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THE FLETCHER GROUP
Engineering and Environmental Solutions

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1999 SEMIANNUAL GROUNDWATER MONITORING REPORT

FOR

THE JACKSON COUNTY MUNICIPAL SOLID WASTE LANDFILL

Prepared for
JACKSON COUNTY MSWLF
Sylva, North Carolina

Prepared by
THE FLETCHER GROUP, INC.
Asheville, North Carolina

June 22, 1999

NORTH CAROLINA PROFESSIONAL SEAL 20200 ENGINEER JAMES S. McELDUFF 6-22-99

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TABLE OF CONTENTS

Section **Page**

1.0 INTRODUCTION 1

2.0 SEMIANNUAL MONITORING 2
2.1 GROUNDWATER AND SURFACE WATER SAMPLING 2
2.2 ANALYTICAL RESULTS 3
2.3 HYDROGEOLOGY 3
2.4 STATISTICAL ANALYSES 4

3.0 CONCLUSIONS 6

LIST OF FIGURES

Figure 1: Site Location Map
Figure 2: Monitoring Well and Surface Water Sample Location Map
Figure 3: Groundwater Flow Direction – April 22, 1999

LIST OF TABLES

Table 1: Field Indicator Parameters
Table 2: Summary of Analytical Results: Appendix I Metals
Table 3: Summary of Analytical Results: Volatile Organic Compounds
Table 4: Monitoring Well and Water Table Elevations

LIST OF APPENDICES

Appendix A: Field Data Sampling Logs
Appendix B: Laboratory Analytical Reports
Appendix C: Groundwater Velocity Calculation
Appendix D: ANOVA Statistical Analyses

1.0 INTRODUCTION

The Jackson County Solid Waste Department maintains a closed landfill located approximately three quarters of a mile west of Dillsboro, North Carolina, north of Old Dillsboro Road (Old US 74). Entrance to the landfill is by State Road (SR) 1539. The site location is shown on Figure 1. The permit for the landfill requires semiannual monitoring of groundwater and surface water quality. This report serves as the first semiannual groundwater and surface water monitoring report for 1999. The data are being submitted in accordance with requirements stipulated in the North Carolina Department of Environment and Natural Resources (DENR) Solid Waste Management Rules 15A North Carolina Administrative Code (NCAC) 13B. The data and report also comply with the subsequent memorandum regarding Appendix II monitoring from DENR, dated April 21, 1995. This report provides an evaluation of the groundwater and surface water quality. Statistical analyses of groundwater data and groundwater flow information are also provided for the landfill.

This report contains the following items:

- Water level measurements and elevations for the landfill monitoring wells;
- Surface water sampling locations;
- Groundwater and surface water quality analytical results with chain-of-custody forms;
- Field blank and laboratory blank analytical results;
- Summary of the statistical analyses of constituents detected during this sampling event;
- Map showing groundwater flow direction; and,
- Field data sampling logs.

2.0 SEMI-ANNUAL MONITORING

2.1 Groundwater and Surface Water Sampling

The Jackson County Landfill monitoring wells (MW-1 through MW-5) and the surface water sample locations (SW-1 and SW-2) were sampled by The Fletcher Group, Inc. on April 22, 1999. The monitoring well locations are shown on Figure 2. Surface water samples were collected where the property lines intersect the Tuckasegee River.

Prior to sampling the groundwater, static water level measurements were taken in each well from the referenced measuring point. Each well was then purged and sampled using a disposable bailer. Samples were obtained after a minimum of three well volumes had been purged and consistent pH, specific conductivity, and temperature readings had been collected. Purge water was collected and stored onsite in secure drums. A summary of water level measurements and field indicator parameters is included in Table 1. Copies of the Field Data Sampling Logs are included in Appendix A.

Groundwater and surface water samples were analyzed for the following parameters:

- Appendix I metals using various US EPA Methods from the 6010/7000 series.
- Volatile organic compounds (VOCs) using US EPA Method 8260.
- Two Appendix II VOCs (methylene chloride and vinyl chloride) using US EPA Method 8260.

The samples were analyzed by Pace Analytical Services, Inc. (Pace), a North Carolina certified laboratory, in Huntersville, North Carolina. Proper chain-of-custody documentation was followed during collection and transport of each sample.

2.2 Analytical Results

The laboratory analytical results are summarized in Tables 2 and 3. The Pace laboratory analytical reports and chain-of-custody forms are included in Appendix B.

Analytical results for the Appendix I metals analyses are shown in Table 2. As shown, arsenic, barium, beryllium, cadmium, chromium, cobalt, lead, mercury, nickel, vanadium, and zinc were detected in one or more of the monitoring wells. The table also shows that the concentration of barium and mercury in well MW-4 exceeded the NCAC Title 15A, Subchapter 2L groundwater quality standards (2L standards). In MW-5, the concentration of chromium, lead, and mercury were found to be in excess of the 2L standards. All other metals detected in the monitoring wells and surface water samples were found at concentrations less than the 2L standards.

The analytical results for organic compounds are shown in Table 3. Five VOCs were found in excess of the 2L standards in MW-1. These compounds are benzene at a concentration of 7.9 micrograms per liter (µg/L); methylene chloride at a concentration of 62 µg/L; tetrachloroethene at a concentration of 3.7 µg/L; trichloroethene at a concentration of 4.3 µg/L; and vinyl chloride at a concentration of 2.1 µg/L. Three VOCs were found in excess of the 2L standards in MW-3. These compounds are benzene at a concentration of 4.8 µg/L; tetrachloroethene at a concentration of 1.0 µg/L; and vinyl chloride at a concentration of 1.2 µg/L. Four VOCs were found in excess of the 2L standards in MW-4. These compounds and their concentrations are benzene at 2.8 µg/L, tetrachloroethene at 3.9 µg/L, trichloroethene at 3.5 µg/L, vinyl chloride at 2.0 µg/L. Two volatile organic compounds were found in excess of the 2L standards in MW-5. These compounds are benzene at a concentration of 3.4 µg/L and vinyl chloride at a concentration of 2.2 µg/L.

2.3 Hydrogeology

Groundwater at the landfill occurs under water table conditions in fractured bedrock near the top of the landfill along northern property boundary (MW-1) and in saprolite near the toe of the landfill in wells MW-3, MW-4, and MW-5. Water level data collected from MW-1, MW-3 and MW-4 indicate that the

predominant horizontal shallow (saprolite) groundwater flow direction is to the west toward the Tuckasegee River. Figure 3 depicts the estimated generalized groundwater flow direction based on the groundwater measurements made by The Fletcher Group on April 22, 1999.

The groundwater flow rate in saprolite was calculated using information from three sources: the hydraulic conductivity data reported by Law Engineering in 1994, average hydraulic gradients calculated using the April 1999 water level data, and an average effective porosity value for sand and silt mixtures of 30 to 35 percent. Using these data, the calculated groundwater flow rate in saprolite ranged from approximately 325 to 375 feet/year (ft/yr) in the upper portion of the site and 215 to 250 ft/yr in the lower portion of the site. The groundwater flow rate calculations are summarized in Appendix C.

2.4 Statistical Analyses

The statistical testing procedure Analysis of Variance (ANOVA) was performed on all seven sampling locations. In accordance with the February 19, 1999 directions from Mr. Mark Poindexter of DENR, an analysis was conducted for each parameter detected during this sampling event. The statistical analysis utilized the ANOVA option in the EXCEL 5.0 analysis tool-pack. The historic database used in this evaluation was based was prepared by G.N. Richardson & Associates (G.N. Richarson) using data collected prior to January 19, 1999. Data collected in 1999 (January and April) were added prior to the analyses summarized in this report. The database contains all analytical results known to The Fletcher Group.

The ideal set of wells, under the same groundwater quality conditions, would yield identical laboratory results. The ANOVA procedure takes into account the dissimilarity of one monitoring well from another, and the expectation that analytical results for each well will vary slightly due to the dissimilarities.

Two hypotheses are set:

- H_0: the variance among the group of monitoring wells is the same as the variance within each individual well. This is reported as no significant deviation.

- H_1: that a significant difference in the variance exists among the group of wells and each individual well. This is reported as significant deviation.

Based on the results of computations, the H_0 hypothesis is either accepted or rejected. If the critical value of the variance (F_{crit}) is greater than expected, the H_0 hypothesis is accepted and the conclusion is that contamination is unlikely. Similarly, if F_{crit} is smaller than the expected value of the variance, then the H_0 hypothesis is rejected. H_1 is then accepted and the conclusion is that contamination is possible. All available laboratory analyses performed to date were taken into account. Non-detected observations were entered as one-half the Report Limit. A summary of the ANOVA statistical calculations is included in Table D.

3.0 CONCLUSIONS

The semiannual groundwater monitoring was conducted on April 22, 1999 at the Jackson County Landfill. The data summarized in Appendix D shows significant deviation for two metals and eleven VOCs.

Metals

Barium and cobalt showed significant deviation. However, review of the data from individual sampling locations (monitoring wells MW-1 through MW-5 and two surface water points) reveals that the detections of barium did not exceed the 2L standards except in well MW-4. A 2L standard has not been established for cobalt.

