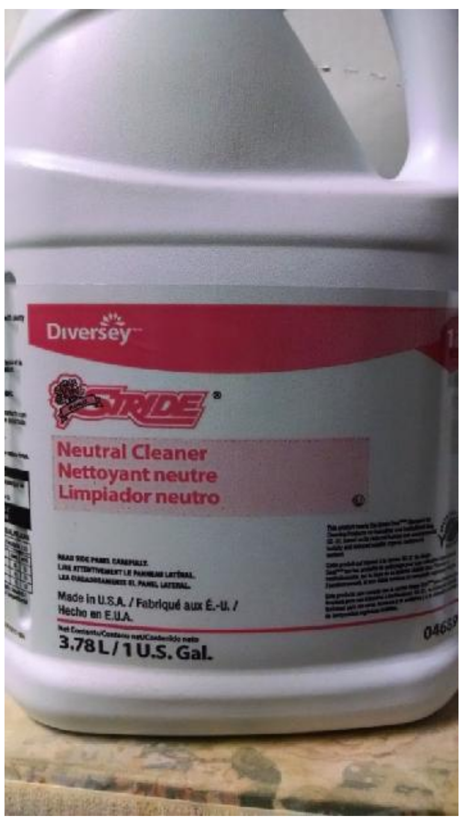
Photos 1 to 13 represent contents of the Janitorial Closet near sample IA-I.
Photos 14 to 19 represent contents of the Electrical Closet near sample IA-G.

1. **CHAPCO Safe-Set 7 – A pressure sensitive latex adhesive for the interior installation of vinyl composition tile and asphalt tile.**

2. **Devoe Wonder-Tones Vinyl Latex Primer-Sealer – A primer-sealer for interior walls.**

Photos 1 to 13 represent contents of the Janitorial Closet near sample IA-I.
Photos 14 to 19 represent contents of the Electrical Closet near sample IA-G.

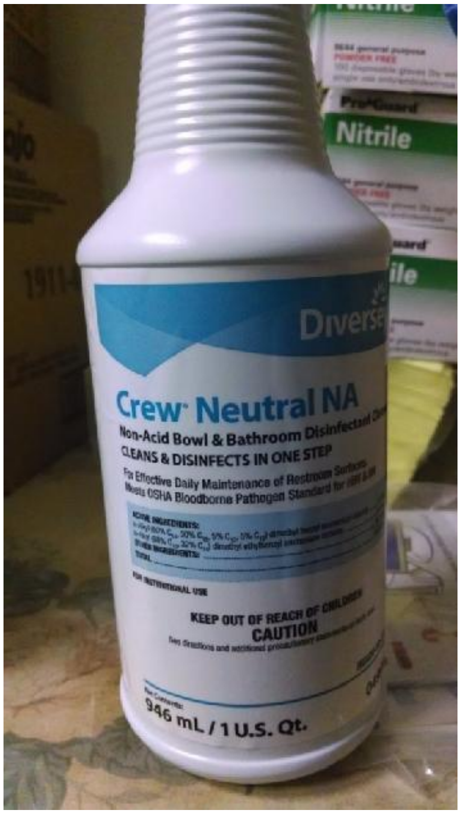
3. Dixie Cure & Seal – Concrete curing/sealing applicant.



4. Diversey Stride Neutral Cleaner – Floor cleaner.

Photos 1 to 13 represent contents of the Janitorial Closet near sample IA-I.
Photos 14 to 19 represent contents of the Electrical Closet near sample IA-G.

5. **Diversey Glance Glass & Multi-Surface Cleaner – Multi-purpose, ammoniated cleaner.**



Photos 1 to 13 represent contents of the Janitorial Closet near sample IA-I.
Photos 14 to 19 represent contents of the Electrical Closet near sample IA-G.

6. **Diversey Crew Neutral NA Disinfectant – Non-acid, multi-surface restroom disinfectant cleaner.**

7. **Radiance Glass Cleaner – Ammonia-free, glass and multi-surface cleaner.**

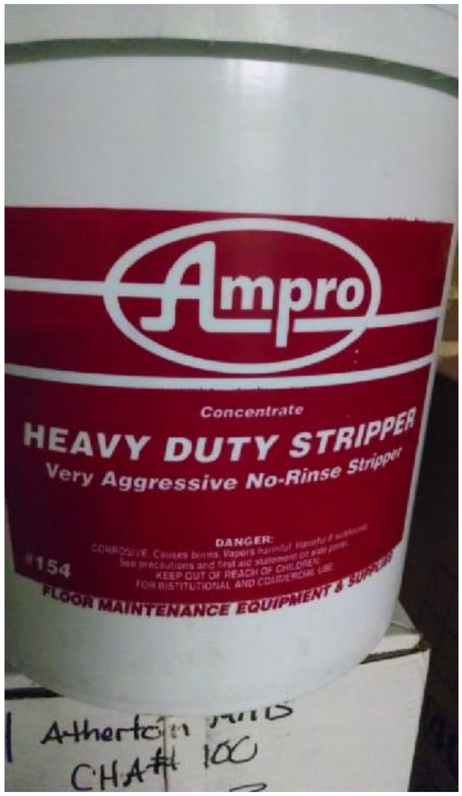
Photos 1 to 13 represent contents of the Janitorial Closet near sample IA-I.
Photos 14 to 19 represent contents of the Electrical Closet near sample IA-G.

8. **Radiance Odor Remover – Bacteria/enzyme based odor eliminator.**

9. **GOJO Clear & Mild Handwash – Foaming hand soap.**

Photos 1 to 13 represent contents of the Janitorial Closet near sample IA-I.
Photos 14 to 19 represent contents of the Electrical Closet near sample IA-G.

10. Kleenex Foam Skin Cleanser – Foaming hand soap.



11. Ampro Heavy Duty Stripper – No rinse floor stripper.

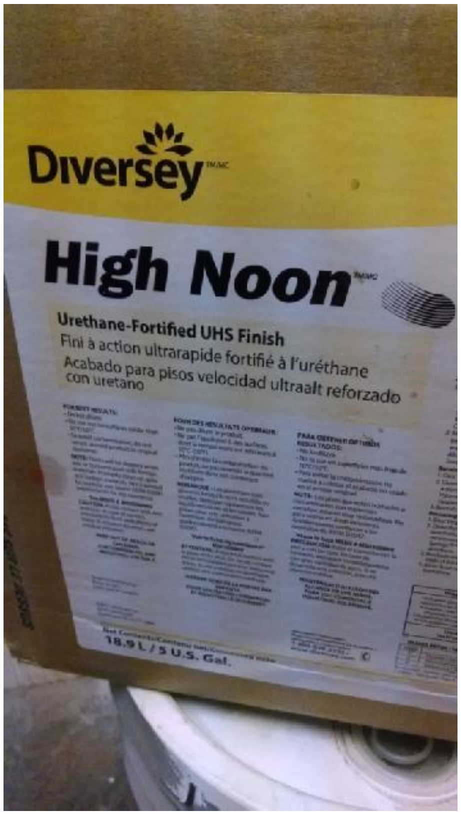
Photos 1 to 13 represent contents of the Janitorial Closet near sample IA-I.
Photos 14 to 19 represent contents of the Electrical Closet near sample IA-G.

12. Bright Solutions Stainless Steel Cleaner & Polish – Oil based steel cleaner/polish.

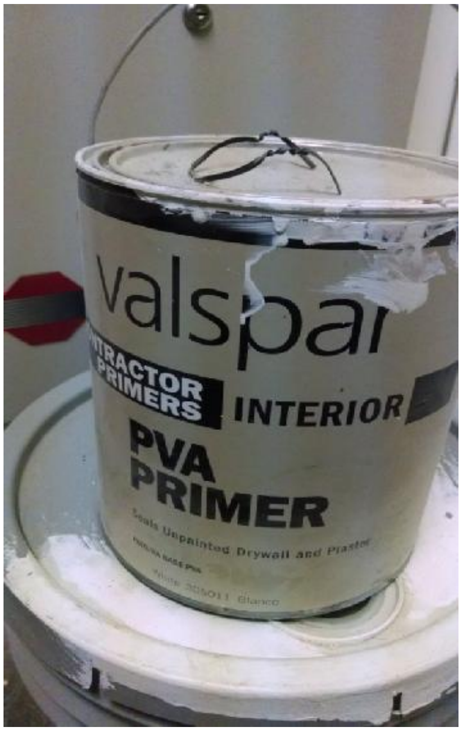
13. Brame Metered Concentrated Room Deodorant – Aerosol deodorant.

14. Olympic Premium Interior Latex Paint.

Photos 1 to 13 represent contents of the Janitorial Closet near sample IA-I.
Photos 14 to 19 represent contents of the Electrical Closet near sample IA-G.



15. Diversey High Noon – Urethane-fortified floor finish.



16. Valspar Interior PVA Primer.

Photos 1 to 13 represent contents of the Janitorial Closet near sample IA-I.
Photos 14 to 19 represent contents of the Electrical Closet near sample IA-G.

17. Sherwin Williams Industrial Enamel.

18. Sherwin Williams Promar 400 Interior Latex Paint

Photos 1 to 13 represent contents of the Janitorial Closet near sample IA-I.
Photos 14 to 19 represent contents of the Electrical Closet near sample IA-G.

19. Color Accents Interior Latex Paint

ATTACHMENT D

LABORATORY ANALYTICAL REPORTS AND CHAIN-OF-CUSTODY FORMS

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

Pace Analytical®
www.pacelabs.com

July 23, 2014

Reviewed by AJ Frantz on 7-24-14

Mr. Andrew Frantz
AMEC-Charlotte
2801 Yorkmont Road
Suite 100
Charlotte, NC 28208

RE: Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Dear Mr. Frantz:

Enclosed are the analytical results for sample(s) received by the laboratory on June 06, 2014. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

Analyses were performed at the Pace Analytical Services location indicated on the sample analyte page for analysis unless otherwise footnoted.

Per client request, report revised 7/23/14 to report MDL and J-Flags.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Kevin Godwin
kevin.godwin@pacelabs.com
Project Manager

Enclosures

REPORT OF LABORATORY ANALYSIS

Pace Analytical®
www.pacelabs.com

Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

CERTIFICATIONS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alabama Certification #40770
Alabama Certification #40770
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #: Pace
Georgia Certification #: 959
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137
Mississippi Certification #: Pace
Montana Certification #: MT0092
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
Wisconsin Certification #: 999407970
West Virginia Certification #: 382
West Virginia TO-15 Approval
West Virginia DHHR #:9952C

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SAMPLE SUMMARY

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Lab ID	Sample ID	Matrix	Date Collected	Date Received
92204369001	IA-A	Air	06/03/14 18:45	06/06/14 13:15
92204369002	IA-B	Air	06/03/14 18:04	06/06/14 13:15
92204369003	IA-C	Air	06/03/14 18:00	06/06/14 13:15
92204369004	IA-D	Air	06/03/14 17:55	06/06/14 13:15
92204369005	IA-E	Air	06/03/14 17:51	06/06/14 13:15
92204369006	IA-F	Air	06/03/14 17:42	06/06/14 13:15
92204369007	IA-G	Air	06/03/14 17:33	06/06/14 13:15
92204369008	IA-H	Air	06/03/14 17:00	06/06/14 13:15
92204369009	IA-I	Air	06/03/14 17:35	06/06/14 13:15
92204369010	IA-J	Air	06/03/14 17:05	06/06/14 13:15
92204369011	IA-K	Air	06/03/14 17:02	06/06/14 13:15
92204369012	IA-L	Air	06/03/14 17:20	06/06/14 13:15

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SAMPLE ANALYTE COUNT

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92204369001	IA-A	TO-15	DL1	59	PASI-M
92204369002	IA-B	TO-15	DL1	59	PASI-M
92204369003	IA-C	TO-15	DL1	59	PASI-M
92204369004	IA-D	TO-15	DL1	59	PASI-M
92204369005	IA-E	TO-15	DL1	59	PASI-M
92204369006	IA-F	TO-15	DL1	59	PASI-M
92204369007	IA-G	TO-15	DL1	59	PASI-M
92204369008	IA-H	TO-15	DL1	59	PASI-M
92204369009	IA-I	TO-15	DL1	59	PASI-M
92204369010	IA-J	TO-15	DL1	59	PASI-M
92204369011	IA-K	TO-15	DL1	59	PASI-M
92204369012	IA-L	TO-15	DL1	59	PASI-M

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-A **Lab ID: 92204369001** Collected: 06/03/14 18:45 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**32.8**	ug/m3	3.6	1.8	1.49		06/23/14 20:49	67-64-1	
Benzene	**6.0**	ug/m3	0.48	0.18	1.49		06/23/14 20:49	71-43-2	
Bromodichloromethane	**3.3**	ug/m3	2.0	0.27	1.49		06/23/14 20:49	75-27-4	
Bromoform	**3.4**	ug/m3	3.1	0.48	1.49		06/23/14 20:49	75-25-2	
Bromomethane	**1.8**	ug/m3	1.2	0.40	1.49		06/23/14 20:49	74-83-9	
1,3-Butadiene	ND	ug/m3	0.67	0.13	1.49		06/23/14 20:49	106-99-0	
2-Butanone (MEK)	**5.6**	ug/m3	0.89	0.41	1.49		06/23/14 20:49	78-93-3	
Carbon disulfide	**6.1**	ug/m3	0.94	0.11	1.49		06/23/14 20:49	75-15-0	
Carbon tetrachloride	**3.0**	ug/m3	1.9	0.48	1.49		06/23/14 20:49	56-23-5	
Chlorobenzene	**1.9**	ug/m3	1.4	0.16	1.49		06/23/14 20:49	108-90-7	
Chloroethane	ND	ug/m3	0.80	0.24	1.49		06/23/14 20:49	75-00-3	
Chloroform	**3.4**	ug/m3	1.5	0.27	1.49		06/23/14 20:49	67-66-3	
Chloromethane	ND	ug/m3	0.63	0.29	1.49		06/23/14 20:49	74-87-3	
Cyclohexane	**3.4**	ug/m3	2.6	0.19	1.49		06/23/14 20:49	110-82-7	
Dibromochloromethane	**3.4**	ug/m3	2.6	1.3	1.49		06/23/14 20:49	124-48-1	
1,2-Dibromoethane (EDB)	**3.1**	ug/m3	2.3	0.35	1.49		06/23/14 20:49	106-93-4	
1,2-Dichlorobenzene	**2.6**	ug/m3	1.8	0.21	1.49		06/23/14 20:49	95-50-1	
1,3-Dichlorobenzene	**2.7**	ug/m3	1.8	0.35	1.49		06/23/14 20:49	541-73-1	
1,4-Dichlorobenzene	**3.2**	ug/m3	1.8	0.30	1.49		06/23/14 20:49	106-46-7	
Dichlorodifluoromethane	**5.0**	ug/m3	1.5	0.16	1.49		06/23/14 20:49	75-71-8	
1,1-Dichloroethane	**2.1**	ug/m3	1.2	0.21	1.49		06/23/14 20:49	75-34-3	
1,2-Dichloroethane	**1.8**	ug/m3	0.61	0.18	1.49		06/23/14 20:49	107-06-2	
1,1-Dichloroethene	**2.7**	ug/m3	1.2	0.15	1.49		06/23/14 20:49	75-35-4	
cis-1,2-Dichloroethene	**2.1**	ug/m3	1.2	0.29	1.49		06/23/14 20:49	156-59-2	
trans-1,2-Dichloroethene	**1.9**	ug/m3	1.2	0.24	1.49		06/23/14 20:49	156-60-5	
1,2-Dichloropropane	**2.2**	ug/m3	1.4	0.23	1.49		06/23/14 20:49	78-87-5	
cis-1,3-Dichloropropene	**2.0**	ug/m3	1.4	0.20	1.49		06/23/14 20:49	10061-01-5	
trans-1,3-Dichloropropene	**2.9J**	ug/m3	3.4	0.22	1.49		06/23/14 20:49	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.1	0.37	1.49		06/23/14 20:49	76-14-2	
Ethyl acetate	**4.2**	ug/m3	1.1	0.19	1.49		06/23/14 20:49	141-78-6	
Ethylbenzene	**6.2**	ug/m3	1.3	0.27	1.49		06/23/14 20:49	100-41-4	
4-Ethyltoluene	**2.5**	ug/m3	1.5	0.26	1.49		06/23/14 20:49	622-96-8	
n-Heptane	**3.4**	ug/m3	1.2	0.24	1.49		06/23/14 20:49	142-82-5	
Hexachloro-1,3-butadiene	**4.5**	ug/m3	3.3	0.61	1.49		06/23/14 20:49	87-68-3	
n-Hexane	**18.6**	ug/m3	1.1	0.15	1.49		06/23/14 20:49	110-54-3	
2-Hexanone	**2.4**	ug/m3	1.2	0.32	1.49		06/23/14 20:49	591-78-6	
Methylene Chloride	**3.3J**	ug/m3	5.3	0.34	1.49		06/23/14 20:49	75-09-2	
4-Methyl-2-pentanone (MIBK)	**2.6**	ug/m3	1.2	0.25	1.49		06/23/14 20:49	108-10-1	
Methyl-tert-butyl ether	**1.5**	ug/m3	1.1	0.13	1.49		06/23/14 20:49	1634-04-4	
Naphthalene	**3.0J**	ug/m3	4.0	0.38	1.49		06/23/14 20:49	91-20-3	
Propylene	ND	ug/m3	1.3	0.16	1.49		06/23/14 20:49	115-07-1	
Styrene	**2.8**	ug/m3	1.3	0.20	1.49		06/23/14 20:49	100-42-5	
1,1,2,2-Tetrachloroethane	**2.8**	ug/m3	2.1	0.35	1.49		06/23/14 20:49	79-34-5	
Tetrachloroethene	**3.2**	ug/m3	2.1	0.28	1.49		06/23/14 20:49	127-18-4	
Tetrahydrofuran	ND	ug/m3	0.89	0.21	1.49		06/23/14 20:49	109-99-9	

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051

Pace Project No.: 92204369

Sample: IA-A **Lab ID: 92204369001** Collected: 06/03/14 18:45 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Toluene	**8.0**	ug/m3	1.1	0.20	1.49		06/23/14 20:49	108-88-3	
1,2,4-Trichlorobenzene	**3.7**	ug/m3	2.2	0.54	1.49		06/23/14 20:49	120-82-1	
1,1,1-Trichloroethane	**2.8**	ug/m3	1.7	0.21	1.49		06/23/14 20:49	71-55-6	
1,1,2-Trichloroethane	**2.8**	ug/m3	1.7	0.36	1.49		06/23/14 20:49	79-00-5	
Trichloroethene	**3.1**	ug/m3	1.6	0.27	1.49		06/23/14 20:49	79-01-6	
Trichlorofluoromethane	**5.6**	ug/m3	1.7	0.21	1.49		06/23/14 20:49	75-69-4	
1,1,2-Trichlorotrifluoroethane	**5.1**	ug/m3	2.4	0.24	1.49		06/23/14 20:49	76-13-1	
1,2,4-Trimethylbenzene	**2.9**	ug/m3	1.5	0.18	1.49		06/23/14 20:49	95-63-6	
1,3,5-Trimethylbenzene	**1.7**	ug/m3	1.5	0.31	1.49		06/23/14 20:49	108-67-8	
Vinyl acetate	**1.4**	ug/m3	1.1	0.52	1.49		06/23/14 20:49	108-05-4	
Vinyl chloride	ND	ug/m3	0.77	0.14	1.49		06/23/14 20:49	75-01-4	
m&p-Xylene	**18.5**	ug/m3	2.6	0.21	1.49		06/23/14 20:49	179601-23-1	
o-Xylene	**4.3**	ug/m3	1.3	0.66	1.49		06/23/14 20:49	95-47-6	

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-B **Lab ID: 92204369002** Collected: 06/03/14 18:04 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**32.0**	ug/m3	24.2	12.1	10.01		06/23/14 21:11	67-64-1	
Benzene	ND	ug/m3	3.3	1.2	10.01		06/23/14 21:11	71-43-2	
Bromodichloromethane	ND	ug/m3	13.6	1.8	10.01		06/23/14 21:11	75-27-4	
Bromoform	ND	ug/m3	21.0	3.2	10.01		06/23/14 21:11	75-25-2	
Bromomethane	ND	ug/m3	7.9	2.7	10.01		06/23/14 21:11	74-83-9	
1,3-Butadiene	ND	ug/m3	4.5	0.85	10.01		06/23/14 21:11	106-99-0	
2-Butanone (MEK)	ND	ug/m3	6.0	2.7	10.01		06/23/14 21:11	78-93-3	
Carbon disulfide	**3.6J**	ug/m3	6.3	0.72	10.01		06/23/14 21:11	75-15-0	
Carbon tetrachloride	ND	ug/m3	12.8	3.2	10.01		06/23/14 21:11	56-23-5	
Chlorobenzene	ND	ug/m3	9.4	1.1	10.01		06/23/14 21:11	108-90-7	
Chloroethane	ND	ug/m3	5.4	1.6	10.01		06/23/14 21:11	75-00-3	
Chloroform	ND	ug/m3	9.9	1.8	10.01		06/23/14 21:11	67-66-3	
Chloromethane	ND	ug/m3	4.2	1.9	10.01		06/23/14 21:11	74-87-3	
Cyclohexane	**11.4J**	ug/m3	17.5	1.3	10.01		06/23/14 21:11	110-82-7	
Dibromochloromethane	ND	ug/m3	17.3	8.7	10.01		06/23/14 21:11	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	15.6	2.3	10.01		06/23/14 21:11	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	12.2	1.4	10.01		06/23/14 21:11	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	12.2	2.3	10.01		06/23/14 21:11	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	12.2	2.0	10.01		06/23/14 21:11	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	10.1	1.1	10.01		06/23/14 21:11	75-71-8	
1,1-Dichloroethane	ND	ug/m3	8.2	1.4	10.01		06/23/14 21:11	75-34-3	
1,2-Dichloroethane	ND	ug/m3	4.1	1.2	10.01		06/23/14 21:11	107-06-2	
1,1-Dichloroethene	ND	ug/m3	8.1	1.0	10.01		06/23/14 21:11	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	8.1	2.0	10.01		06/23/14 21:11	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	8.1	1.6	10.01		06/23/14 21:11	156-60-5	
1,2-Dichloropropane	ND	ug/m3	9.4	1.5	10.01		06/23/14 21:11	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	9.2	1.4	10.01		06/23/14 21:11	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	23.1	1.5	10.01		06/23/14 21:11	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	14.2	2.5	10.01		06/23/14 21:11	76-14-2	
Ethyl acetate	ND	ug/m3	7.3	1.3	10.01		06/23/14 21:11	141-78-6	
Ethylbenzene	ND	ug/m3	8.8	1.8	10.01		06/23/14 21:11	100-41-4	
4-Ethyltoluene	ND	ug/m3	10.0	1.7	10.01		06/23/14 21:11	622-96-8	
n-Heptane	ND	ug/m3	8.3	1.6	10.01		06/23/14 21:11	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	22.0	4.1	10.01		06/23/14 21:11	87-68-3	
n-Hexane	**143**	ug/m3	7.2	1.0	10.01		06/23/14 21:11	110-54-3	
2-Hexanone	ND	ug/m3	8.3	2.1	10.01		06/23/14 21:11	591-78-6	
Methylene Chloride	**18.4J**	ug/m3	35.3	2.3	10.01		06/23/14 21:11	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	8.3	1.7	10.01		06/23/14 21:11	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	7.3	0.89	10.01		06/23/14 21:11	1634-04-4	
Naphthalene	ND	ug/m3	26.6	2.6	10.01		06/23/14 21:11	91-20-3	
Propylene	ND	ug/m3	8.8	1.1	10.01		06/23/14 21:11	115-07-1	
Styrene	ND	ug/m3	8.7	1.4	10.01		06/23/14 21:11	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	14.0	2.3	10.01		06/23/14 21:11	79-34-5	
Tetrachloroethene	ND	ug/m3	13.8	1.9	10.01		06/23/14 21:11	127-18-4	
Tetrahydrofuran	ND	ug/m3	6.0	1.4	10.01		06/23/14 21:11	109-99-9	

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-B **Lab ID: 92204369002** Collected: 06/03/14 18:04 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Toluene	**7.9**	ug/m3	7.7	1.4	10.01		06/23/14 21:11	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	15.1	3.6	10.01		06/23/14 21:11	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	11.1	1.4	10.01		06/23/14 21:11	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	11.1	2.4	10.01		06/23/14 21:11	79-00-5	
Trichloroethene	ND	ug/m3	10.9	1.8	10.01		06/23/14 21:11	79-01-6	
Trichlorofluoromethane	ND	ug/m3	11.4	1.4	10.01		06/23/14 21:11	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	16.0	1.6	10.01		06/23/14 21:11	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/m3	10	1.2	10.01		06/23/14 21:11	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	10	2.1	10.01		06/23/14 21:11	108-67-8	
Vinyl acetate	ND	ug/m3	7.2	3.5	10.01		06/23/14 21:11	108-05-4	
Vinyl chloride	ND	ug/m3	5.2	0.93	10.01		06/23/14 21:11	75-01-4	
m&p-Xylene	**5.8J**	ug/m3	17.6	1.4	10.01		06/23/14 21:11	179601-23-1	
o-Xylene	ND	ug/m3	8.8	4.4	10.01		06/23/14 21:11	95-47-6	