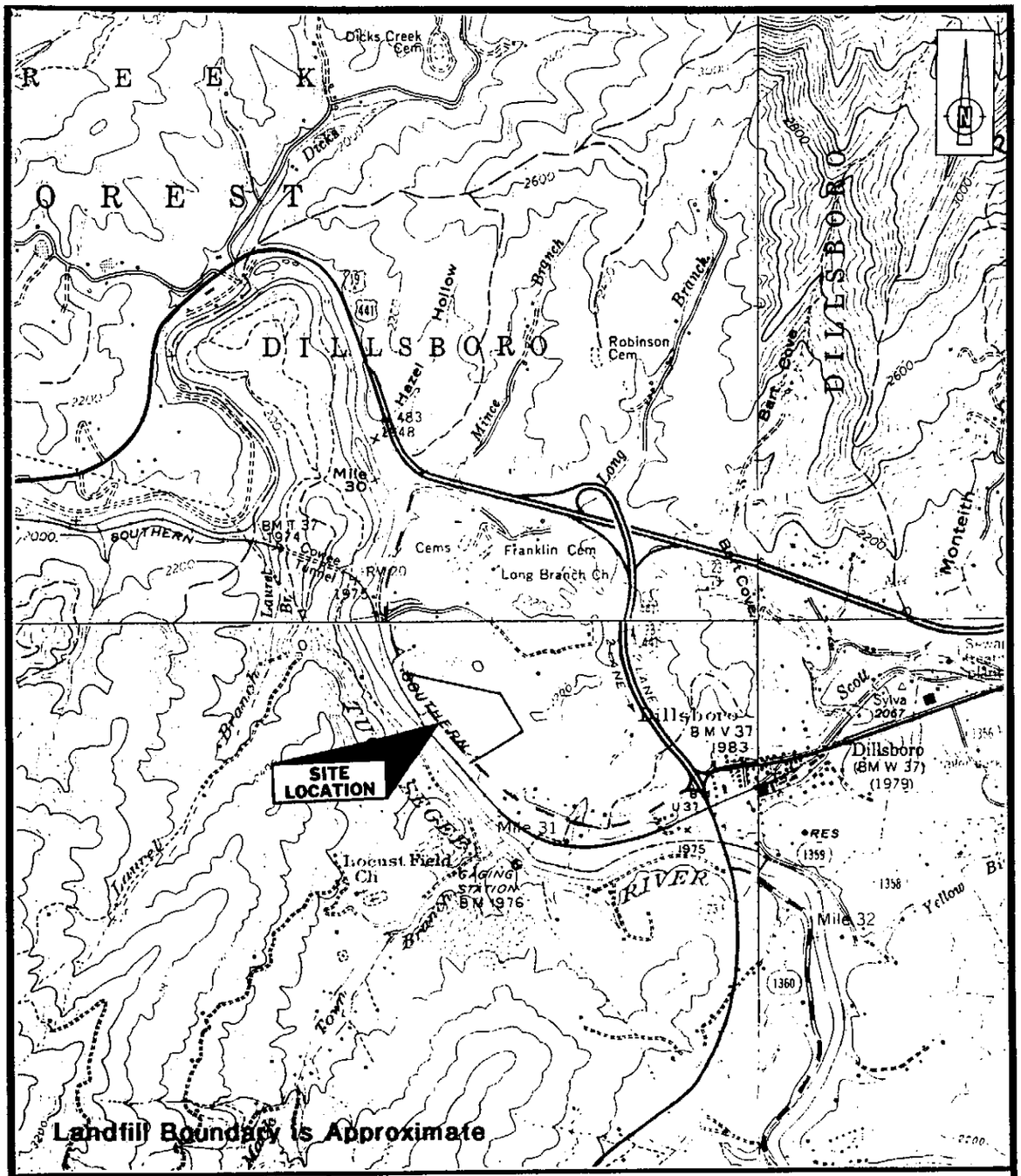
The sample collected from monitoring well MW-5 contained three metals (chromium, lead, and mercury) at concentrations greater than the 2L Standard. However, the statistical analysis did not indicate that these metals exceeded the expected variance. None of the other samples contained metals with exceedances of the 2L standards.

Organic Compounds

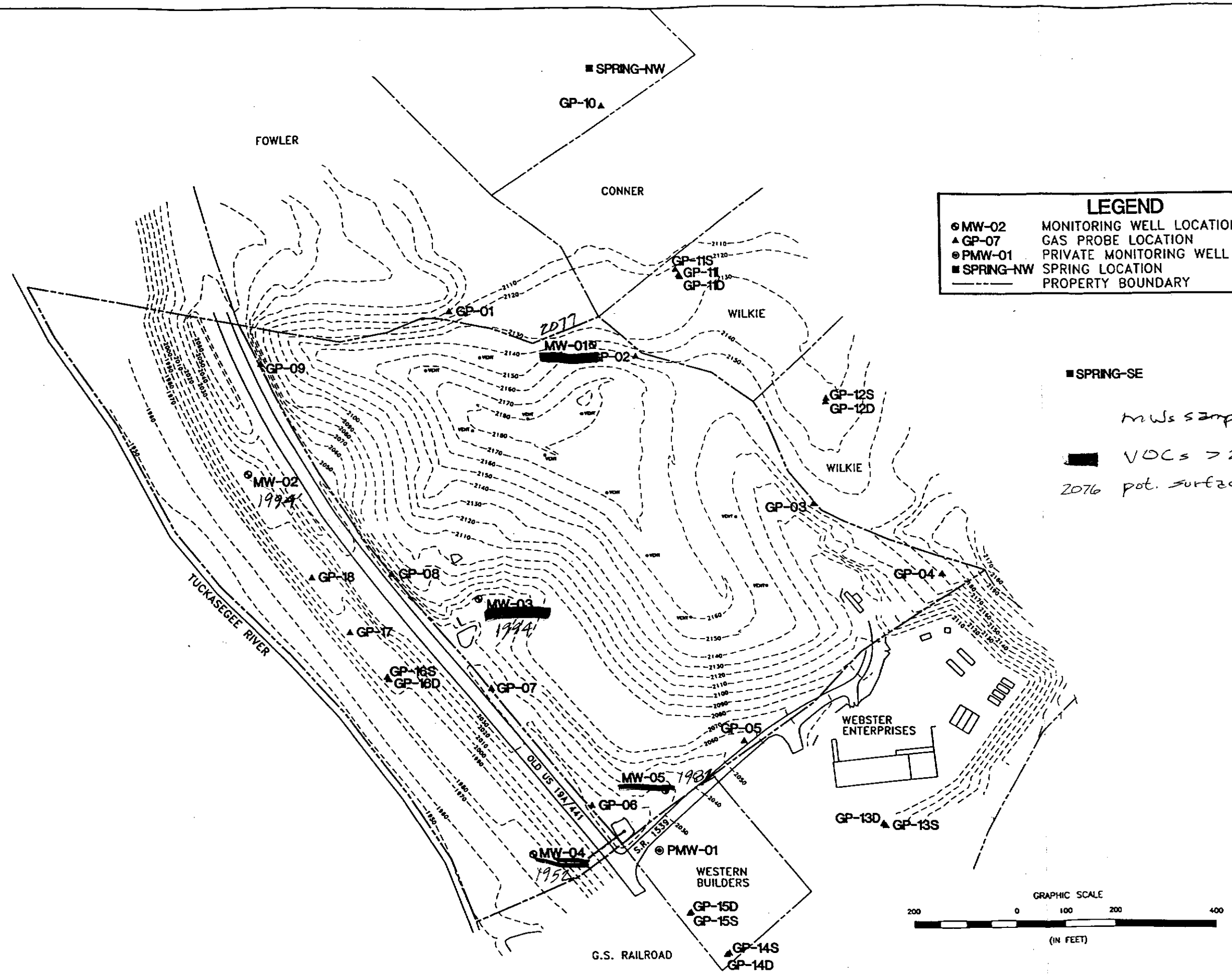
Each of the eleven VOCs showing significant deviation during this sampling event were also detected during the January 1999 round of sampling. A comparison of results from the January 1999 and April 1999 sampling events indicates that the same compounds appear with significant deviations.

Two VOCs, methylene chloride and vinyl chloride, were detected at concentrations exceeding 2L standards in one or more wells. However, the statistical analyses did not show significant deviation. As shown in Appendix D, all other VOCs detected in excess of 2L standards showed significant deviation.

FIGURES



Approximate Scale: **1 in. = 2,000 ft.** **February 10, 1999** THE FLETCHER GROUP, INC. ASHEVILLE, NORTH CAROLINA	**FIGURE 1** **Site Location Map** **Jackson County Landfill** **Dillsboro, North Carolina**



LEGEND

MW-02	MONITORING WELL LOCATION
GP-07	GAS PROBE LOCATION
PMW-01	PRIVATE MONITORING WELL LOCATION
SPRING-NW	SPRING LOCATION
------	PROPERTY BOUNDARY

SPRING-SE

MWs sampled

VOCs > 2L

2076 pot. surface

NOTES:

1. TOPOGRAPHY IS FOR REPRESENTATIVE PURPOSES ONLY AND NOT FOR CONSTRUCTION. THIS TOPOGRAPHY WAS OBTAINED FROM McGILL ASSOCIATES AND IS BASED ON A COMPILATION OF AN AERIAL SURVEY AND SEVERAL LAND SURVEYS.

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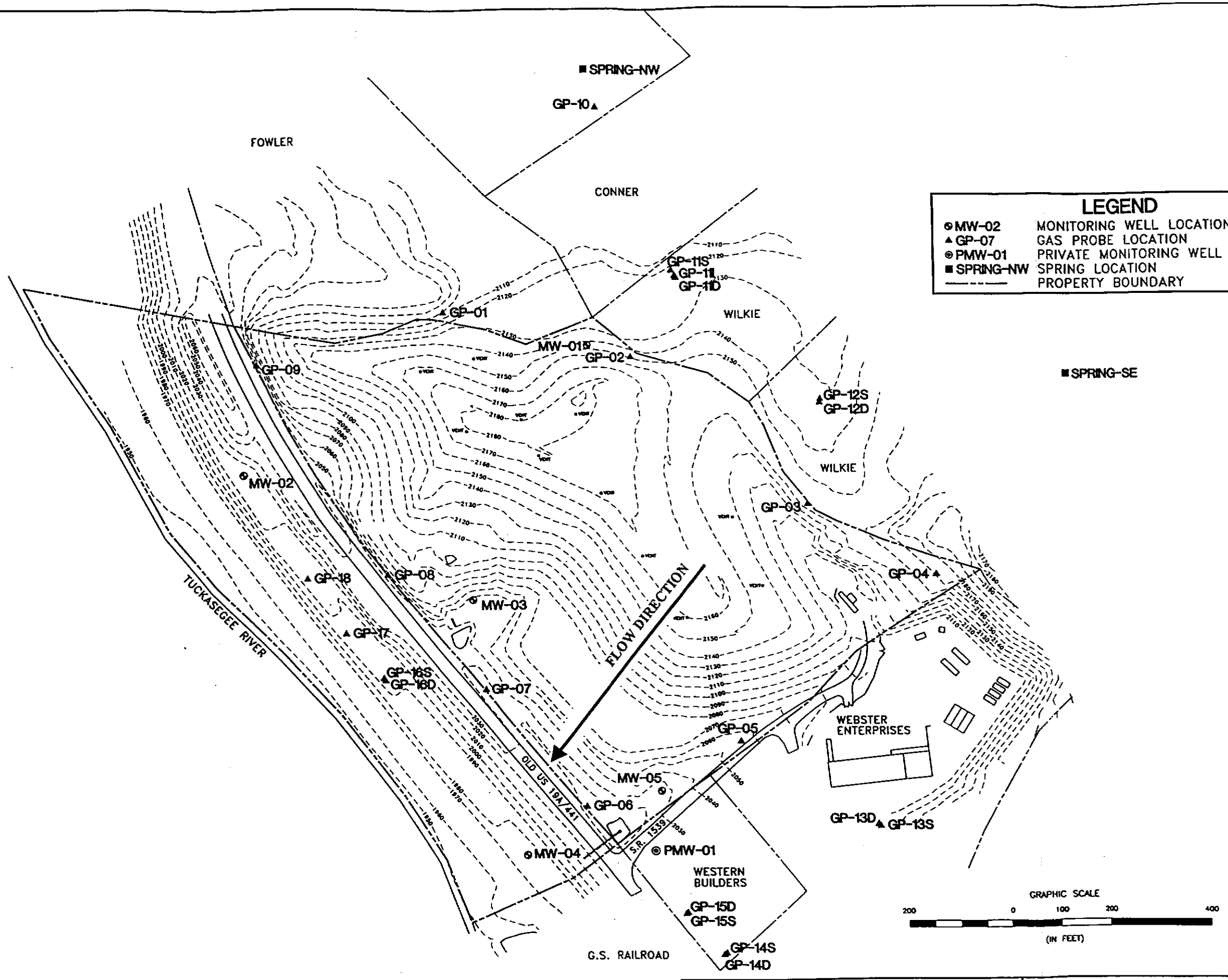
ASHEVILLE, NORTH CAROLINA