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-C **Lab ID: 92204369003** Collected: 06/03/14 18:00 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**45.6**	ug/m3	4.7	2.3	1.93		06/23/14 21:58	67-64-1	
Benzene	**0.38J**	ug/m3	0.63	0.23	1.93		06/23/14 21:58	71-43-2	
Bromodichloromethane	ND	ug/m3	2.6	0.35	1.93		06/23/14 21:58	75-27-4	
Bromoform	ND	ug/m3	4.1	0.62	1.93		06/23/14 21:58	75-25-2	
Bromomethane	ND	ug/m3	1.5	0.52	1.93		06/23/14 21:58	74-83-9	
1,3-Butadiene	ND	ug/m3	0.87	0.16	1.93		06/23/14 21:58	106-99-0	
2-Butanone (MEK)	ND	ug/m3	1.2	0.53	1.93		06/23/14 21:58	78-93-3	
Carbon disulfide	**14.9**	ug/m3	1.2	0.14	1.93		06/23/14 21:58	75-15-0	
Carbon tetrachloride	ND	ug/m3	2.5	0.62	1.93		06/23/14 21:58	56-23-5	
Chlorobenzene	ND	ug/m3	1.8	0.20	1.93		06/23/14 21:58	108-90-7	
Chloroethane	ND	ug/m3	1.0	0.31	1.93		06/23/14 21:58	75-00-3	
Chloroform	ND	ug/m3	1.9	0.35	1.93		06/23/14 21:58	67-66-3	
Chloromethane	**1.0**	ug/m3	0.81	0.37	1.93		06/23/14 21:58	74-87-3	
Cyclohexane	**5.4**	ug/m3	3.4	0.24	1.93		06/23/14 21:58	110-82-7	
Dibromochloromethane	ND	ug/m3	3.3	1.7	1.93		06/23/14 21:58	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	3.0	0.45	1.93		06/23/14 21:58	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.4	0.27	1.93		06/23/14 21:58	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	2.4	0.45	1.93		06/23/14 21:58	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	2.4	0.38	1.93		06/23/14 21:58	106-46-7	
Dichlorodifluoromethane	**2.6**	ug/m3	1.9	0.21	1.93		06/23/14 21:58	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.6	0.27	1.93		06/23/14 21:58	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.79	0.23	1.93		06/23/14 21:58	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.6	0.20	1.93		06/23/14 21:58	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.6	0.38	1.93		06/23/14 21:58	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.6	0.31	1.93		06/23/14 21:58	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.8	0.29	1.93		06/23/14 21:58	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.8	0.26	1.93		06/23/14 21:58	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	4.5	0.29	1.93		06/23/14 21:58	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.7	0.48	1.93		06/23/14 21:58	76-14-2	
Ethyl acetate	ND	ug/m3	1.4	0.24	1.93		06/23/14 21:58	141-78-6	
Ethylbenzene	**1.8**	ug/m3	1.7	0.35	1.93		06/23/14 21:58	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.9	0.34	1.93		06/23/14 21:58	622-96-8	
n-Heptane	**2.2**	ug/m3	1.6	0.31	1.93		06/23/14 21:58	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	4.2	0.79	1.93		06/23/14 21:58	87-68-3	
n-Hexane	**122**	ug/m3	1.4	0.19	1.93		06/23/14 21:58	110-54-3	
2-Hexanone	ND	ug/m3	1.6	0.41	1.93		06/23/14 21:58	591-78-6	
Methylene Chloride	**115**	ug/m3	6.8	0.45	1.93		06/23/14 21:58	75-09-2	
4-Methyl-2-pentanone (MIBK)	**1.7**	ug/m3	1.6	0.33	1.93		06/23/14 21:58	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	1.4	0.17	1.93		06/23/14 21:58	1634-04-4	
Naphthalene	**1.1J**	ug/m3	5.1	0.50	1.93		06/23/14 21:58	91-20-3	
Propylene	ND	ug/m3	1.7	0.21	1.93		06/23/14 21:58	115-07-1	
Styrene	ND	ug/m3	1.7	0.26	1.93		06/23/14 21:58	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	2.7	0.45	1.93		06/23/14 21:58	79-34-5	
Tetrachloroethene	ND	ug/m3	2.7	0.36	1.93		06/23/14 21:58	127-18-4	
Tetrahydrofuran	ND	ug/m3	1.2	0.27	1.93		06/23/14 21:58	109-99-9	

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-C **Lab ID: 92204369003** Collected: 06/03/14 18:00 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Toluene	**12.8**	ug/m3	1.5	0.26	1.93		06/23/14 21:58	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	2.9	0.70	1.93		06/23/14 21:58	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	2.1	0.27	1.93		06/23/14 21:58	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	2.1	0.47	1.93		06/23/14 21:58	79-00-5	
Trichloroethene	**0.97J**	ug/m3	2.1	0.34	1.93		06/23/14 21:58	79-01-6	
Trichlorofluoromethane	**1.7J**	ug/m3	2.2	0.27	1.93		06/23/14 21:58	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	3.1	0.31	1.93		06/23/14 21:58	76-13-1	
1,2,4-Trimethylbenzene	**1.5J**	ug/m3	1.9	0.24	1.93		06/23/14 21:58	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.9	0.40	1.93		06/23/14 21:58	108-67-8	
Vinyl acetate	ND	ug/m3	1.4	0.67	1.93		06/23/14 21:58	108-05-4	
Vinyl chloride	ND	ug/m3	1.0	0.18	1.93		06/23/14 21:58	75-01-4	
m&p-Xylene	**5.2**	ug/m3	3.4	0.27	1.93		06/23/14 21:58	179601-23-1	
o-Xylene	**1.1J**	ug/m3	1.7	0.85	1.93		06/23/14 21:58	95-47-6	

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-D **Lab ID: 92204369004** Collected: 06/03/14 17:55 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**20.9**	ug/m3	3.6	1.8	1.49		06/23/14 22:20	67-64-1	
Benzene	**0.63**	ug/m3	0.48	0.18	1.49		06/23/14 22:20	71-43-2	
Bromodichloromethane	ND	ug/m3	2.0	0.27	1.49		06/23/14 22:20	75-27-4	
Bromoform	ND	ug/m3	3.1	0.48	1.49		06/23/14 22:20	75-25-2	
Bromomethane	ND	ug/m3	1.2	0.40	1.49		06/23/14 22:20	74-83-9	
1,3-Butadiene	ND	ug/m3	0.67	0.13	1.49		06/23/14 22:20	106-99-0	
2-Butanone (MEK)	**3.4**	ug/m3	0.89	0.41	1.49		06/23/14 22:20	78-93-3	
Carbon disulfide	**59.8**	ug/m3	0.94	0.11	1.49		06/23/14 22:20	75-15-0	
Carbon tetrachloride	ND	ug/m3	1.9	0.48	1.49		06/23/14 22:20	56-23-5	
Chlorobenzene	**80.9**	ug/m3	1.4	0.16	1.49		06/23/14 22:20	108-90-7	
Chloroethane	ND	ug/m3	0.80	0.24	1.49		06/23/14 22:20	75-00-3	
Chloroform	ND	ug/m3	1.5	0.27	1.49		06/23/14 22:20	67-66-3	
Chloromethane	**0.93**	ug/m3	0.63	0.29	1.49		06/23/14 22:20	74-87-3	
Cyclohexane	**1.6J**	ug/m3	2.6	0.19	1.49		06/23/14 22:20	110-82-7	
Dibromochloromethane	ND	ug/m3	2.6	1.3	1.49		06/23/14 22:20	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.3	0.35	1.49		06/23/14 22:20	106-93-4	
1,2-Dichlorobenzene	**7.9**	ug/m3	1.8	0.21	1.49		06/23/14 22:20	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	1.8	0.35	1.49		06/23/14 22:20	541-73-1	
1,4-Dichlorobenzene	**16.3**	ug/m3	1.8	0.30	1.49		06/23/14 22:20	106-46-7	
Dichlorodifluoromethane	**2.0**	ug/m3	1.5	0.16	1.49		06/23/14 22:20	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.2	0.21	1.49		06/23/14 22:20	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.61	0.18	1.49		06/23/14 22:20	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.2	0.15	1.49		06/23/14 22:20	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.2	0.29	1.49		06/23/14 22:20	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.2	0.24	1.49		06/23/14 22:20	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.4	0.23	1.49		06/23/14 22:20	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.4	0.20	1.49		06/23/14 22:20	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	3.4	0.22	1.49		06/23/14 22:20	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.1	0.37	1.49		06/23/14 22:20	76-14-2	
Ethyl acetate	**1.9**	ug/m3	1.1	0.19	1.49		06/23/14 22:20	141-78-6	
Ethylbenzene	ND	ug/m3	1.3	0.27	1.49		06/23/14 22:20	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.5	0.26	1.49		06/23/14 22:20	622-96-8	
n-Heptane	ND	ug/m3	1.2	0.24	1.49		06/23/14 22:20	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.3	0.61	1.49		06/23/14 22:20	87-68-3	
n-Hexane	ND	ug/m3	1.1	0.15	1.49		06/23/14 22:20	110-54-3	
2-Hexanone	**1.4**	ug/m3	1.2	0.32	1.49		06/23/14 22:20	591-78-6	
Methylene Chloride	**4.4J**	ug/m3	5.3	0.34	1.49		06/23/14 22:20	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	1.2	0.25	1.49		06/23/14 22:20	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	1.1	0.13	1.49		06/23/14 22:20	1634-04-4	
Naphthalene	ND	ug/m3	4.0	0.38	1.49		06/23/14 22:20	91-20-3	
Propylene	ND	ug/m3	1.3	0.16	1.49		06/23/14 22:20	115-07-1	
Styrene	ND	ug/m3	1.3	0.20	1.49		06/23/14 22:20	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	2.1	0.35	1.49		06/23/14 22:20	79-34-5	
Tetrachloroethene	ND	ug/m3	2.1	0.28	1.49		06/23/14 22:20	127-18-4	
Tetrahydrofuran	ND	ug/m3	0.89	0.21	1.49		06/23/14 22:20	109-99-9	

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-D **Lab ID: 92204369004** Collected: 06/03/14 17:55 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Toluene	**2.1**	ug/m3	1.1	0.20	1.49		06/23/14 22:20	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	2.2	0.54	1.49		06/23/14 22:20	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.7	0.21	1.49		06/23/14 22:20	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	1.7	0.36	1.49		06/23/14 22:20	79-00-5	
Trichloroethene	**1.1J**	ug/m3	1.6	0.27	1.49		06/23/14 22:20	79-01-6	
Trichlorofluoromethane	**1.6J**	ug/m3	1.7	0.21	1.49		06/23/14 22:20	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.4	0.24	1.49		06/23/14 22:20	76-13-1	
1,2,4-Trimethylbenzene	ND	ug/m3	1.5	0.18	1.49		06/23/14 22:20	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.5	0.31	1.49		06/23/14 22:20	108-67-8	
Vinyl acetate	ND	ug/m3	1.1	0.52	1.49		06/23/14 22:20	108-05-4	
Vinyl chloride	ND	ug/m3	0.77	0.14	1.49		06/23/14 22:20	75-01-4	
m&p-Xylene	**0.80J**	ug/m3	2.6	0.21	1.49		06/23/14 22:20	179601-23-1	
o-Xylene	ND	ug/m3	1.3	0.66	1.49		06/23/14 22:20	95-47-6	

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-E **Lab ID: 92204369005** Collected: 06/03/14 17:51 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**112**	ug/m3	17.4	8.7	7.2		06/23/14 22:42	67-64-1	
Benzene	ND	ug/m3	2.3	0.85	7.2		06/23/14 22:42	71-43-2	
Bromodichloromethane	ND	ug/m3	9.8	1.3	7.2		06/23/14 22:42	75-27-4	
Bromoform	ND	ug/m3	15.1	2.3	7.2		06/23/14 22:42	75-25-2	
Bromomethane	ND	ug/m3	5.7	1.9	7.2		06/23/14 22:42	74-83-9	
1,3-Butadiene	ND	ug/m3	3.2	0.61	7.2		06/23/14 22:42	106-99-0	
2-Butanone (MEK)	**6.3**	ug/m3	4.3	2.0	7.2		06/23/14 22:42	78-93-3	
Carbon disulfide	ND	ug/m3	4.5	0.52	7.2		06/23/14 22:42	75-15-0	
Carbon tetrachloride	ND	ug/m3	9.2	2.3	7.2		06/23/14 22:42	56-23-5	
Chlorobenzene	ND	ug/m3	6.8	0.76	7.2		06/23/14 22:42	108-90-7	
Chloroethane	ND	ug/m3	3.9	1.2	7.2		06/23/14 22:42	75-00-3	
Chloroform	ND	ug/m3	7.1	1.3	7.2		06/23/14 22:42	67-66-3	
Chloromethane	ND	ug/m3	3.0	1.4	7.2		06/23/14 22:42	74-87-3	
Cyclohexane	ND	ug/m3	12.6	0.91	7.2		06/23/14 22:42	110-82-7	
Dibromochloromethane	ND	ug/m3	12.5	6.2	7.2		06/23/14 22:42	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	11.2	1.7	7.2		06/23/14 22:42	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	8.8	1.0	7.2		06/23/14 22:42	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	8.8	1.7	7.2		06/23/14 22:42	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	8.8	1.4	7.2		06/23/14 22:42	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	7.3	0.78	7.2		06/23/14 22:42	75-71-8	
1,1-Dichloroethane	ND	ug/m3	5.9	1.0	7.2		06/23/14 22:42	75-34-3	
1,2-Dichloroethane	ND	ug/m3	3.0	0.86	7.2		06/23/14 22:42	107-06-2	
1,1-Dichloroethene	ND	ug/m3	5.8	0.74	7.2		06/23/14 22:42	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	5.8	1.4	7.2		06/23/14 22:42	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	5.8	1.2	7.2		06/23/14 22:42	156-60-5	
1,2-Dichloropropane	ND	ug/m3	6.8	1.1	7.2		06/23/14 22:42	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	6.6	0.98	7.2		06/23/14 22:42	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	16.6	1.1	7.2		06/23/14 22:42	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	10.2	1.8	7.2		06/23/14 22:42	76-14-2	
Ethyl acetate	**4.7J**	ug/m3	5.3	0.91	7.2		06/23/14 22:42	141-78-6	
Ethylbenzene	ND	ug/m3	6.3	1.3	7.2		06/23/14 22:42	100-41-4	
4-Ethyltoluene	**4.5J**	ug/m3	7.2	1.3	7.2		06/23/14 22:42	622-96-8	
n-Heptane	**6.1**	ug/m3	6.0	1.2	7.2		06/23/14 22:42	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	15.8	3.0	7.2		06/23/14 22:42	87-68-3	
n-Hexane	**32.7**	ug/m3	5.2	0.73	7.2		06/23/14 22:42	110-54-3	
2-Hexanone	ND	ug/m3	6.0	1.5	7.2		06/23/14 22:42	591-78-6	
Methylene Chloride	**6.6J**	ug/m3	25.4	1.7	7.2		06/23/14 22:42	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	6.0	1.2	7.2		06/23/14 22:42	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	5.3	0.64	7.2		06/23/14 22:42	1634-04-4	
Naphthalene	**164**	ug/m3	19.2	1.9	7.2		06/23/14 22:42	91-20-3	
Propylene	ND	ug/m3	6.3	0.79	7.2		06/23/14 22:42	115-07-1	
Styrene	**6.8**	ug/m3	6.3	0.97	7.2		06/23/14 22:42	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	10.1	1.7	7.2		06/23/14 22:42	79-34-5	
Tetrachloroethene	**240**	ug/m3	9.9	1.4	7.2		06/23/14 22:42	127-18-4	
Tetrahydrofuran	ND	ug/m3	4.3	1.0	7.2		06/23/14 22:42	109-99-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-E **Lab ID: 92204369005** Collected: 06/03/14 17:51 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Toluene	**12.0**	ug/m3	5.5	0.97	7.2		06/23/14 22:42	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	10.9	2.6	7.2		06/23/14 22:42	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	8.0	1.0	7.2		06/23/14 22:42	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	8.0	1.7	7.2		06/23/14 22:42	79-00-5	
Trichloroethene	**4.3J**	ug/m3	7.9	1.3	7.2		06/23/14 22:42	79-01-6	
Trichlorofluoromethane	ND	ug/m3	8.2	0.99	7.2		06/23/14 22:42	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	11.5	1.2	7.2		06/23/14 22:42	76-13-1	
1,2,4-Trimethylbenzene	**14.7**	ug/m3	7.2	0.88	7.2		06/23/14 22:42	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	7.2	1.5	7.2		06/23/14 22:42	108-67-8	
Vinyl acetate	ND	ug/m3	5.2	2.5	7.2		06/23/14 22:42	108-05-4	
Vinyl chloride	ND	ug/m3	3.7	0.67	7.2		06/23/14 22:42	75-01-4	
m&p-Xylene	**7.5J**	ug/m3	12.7	1.0	7.2		06/23/14 22:42	179601-23-1	
o-Xylene	ND	ug/m3	6.3	3.2	7.2		06/23/14 22:42	95-47-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-F **Lab ID: 92204369006** Collected: 06/03/14 17:42 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**53.9**	ug/m3	3.7	1.9	1.55		06/23/14 23:28	67-64-1	
Benzene	**0.34J**	ug/m3	0.50	0.18	1.55		06/23/14 23:28	71-43-2	
Bromodichloromethane	ND	ug/m3	2.1	0.28	1.55		06/23/14 23:28	75-27-4	
Bromoform	ND	ug/m3	3.3	0.50	1.55		06/23/14 23:28	75-25-2	
Bromomethane	ND	ug/m3	1.2	0.42	1.55		06/23/14 23:28	74-83-9	
1,3-Butadiene	ND	ug/m3	0.70	0.13	1.55		06/23/14 23:28	106-99-0	
2-Butanone (MEK)	**3.2**	ug/m3	0.93	0.42	1.55		06/23/14 23:28	78-93-3	
Carbon disulfide	**1.3**	ug/m3	0.98	0.11	1.55		06/23/14 23:28	75-15-0	
Carbon tetrachloride	**0.53J**	ug/m3	2.0	0.50	1.55		06/23/14 23:28	56-23-5	
Chlorobenzene	ND	ug/m3	1.5	0.16	1.55		06/23/14 23:28	108-90-7	
Chloroethane	ND	ug/m3	0.84	0.25	1.55		06/23/14 23:28	75-00-3	
Chloroform	ND	ug/m3	1.5	0.28	1.55		06/23/14 23:28	67-66-3	
Chloromethane	**1.2**	ug/m3	0.65	0.30	1.55		06/23/14 23:28	74-87-3	
Cyclohexane	**1.6J**	ug/m3	2.7	0.20	1.55		06/23/14 23:28	110-82-7	
Dibromochloromethane	ND	ug/m3	2.7	1.3	1.55		06/23/14 23:28	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.4	0.36	1.55		06/23/14 23:28	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	1.9	0.22	1.55		06/23/14 23:28	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	1.9	0.36	1.55		06/23/14 23:28	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	1.9	0.31	1.55		06/23/14 23:28	106-46-7	
Dichlorodifluoromethane	**2.1**	ug/m3	1.6	0.17	1.55		06/23/14 23:28	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.3	0.22	1.55		06/23/14 23:28	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.64	0.18	1.55		06/23/14 23:28	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.3	0.16	1.55		06/23/14 23:28	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.3	0.30	1.55		06/23/14 23:28	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.3	0.25	1.55		06/23/14 23:28	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.5	0.24	1.55		06/23/14 23:28	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.4	0.21	1.55		06/23/14 23:28	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	3.6	0.23	1.55		06/23/14 23:28	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.2	0.39	1.55		06/23/14 23:28	76-14-2	
Ethyl acetate	ND	ug/m3	1.1	0.20	1.55		06/23/14 23:28	141-78-6	
Ethylbenzene	**1.0J**	ug/m3	1.4	0.28	1.55		06/23/14 23:28	100-41-4	
4-Ethyltoluene	**4.1**	ug/m3	1.6	0.27	1.55		06/23/14 23:28	622-96-8	
n-Heptane	**2.0**	ug/m3	1.3	0.25	1.55		06/23/14 23:28	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.4	0.64	1.55		06/23/14 23:28	87-68-3	
n-Hexane	**3.4**	ug/m3	1.1	0.16	1.55		06/23/14 23:28	110-54-3	
2-Hexanone	**1.6**	ug/m3	1.3	0.33	1.55		06/23/14 23:28	591-78-6	
Methylene Chloride	**1.8J**	ug/m3	5.5	0.36	1.55		06/23/14 23:28	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	1.3	0.27	1.55		06/23/14 23:28	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	1.1	0.14	1.55		06/23/14 23:28	1634-04-4	
Naphthalene	**112**	ug/m3	4.1	0.40	1.55		06/23/14 23:28	91-20-3	
Propylene	ND	ug/m3	1.4	0.17	1.55		06/23/14 23:28	115-07-1	
Styrene	ND	ug/m3	1.3	0.21	1.55		06/23/14 23:28	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	2.2	0.36	1.55		06/23/14 23:28	79-34-5	
Tetrachloroethene	**19.3**	ug/m3	2.1	0.29	1.55		06/23/14 23:28	127-18-4	
Tetrahydrofuran	ND	ug/m3	0.93	0.22	1.55		06/23/14 23:28	109-99-9	

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-F **Lab ID: 92204369006** Collected: 06/03/14 17:42 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Toluene	**6.4**	ug/m3	1.2	0.21	1.55		06/23/14 23:28	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	2.3	0.56	1.55		06/23/14 23:28	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.7	0.22	1.55		06/23/14 23:28	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	1.7	0.38	1.55		06/23/14 23:28	79-00-5	
Trichloroethene	**1.8**	ug/m3	1.7	0.28	1.55		06/23/14 23:28	79-01-6	
Trichlorofluoromethane	**1.6J**	ug/m3	1.8	0.21	1.55		06/23/14 23:28	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.5	0.25	1.55		06/23/14 23:28	76-13-1	
1,2,4-Trimethylbenzene	**11.6**	ug/m3	1.5	0.19	1.55		06/23/14 23:28	95-63-6	
1,3,5-Trimethylbenzene	**2.4**	ug/m3	1.5	0.32	1.55		06/23/14 23:28	108-67-8	
Vinyl acetate	ND	ug/m3	1.1	0.54	1.55		06/23/14 23:28	108-05-4	
Vinyl chloride	ND	ug/m3	0.81	0.14	1.55		06/23/14 23:28	75-01-4	
m&p-Xylene	**3.9**	ug/m3	2.7	0.22	1.55		06/23/14 23:28	179601-23-1	
o-Xylene	**1.7**	ug/m3	1.4	0.68	1.55		06/23/14 23:28	95-47-6	

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-G **Lab ID: 92204369007** Collected: 06/03/14 17:33 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**289**	ug/m3	18.7	9.4	7.75		06/23/14 23:50	67-64-1	
Benzene	ND	ug/m3	2.5	0.91	7.75		06/23/14 23:50	71-43-2	
Bromodichloromethane	ND	ug/m3	10.5	1.4	7.75		06/23/14 23:50	75-27-4	
Bromoform	ND	ug/m3	16.3	2.5	7.75		06/23/14 23:50	75-25-2	
Bromomethane	ND	ug/m3	6.1	2.1	7.75		06/23/14 23:50	74-83-9	
1,3-Butadiene	ND	ug/m3	3.5	0.66	7.75		06/23/14 23:50	106-99-0	
2-Butanone (MEK)	**5.1**	ug/m3	4.6	2.1	7.75		06/23/14 23:50	78-93-3	
Carbon disulfide	ND	ug/m3	4.9	0.56	7.75		06/23/14 23:50	75-15-0	
Carbon tetrachloride	ND	ug/m3	9.9	2.5	7.75		06/23/14 23:50	56-23-5	
Chlorobenzene	ND	ug/m3	7.3	0.82	7.75		06/23/14 23:50	108-90-7	
Chloroethane	ND	ug/m3	4.2	1.2	7.75		06/23/14 23:50	75-00-3	
Chloroform	ND	ug/m3	7.7	1.4	7.75		06/23/14 23:50	67-66-3	
Chloromethane	ND	ug/m3	3.3	1.5	7.75		06/23/14 23:50	74-87-3	
Cyclohexane	ND	ug/m3	13.6	0.98	7.75		06/23/14 23:50	110-82-7	
Dibromochloromethane	ND	ug/m3	13.4	6.7	7.75		06/23/14 23:50	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	12.1	1.8	7.75		06/23/14 23:50	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	9.5	1.1	7.75		06/23/14 23:50	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	9.5	1.8	7.75		06/23/14 23:50	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	9.5	1.5	7.75		06/23/14 23:50	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	7.8	0.84	7.75		06/23/14 23:50	75-71-8	
1,1-Dichloroethane	ND	ug/m3	6.4	1.1	7.75		06/23/14 23:50	75-34-3	
1,2-Dichloroethane	ND	ug/m3	3.2	0.92	7.75		06/23/14 23:50	107-06-2	
1,1-Dichloroethene	ND	ug/m3	6.3	0.80	7.75		06/23/14 23:50	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	6.3	1.5	7.75		06/23/14 23:50	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	6.3	1.3	7.75		06/23/14 23:50	156-60-5	
1,2-Dichloropropane	ND	ug/m3	7.3	1.2	7.75		06/23/14 23:50	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	7.1	1.1	7.75		06/23/14 23:50	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	17.9	1.2	7.75		06/23/14 23:50	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	11.0	1.9	7.75		06/23/14 23:50	76-14-2	
Ethyl acetate	**4.4J**	ug/m3	5.7	0.98	7.75		06/23/14 23:50	141-78-6	
Ethylbenzene	**4.7J**	ug/m3	6.8	1.4	7.75		06/23/14 23:50	100-41-4	
4-Ethyltoluene	ND	ug/m3	7.8	1.3	7.75		06/23/14 23:50	622-96-8	
n-Heptane	**7.7**	ug/m3	6.4	1.3	7.75		06/23/14 23:50	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	17.0	3.2	7.75		06/23/14 23:50	87-68-3	
n-Hexane	**3.1J**	ug/m3	5.6	0.78	7.75		06/23/14 23:50	110-54-3	
2-Hexanone	ND	ug/m3	6.4	1.7	7.75		06/23/14 23:50	591-78-6	
Methylene Chloride	**4.1J**	ug/m3	27.4	1.8	7.75		06/23/14 23:50	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	6.4	1.3	7.75		06/23/14 23:50	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	5.7	0.69	7.75		06/23/14 23:50	1634-04-4	
Naphthalene	**67.8**	ug/m3	20.6	2.0	7.75		06/23/14 23:50	91-20-3	
Propylene	ND	ug/m3	6.8	0.85	7.75		06/23/14 23:50	115-07-1	
Styrene	ND	ug/m3	6.7	1.0	7.75		06/23/14 23:50	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	10.8	1.8	7.75		06/23/14 23:50	79-34-5	
Tetrachloroethene	**10.1J**	ug/m3	10.7	1.5	7.75		06/23/14 23:50	127-18-4	
Tetrahydrofuran	ND	ug/m3	4.6	1.1	7.75		06/23/14 23:50	109-99-9	