FIGURE 2
MONITORING WELL AND GAS PROBE LOCATION MAP
JACKSON COUNTY LANDFILL
JACKSON COUNTY, NORTH CAROLINA

DRAWN BY: YOUNG PROJ MAN: SB DATE: 05-18-00 CADD FILENAME: P:\OASHVE\JACKSON CO.040\GWASSREP.03\20400LF1.DWG



NOTES:

1. TOPOGRAPHY IS FOR REPRESENTATIVE PURPOSES ONLY AND NOT FOR CONSTRUCTION. THIS TOPOGRAPHY WAS OBTAINED FROM McGILL ASSOCIATES AND IS BASED ON A COMPILATION OF AN AERIAL SURVEY AND SEVERAL LAND SURVEYS.

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ASHEVILLE, NORTH CAROLINA

FIGURE 3
GROUNDWATER FLOW DIRECTION - APRIL 22, 1999
JACKSON COUNTY LANDFILL
JACKSON COUNTY, NORTH CAROLINA

DRAWN BY: JOHNC. PROJ MAN: SR DATE: 05-18-99 CADD FILENAME: P:\0ASHVL\JACKSON CO.040\GWASSREP.03\20400LF1.DWG

TABLES

TABLE 1

FIELD INDICATOR PARAMETERS
JACKSON COUNTY LANDFILL

April 22, 1999

JACKSON COUNTY, NORTH CAROLINA

Well ID	Date	Time Sample Collected	Water Level Depth (feet)	pH	Temperature (°C)	Specific Conductivity (umhos/cm)
MW-1	4/22/99	13:00	94.49	4.36	12.5	69.9
MW-2	4/22/99	17:20	21.19	4.80	13.1	68.4
MW-3	4/22/99	16:30	51.64	4.50	14.6	88.5
MW-4	4/22/99	16:00	28.63	4.46	14.9	90.5
MW-5	4/22/99	14:20	48.25	5.35	15.0	84.3

TABLE 2

APPENDIX I METALS ANALYTICAL RESULTS
JACKSON COUNTY LANDFILL

April 22, 1999

JACKSON COUNTY, NORTH CAROLINA

Compound	Units	MW-1	MW-2	MW-3	MW-4	MW-5	SW-1	SW-2	NC 2L Standard
Antimony	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	NL
Arsenic	mg/L	<0.005	<0.005	<0.005	<0.005	0.0065	<0.005	<0.005	0.05
Barium	mg/L	0.078	0.03	0.01	**8.3**	0.75	0.016	0.013	2.0
Beryllium	mg/L	<0.001	<0.001	<0.001	<0.001	0.0033	<0.001	<0.001	NL
Cadmium	mg/L	0.0012	<0.001	<0.001	0.003	0.0048	<0.001	<0.001	0.005
Chromium	mg/L	<0.002	<0.002	<0.002	0.023	**0.07**	<0.002	<0.002	0.05
Cobalt	mg/L	0.064	<0.005	0.011	0.013	0.046	<0.005	<0.005	NL
Copper	mg/L	0.0052	0.0025	0.0034	0.027	0.140	0.0031	0.0037	1.0
Lead	mg/L	<0.005	<0.005	<0.005	0.0083	**0.032**	<0.005	<0.005	0.015
Mercury	mg/L	<0.0002	<0.0002	<0.0002	0.00025	**0.0053**	<0.0002	<0.0002	0.0011
Nickel	mg/L	0.0052	<0.005	<0.005	0.025	0.068	<0.005	<0.005	0.1
Selenium	mg/L	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.05
Silver	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.018
Thallium	mg/L	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	NL
Vanadium	mg/L	<0.005	<0.005	<0.005	0.028	0.11	<0.005	<0.005	NL
Zinc	mg/L	<0.01	<0.01	<0.01	0.11	0.26	<0.01	0.015	2.1

Note: < indicates compound not detected at or above the concentration shown (PACE detection limit)
Bold indicates exceedance of 2L Standard
NL = means no NC 2L standard established

TABLE 3

VOLATILE ORGANICS ANALYTICAL RESULTS
JACKSON COUNTY LANDFILL

April 22, 1999

JACKSON COUNTY, NORTH CAROLINA

Compound	Units	MW-1	MW-2	MW-3	MW-4	MW-5	SW-1	SW-2	NC 2L Standard
Acetone	µg/L	<10	<10	<10	<10	<10	<10	<10	700
Acrylonitrile	µg/L	<10	<10	<10	<10	<10	<10	<10	NL
Benzene	µg/L	**7.9**	<1	**4.8**	**2.8**	**3.4**	<1	<1	1
Bromochloromethane	µg/L	<1	<1	<1	<1	<1	<1	<1	NL
Bromoform	µg/L	<1	<1	<1	<1	<1	<1	<1	0.19
Bromomethane	µg/L	<1	<1	<1	<1	<1	<1	<1	NL
2-Butanone	µg/L	<5	<5	<5	<5	<5	<5	<5	170
Carbon disulfide	µg/L	<1	<1	<1	<1	<1	<1	<1	NL
Carbon tetrachloride	µg/L	<1	<1	<1	<1	<1	<1	<1	0.3
Chlorobenzene	µg/L	<1	<1	5.4	5.1	5.2	<1	<1	50
Chloroethane	µg/L	14	1.5	2.4	2.5	1.8	<1	<1	NL
Chloroform	µg/L	<1	<1	<1	<1	<1	<1	<1	0.19
Chloromethane	µg/L	1.1	<1	<1	2.5	<1	<1	<1	NL
1,2-Dibromo-3-chloropropane	µg/L	<1	<1	<1	<1	<1	<1	<1	0.025
Dibromochloromethane	µg/L	<1	<1	<1	<1	<1	<1	<1	NL
Dibromomethane	µg/L	<1	<1	<1	<1	<1	<1	<1	NL
1,2-Dibromoethane	µg/L	<1	<1	<1	<1	<1	<1	<1	NL
trans-1,4-Dichloro-2-butene	µg/L	<1	<1	<1	<1	<1	<1	<1	NL
1,2-Dichlorobenzene	µg/L	<1	<1	<1	<1	<1	<1	<1	NL
1,4-Dichlorbenzene	µg/L	3.5	<1	4.8	7.9	14	<1	<1	NL
1,1-Dichloroethane	µg/L	31	3.7	7.0	4.0	3.0	<1	<1	700
1,2-Dichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1	0.38
1,1-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1	7
cis-1,2-Dichloroethene	µg/L	7.5	<1	5.5	24	36	<1	<1	70

GWPS
0.6
700
2800
2.6
0.56
.0004
620
75

Notes: < indicates compound not detected at or above the concentration shown (PACE detection limit)
Bold indicates exceedance of 2L Standard
µg/L = micrograms per liter
NL = indicates the compound was not listed on the NC 2L Standards list

TABLE 3

VOLATILE ORGANICS ANALYTICAL RESULTS
JACKSON COUNTY LANDFILL

April 22, 1999

JACKSON COUNTY, NORTH CAROLINA

Compound	Units	MW-1	MW-2	MW-3	MW-4	MW-5	SW-1	SW-2	NC 2L Standard	
trans-1,2-Dichloroethene	µg/L	<1	<1	<1	<1	<1	<1	<1	70	
1,2-Dichloropropane	µg/L	<1	<1	<1	<1	<1	<1	<1	0.56	
cis-1,3-Dichloropropene	µg/L	<1	<1	<1	<1	<1	<1	<1	NL	0.2
Ethylbenzene	µg/L	<1	<1	<1	<1	<1	<1	<1	29	
2-Hexanone	µg/L	<5	<5	<5	<5	<5	<5	<5	NL	280
Iodomethane	µg/L	<1	<1	<1	<1	<1	<1	<1	NL	
4-Methyl-2-pentanone	µg/L	<5	<5	<5	<5	<5	<5	<5	NL	560
Methylene chloride	µg/L	**62**	<1	<1	1.3	<1	<1	<1	5	
Styrene	µg/L	<1	<1	<1	<1	<1	<1	<1	100	
1,1,1,2-Tetrachloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1	NL	1.3
1,1,2,2-Tetrachloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1	NL	0.17
Tetrachloroethene	µg/L	**3.7**	<1	**1.0**	**3.9**	<1	<1	<1	0.7	
Toluene	µg/L	2.4	<1	<1	<1	<1	<1	<1	1000	
1,1,1-Trichloroethane	µg/L	3.4	<1	<1	<1	<1	<1	<1	200	
1,1,2-Trichloroethane	µg/L	<1	<1	<1	<1	<1	<1	<1	NL	0.6
Trichloroethene	µg/L	**4.3**	1.1	1.3	**3.5**	<1	<1	<1	2.8	
1,2,3-Trichloropropane	µg/L	<1	<1	<1	<1	<1	<1	<1	NL	0.005
Vinyl acetate	µg/L	<2	<2	<2	<2	<2	<2	<2	NL	88
Vinyl chloride	µg/L	**2.1**	<1	**1.2**	**2.0**	**2.2**	<1	<1	0.015	
m&p-Xylene	µg/L	4.1	<2	<2	<2	<2	<2	<2	530	
o-Xylene	µg/L	10.0	<1	<1	<1	<1	<1	<1	530	
Bromodichloromethane	µg/L	<1	<1	<1	<1	<1	<1	<1	NL	0.56
Trichlorofluoromethane	µg/L	<1	<1	<1	<1	<1	<1	<1	2100	