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-G **Lab ID: 92204369007** Collected: 06/03/14 17:33 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Toluene	**8.3**	ug/m3	6.0	1.0	7.75		06/23/14 23:50	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	11.7	2.8	7.75		06/23/14 23:50	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	8.6	1.1	7.75		06/23/14 23:50	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	8.6	1.9	7.75		06/23/14 23:50	79-00-5	
Trichloroethene	**11.1**	ug/m3	8.5	1.4	7.75		06/23/14 23:50	79-01-6	
Trichlorofluoromethane	ND	ug/m3	8.8	1.1	7.75		06/23/14 23:50	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	12.4	1.2	7.75		06/23/14 23:50	76-13-1	
1,2,4-Trimethylbenzene	**6.3J**	ug/m3	7.7	0.95	7.75		06/23/14 23:50	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	7.7	1.6	7.75		06/23/14 23:50	108-67-8	
Vinyl acetate	ND	ug/m3	5.5	2.7	7.75		06/23/14 23:50	108-05-4	
Vinyl chloride	ND	ug/m3	4.0	0.72	7.75		06/23/14 23:50	75-01-4	
m&p-Xylene	**28.1**	ug/m3	13.6	1.1	7.75		06/23/14 23:50	179601-23-1	
o-Xylene	**8.2**	ug/m3	6.8	3.4	7.75		06/23/14 23:50	95-47-6	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-H **Lab ID: 92204369008** Collected: 06/03/14 17:00 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**91.7**	ug/m3	3.5	1.7	1.44		06/24/14 00:13	67-64-1	
Benzene	**0.30J**	ug/m3	0.47	0.17	1.44		06/24/14 00:13	71-43-2	
Bromodichloromethane	ND	ug/m3	2.0	0.26	1.44		06/24/14 00:13	75-27-4	
Bromoform	ND	ug/m3	3.0	0.47	1.44		06/24/14 00:13	75-25-2	
Bromomethane	ND	ug/m3	1.1	0.39	1.44		06/24/14 00:13	74-83-9	
1,3-Butadiene	ND	ug/m3	0.65	0.12	1.44		06/24/14 00:13	106-99-0	
2-Butanone (MEK)	**9.9**	ug/m3	0.86	0.39	1.44		06/24/14 00:13	78-93-3	
Carbon disulfide	ND	ug/m3	0.91	0.10	1.44		06/24/14 00:13	75-15-0	
Carbon tetrachloride	**0.47J**	ug/m3	1.8	0.46	1.44		06/24/14 00:13	56-23-5	
Chlorobenzene	ND	ug/m3	1.4	0.15	1.44		06/24/14 00:13	108-90-7	
Chloroethane	ND	ug/m3	0.78	0.23	1.44		06/24/14 00:13	75-00-3	
Chloroform	ND	ug/m3	1.4	0.26	1.44		06/24/14 00:13	67-66-3	
Chloromethane	**0.85**	ug/m3	0.60	0.28	1.44		06/24/14 00:13	74-87-3	
Cyclohexane	**1.8J**	ug/m3	2.5	0.18	1.44		06/24/14 00:13	110-82-7	
Dibromochloromethane	ND	ug/m3	2.5	1.2	1.44		06/24/14 00:13	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.2	0.34	1.44		06/24/14 00:13	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	1.8	0.20	1.44		06/24/14 00:13	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	1.8	0.33	1.44		06/24/14 00:13	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	1.8	0.29	1.44		06/24/14 00:13	106-46-7	
Dichlorodifluoromethane	**1.8**	ug/m3	1.5	0.16	1.44		06/24/14 00:13	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.2	0.20	1.44		06/24/14 00:13	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.59	0.17	1.44		06/24/14 00:13	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.2	0.15	1.44		06/24/14 00:13	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.2	0.28	1.44		06/24/14 00:13	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.2	0.23	1.44		06/24/14 00:13	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.4	0.22	1.44		06/24/14 00:13	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.3	0.20	1.44		06/24/14 00:13	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	3.3	0.22	1.44		06/24/14 00:13	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.0	0.36	1.44		06/24/14 00:13	76-14-2	
Ethyl acetate	**2.1**	ug/m3	1.1	0.18	1.44		06/24/14 00:13	141-78-6	
Ethylbenzene	**0.96J**	ug/m3	1.3	0.26	1.44		06/24/14 00:13	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.4	0.25	1.44		06/24/14 00:13	622-96-8	
n-Heptane	**2.7**	ug/m3	1.2	0.23	1.44		06/24/14 00:13	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.2	0.59	1.44		06/24/14 00:13	87-68-3	
n-Hexane	ND	ug/m3	1.0	0.15	1.44		06/24/14 00:13	110-54-3	
2-Hexanone	**2.5**	ug/m3	1.2	0.31	1.44		06/24/14 00:13	591-78-6	
Methylene Chloride	**1.2J**	ug/m3	5.1	0.33	1.44		06/24/14 00:13	75-09-2	
4-Methyl-2-pentanone (MIBK)	**2.3**	ug/m3	1.2	0.25	1.44		06/24/14 00:13	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	1.1	0.13	1.44		06/24/14 00:13	1634-04-4	
Naphthalene	**41.9**	ug/m3	3.8	0.37	1.44		06/24/14 00:13	91-20-3	
Propylene	ND	ug/m3	1.3	0.16	1.44		06/24/14 00:13	115-07-1	
Styrene	ND	ug/m3	1.3	0.19	1.44		06/24/14 00:13	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	2.0	0.34	1.44		06/24/14 00:13	79-34-5	
Tetrachloroethene	**1.3J**	ug/m3	2.0	0.27	1.44		06/24/14 00:13	127-18-4	
Tetrahydrofuran	ND	ug/m3	0.86	0.20	1.44		06/24/14 00:13	109-99-9	

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-H **Lab ID: 92204369008** Collected: 06/03/14 17:00 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Toluene	**6.7**	ug/m3	1.1	0.19	1.44		06/24/14 00:13	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	2.2	0.52	1.44		06/24/14 00:13	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.6	0.20	1.44		06/24/14 00:13	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	1.6	0.35	1.44		06/24/14 00:13	79-00-5	
Trichloroethene	**17.6**	ug/m3	1.6	0.26	1.44		06/24/14 00:13	79-01-6	
Trichlorofluoromethane	**1.5J**	ug/m3	1.6	0.20	1.44		06/24/14 00:13	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.3	0.23	1.44		06/24/14 00:13	76-13-1	
1,2,4-Trimethylbenzene	**1.9**	ug/m3	1.4	0.18	1.44		06/24/14 00:13	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.4	0.30	1.44		06/24/14 00:13	108-67-8	
Vinyl acetate	ND	ug/m3	1.0	0.50	1.44		06/24/14 00:13	108-05-4	
Vinyl chloride	ND	ug/m3	0.75	0.13	1.44		06/24/14 00:13	75-01-4	
m&p-Xylene	**3.3**	ug/m3	2.5	0.20	1.44		06/24/14 00:13	179601-23-1	
o-Xylene	**1.1J**	ug/m3	1.3	0.64	1.44		06/24/14 00:13	95-47-6	

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-I **Lab ID: 92204369009** Collected: 06/03/14 17:35 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**144**	ug/m3	5.0	2.5	2.08		06/24/14 00:36	67-64-1	
Benzene	ND	ug/m3	0.68	0.25	2.08		06/24/14 00:36	71-43-2	
Bromodichloromethane	ND	ug/m3	2.8	0.38	2.08		06/24/14 00:36	75-27-4	
Bromoform	ND	ug/m3	4.4	0.67	2.08		06/24/14 00:36	75-25-2	
Bromomethane	ND	ug/m3	1.6	0.56	2.08		06/24/14 00:36	74-83-9	
1,3-Butadiene	ND	ug/m3	0.94	0.18	2.08		06/24/14 00:36	106-99-0	
2-Butanone (MEK)	**6.7**	ug/m3	1.2	0.57	2.08		06/24/14 00:36	78-93-3	
Carbon disulfide	ND	ug/m3	1.3	0.15	2.08		06/24/14 00:36	75-15-0	
Carbon tetrachloride	ND	ug/m3	2.7	0.67	2.08		06/24/14 00:36	56-23-5	
Chlorobenzene	ND	ug/m3	2.0	0.22	2.08		06/24/14 00:36	108-90-7	
Chloroethane	ND	ug/m3	1.1	0.33	2.08		06/24/14 00:36	75-00-3	
Chloroform	ND	ug/m3	2.1	0.37	2.08		06/24/14 00:36	67-66-3	
Chloromethane	**0.97**	ug/m3	0.87	0.40	2.08		06/24/14 00:36	74-87-3	
Cyclohexane	**2.1J**	ug/m3	3.6	0.26	2.08		06/24/14 00:36	110-82-7	
Dibromochloromethane	ND	ug/m3	3.6	1.8	2.08		06/24/14 00:36	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	3.2	0.49	2.08		06/24/14 00:36	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	2.5	0.29	2.08		06/24/14 00:36	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	2.5	0.48	2.08		06/24/14 00:36	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	2.5	0.41	2.08		06/24/14 00:36	106-46-7	
Dichlorodifluoromethane	**2.1**	ug/m3	2.1	0.23	2.08		06/24/14 00:36	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.7	0.29	2.08		06/24/14 00:36	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.85	0.25	2.08		06/24/14 00:36	107-06-2	
1,1-Dichloroethene	**0.99J**	ug/m3	1.7	0.21	2.08		06/24/14 00:36	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.7	0.41	2.08		06/24/14 00:36	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.7	0.34	2.08		06/24/14 00:36	156-60-5	
1,2-Dichloropropane	ND	ug/m3	2.0	0.32	2.08		06/24/14 00:36	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.9	0.28	2.08		06/24/14 00:36	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	4.8	0.31	2.08		06/24/14 00:36	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	3.0	0.52	2.08		06/24/14 00:36	76-14-2	
Ethyl acetate	**2.7**	ug/m3	1.5	0.26	2.08		06/24/14 00:36	141-78-6	
Ethylbenzene	**2.4**	ug/m3	1.8	0.37	2.08		06/24/14 00:36	100-41-4	
4-Ethyltoluene	ND	ug/m3	2.1	0.36	2.08		06/24/14 00:36	622-96-8	
n-Heptane	**3.2**	ug/m3	1.7	0.34	2.08		06/24/14 00:36	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	4.6	0.85	2.08		06/24/14 00:36	87-68-3	
n-Hexane	ND	ug/m3	1.5	0.21	2.08		06/24/14 00:36	110-54-3	
2-Hexanone	**2.3**	ug/m3	1.7	0.44	2.08		06/24/14 00:36	591-78-6	
Methylene Chloride	**2.3J**	ug/m3	7.3	0.48	2.08		06/24/14 00:36	75-09-2	
4-Methyl-2-pentanone (MIBK)	**2.0**	ug/m3	1.7	0.36	2.08		06/24/14 00:36	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	1.5	0.19	2.08		06/24/14 00:36	1634-04-4	
Naphthalene	**50.0**	ug/m3	5.5	0.54	2.08		06/24/14 00:36	91-20-3	
Propylene	ND	ug/m3	1.8	0.23	2.08		06/24/14 00:36	115-07-1	
Styrene	ND	ug/m3	1.8	0.28	2.08		06/24/14 00:36	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	2.9	0.48	2.08		06/24/14 00:36	79-34-5	
Tetrachloroethene	**3.7**	ug/m3	2.9	0.39	2.08		06/24/14 00:36	127-18-4	
Tetrahydrofuran	**1.5**	ug/m3	1.2	0.29	2.08		06/24/14 00:36	109-99-9	

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-I **Lab ID: 92204369009** Collected: 06/03/14 17:35 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Toluene	**7.0**	ug/m3	1.6	0.28	2.08		06/24/14 00:36	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	3.1	0.76	2.08		06/24/14 00:36	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	2.3	0.29	2.08		06/24/14 00:36	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	2.3	0.51	2.08		06/24/14 00:36	79-00-5	
Trichloroethene	**14.4**	ug/m3	2.3	0.37	2.08		06/24/14 00:36	79-01-6	
Trichlorofluoromethane	**1.5J**	ug/m3	2.4	0.29	2.08		06/24/14 00:36	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	3.3	0.33	2.08		06/24/14 00:36	76-13-1	
1,2,4-Trimethylbenzene	**3.1**	ug/m3	2.1	0.25	2.08		06/24/14 00:36	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	2.1	0.43	2.08		06/24/14 00:36	108-67-8	
Vinyl acetate	ND	ug/m3	1.5	0.72	2.08		06/24/14 00:36	108-05-4	
Vinyl chloride	ND	ug/m3	1.1	0.19	2.08		06/24/14 00:36	75-01-4	
m&p-Xylene	**11.5**	ug/m3	3.7	0.29	2.08		06/24/14 00:36	179601-23-1	
o-Xylene	**4.4**	ug/m3	1.8	0.92	2.08		06/24/14 00:36	95-47-6	

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-J **Lab ID: 92204369010** Collected: 06/03/14 17:05 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**55.2**	ug/m3	3.2	1.6	1.34		06/24/14 00:59	67-64-1	
Benzene	**0.25J**	ug/m3	0.44	0.16	1.34		06/24/14 00:59	71-43-2	
Bromodichloromethane	ND	ug/m3	1.8	0.24	1.34		06/24/14 00:59	75-27-4	
Bromoform	ND	ug/m3	2.8	0.43	1.34		06/24/14 00:59	75-25-2	
Bromomethane	ND	ug/m3	1.1	0.36	1.34		06/24/14 00:59	74-83-9	
1,3-Butadiene	ND	ug/m3	0.60	0.11	1.34		06/24/14 00:59	106-99-0	
2-Butanone (MEK)	**8.1**	ug/m3	0.80	0.37	1.34		06/24/14 00:59	78-93-3	
Carbon disulfide	**1.5**	ug/m3	0.84	0.096	1.34		06/24/14 00:59	75-15-0	
Carbon tetrachloride	**0.46J**	ug/m3	1.7	0.43	1.34		06/24/14 00:59	56-23-5	
Chlorobenzene	ND	ug/m3	1.3	0.14	1.34		06/24/14 00:59	108-90-7	
Chloroethane	ND	ug/m3	0.72	0.22	1.34		06/24/14 00:59	75-00-3	
Chloroform	ND	ug/m3	1.3	0.24	1.34		06/24/14 00:59	67-66-3	
Chloromethane	**1.1**	ug/m3	0.56	0.26	1.34		06/24/14 00:59	74-87-3	
Cyclohexane	**2.2J**	ug/m3	2.3	0.17	1.34		06/24/14 00:59	110-82-7	
Dibromochloromethane	ND	ug/m3	2.3	1.2	1.34		06/24/14 00:59	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.1	0.31	1.34		06/24/14 00:59	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	1.6	0.19	1.34		06/24/14 00:59	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	1.6	0.31	1.34		06/24/14 00:59	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	1.6	0.27	1.34		06/24/14 00:59	106-46-7	
Dichlorodifluoromethane	**2.4**	ug/m3	1.4	0.15	1.34		06/24/14 00:59	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.1	0.19	1.34		06/24/14 00:59	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.55	0.16	1.34		06/24/14 00:59	107-06-2	
1,1-Dichloroethene	**0.65J**	ug/m3	1.1	0.14	1.34		06/24/14 00:59	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.1	0.26	1.34		06/24/14 00:59	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.1	0.22	1.34		06/24/14 00:59	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.3	0.20	1.34		06/24/14 00:59	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.2	0.18	1.34		06/24/14 00:59	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	3.1	0.20	1.34		06/24/14 00:59	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	1.9	0.33	1.34		06/24/14 00:59	76-14-2	
Ethyl acetate	**5.1**	ug/m3	0.98	0.17	1.34		06/24/14 00:59	141-78-6	
Ethylbenzene	**1.5**	ug/m3	1.2	0.24	1.34		06/24/14 00:59	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.3	0.23	1.34		06/24/14 00:59	622-96-8	
n-Heptane	**2.4**	ug/m3	1.1	0.22	1.34		06/24/14 00:59	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	2.9	0.55	1.34		06/24/14 00:59	87-68-3	
n-Hexane	ND	ug/m3	0.96	0.14	1.34		06/24/14 00:59	110-54-3	
2-Hexanone	**1.4**	ug/m3	1.1	0.29	1.34		06/24/14 00:59	591-78-6	
Methylene Chloride	**5.9**	ug/m3	4.7	0.31	1.34		06/24/14 00:59	75-09-2	
4-Methyl-2-pentanone (MIBK)	**1.5**	ug/m3	1.1	0.23	1.34		06/24/14 00:59	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	0.98	0.12	1.34		06/24/14 00:59	1634-04-4	
Naphthalene	**8.1**	ug/m3	3.6	0.35	1.34		06/24/14 00:59	91-20-3	
Propylene	ND	ug/m3	1.2	0.15	1.34		06/24/14 00:59	115-07-1	
Styrene	**2.5**	ug/m3	1.2	0.18	1.34		06/24/14 00:59	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	1.9	0.31	1.34		06/24/14 00:59	79-34-5	
Tetrachloroethene	**0.92J**	ug/m3	1.8	0.25	1.34		06/24/14 00:59	127-18-4	
Tetrahydrofuran	**1.3**	ug/m3	0.80	0.19	1.34		06/24/14 00:59	109-99-9	