Notes: < indicates compound not detected at or above the concentration shown (PACE detection limit)
Bold indicates exceedance of 2L Standard
µg/L = micrograms per liter
NL = indicates the compound was not listed on the NC 2L Standards list

TABLE 4

MONITORING WELL AND WATER TABLE ELEVATIONS
JACKSON COUNTY LANDFILL

April 22, 1999

JACKSON COUNTY, NORTH CAROLINA

Well ID	Units	Ground Surface Elevation	TOC Elevation	Depth to Water	Water Elevation	Depth to Bedrock	Bedrock Elevation	Screened Interval	Screened Elevation
MW-1	Feet	2169.40	2171.42	94.49	2076.93	83.00	2086.40	95 to 110	2074.40 to 2059.40
MW-2	Feet	2013.15	2015.38	21.19	1994.19	13.00	2000.15	45 to 60	1968.15 to 1953.15
MW-3	Feet	2044.16	2045.53	51.64	1993.89	57.00	1987.16	48.5 to 63.5	1995.66 to 1980.66
MW-4	Feet	1976.68	1980.77	28.63	1952.14	Unknown	Unknown	25 to 40	1951.68 to 1936.68
MW-5	Feet	2027.38	2028.97	48.25	1980.72	Unknown	Unknown	50 to 60	1977.38 to 1967.38

Notes: Elevations based on a survey completed on April 9, 1999 by Davenport & Assoc., Inc

TOC = Top of Casing

Depth to Bedrock and Screened Interval taken from boring logs completed on April 21, 22, & 23, 1992 by S&ME

Water Elevation based on TOC Elevation minus Depth to Water (measured from TOC)

Bedrock Elevation based on Ground Surface Elevation minus Depth to Bedrock (measured from ground surface)

Screened Elevation based on Ground Surface Elevation minus Screened Interval (measured from ground surface)

APPENDICES

APPENDIX A

FIELD DATA SAMPLING LOGS

THE FLETCHER GROUP
322 SOUTH MAIN STREET
GREENVILLE, SOUTH CAROLINA 29601
(864) 421-9999 FAX (864) 421-9909

WELL SAMPLING LOG

FACILITY NAME: Jackson Co. Landfill 2040.04 DATE: 4-22-99
LOCATION: Dillsboro, NC - MW-1 SAMPLING TIME: 13:00
SAMPLING PERSONNEL: JMC WEATHER: Pt. Cloudy - 75°F

WELL NUMBER: MW-1
WELL DIAMETER: 2"
TYPE OF CASING: PVC
MEASURING POINT: TOC
COMMENTS:

WELL DEPTH: (WD) 115.10' DATE: 4-22-99 @ 11:15
WATER LEVEL: (WL) 94.49' DATE: 4-22-99 @ 11:46
LENGTH OF WATER COLUMN: (WD)-(WL) = (LWC) 20.61' FEET
1 CASING VOLUME (LWC) x (WCV) 3.5 GALLONS
3 CASING VOLUMES: 10.5 GALLONS
ACTUAL VOL. PURGED: 10.5 GALLONS

WELL CASING VOLUMES (WCV)

(2" = 0.17 Gal/Ft) 3" = 0.38 Gal/Ft 4" = 0.66 Gal/Ft 6" = 1.5 Gal/Ft 8" = 2.6 Gal/Ft 12" = 5.8 Gal/Ft

PURGE METHOD: BAILER-TEFLON (BAILER-DISP.) DEDICATED PUMP HOMELITE GRUNDFOS OTHER:
SAMPLE METHOD: BAILER-TEFLON (BAILER-DISP.) DEDICATED PUMP HOMELITE GRUNDFOS OTHER:

READING	GALLONS PURGED	pH UNITS	SPECIFIC CONDUCTANCE umhos/cm	TEMPERATURE C°	COLOR	TURBIDITY	COMMENTS
1	3.0	4.76	71.6	13.1	clear	none	
2	6.0	4.39	69.9	12.5	clear	none	
3	10.0	4.76	69.9	12.5	Clear	none	
4							
5							
6							
7							
8							
9							
10							

CONSTITUENTS SAMPLED	125 ml PLASTIC	250 ml PLASTIC	500 ml PLASTIC	40 ml GLASS	250 ml GLASS	500 ml GLASS	1 L GLASS	CONSTITUENTS SAMPLED	125 ml PLASTIC	250 ml PLASTIC	500 ml PLASTIC	40 ml GLASS	250 ml GLASS	500 ml GLASS	1 L GLASS
Metals			1												
VOCs w/ Vinyl Chloride + Methylene Chloride				4											

PROTECTIVE CASING: _____ PAD: _____ LOCK: _____ VEGETATION: _____ COMMENTS: _____

THE FLETCHER GROUP
322 SOUTH MAIN STREET
GREENVILLE, SOUTH CAROLINA 29601
(864) 421-9999 FAX (864) 421-9909

WELL SAMPLING LOG

FACILITY NAME: Jackson Co. Landfill DATE: 4-22-99
LOCATION: Dillsboro, NC MW-2 SAMPLING TIME: 17:20
SAMPLING PERSONNEL: JMC WEATHER: Pt. Cloudy - 75° F

WELL NUMBER: MW-2
WELL DIAMETER: 2"
TYPE OF CASING: PVC
MEASURING POINT: TOC
COMMENTS:

WELL DEPTH: (WD) 61.90 DATE: 4/22/99 17:00
WATER LEVEL: (WL) 21.19 DATE: 4-22-99 17:00
LENGTH OF WATER COLUMN: (WD)-(WL) = (LWC) 40.71 FEET
1 CASING VOLUME (LWC) x (WCV) 6.9 ~~10.52~~ GALLONS
3 CASING VOLUMES: 20.8 GALLONS
ACTUAL VOL. PURGED: 21.0 GALLONS

WELL CASING VOLUMES (WCV)

2" = 0.17 Gal/Ft 3" = 0.38 Gal/Ft 4" = 0.66 Gal/Ft 6" = 1.5 Gal/Ft 8" = 2.6 Gal/Ft 12" = 5.8 Gal/Ft

PURGE METHOD: BAILER-TEFLON (BAILER-DISP.) DEDICATED PUMP HOMELITE GRUNDFOS OTHER:
SAMPLE METHOD: BAILER-TEFLON ~~BAILER-DISP.~~ DEDICATED PUMP HOMELITE GRUNDFOS OTHER:

READING	GALLONS PURGED	pH UNITS	SPECIFIC CONDUCTANCE umhos/cm	TEMPERATURE C°	COLOR	TURBIDITY	COMMENTS
1	7.5	5.22	72.1	14.3	clear	none	
2	15.0	5.01	70.1	13.6	Clear	none	
3	21.0	4.80	68.4	13.1	Clear	none	
4							
5							
6							
7							
8							
9							
10							

CONSTITUENTS SAMPLED	125 ml PLASTIC	250 ml PLASTIC	500 ml PLASTIC	40 ml GLASS	250 ml GLASS	500 ml GLASS	1 L GLASS
Use tals			1				
VOCs w/Methylene				4			
Chloride and							
Vinyl Chloride							

CONSTITUENTS SAMPLED	125 ml PLASTIC	250 ml PLASTIC	500 ml PLASTIC	40 ml GLASS	250 ml GLASS	500 ml GLASS	1 L GLASS

PROTECTIVE CASING: _____ PAD: _____ LOCK: _____ VEGETATION: _____ COMMENTS: _____

THE FLETCHER GROUP
322 SOUTH MAIN STREET
GREENVILLE, SOUTH CAROLINA 29601
(864) 421-9999 FAX (864) 421-9909

WELL SAMPLING LOG

FACILITY NAME: Jackson Co. Landfill DATE: 4-22-99
LOCATION: Dillsboro NC MW-3 SAMPLING TIME: 16:30
SAMPLING PERSONNEL: JMC WEATHER: Pt. Cloudy 75° F

WELL NUMBER: MW-3
WELL DIAMETER: 2"
TYPE OF CASING: PVC
MEASURING POINT: TOC
COMMENTS:

WELL DEPTH: (wd) 62.50 DATE: 4-22-99@16:20
WATER LEVEL: (wl) 51.64 DATE: 4-22-99@16:20
LENGTH OF WATER COLUMN: (wd)-(wl) = (lwc) 10.86 FEET
1 CASING VOLUME (lwc) x (wcv) 1.8 GALLONS
3 CASING VOLUMES: 5.5 GALLONS
ACTUAL VOL. PURGED: 5.5 GALLONS

WELL CASING VOLUMES (WCV)

2" = 0.17 Gal/Ft 3" = 0.38 Gal/Ft 4" = 0.66 Gal/Ft 6" = 1.5 Gal/Ft 8" = 2.6 Gal/Ft 12" = 5.8 Gal/Ft

PURGE METHOD: BAILER-TEFLON BAILER-DISP. DEDICATED PUMP HOMELITE GRUNDFOS OTHER:
SAMPLE METHOD: BAILER-TEFLON BAILER-DISP DEDICATED PUMP HOMELITE GRUNDFOS OTHER:

READING	GALLONS PURGED	pH UNITS	SPECIFIC CONDUCTANCE umhos/cm	TEMPERATURE C°	COLOR	TURBIDITY	COMMENTS
1	1.5	4.64	90.4	15.2	Clear	None	
2	3.0	4.51	92.0	14.7	Clear	None	
3	5.5	4.50	88.5	14.6	"	"	
4							
5							
6							
7							
8							
9							
10							

CONSTITUENTS SAMPLED	125 ml PLASTIC	250 ml PLASTIC	500 ml PLASTIC	40 ml GLASS	250 ml GLASS	500 ml GLASS	1 L GLASS	CONSTITUENTS SAMPLED	125 ml PLASTIC	250 ml PLASTIC	500 ml PLASTIC	40 ml GLASS	250 ml GLASS	500 ml GLASS	1 L GLASS
Metals			1												
VOCs w/ Vinyl Chloride and methylene Chloride				4											

PROTECTIVE CASING: PAD: LOCK: VEGETATION: COMMENTS:

THE FLETCHER GROUP
322 SOUTH MAIN STREET
GREENVILLE, SOUTH CAROLINA 29601
(864) 421-9999 FAX (864) 421-9909

WELL SAMPLING LOG

FACILITY NAME: Jackson Co. Landfill 2040.04 DATE: 4-22-99
LOCATION: Dillsboro, NC MW-4 SAMPLING TIME: 16:00
SAMPLING PERSONNEL: JWC WEATHER: Pt. Cloudy - 75°F

WELL NUMBER: MW-4
WELL DIAMETER: 2"
TYPE OF CASING: PVC
MEASURING POINT: TOC
COMMENTS:

WELL DEPTH: (wd) 42.60 DATE: 4-22-99 @ 14:45
WATER LEVEL: (wl) 28.63' DATE: 4-22-99 @ 14:45
LENGTH OF WATER COLUMN: (wd)-(wl) = (lwc) 13.97 FEET
1 CASING VOLUME (lwc) x (wcv) 2.3 GALLONS
3 CASING VOLUMES: 7.1 GALLONS
ACTUAL VOL. PURGED: 7.5 GALLONS

WELL CASING VOLUMES (WCV)

2" = 0.17 Gal/Ft 3" = 0.38 Gal/Ft 4" = 0.66 Gal/Ft 6" = 1.5 Gal/Ft 8" = 2.6 Gal/Ft 12" = 5.8 Gal/Ft

PURGE METHOD: BAILER-TEFLON (BAILER-DISP.) DEDICATED PUMP HOMELITE GRUNDFOS OTHER:
SAMPLE METHOD: BAILER-TEFLON (BAILER-DISP.) DEDICATED PUMP HOMELITE GRUNDFOS OTHER:

READING	GALLONS PURGED	pH UNITS	SPECIFIC CONDUCTANCE umhos/cm	TEMPERATURE C°	COLOR	TURBIDITY	COMMENTS
1	2.5	4.57	94.2	16.1	clear	Slight	
2	5.0	4.47	91.7	15.0	clear	Slight	
3	7.5	4.46	90.5	14.7	clear	Slight	
4							
5							
6							
7							
8							
9							
10							

CONSTITUENTS SAMPLED	125 ml PLASTIC	250 ml PLASTIC	500 ml PLASTIC	40 ml GLASS	250 ml GLASS	500 ml GLASS	1 L GLASS	CONSTITUENTS SAMPLED	125 ml PLASTIC	250 ml PLASTIC	500 ml PLASTIC	40 ml GLASS	250 ml GLASS	500 ml GLASS	1 L GLASS
Metals			1												
VOCs w/ Vinyl Chloride & Methylene Chloride				4											

PROTECTIVE CASING: PAD: LOCK: VEGETATION: COMMENTS:

THE FLETCHER GROUP 322 SOUTH MAIN STREET GREENVILLE, SOUTH CAROLINA 29601 (864) 421-9999 FAX (864) 421-9909

WELL SAMPLING LOG

FACILITY NAME: Jackson Co. Landfill 2040.04 DATE: 4-22-99

LOCATION: Dillsboro, NC - MW-5 SAMPLING TIME: 14:20

SAMPLING PERSONNEL: JMC WEATHER: Pt. Cloudy - 75°F

WELL NUMBER: MW-5 WELL DEPTH: (WD) 79.90' DATE: 4-22-99 @ 13:30

WELL DIAMETER: 2" WATER LEVEL: (WL) 48.25 DATE: 4-22-99 @ 13:30

TYPE OF CASING: PVC LENGTH OF WATER COLUMN: (WD)-(WL) = (LWC) 31.65 FEET

MEASURING POINT: TOC 1 CASING VOLUME (LWC) x (WCV) 5.3 GALLONS

COMMENTS: 3 CASING VOLUMES: 16.1 GALLONS

ACTUAL VOL. PURGED: 16.1 GALLONS

WELL CASING VOLUMES (WCV)

2" = 0.17 Gal/Ft 3" = 0.38 Gal/Ft 4" = 0.66 Gal/Ft 6" = 1.5 Gal/Ft 8" = 2.6 Gal/Ft 12" = 5.8 Gal/Ft

PURGE METHOD: BAILER-TEFLON BAILER-DISP. DEDICATED PUMP HOMELITE GRUNDFOS OTHER:

SAMPLE METHOD: BAILER-TEFLON BAILER-DISP. DEDICATED PUMP HOMELITE GRUNDFOS OTHER:

READING	GALLONS PURGED	pH UNITS	SPECIFIC CONDUCTANCE umhos/cm	TEMPERATURE C°	COLOR	TURBIDITY	COMMENTS
1	5.0	5.33	78.5	15.7	Brown	Turbid	
2	10.0	5.28	80.1	15.2	"	"	
3	16.0	5.35	84.3	15.0	"	"	
4							
5							
6							
7							
8							
9							
10							

CONSTITUENTS SAMPLED	125 ml PLASTIC	250 ml PLASTIC	500 ml PLASTIC	40 ml GLASS	250 ml GLASS	500 ml GLASS	1 L GLASS				CONSTITUENTS SAMPLED	125 ml PLASTIC	250 ml PLASTIC	500 ml PLASTIC	40 ml GLASS	250 ml GLASS	500 ml GLASS	1 L GLASS			
Metals			1																		
Vocs w/ Vinyl Chloride				4																	
+ Methylene Chloride																					

PROTECTIVE CASING: _____ PAD: _____ LOCK: _____ VEGETATION: _____ COMMENTS: _____

APPENDIX B

LABORATORY ANALYTICAL REPORTS

Pace Analytical Services, Inc.
9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
Tel: 704-875-9092
Fax: 704-875-9091

Pace Analytical

May 07, 1999

Mr. Jim McElduff
The Fletcher Group
48 Patton Ave.
Suite 303
Asheville, NC 28801

RE: Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Dear Mr. McElduff:

Enclosed are the results of analyses for sample(s) received by the laboratory on April 23, 1999. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Ron Kerr
Project Manager

Enclosures

This report shall not be reproduced, except in full,
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Pace Analytical

DATE: 05/07/99
PAGE: 1

The Fletcher Group
48 Patton Ave.
Suite 303
Asheville, NC 28801

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Attn: Mr. Jim McElduff
Phone: (828)281-3350

Solid results are reported on a dry weight basis

Pace Sample No: 92426204 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: MW-1 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Metals							
Metals by Trace ICP	Method: EPA 6010				Prep Method: EPA 3010		
Antimony	ND	mg/l	0.005	05/04/99	CBJ	7440-36-0	
Arsenic	ND	mg/l	0.005	05/04/99	CBJ	7440-38-2	
Barium	0.078	mg/l	0.005	05/04/99	CBJ	7440-39-3	
Beryllium	ND	mg/l	0.001	05/04/99	CBJ	7440-41-7	
Cadmium	0.0012	mg/l	0.001	05/04/99	CBJ	7440-43-9	
Chromium	ND	mg/l	0.002	05/04/99	CBJ	7440-47-3	
Cobalt	0.064	mg/l	0.005	05/04/99	CBJ	7440-48-4	
Copper	0.0052	mg/l	0.002	05/04/99	CBJ	7440-50-8	
Lead	ND	mg/l	0.005	05/04/99	CBJ	7439-92-1	
Nickel	0.0052	mg/l	0.005	05/04/99	CBJ	7440-02-0	
Selenium	ND	mg/l	0.005	05/04/99	CBJ	7782-49-2	
Silver	ND	mg/l	0.002	05/04/99	CBJ	7440-22-4	
Vanadium	ND	mg/l	0.005	05/04/99	CBJ	7440-62-2	
Zinc	ND	mg/l	0.01	05/04/99	CBJ	7440-66-6	
Date Digested				04/28/99			
Mercury in Water	Method: EPA 7470				Prep Method: EPA 7470		
Mercury	ND	mg/l	0.0002	04/28/99	TYM	7439-97-6	
Thallium, AAS Furnace	Method: EPA 7841				Prep Method: EPA 3020		
Thallium	ND	mg/l	0.002	05/03/99	TYM	7440-28-0	
Date Digested				04/23/99			
GC/MS Volatiles							
GC/MS VOCs by 8260, low level	Method: EPA 8260				Prep Method: EPA 8260		