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-J **Lab ID: 92204369010** Collected: 06/03/14 17:05 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Toluene	**21.8**	ug/m3	1.0	0.18	1.34		06/24/14 00:59	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	2.0	0.49	1.34		06/24/14 00:59	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.5	0.19	1.34		06/24/14 00:59	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	1.5	0.33	1.34		06/24/14 00:59	79-00-5	
Trichloroethene	**5.2**	ug/m3	1.5	0.24	1.34		06/24/14 00:59	79-01-6	
Trichlorofluoromethane	**2.5**	ug/m3	1.5	0.18	1.34		06/24/14 00:59	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	2.1	0.21	1.34		06/24/14 00:59	76-13-1	
1,2,4-Trimethylbenzene	**1.8**	ug/m3	1.3	0.16	1.34		06/24/14 00:59	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.3	0.28	1.34		06/24/14 00:59	108-67-8	
Vinyl acetate	ND	ug/m3	0.96	0.47	1.34		06/24/14 00:59	108-05-4	
Vinyl chloride	ND	ug/m3	0.70	0.12	1.34		06/24/14 00:59	75-01-4	
m&p-Xylene	**5.8**	ug/m3	2.4	0.19	1.34		06/24/14 00:59	179601-23-1	
o-Xylene	**1.9**	ug/m3	1.2	0.59	1.34		06/24/14 00:59	95-47-6	

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-K **Lab ID: 92204369011** Collected: 06/03/14 17:02 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**67.1**	ug/m3	16.8	8.4	6.95		06/24/14 01:21	67-64-1	
Benzene	ND	ug/m3	2.3	0.82	6.95		06/24/14 01:21	71-43-2	
Bromodichloromethane	ND	ug/m3	9.5	1.3	6.95		06/24/14 01:21	75-27-4	
Bromoform	ND	ug/m3	14.6	2.2	6.95		06/24/14 01:21	75-25-2	
Bromomethane	ND	ug/m3	5.5	1.9	6.95		06/24/14 01:21	74-83-9	
1,3-Butadiene	ND	ug/m3	3.1	0.59	6.95		06/24/14 01:21	106-99-0	
2-Butanone (MEK)	**41.2**	ug/m3	4.2	1.9	6.95		06/24/14 01:21	78-93-3	
Carbon disulfide	**16.0**	ug/m3	4.4	0.50	6.95		06/24/14 01:21	75-15-0	
Carbon tetrachloride	ND	ug/m3	8.9	2.2	6.95		06/24/14 01:21	56-23-5	
Chlorobenzene	ND	ug/m3	6.5	0.74	6.95		06/24/14 01:21	108-90-7	
Chloroethane	ND	ug/m3	3.8	1.1	6.95		06/24/14 01:21	75-00-3	
Chloroform	ND	ug/m3	6.9	1.2	6.95		06/24/14 01:21	67-66-3	
Chloromethane	ND	ug/m3	2.9	1.3	6.95		06/24/14 01:21	74-87-3	
Cyclohexane	**14.8**	ug/m3	12.2	0.88	6.95		06/24/14 01:21	110-82-7	
Dibromochloromethane	ND	ug/m3	12.0	6.0	6.95		06/24/14 01:21	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	10.8	1.6	6.95		06/24/14 01:21	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	8.5	0.98	6.95		06/24/14 01:21	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	8.5	1.6	6.95		06/24/14 01:21	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	8.5	1.4	6.95		06/24/14 01:21	106-46-7	
Dichlorodifluoromethane	ND	ug/m3	7.0	0.76	6.95		06/24/14 01:21	75-71-8	
1,1-Dichloroethane	ND	ug/m3	5.7	0.97	6.95		06/24/14 01:21	75-34-3	
1,2-Dichloroethane	ND	ug/m3	2.8	0.83	6.95		06/24/14 01:21	107-06-2	
1,1-Dichloroethene	ND	ug/m3	5.6	0.72	6.95		06/24/14 01:21	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	5.6	1.4	6.95		06/24/14 01:21	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	5.6	1.1	6.95		06/24/14 01:21	156-60-5	
1,2-Dichloropropane	ND	ug/m3	6.5	1.1	6.95		06/24/14 01:21	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	6.4	0.95	6.95		06/24/14 01:21	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	16.0	1.0	6.95		06/24/14 01:21	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	9.9	1.7	6.95		06/24/14 01:21	76-14-2	
Ethyl acetate	**32.9**	ug/m3	5.1	0.88	6.95		06/24/14 01:21	141-78-6	
Ethylbenzene	ND	ug/m3	6.1	1.2	6.95		06/24/14 01:21	100-41-4	
4-Ethyltoluene	ND	ug/m3	7.0	1.2	6.95		06/24/14 01:21	622-96-8	
n-Heptane	**11.1**	ug/m3	5.8	1.1	6.95		06/24/14 01:21	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	15.3	2.9	6.95		06/24/14 01:21	87-68-3	
n-Hexane	**21.6**	ug/m3	5.0	0.70	6.95		06/24/14 01:21	110-54-3	
2-Hexanone	ND	ug/m3	5.8	1.5	6.95		06/24/14 01:21	591-78-6	
Methylene Chloride	**17.9J**	ug/m3	24.5	1.6	6.95		06/24/14 01:21	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	5.8	1.2	6.95		06/24/14 01:21	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	5.1	0.62	6.95		06/24/14 01:21	1634-04-4	
Naphthalene	ND	ug/m3	18.5	1.8	6.95		06/24/14 01:21	91-20-3	
Propylene	ND	ug/m3	6.1	0.76	6.95		06/24/14 01:21	115-07-1	
Styrene	**14.1**	ug/m3	6.0	0.94	6.95		06/24/14 01:21	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	9.7	1.6	6.95		06/24/14 01:21	79-34-5	
Tetrachloroethene	ND	ug/m3	9.6	1.3	6.95		06/24/14 01:21	127-18-4	
Tetrahydrofuran	ND	ug/m3	4.2	0.97	6.95		06/24/14 01:21	109-99-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-K **Lab ID: 92204369011** Collected: 06/03/14 17:02 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Toluene	**196**	ug/m3	5.4	0.94	6.95		06/24/14 01:21	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	10.5	2.5	6.95		06/24/14 01:21	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	7.7	0.97	6.95		06/24/14 01:21	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	7.7	1.7	6.95		06/24/14 01:21	79-00-5	
Trichloroethene	**5.1J**	ug/m3	7.6	1.2	6.95		06/24/14 01:21	79-01-6	
Trichlorofluoromethane	**5.4J**	ug/m3	7.9	0.96	6.95		06/24/14 01:21	75-69-4	
1,1,2-Trichlorotrifluoroethane	ND	ug/m3	11.1	1.1	6.95		06/24/14 01:21	76-13-1	
1,2,4-Trimethylbenzene	**3.8J**	ug/m3	6.9	0.85	6.95		06/24/14 01:21	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	6.9	1.4	6.95		06/24/14 01:21	108-67-8	
Vinyl acetate	ND	ug/m3	5.0	2.4	6.95		06/24/14 01:21	108-05-4	
Vinyl chloride	ND	ug/m3	3.6	0.65	6.95		06/24/14 01:21	75-01-4	
m&p-Xylene	**3.8J**	ug/m3	12.2	0.97	6.95		06/24/14 01:21	179601-23-1	
o-Xylene	ND	ug/m3	6.1	3.1	6.95		06/24/14 01:21	95-47-6	

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-L **Lab ID: 92204369012** Collected: 06/03/14 17:20 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Acetone	**21.7**	ug/m3	3.6	1.8	1.49		06/24/14 01:46	67-64-1	
Benzene	ND	ug/m3	0.48	0.18	1.49		06/24/14 01:46	71-43-2	
Bromodichloromethane	ND	ug/m3	2.0	0.27	1.49		06/24/14 01:46	75-27-4	
Bromoform	ND	ug/m3	3.1	0.48	1.49		06/24/14 01:46	75-25-2	
Bromomethane	ND	ug/m3	1.2	0.40	1.49		06/24/14 01:46	74-83-9	
1,3-Butadiene	ND	ug/m3	0.67	0.13	1.49		06/24/14 01:46	106-99-0	
2-Butanone (MEK)	**3.4**	ug/m3	0.89	0.41	1.49		06/24/14 01:46	78-93-3	
Carbon disulfide	**0.91J**	ug/m3	0.94	0.11	1.49		06/24/14 01:46	75-15-0	
Carbon tetrachloride	**0.89J**	ug/m3	1.9	0.48	1.49		06/24/14 01:46	56-23-5	
Chlorobenzene	ND	ug/m3	1.4	0.16	1.49		06/24/14 01:46	108-90-7	
Chloroethane	ND	ug/m3	0.80	0.24	1.49		06/24/14 01:46	75-00-3	
Chloroform	**0.40J**	ug/m3	1.5	0.27	1.49		06/24/14 01:46	67-66-3	
Chloromethane	**1.1**	ug/m3	0.63	0.29	1.49		06/24/14 01:46	74-87-3	
Cyclohexane	**1.3J**	ug/m3	2.6	0.19	1.49		06/24/14 01:46	110-82-7	
Dibromochloromethane	ND	ug/m3	2.6	1.3	1.49		06/24/14 01:46	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/m3	2.3	0.35	1.49		06/24/14 01:46	106-93-4	
1,2-Dichlorobenzene	ND	ug/m3	1.8	0.21	1.49		06/24/14 01:46	95-50-1	
1,3-Dichlorobenzene	ND	ug/m3	1.8	0.35	1.49		06/24/14 01:46	541-73-1	
1,4-Dichlorobenzene	ND	ug/m3	1.8	0.30	1.49		06/24/14 01:46	106-46-7	
Dichlorodifluoromethane	**2.5**	ug/m3	1.5	0.16	1.49		06/24/14 01:46	75-71-8	
1,1-Dichloroethane	ND	ug/m3	1.2	0.21	1.49		06/24/14 01:46	75-34-3	
1,2-Dichloroethane	ND	ug/m3	0.61	0.18	1.49		06/24/14 01:46	107-06-2	
1,1-Dichloroethene	ND	ug/m3	1.2	0.15	1.49		06/24/14 01:46	75-35-4	
cis-1,2-Dichloroethene	ND	ug/m3	1.2	0.29	1.49		06/24/14 01:46	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.2	0.24	1.49		06/24/14 01:46	156-60-5	
1,2-Dichloropropane	ND	ug/m3	1.4	0.23	1.49		06/24/14 01:46	78-87-5	
cis-1,3-Dichloropropene	ND	ug/m3	1.4	0.20	1.49		06/24/14 01:46	10061-01-5	
trans-1,3-Dichloropropene	ND	ug/m3	3.4	0.22	1.49		06/24/14 01:46	10061-02-6	
Dichlorotetrafluoroethane	ND	ug/m3	2.1	0.37	1.49		06/24/14 01:46	76-14-2	
Ethyl acetate	**0.72J**	ug/m3	1.1	0.19	1.49		06/24/14 01:46	141-78-6	
Ethylbenzene	ND	ug/m3	1.3	0.27	1.49		06/24/14 01:46	100-41-4	
4-Ethyltoluene	ND	ug/m3	1.5	0.26	1.49		06/24/14 01:46	622-96-8	
n-Heptane	ND	ug/m3	1.2	0.24	1.49		06/24/14 01:46	142-82-5	
Hexachloro-1,3-butadiene	ND	ug/m3	3.3	0.61	1.49		06/24/14 01:46	87-68-3	
n-Hexane	**2.0**	ug/m3	1.1	0.15	1.49		06/24/14 01:46	110-54-3	
2-Hexanone	**1.3**	ug/m3	1.2	0.32	1.49		06/24/14 01:46	591-78-6	
Methylene Chloride	**4.9J**	ug/m3	5.3	0.34	1.49		06/24/14 01:46	75-09-2	
4-Methyl-2-pentanone (MIBK)	ND	ug/m3	1.2	0.25	1.49		06/24/14 01:46	108-10-1	
Methyl-tert-butyl ether	ND	ug/m3	1.1	0.13	1.49		06/24/14 01:46	1634-04-4	
Naphthalene	ND	ug/m3	4.0	0.38	1.49		06/24/14 01:46	91-20-3	
Propylene	**1.9**	ug/m3	1.3	0.16	1.49		06/24/14 01:46	115-07-1	
Styrene	ND	ug/m3	1.3	0.20	1.49		06/24/14 01:46	100-42-5	
1,1,2,2-Tetrachloroethane	ND	ug/m3	2.1	0.35	1.49		06/24/14 01:46	79-34-5	
Tetrachloroethene	**0.56J**	ug/m3	2.1	0.28	1.49		06/24/14 01:46	127-18-4	
Tetrahydrofuran	ND	ug/m3	0.89	0.21	1.49		06/24/14 01:46	109-99-9	