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Fax: 704-875-9091

Pace Analytical

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Pace Sample No: 92426204 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: MW-1 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Chloromethane	1.1	ug/l	1	05/05/99	JRS	74-87-3	
Vinyl Chloride	2.1	ug/l	1	05/05/99	JRS	75-01-4	
Bromomethane	ND	ug/l	1	05/05/99	JRS	74-83-9	
Chloroethane	14	ug/l	1	05/05/99	JRS	75-00-3	
Trichlorofluoromethane	ND	ug/l	1	05/05/99	JRS	75-69-4	
Acetone	ND	ug/l	10	05/05/99	JRS	67-64-1	
1,1-Dichloroethene	ND	ug/l	1	05/05/99	JRS	75-35-4	
Iodomethane	ND	ug/l	1	05/05/99	JRS	74-88-4	
Acrylonitrile	ND	ug/l	10	05/05/99	JRS	107-13-1	
Methylene Chloride	62	ug/l	5	05/05/99	JRS	75-09-2	
Carbon Disulfide	ND	ug/l	1	05/05/99	JRS	75-15-0	
trans-1,2-Dichloroethene	ND	ug/l	1	05/05/99	JRS	156-60-5	
1,1-Dichloroethane	31	ug/l	1	05/05/99	JRS	75-34-3	
Vinyl Acetate	ND	ug/l	2	05/05/99	JRS	108-05-4	
2-Butanone	ND	ug/l	5	05/05/99	JRS	78-93-3	
cis-1,2-Dichloroethene	7.5	ug/l	1	05/05/99	JRS	156-59-2	
Chloroform	ND	ug/l	1	05/05/99	JRS	67-66-3	
Bromochloromethane	ND	ug/l	1	05/05/99	JRS	74-97-5	
1,1,1-Trichloroethane	3.4	ug/l	1	05/05/99	JRS	71-55-6	
1,2-Dichloroethane	ND	ug/l	1	05/05/99	JRS	107-06-2	
Carbon Tetrachloride	ND	ug/l	1	05/05/99	JRS	56-23-5	
Benzene	7.9	ug/l	1	05/05/99	JRS	71-43-2	
Trichloroethene	4.3	ug/l	1	05/05/99	JRS	79-01-6	
1,2-Dichloropropane	ND	ug/l	1	05/05/99	JRS	78-87-5	
Dibromomethane	ND	ug/l	1	05/05/99	JRS	74-95-3	
Bromodichloromethane	ND	ug/l	1	05/05/99	JRS	75-27-4	
4-Methyl-2-Pentanone	ND	ug/l	5	05/05/99	JRS	108-10-1	
cis-1,3-Dichloropropene	ND	ug/l	1	05/05/99	JRS	10061-01-5	
Toluene	2.4	ug/l	1	05/05/99	JRS	108-88-3	
1,1,2-Trichloroethane	ND	ug/l	1	05/05/99	JRS	79-00-5	
2-Hexanone	ND	ug/l	5	05/05/99	JRS	591-78-6	
Dibromochloromethane	ND	ug/l	1	05/05/99	JRS	124-48-1	
Tetrachloroethene	3.7	ug/l	1	05/05/99	JRS	127-18-4	
1,2-Dibromoethane	ND	ug/l	1	05/05/99	JRS	106-93-4	
Chlorobenzene	ND	ug/l	1	05/05/99	JRS	108-90-7	
1,1,1,2-Tetrachloroethane	ND	ug/l	1	05/05/99	JRS	630-20-6	
Ethylbenzene	ND	ug/l	1	05/05/99	JRS	100-41-4	
m&p-Xylene	4.1	ug/l	2	05/05/99	JRS	7816-60-0	
Styrene	ND	ug/l	1	05/05/99	JRS	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	10	ug/l	1	05/05/99	JRS	95-47-6	

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Pace Analytical

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Pace Sample No: 92426204 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: MW-1 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Bromoform	ND	ug/l	1	05/05/99	JRS	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/l	1	05/05/99	JRS	79-34-5	
1,2,3-Trichloropropane	ND	ug/l	1	05/05/99	JRS	96-18-4	
trans-1,4-Dichloro-2-Butene	ND	ug/l	1	05/05/99	JRS	110-57-6	
1,4-Dichlorobenzene	3.5	ug/l	1	05/05/99	JRS	106-46-7	
1,2-Dichlorobenzene	ND	ug/l	1	05/05/99	JRS	95-50-1	
1,2-Dibromo-3-Chloropropane	ND	ug/l	1	05/05/99	JRS	96-12-8	
Dibromofluoromethane (S)	105	%		05/05/99	JRS	1868-53-7	
1,2-Dichloroethane-d4 (S)	98	%		05/05/99	JRS	17060-07-0	
Toluene-d8 (S)	98	%		05/05/99	JRS	2037-26-5	
4-Bromofluorobenzene (S)	103	%		05/05/99	JRS	460-00-4	

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Pace Analytical

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Pace Sample No: 92426212 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: MW-5 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Metals							
Metals by Trace ICP	Method: EPA 6010				Prep Method: EPA 3010		
Antimony	ND	mg/l	0.005	05/04/99	CBJ	7440-36-0	
Arsenic	0.0065	mg/l	0.005	05/04/99	CBJ	7440-38-2	
Barium	0.75	mg/l	0.005	05/04/99	CBJ	7440-39-3	
Beryllium	0.0033	mg/l	0.001	05/04/99	CBJ	7440-41-7	
Cadmium	0.0048	mg/l	0.001	05/04/99	CBJ	7440-43-9	
Chromium	0.07	mg/l	0.002	05/04/99	CBJ	7440-47-3	
Cobalt	0.046	mg/l	0.005	05/04/99	CBJ	7440-48-4	
Copper	0.14	mg/l	0.002	05/04/99	CBJ	7440-50-8	
Lead	0.032	mg/l	0.005	05/04/99	CBJ	7439-92-1	
Nickel	0.068	mg/l	0.005	05/04/99	CBJ	7440-02-0	
Selenium	ND	mg/l	0.005	05/04/99	CBJ	7782-49-2	
Silver	ND	mg/l	0.002	05/04/99	CBJ	7440-22-4	
Vanadium	0.11	mg/l	0.005	05/04/99	CBJ	7440-62-2	
Zinc	0.26	mg/l	0.01	05/04/99	CBJ	7440-66-6	
Date Digested				04/28/99			
Mercury in Water	Method: EPA 7470				Prep Method: EPA 7470		
Mercury	0.0053	mg/l	0.0002	04/28/99	TYM	7439-97-6	
Thallium, AAS Furnace	Method: EPA 7841				Prep Method: EPA 3020		
Thallium	ND	mg/l	0.002	05/04/99	TYM	7440-28-0	
Date Digested				04/29/99			
GC/MS Volatiles							
GC/MS VOCs by 8260, low level	Method: EPA 8260				Prep Method: EPA 8260		
Chloromethane	ND	ug/l	1	05/05/99	JRS	74-87-3	
Vinyl Chloride	2.2	ug/l	1	05/05/99	JRS	75-01-4	
Bromomethane	ND	ug/l	1	05/05/99	JRS	74-83-9	
Chloroethane	1.8	ug/l	1	05/05/99	JRS	75-00-3	
Trichlorofluoromethane	ND	ug/l	1	05/05/99	JRS	75-69-4	
Acetone	ND	ug/l	10	05/05/99	JRS	67-64-1	
1,1-Dichloroethene	ND	ug/l	1	05/05/99	JRS	75-35-4	
Iodomethane	ND	ug/l	1	05/05/99	JRS	74-88-4	
Acrylonitrile	ND	ug/l	10	05/05/99	JRS	107-13-1	
Methylene Chloride	ND	ug/l	1	05/05/99	JRS	75-09-2	

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Pace Analytical

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Pace Sample No: 92426212 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: MW-5 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Carbon Disulfide	ND	ug/l	1	05/05/99	JRS	75-15-0	
trans-1,2-Dichloroethene	ND	ug/l	1	05/05/99	JRS	156-60-5	
1,1-Dichloroethane	3.0	ug/l	1	05/05/99	JRS	75-34-3	
Vinyl Acetate	ND	ug/l	2	05/05/99	JRS	108-05-4	
2-Butanone	ND	ug/l	5	05/05/99	JRS	78-93-3	
cis-1,2-Dichloroethene	36	ug/l	2	05/05/99	JRS	156-59-2	
Chloroform	ND	ug/l	1	05/05/99	JRS	67-66-3	
Bromochloromethane	ND	ug/l	1	05/05/99	JRS	74-97-5	
1,1,1-Trichloroethane	ND	ug/l	1	05/05/99	JRS	71-55-6	
1,2-Dichloroethane	ND	ug/l	1	05/05/99	JRS	107-06-2	
Carbon Tetrachloride	ND	ug/l	1	05/05/99	JRS	56-23-5	
Benzene	3.4	ug/l	1	05/05/99	JRS	71-43-2	
Trichloroethene	ND	ug/l	1	05/05/99	JRS	79-01-6	
1,2-Dichloropropane	ND	ug/l	1	05/05/99	JRS	78-87-5	
Dibromomethane	ND	ug/l	1	05/05/99	JRS	74-95-3	
Bromodichloromethane	ND	ug/l	1	05/05/99	JRS	75-27-4	
4-Methyl-2-Pentanone	ND	ug/l	5	05/05/99	JRS	108-10-1	
cis-1,3-Dichloropropene	ND	ug/l	1	05/05/99	JRS	10061-01-5	
Toluene	ND	ug/l	1	05/05/99	JRS	108-88-3	
1,1,2-Trichloroethane	ND	ug/l	1	05/05/99	JRS	79-00-5	
2-Hexanone	ND	ug/l	5	05/05/99	JRS	591-78-6	
Dibromochloromethane	ND	ug/l	1	05/05/99	JRS	124-48-1	
Tetrachloroethene	ND	ug/l	1	05/05/99	JRS	127-18-4	
1,2-Dibromoethane	ND	ug/l	1	05/05/99	JRS	106-93-4	
Chlorobenzene	5.2	ug/l	1	05/05/99	JRS	108-90-7	
1,1,1,2-Tetrachloroethane	ND	ug/l	1	05/05/99	JRS	630-20-6	
Ethylbenzene	ND	ug/l	1	05/05/99	JRS	100-41-4	
m&p-Xylene	ND	ug/l	2	05/05/99	JRS	7816-60-0	
Styrene	ND	ug/l	1	05/05/99	JRS	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	ND	ug/l	1	05/05/99	JRS	95-47-6	
Bromoform	ND	ug/l	1	05/05/99	JRS	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/l	1	05/05/99	JRS	79-34-5	
1,2,3-Trichloropropane	ND	ug/l	1	05/05/99	JRS	96-18-4	
trans-1,4-Dichloro-2-Butene	ND	ug/l	1	05/05/99	JRS	110-57-6	
1,4-Dichlorobenzene	14	ug/l	1	05/05/99	JRS	106-46-7	
1,2-Dichlorobenzene	ND	ug/l	1	05/05/99	JRS	95-50-1	
1,2-Dibromo-3-Chloropropane	ND	ug/l	1	05/05/99	JRS	96-12-8	
Dibromofluoromethane (S)	104	%		05/05/99	JRS	1868-53-7	
1,2-Dichloroethane-d4 (S)	98	%		05/05/99	JRS	17060-07-0	
Toluene-d8 (S)	100	%		05/05/99	JRS	2037-26-5	

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Pace Analytical

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Pace Sample No: 92426212 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: MW-5 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
4-Bromofluorobenzene (S)	101	%		05/05/99	JRS	460-00-4	

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Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Pace Sample No: 92426220 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: MW-4 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Metals							
Metals by Trace ICP	Method: EPA 6010				Prep Method: EPA 3010		
Antimony	ND	mg/l	0.005	05/04/99	CBJ	7440-36-0	
Arsenic	ND	mg/l	0.005	05/04/99	CBJ	7440-38-2	
Barium	8.3	mg/l	0.005	05/04/99	CBJ	7440-39-3	
Beryllium	ND	mg/l	0.001	05/04/99	CBJ	7440-41-7	
Cadmium	0.003	mg/l	0.001	05/04/99	CBJ	7440-43-9	
Chromium	0.023	mg/l	0.002	05/04/99	CBJ	7440-47-3	
Cobalt	0.013	mg/l	0.005	05/04/99	CBJ	7440-48-4	
Copper	0.027	mg/l	0.002	05/04/99	CBJ	7440-50-8	
Lead	0.0083	mg/l	0.005	05/04/99	CBJ	7439-92-1	
Nickel	0.025	mg/l	0.005	05/04/99	CBJ	7440-02-0	
Selenium	ND	mg/l	0.005	05/04/99	CBJ	7782-49-2	
Silver	ND	mg/l	0.002	05/04/99	CBJ	7440-22-4	
Vanadium	0.028	mg/l	0.005	05/04/99	CBJ	7440-62-2	
Zinc	0.11	mg/l	0.01	05/04/99	CBJ	7440-66-6	
Date Digested				04/28/99			
Mercury in Water	Method: EPA 7470				Prep Method: EPA 7470		
Mercury	0.00025	mg/l	0.0002	04/28/99	TYM	7439-97-6	
Thallium, AAS Furnace	Method: EPA 7841				Prep Method: EPA 3020		
Thallium	ND	mg/l	0.002	05/04/99	TYM	7440-28-0	
Date Digested				04/29/99			
GC/MS Volatiles							
GC/MS VOCs by 8260, low level	Method: EPA 8260				Prep Method: EPA 8260		
Chloromethane	ND	ug/l	1	05/05/99	JRS	74-87-3	
Vinyl Chloride	2.0	ug/l	1	05/05/99	JRS	75-01-4	
Bromomethane	ND	ug/l	1	05/05/99	JRS	74-83-9	
Chloroethane	2.5	ug/l	1	05/05/99	JRS	75-00-3	
Trichlorofluoromethane	ND	ug/l	1	05/05/99	JRS	75-69-4	
Acetone	ND	ug/l	10	05/05/99	JRS	67-64-1	
1,1-Dichloroethene	ND	ug/l	1	05/05/99	JRS	75-35-4	
Iodomethane	ND	ug/l	1	05/05/99	JRS	74-88-4	
Acrylonitrile	ND	ug/l	10	05/05/99	JRS	107-13-1	
Methylene Chloride	1.3	ug/l	1	05/05/99	JRS	75-09-2	1

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Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Pace Sample No: 92426220 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: MW-4 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Carbon Disulfide	ND	ug/l	1	05/05/99	JRS	75-15-0	
trans-1,2-Dichloroethene	ND	ug/l	1	05/05/99	JRS	156-60-5	
1,1-Dichloroethane	4.0	ug/l	1	05/05/99	JRS	75-34-3	
Vinyl Acetate	ND	ug/l	2	05/05/99	JRS	108-05-4	
2-Butanone	ND	ug/l	5	05/05/99	JRS	78-93-3	
cis-1,2-Dichloroethene	24	ug/l	1	05/05/99	JRS	156-59-2	
Chloroform	ND	ug/l	1	05/05/99	JRS	67-66-3	
Bromochloromethane	ND	ug/l	1	05/05/99	JRS	74-97-5	
1,1,1-Trichloroethane	ND	ug/l	1	05/05/99	JRS	71-55-6	
1,2-Dichloroethane	ND	ug/l	1	05/05/99	JRS	107-06-2	
Carbon Tetrachloride	ND	ug/l	1	05/05/99	JRS	56-23-5	
Benzene	2.8	ug/l	1	05/05/99	JRS	71-43-2	
Trichloroethene	3.5	ug/l	1	05/05/99	JRS	79-01-6	
1,2-Dichloropropane	ND	ug/l	1	05/05/99	JRS	78-87-5	
Dibromomethane	ND	ug/l	1	05/05/99	JRS	74-95-3	
Bromodichloromethane	ND	ug/l	1	05/05/99	JRS	75-27-4	
4-Methyl-2-Pentanone	ND	ug/l	5	05/05/99	JRS	108-10-1	
cis-1,3-Dichloropropene	ND	ug/l	1	05/05/99	JRS	10061-01-5	
Toluene	ND	ug/l	1	05/05/99	JRS	108-88-3	
1,1,2-Trichloroethane	ND	ug/l	1	05/05/99	JRS	79-00-5	
2-Hexanone	ND	ug/l	5	05/05/99	JRS	591-78-6	
Dibromochloromethane	ND	ug/l	1	05/05/99	JRS	124-48-1	
Tetrachloroethene	3.9	ug/l	1	05/05/99	JRS	127-18-4	
1,2-Dibromoethane	ND	ug/l	1	05/05/99	JRS	106-93-4	
Chlorobenzene	5.1	ug/l	1	05/05/99	JRS	108-90-7	
1,1,1,2-Tetrachloroethane	ND	ug/l	1	05/05/99	JRS	630-20-6	
Ethylbenzene	ND	ug/l	1	05/05/99	JRS	100-41-4	
m&p-Xylene	ND	ug/l	2	05/05/99	JRS	7816-60-0	
Styrene	ND	ug/l	1	05/05/99	JRS	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	ND	ug/l	1	05/05/99	JRS	95-47-6	
Bromoform	ND	ug/l	1	05/05/99	JRS	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/l	1	05/05/99	JRS	79-34-5	
1,2,3-Trichloropropane	ND	ug/l	1	05/05/99	JRS	96-18-4	
trans-1,4-Dichloro-2-Butene	ND	ug/l	1	05/05/99	JRS	110-57-6	
1,4-Dichlorobenzene	7.9	ug/l	1	05/05/99	JRS	106-46-7	
1,2-Dichlorobenzene	ND	ug/l	1	05/05/99	JRS	95-50-1	
1,2-Dibromo-3-Chloropropane	ND	ug/l	1	05/05/99	JRS	96-12-8	
Dibromofluoromethane (S)	104	%		05/05/99	JRS	1868-53-7	
1,2-Dichloroethane-d4 (S)	98	%		05/05/99	JRS	17060-07-0	
Toluene-d8 (S)	103	%		05/05/99	JRS	2037-26-5	

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Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Pace Sample No: 92426220 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: MW-4 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
4-Bromofluorobenzene (S)	104	%		05/05/99	JRS	460-00-4	

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Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Pace Sample No: 92426238 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: MW-3 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Metals							
Metals by Trace ICP	Method: EPA 6010				Prep Method: EPA 3010		
Antimony	ND	mg/l	0.005	05/04/99	CBJ	7440-36-0	
Arsenic	ND	mg/l	0.005	05/04/99	CBJ	7440-38-2	
Barium	0.10	mg/l	0.005	05/04/99	CBJ	7440-39-3	
Beryllium	ND	mg/l	0.001	05/04/99	CBJ	7440-41-7	
Cadmium	ND	mg/l	0.001	05/04/99	CBJ	7440-43-9	
Chromium	ND	mg/l	0.002	05/04/99	CBJ	7440-47-3	
Cobalt	0.011	mg/l	0.005	05/04/99	CBJ	7440-48-4	
Copper	0.0034	mg/l	0.002	05/04/99	CBJ	7440-50-8	
Lead	ND	mg/l	0.005	05/04/99	CBJ	7439-92-1	
Nickel	ND	mg/l	0.005	05/04/99	CBJ	7440-02-0	
Selenium	ND	mg/l	0.005	05/04/99	CBJ	7782-49-2	
Silver	ND	mg/l	0.002	05/04/99	CBJ	7440-22-4	
Vanadium	ND	mg/l	0.005	05/04/99	CBJ	7440-62-2	
Zinc	ND	mg/l	0.01	05/04/99	CBJ	7440-66-6	
Date Digested				04/28/99			
Mercury in Water	Method: EPA 7470				Prep Method: EPA 7470		
Mercury	ND	mg/l	0.0002	04/28/99	TYM	7439-97-6	
Thallium, AAS Furnace	Method: EPA 7841				Prep Method: EPA 3020		
Thallium	ND	mg/l	0.002	05/04/99	TYM	7440-28-0	
Date Digested				04/29/99			
GC/MS Volatiles							
GC/MS VOCs by 8260, low level	Method: EPA 8260				Prep Method: EPA 8260		
Chloromethane	ND	ug/l	1	05/05/99	JRS	74-87-3	
Vinyl Chloride	1.2	ug/l	1	05/05/99	JRS	75-01-4	
Bromomethane	ND	ug/l	1	05/05/99	JRS	74-83-9	
Chloroethane	2.4	ug/l	1	05/05/99	JRS	75-00-3	
Trichlorofluoromethane	ND	ug/l	1	05/05/99	JRS	75-69-4	
Acetone	ND	ug/l	10	05/05/99	JRS	67-64-1	
1,1-Dichloroethene	ND	ug/l	1	05/05/99	JRS	75-35-4	
Iodomethane	ND	ug/l	1	05/05/99	JRS	74-88-4	
Acrylonitrile	ND	ug/l	10	05/05/99	JRS	107-13-1	
Methylene Chloride	ND	ug/l	1	05/05/99	JRS	75-09-2	