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ANALYTICAL RESULTS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Sample: IA-L **Lab ID: 92204369012** Collected: 06/03/14 17:20 Received: 06/06/14 13:15 Matrix: Air

Parameters	Results	Units	Report Limit	MDL	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR	Analytical Method: TO-15								
Toluene	**4.2**	ug/m3	1.1	0.20	1.49		06/24/14 01:46	108-88-3	
1,2,4-Trichlorobenzene	ND	ug/m3	2.2	0.54	1.49		06/24/14 01:46	120-82-1	
1,1,1-Trichloroethane	ND	ug/m3	1.7	0.21	1.49		06/24/14 01:46	71-55-6	
1,1,2-Trichloroethane	ND	ug/m3	1.7	0.36	1.49		06/24/14 01:46	79-00-5	
Trichloroethene	**1.0J**	ug/m3	1.6	0.27	1.49		06/24/14 01:46	79-01-6	
Trichlorofluoromethane	**2.0**	ug/m3	1.7	0.21	1.49		06/24/14 01:46	75-69-4	
1,1,2-Trichlorotrifluoroethane	**1.2J**	ug/m3	2.4	0.24	1.49		06/24/14 01:46	76-13-1	
1,2,4-Trimethylbenzene	**1.0J**	ug/m3	1.5	0.18	1.49		06/24/14 01:46	95-63-6	
1,3,5-Trimethylbenzene	ND	ug/m3	1.5	0.31	1.49		06/24/14 01:46	108-67-8	
Vinyl acetate	ND	ug/m3	1.1	0.52	1.49		06/24/14 01:46	108-05-4	
Vinyl chloride	ND	ug/m3	0.77	0.14	1.49		06/24/14 01:46	75-01-4	
m&p-Xylene	**0.75J**	ug/m3	2.6	0.21	1.49		06/24/14 01:46	179601-23-1	
o-Xylene	ND	ug/m3	1.3	0.66	1.49		06/24/14 01:46	95-47-6	

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QUALITY CONTROL DATA

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

QC Batch: AIR/20599 Analysis Method: TO-15
QC Batch Method: TO-15 Analysis Description: TO15 MSV AIR Low Level
Associated Lab Samples: 92204369001, 92204369002, 92204369003, 92204369004, 92204369005, 92204369006, 92204369007, 92204369008, 92204369009, 92204369010, 92204369011, 92204369012

METHOD BLANK: 1713703 Matrix: Air
Associated Lab Samples: 92204369001, 92204369002, 92204369003, 92204369004, 92204369005, 92204369006, 92204369007, 92204369008, 92204369009, 92204369010, 92204369011, 92204369012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
1,1,1-Trichloroethane	ug/m3	ND	1.1	06/23/14 20:26	
1,1,2,2-Tetrachloroethane	ug/m3	ND	1.4	06/23/14 20:26	
1,1,2-Trichloroethane	ug/m3	ND	1.1	06/23/14 20:26	
1,1,2-Trichlorotrifluoroethane	ug/m3	ND	1.6	06/23/14 20:26	
1,1-Dichloroethane	ug/m3	ND	0.82	06/23/14 20:26	
1,1-Dichloroethene	ug/m3	ND	0.81	06/23/14 20:26	
1,2,4-Trichlorobenzene	ug/m3	ND	1.5	06/23/14 20:26	
1,2,4-Trimethylbenzene	ug/m3	ND	1.0	06/23/14 20:26	
1,2-Dibromoethane (EDB)	ug/m3	ND	1.6	06/23/14 20:26	
1,2-Dichlorobenzene	ug/m3	ND	1.2	06/23/14 20:26	
1,2-Dichloroethane	ug/m3	ND	0.41	06/23/14 20:26	
1,2-Dichloropropane	ug/m3	ND	0.94	06/23/14 20:26	
1,3,5-Trimethylbenzene	ug/m3	ND	1.0	06/23/14 20:26	
1,3-Butadiene	ug/m3	ND	0.45	06/23/14 20:26	
1,3-Dichlorobenzene	ug/m3	ND	1.2	06/23/14 20:26	
1,4-Dichlorobenzene	ug/m3	ND	1.2	06/23/14 20:26	
2-Butanone (MEK)	ug/m3	ND	0.60	06/23/14 20:26	
2-Hexanone	ug/m3	ND	0.83	06/23/14 20:26	
4-Ethyltoluene	ug/m3	ND	1.0	06/23/14 20:26	
4-Methyl-2-pentanone (MIBK)	ug/m3	ND	0.83	06/23/14 20:26	
Acetone	ug/m3	ND	2.4	06/23/14 20:26	
Benzene	ug/m3	ND	0.32	06/23/14 20:26	
Bromodichloromethane	ug/m3	ND	1.4	06/23/14 20:26	
Bromoform	ug/m3	ND	2.1	06/23/14 20:26	
Bromomethane	ug/m3	ND	0.79	06/23/14 20:26	
Carbon disulfide	ug/m3	ND	0.63	06/23/14 20:26	
Carbon tetrachloride	ug/m3	ND	1.3	06/23/14 20:26	
Chlorobenzene	ug/m3	ND	0.94	06/23/14 20:26	
Chloroethane	ug/m3	ND	0.54	06/23/14 20:26	
Chloroform	ug/m3	ND	0.99	06/23/14 20:26	
Chloromethane	ug/m3	ND	0.42	06/23/14 20:26	
cis-1,2-Dichloroethene	ug/m3	ND	0.81	06/23/14 20:26	
cis-1,3-Dichloropropene	ug/m3	ND	0.92	06/23/14 20:26	
Cyclohexane	ug/m3	ND	1.7	06/23/14 20:26	
Dibromochloromethane	ug/m3	ND	1.7	06/23/14 20:26	
Dichlorodifluoromethane	ug/m3	ND	1.0	06/23/14 20:26	
Dichlorotetrafluoroethane	ug/m3	ND	1.4	06/23/14 20:26	
Ethyl acetate	ug/m3	ND	0.73	06/23/14 20:26	
Ethylbenzene	ug/m3	ND	0.88	06/23/14 20:26	
Hexachloro-1,3-butadiene	ug/m3	ND	2.2	06/23/14 20:26	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALITY CONTROL DATA

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

METHOD BLANK: 1713703 Matrix: Air

Associated Lab Samples: 92204369001, 92204369002, 92204369003, 92204369004, 92204369005, 92204369006, 92204369007, 92204369008, 92204369009, 92204369010, 92204369011, 92204369012

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
m&p-Xylene	ug/m3	ND	1.8	06/23/14 20:26	
Methyl-tert-butyl ether	ug/m3	ND	0.73	06/23/14 20:26	
Methylene Chloride	ug/m3	ND	3.5	06/23/14 20:26	
n-Heptane	ug/m3	ND	0.83	06/23/14 20:26	
n-Hexane	ug/m3	ND	0.72	06/23/14 20:26	
Naphthalene	ug/m3	ND	2.7	06/23/14 20:26	
o-Xylene	ug/m3	ND	0.88	06/23/14 20:26	
Propylene	ug/m3	ND	0.88	06/23/14 20:26	
Styrene	ug/m3	ND	0.87	06/23/14 20:26	
Tetrachloroethene	ug/m3	ND	1.4	06/23/14 20:26	
Tetrahydrofuran	ug/m3	ND	0.60	06/23/14 20:26	
THC as Gas	ug/m3	ND	60.8	06/23/14 20:26	
Toluene	ug/m3	ND	0.77	06/23/14 20:26	
trans-1,2-Dichloroethene	ug/m3	ND	0.81	06/23/14 20:26	
trans-1,3-Dichloropropene	ug/m3	ND	2.3	06/23/14 20:26	
Trichloroethene	ug/m3	ND	1.1	06/23/14 20:26	
Trichlorofluoromethane	ug/m3	ND	1.1	06/23/14 20:26	
Vinyl acetate	ug/m3	ND	0.72	06/23/14 20:26	
Vinyl chloride	ug/m3	ND	0.52	06/23/14 20:26	

LABORATORY CONTROL SAMPLE: 1713704

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
1,1,1-Trichloroethane	ug/m3	55.5	55.5	100	72-128	
1,1,2,2-Tetrachloroethane	ug/m3	69.8	67.7	97	72-136	
1,1,2-Trichloroethane	ug/m3	55.5	52.9	95	72-130	
1,1,2-Trichlorotrifluoroethane	ug/m3	77.9	76.1	98	68-126	
1,1-Dichloroethane	ug/m3	41.2	37.6	91	68-128	
1,1-Dichloroethene	ug/m3	40.3	42.5	105	68-130	
1,2,4-Trichlorobenzene	ug/m3	75.5	75.9	101	30-150	
1,2,4-Trimethylbenzene	ug/m3	50	47.2	94	71-140	
1,2-Dibromoethane (EDB)	ug/m3	78.1	78.0	100	73-136	
1,2-Dichlorobenzene	ug/m3	61.2	72.9	119	63-150	
1,2-Dichloroethane	ug/m3	41.2	42.7	104	71-132	
1,2-Dichloropropane	ug/m3	47	48.6	103	72-130	
1,3,5-Trimethylbenzene	ug/m3	50	48.1	96	73-136	
1,3-Butadiene	ug/m3	22.5	25.5	113	72-130	
1,3-Dichlorobenzene	ug/m3	61.2	71.2	116	69-142	
1,4-Dichlorobenzene	ug/m3	61.2	64.3	105	65-142	
2-Butanone (MEK)	ug/m3	30	28.7	96	71-135	
2-Hexanone	ug/m3	41.7	41.4	99	75-133	
4-Ethyltoluene	ug/m3	50	49.4	99	73-134	
4-Methyl-2-pentanone (MIBK)	ug/m3	41.7	42.3	102	72-137	

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REPORT OF LABORATORY ANALYSIS

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Pace Analytical Services, Inc.
9800 Kincey Ave. Suite 100
Huntersville, NC 28078
(704)875-9092

QUALITY CONTROL DATA

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

LABORATORY CONTROL SAMPLE: 1713704

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
Acetone	ug/m3	24.2	25.5	106	68-136	
Benzene	ug/m3	32.5	35.2	108	69-134	
Bromodichloromethane	ug/m3	68.2	66.2	97	74-129	
Bromoform	ug/m3	105	108	103	69-138	
Bromomethane	ug/m3	39.5	40.2	102	68-127	
Carbon disulfide	ug/m3	31.7	32.3	102	68-130	
Carbon tetrachloride	ug/m3	64	57.4	90	66-134	
Chlorobenzene	ug/m3	46.8	44.4	95	72-137	
Chloroethane	ug/m3	26.8	26.2	98	69-128	
Chloroform	ug/m3	49.7	48.6	98	72-127	
Chloromethane	ug/m3	21	22.4	107	69-125	
cis-1,2-Dichloroethene	ug/m3	40.3	43.6	108	71-135	
cis-1,3-Dichloropropene	ug/m3	46.2	52.7	114	74-134	
Cyclohexane	ug/m3	35	37.3	107	72-130	
Dibromochloromethane	ug/m3	86.6	88.1	102	73-133	
Dichlorodifluoromethane	ug/m3	50.3	52.3	104	69-125	
Dichlorotetrafluoroethane	ug/m3	71.1	72.5	102	68-128	
Ethyl acetate	ug/m3	36.6	36.0	98	71-134	
Ethylbenzene	ug/m3	44.2	43.8	99	73-139	
Hexachloro-1,3-butadiene	ug/m3	108	90.2	83	30-150	
m&p-Xylene	ug/m3	44.2	42.4	96	73-139	
Methyl-tert-butyl ether	ug/m3	36.7	37.4	102	72-132	
Methylene Chloride	ug/m3	35.3	31.7	90	64-134	
n-Heptane	ug/m3	41.7	42.1	101	70-130	
n-Hexane	ug/m3	35.8	38.7	108	69-128	
Naphthalene	ug/m3	53.3	57.0	107	61-150	
o-Xylene	ug/m3	44.2	43.6	99	71-138	
Propylene	ug/m3	17.5	19.9	114	69-133	
Styrene	ug/m3	43.3	41.7	96	74-136	
Tetrachloroethene	ug/m3	69	65.7	95	69-136	
Tetrahydrofuran	ug/m3	30	31.9	106	73-131	
THC as Gas	ug/m3	3520	3600	102	65-136	
Toluene	ug/m3	38.3	44.0	115	67-133	
trans-1,2-Dichloroethene	ug/m3	40.3	38.4	95	70-131	
trans-1,3-Dichloropropene	ug/m3	46.2	47.0	102	72-135	
Trichloroethene	ug/m3	54.6	55.1	101	70-135	
Trichlorofluoromethane	ug/m3	57.1	54.1	95	67-125	
Vinyl acetate	ug/m3	35.8	44.1	123	72-133	
Vinyl chloride	ug/m3	26	27.4	105	69-132	

SAMPLE DUPLICATE: 1715986

Parameter	Units	92204369002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,1-Trichloroethane	ug/m3	ND	ND		25	
1,1,2,2-Tetrachloroethane	ug/m3	ND	ND		25	

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REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

SAMPLE DUPLICATE: 1715986

Parameter	Units	92204369002 Result	Dup Result	RPD	Max RPD	Qualifiers
1,1,2-Trichloroethane	ug/m3	ND	ND		25	
1,1,2-Trichlorotrifluoroethane	ug/m3	ND	ND		25	
1,1-Dichloroethane	ug/m3	ND	ND		25	
1,1-Dichloroethene	ug/m3	ND	ND		25	
1,2,4-Trichlorobenzene	ug/m3	ND	ND		25	
1,2,4-Trimethylbenzene	ug/m3	ND	ND		25	
1,2-Dibromoethane (EDB)	ug/m3	ND	ND		25	
1,2-Dichlorobenzene	ug/m3	ND	ND		25	
1,2-Dichloroethane	ug/m3	ND	ND		25	
1,2-Dichloropropane	ug/m3	ND	ND		25	
1,3,5-Trimethylbenzene	ug/m3	ND	ND		25	
1,3-Butadiene	ug/m3	ND	ND		25	
1,3-Dichlorobenzene	ug/m3	ND	ND		25	
1,4-Dichlorobenzene	ug/m3	ND	ND		25	
2-Butanone (MEK)	ug/m3	ND	5.3J		25	
2-Hexanone	ug/m3	ND	ND		25	
4-Ethyltoluene	ug/m3	ND	ND		25	
4-Methyl-2-pentanone (MIBK)	ug/m3	ND	ND		25	
Acetone	ug/m3	32.0	29.4	9	25	
Benzene	ug/m3	ND	ND		25	
Bromodichloromethane	ug/m3	ND	ND		25	
Bromoform	ug/m3	ND	ND		25	
Bromomethane	ug/m3	ND	ND		25	
Carbon disulfide	ug/m3	3.6J	3.2J		25	
Carbon tetrachloride	ug/m3	ND	ND		25	
Chlorobenzene	ug/m3	ND	ND		25	
Chloroethane	ug/m3	ND	ND		25	
Chloroform	ug/m3	ND	ND		25	
Chloromethane	ug/m3	ND	ND		25	
cis-1,2-Dichloroethene	ug/m3	ND	ND		25	
cis-1,3-Dichloropropene	ug/m3	ND	ND		25	
Cyclohexane	ug/m3	11.4J	11.7J		25	
Dibromochloromethane	ug/m3	ND	ND		25	
Dichlorodifluoromethane	ug/m3	ND	ND		25	
Dichlorotetrafluoroethane	ug/m3	ND	ND		25	
Ethyl acetate	ug/m3	ND	ND		25	
Ethylbenzene	ug/m3	ND	ND		25	
Hexachloro-1,3-butadiene	ug/m3	ND	ND		25	
m&p-Xylene	ug/m3	5.8J	5.7J		25	
Methyl-tert-butyl ether	ug/m3	ND	ND		25	
Methylene Chloride	ug/m3	18.4J	17.6J		25	
n-Heptane	ug/m3	ND	ND		25	
n-Hexane	ug/m3	143	142	1	25	
Naphthalene	ug/m3	ND	ND		25	
o-Xylene	ug/m3	ND	ND		25	
Propylene	ug/m3	ND	ND		25	
Styrene	ug/m3	ND	ND		25	

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QUALITY CONTROL DATA

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

SAMPLE DUPLICATE: 1715986

Parameter	Units	92204369002 Result	Dup Result	RPD	Max RPD	Qualifiers
Tetrachloroethene	ug/m3	ND	ND		25	
Tetrahydrofuran	ug/m3	ND	ND		25	
THC as Gas	ug/m3	1890	1770	6	25	
Toluene	ug/m3	7.9	7.4J		25	
trans-1,2-Dichloroethene	ug/m3	ND	ND		25	
trans-1,3-Dichloropropene	ug/m3	ND	ND		25	
Trichloroethene	ug/m3	ND	ND		25	
Trichlorofluoromethane	ug/m3	ND	ND		25	
Vinyl acetate	ug/m3	ND	ND		25	
Vinyl chloride	ug/m3	ND	ND		25	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Acid preservation may not be appropriate for 2-Chloroethylvinyl ether, Styrene, and Vinyl chloride.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: ATHERTON MILL 6228-12-0051
Pace Project No.: 92204369

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92204369001	**IA-A**	TO-15	AIR/20599		
92204369002	**IA-B**	TO-15	AIR/20599		
92204369003	**IA-C**	TO-15	AIR/20599		
92204369004	**IA-D**	TO-15	AIR/20599		
92204369005	**IA-E**	TO-15	AIR/20599		
92204369006	**IA-F**	TO-15	AIR/20599		
92204369007	**IA-G**	TO-15	AIR/20599		
92204369008	**IA-H**	TO-15	AIR/20599		
92204369009	**IA-I**	TO-15	AIR/20599		
92204369010	**IA-J**	TO-15	AIR/20599		
92204369011	**IA-K**	TO-15	AIR/20599		
92204369012	**IA-L**	TO-15	AIR/20599		

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AIR: CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Page: 1 of 1

Section A Required Client Information:

Company: AMEC
Address: 2801 Yorkmont Rd
Charlotte, NC 28208
Email To:
Phone: Fax:
Requested Due Date/TAT: Normal

Section B Required Project Information:

Report To: Andrew Frantz
Copy To:
Purchase Order No.: C012503534
Project Name: Atherton Mill
Project Number: 6228-12-0051

Section C Invoice Information:

Attention: Jackie Williams
Company Name: AMEC
Address: 2801 Yorkmont Rd, Charlotte, NC 28208
Pace Quote Reference:
Pace Project Manager/Sales Rep. Kevin Godwin
Pace Profile #:

Program

UST Superfund Emissions Clean Air Act
Voluntary Clean Up Dry Clean RCRA Other___

Location of Sampling by State: NC

Reporting Units: ug/m³ X mg/m³ ___ PPBV ___ PPMV ___ Other ___

Report Level II.___ III.___ IV.___ Other___

Section D Required Client Information — AIR SAMPLE ID — Sample IDs MUST BE UNIQUE

Valid Media Codes

MEDIA	CODE
Tedlar Bag	TB
1 Liter Summa Can	1LC
6 Liter Summa Can	6LC
Low Volume Puff	LVP
High Volume Puff	HVP
Other	PM10

Method: PM10, 3C- Fixed Gas (%), TO-3, TO-3M (Methane), TO-4 (PCBs), TO-13 (PAH), TO-14, TO-15 Low Level, TO15 Short List*

Pace Lab ID: 92204869

ITEM #	AIR SAMPLE ID	MEDIA CODE	PID Reading (Client only)	Composite Start/Endgrab DATE	Composite Start/Endgrab TIME	Composite - DATE	Composite - TIME	Canister Pressure (Initial Field - psig)	Canister Pressure (Final Field - psig)	Summa Can Number	Flow Control Number	TO-15	Pace Lab ID
1	IA-A	6LC		6-3-14	10:45	6-3-14	18:45	-29	-2	0466	0382	x	001
2	IA-B	↓		↓	10:04	↓	18:04	-30	-2	0400	1033	↓	002
3	IA-C				10:00		18:00	-30	-2	1073	1014		003
4	IA-D				9:55		17:55	-30	-3	1293	0338		004
5	IA-E				9:51		17:51	-30	-2	0399	1011		005
6	IA-F				9:42		17:42	-30	-4	0963	0445		006
7	IA-G				9:33		17:33	-30	-4	1044	0105		007
8	IA-H				9:00		17:00	-30	-2	2331	1009		008
9	IA-I				9:35		17:35	-29	-3	2038	0128		009
10	IA-J				9:05		17:05	-29	0	1270	1016		010
11	IA-K				9:02		17:02	-20	0	0110	0407		011
12	IA-L	↓		↓	9:20	↓	17:20	-30	-1	1248	0063	↓	012

Comments :

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME
[signature] / AMEC	6-6-14	7:00	B Moody Pace	06-06-14	12:00
B Moody	06-06-14	13:15	[signature]	[illegible]	[illegible]

SAMPLE CONDITIONS

Temp in °C	Received on Ice	Custody Sealed Cooler	Samples Intact
	Y/N	Y/N	Y/N
n/a	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N
	Y/N	Y/N	Y/N

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: Andrew Frantz
SIGNATURE of SAMPLER: [signature]
DATE Signed (MM / DD / YY): 6-6-14

ATTACHMENT E

MSDS FOR PAINTS STORED AT PINOT'S PALETTE (UNIT 75)

00711-all codes except:
-1006 -1007 -1016 -1017 -1018
-1026 -1027 -1028 -1059

MATERIAL SAFETY DATA SHEET

May be used to comply with OSHA's 29 CFR 1910.1200)

IDENTITY (AS USED ON LABEL AND LIST)

Note blank spaces are not permitted If any item is not applicable or no information available the space must be marked appropriately

DICK BLICK BLICKRYLIC COLORS

SECTION 1 - MATERIAL IDENTIFICATION AND INFORMATION

00734-1009 set

(608) 868-6873
EMERGENCY TELEPHONE NUMBER

MAY 2011
DATE PREPARED

SECTION 2 - MATERIAL IDENTIFICATION AND INFORMATION

COMPONENTS: CHEMICAL NAME & COMMON NAMES	%	OSHA PEL	ACGIH TLV	OTHER LIMITS RECOMMENDED

Contains no hazardous substand per OSHA
29 CFR 1910.1200

Material is a water based product with the AP Seal. Products with, the AP Approved Products Seal of the Art and Craft Materials Institute Inc. are certified in a program of toxicological evaluation by a medium expert to contain no material in sufficient quantities to be toxic or injurious to humans or to cause acute or chronic health problems. These products are certitied by the Institute to be in accordance with the voluntary chronic hazard labeling standard ASTM D-4236. In addition, there is no physical hazard as defined within 29 CFR Part 1910.1200 (c).

SECTION 3 - PHYSICAL/CHEMICAL CHARACTERISTICS

BOILING POINT -	Range 215-225 F	SPECIFIC GRAVITY (H_2O = 1) -	Range 1.03-1.68
VAPOR PRESSURE (mm Hg & TEMPERATURE) -	N/A	MELTING POINT -	N/A
VAPOR DENSITY (AIR=1) -	lighter than air	EVAPORATION RATE (WATER = 1) -	›wer than ether
SOLUBILITY IN WATER -	completely soluble in water	WATER REACTIVE -	N/A
APPEARANCE & ODOR -	various colors and odorless		

SECTION 4 - FIRE AND EXPLOSION HAZARD DATA

FLASH POINT & METHOD USED	FLAMMABILITY LIMITS IN AIR % BY VOLUME	
N/A	N/A	
EXTINGUISHER MEDIA	LEL	UEL
CO_2, Foam or Water	N/A	N/A

SPECIAL FIRE FIGHTING PROCEDURES
None known

UNUSUAL FIRE AND EXPLOSION HAZARDS
None

SECTION 5 - REACTIVITY HAZARD DATA

STABILITY	CONDITIONS TO AVOID
[X] STABLE [ ] UNSTABLE	None
INCOMPATABILITY (MATERIALS TO AVOID)	N/A
HAZARDOUS DECOMPOSITION PRODUCTS	N/A
HAZARDOUS POLYMERIZATION [ ] MAY OCCUR [ ] WILL NOT OCCUR N/A	CONDITIONS TO AVOID None known

SECTION 6 - HEALTH HAZARD DATA

PRIMARY ROUTES OF ENT N/A	CARCINOGEN LISTED IN N/A
[ ] INHALATION [ ] INGESTION [ ] SKIN ABSORTION [ ] NOT HAZARDOUS	[ ] NTP [ ] OSHA [ ] IARC MONOGRAPH [X] NOT LISTED

HEALTH HAZARDS	
Refer to Section 2	ACUTE
	CHRONIC
SIGNS AND SYMPTOMS	Not known
MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE	Not known
EMERGENY FIRST AID PROCEDURES -	Consult a Physician Immediatley.

SECTION 7 - PRECAUTIONS FOR SAFE HANDLING AND USE/LEAK PROCEDURES

STEPS TO BE TAKEN IS MATERIAL IS SPILLED OR RELEASED
Usual Clean Up Procedure

WASTE DISPOSAL METHODS
Dispose of in accordance with Federal and Local State Regulations

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE
Store at room temperature.

OTHER PRECAUTIONS AND/OR SPECIAL HAZARDS
Not known

SECTION 8 - CONTROL AND PROTECTIVE MEASURES

RESPIRATORY PROTECTION (SPECIFY TYPE)
None required

VENTILATION TO BE USED	LOCAL EXHAUSE	MECHANICAL (GENERAL)	SPECIAL
None required	OTHER (SPECIFY)		
PROTECTIVE GLOVES N/A	EYE PROTECTION N/A		
OTHER PROTECTIVE CLOTHING AND EQUIPMENT	N/A		
HYGIENIC WORK PRACTICES	N/A		