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Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Pace Sample No: 92426238 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: MW-3 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Carbon Disulfide	ND	ug/l	1	05/05/99	JRS	75-15-0	
trans-1,2-Dichloroethene	ND	ug/l	1	05/05/99	JRS	156-60-5	
1,1-Dichloroethane	7.0	ug/l	1	05/05/99	JRS	75-34-3	
Vinyl Acetate	ND	ug/l	2	05/05/99	JRS	108-05-4	
2-Butanone	ND	ug/l	5	05/05/99	JRS	78-93-3	
cis-1,2-Dichloroethene	5.5	ug/l	1	05/05/99	JRS	156-59-2	
Chloroform	ND	ug/l	1	05/05/99	JRS	67-66-3	
Bromochloromethane	ND	ug/l	1	05/05/99	JRS	74-97-5	
1,1,1-Trichloroethane	ND	ug/l	1	05/05/99	JRS	71-55-6	
1,2-Dichloroethane	ND	ug/l	1	05/05/99	JRS	107-06-2	
Carbon Tetrachloride	ND	ug/l	1	05/05/99	JRS	56-23-5	
Benzene	4.8	ug/l	1	05/05/99	JRS	71-43-2	
Trichloroethene	1.3	ug/l	1	05/05/99	JRS	79-01-6	
1,2-Dichloropropane	ND	ug/l	1	05/05/99	JRS	78-87-5	
Dibromomethane	ND	ug/l	1	05/05/99	JRS	74-95-3	
Bromodichloromethane	ND	ug/l	1	05/05/99	JRS	75-27-4	
4-Methyl-2-Pentanone	ND	ug/l	5	05/05/99	JRS	108-10-1	
cis-1,3-Dichloropropene	ND	ug/l	1	05/05/99	JRS	10061-01-5	
Toluene	ND	ug/l	1	05/05/99	JRS	108-88-3	
1,1,2-Trichloroethane	ND	ug/l	1	05/05/99	JRS	79-00-5	
2-Hexanone	ND	ug/l	5	05/05/99	JRS	591-78-6	
Dibromochloromethane	ND	ug/l	1	05/05/99	JRS	124-48-1	
Tetrachloroethene	1.0	ug/l	1	05/05/99	JRS	127-18-4	
1,2-Dibromoethane	ND	ug/l	1	05/05/99	JRS	106-93-4	
Chlorobenzene	5.4	ug/l	1	05/05/99	JRS	108-90-7	
1,1,1,2-Tetrachloroethane	ND	ug/l	1	05/05/99	JRS	630-20-6	
Ethylbenzene	ND	ug/l	1	05/05/99	JRS	100-41-4	
m&p-Xylene	ND	ug/l	2	05/05/99	JRS	7816-60-0	
Styrene	ND	ug/l	1	05/05/99	JRS	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	ND	ug/l	1	05/05/99	JRS	95-47-6	
Bromoform	ND	ug/l	1	05/05/99	JRS	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/l	1	05/05/99	JRS	79-34-5	
1,2,3-Trichloropropane	ND	ug/l	1	05/05/99	JRS	96-18-4	
trans-1,4-Dichloro-2-Butene	ND	ug/l	1	05/05/99	JRS	110-57-6	
1,4-Dichlorobenzene	4.8	ug/l	1	05/05/99	JRS	106-46-7	
1,2-Dichlorobenzene	ND	ug/l	1	05/05/99	JRS	95-50-1	
1,2-Dibromo-3-Chloropropane	ND	ug/l	1	05/05/99	JRS	96-12-8	
Dibromofluoromethane (S)	102	%		05/05/99	JRS	1868-53-7	
1,2-Dichloroethane-d4 (S)	94	%		05/05/99	JRS	17060-07-0	
Toluene-d8 (S)	101	%		05/05/99	JRS	2037-26-5	

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Client Project ID: Jackson Co./2040.04

Pace Sample No: 92426238 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: MW-3 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
4-Bromofluorobenzene (S)	102	%		05/05/99	JRS	460-00-4	

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Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Pace Sample No: 92426246 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: MW-2 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Metals							
Metals by Trace ICP	Method: EPA 6010				Prep Method: EPA 3010		
Antimony	ND	mg/l	0.005	05/06/99	JML	7440-36-0	
Arsenic	ND	mg/l	0.005	05/06/99	JML	7440-38-2	
Barium	0.03	mg/l	0.005	05/06/99	JML	7440-39-3	
Beryllium	ND	mg/l	0.001	05/06/99	JML	7440-41-7	
Cadmium	ND	mg/l	0.001	05/06/99	JML	7440-43-9	
Chromium	ND	mg/l	0.002	05/06/99	JML	7440-47-3	
Cobalt	ND	mg/l	0.005	05/06/99	JML	7440-48-4	
Copper	0.0025	mg/l	0.002	05/06/99	JML	7440-50-8	
Lead	ND	mg/l	0.005	05/06/99	JML	7439-92-1	
Nickel	ND	mg/l	0.005	05/06/99	JML	7440-02-0	
Selenium	ND	mg/l	0.005	05/06/99	JML	7782-49-2	
Silver	ND	mg/l	0.002	05/06/99	JML	7440-22-4	
Vanadium	ND	mg/l	0.005	05/06/99	JML	7440-62-2	
Zinc	ND	mg/l	0.01	05/06/99	JML	7440-66-6	
Date Digested				04/30/99			
Mercury in Water	Method: EPA 7470				Prep Method: EPA 7470		
Mercury	ND	mg/l	0.0002	04/28/99	TYM	7439-97-6	
Thallium, AAS Furnace	Method: EPA 7841				Prep Method: EPA 3020		
Thallium	ND	mg/l	0.002	05/04/99	TYM	7440-28-0	
Date Digested				04/29/99			
GC/MS Volatiles							
GC/MS VOCs by 8260, low level	Method: EPA 8260				Prep Method: EPA 8260		
Chloromethane	ND	ug/l	1	05/05/99	JRS	74-87-3	
Vinyl Chloride	ND	ug/l	1	05/05/99	JRS	75-01-4	
Bromomethane	ND	ug/l	1	05/05/99	JRS	74-83-9	
Chloroethane	1.5	ug/l	1	05/05/99	JRS	75-00-3	
Trichlorofluoromethane	ND	ug/l	1	05/05/99	JRS	75-69-4	
Acetone	ND	ug/l	10	05/05/99	JRS	67-64-1	
1,1-Dichloroethene	ND	ug/l	1	05/05/99	JRS	75-35-4	
Iodomethane	ND	ug/l	1	05/05/99	JRS	74-88-4	
Acrylonitrile	ND	ug/l	10	05/05/99	JRS	107-13-1	
Methylene Chloride	ND	ug/l	1	05/05/99	JRS	75-09-2	

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Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Pace Sample No: 92426246 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: MW-2 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Carbon Disulfide	ND	ug/l	1	05/05/99	JRS	75-15-0	
trans-1,2-Dichloroethene	ND	ug/l	1	05/05/99	JRS	156-60-5	
1,1-Dichloroethane	3.7	ug/l	1	05/05/99	JRS	75-34-3	
Vinyl Acetate	ND	ug/l	2	05/05/99	JRS	108-05-4	
2-Butanone	ND	ug/l	5	05/05/99	JRS	78-93-3	
cis-1,2-Dichloroethene	ND	ug/l	1	05/05/99	JRS	156-59-2	
Chloroform	ND	ug/l	1	05/05/99	JRS	67-66-3	
Bromochloromethane	ND	ug/l	1	05/05/99	JRS	74-97-5	
1,1,1-Trichloroethane	ND	ug/l	1	05/05/99	JRS	71-55-6	
1,2-Dichloroethane	ND	ug/l	1	05/05/99	JRS	107-06-2	
Carbon Tetrachloride	ND	ug/l	1	05/05/99	JRS	56-23-5	
Benzene	ND	ug/l	1	05/05/99	JRS	71-43-2	
Trichloroethene	1.1	ug/l	1	05/05/99	JRS	79-01-6	
1,2-Dichloropropane	ND	ug/l	1	05/05/99	JRS	78-87-5	
Dibromomethane	ND	ug/l	1	05/05/99	JRS	74-95-3	
Bromodichloromethane	ND	ug/l	1	05/05/99	JRS	75-27-4	
4-Methyl-2-Pentanone	ND	ug/l	5	05/05/99	JRS	108-10-1	
cis-1,3-Dichloropropene	ND	ug/l	1	05/05/99	JRS	10061-01-5	
Toluene	ND	ug/l	1	05/05/99	JRS	108-88-3	
1,1,2-Trichloroethane	ND	ug/l	1	05/05/99	JRS	79-00-5	
2-Hexanone	ND	ug/l	5	05/05/99	JRS	591-78-6	
Dibromochloromethane	ND	ug/l	1	05/05/99	JRS	124-48-1	
Tetrachloroethene	ND	ug/l	1	05/05/99	JRS	127-18-4	
1,2-Dibromoethane	ND	ug/l	1	05/05/99	JRS	106-93-4	
Chlorobenzene	ND	ug/l	1	05/05/99	JRS	108-90-7	
1,1,1,2-Tetrachloroethane	ND	ug/l	1	05/05/99	JRS	630-20-6	
Ethylbenzene	ND	ug/l	1	05/05/99	JRS	100-41-4	
m&p-Xylene	ND	ug/l	2	05/05/99	JRS	7816-60-0	
Styrene	ND	ug/l	1	05/05/99	JRS	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	ND	ug/l	1	05/05/99	JRS	95-47-6	
Bromoform	ND	ug/l	1	05/05/99	JRS	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/l	1	05/05/99	JRS	79-34-5	
1,2,3-Trichloropropane	ND	ug/l	1	05/05/99	JRS	96-18-4	
trans-1,4-Dichloro-2-Butene	ND	ug/l	1	05/05/99	JRS	110-57-6	
1,4-Dichlorobenzene	ND	ug/l	1	05/05/99	JRS	106-46-7	
1,2-Dichlorobenzene	ND	ug/l	1	05/05/99	JRS	95-50-1	
1,2-Dibromo-3-Chloropropane	ND	ug/l	1	05/05/99	JRS	96-12-8	
Dibromofluoromethane (S)	105	%		05/05/99	JRS	1868-53-7	
1,2-Dichloroethane-d4 (S)	100	%		05/05/99	JRS	17060-07-0	
Toluene-d8 (S)	101	%		05/05/99	JRS	2037-26-5	

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Pace Analytical

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Pace Sample No: 92426246 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: MW-2 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
4-Bromofluorobenzene (S)	101	%		05/05/99	JRS	460-00-4	

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Pace Analytical

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Pace Sample No: 92426253 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: SW-1 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Metals							
Metals by Trace ICP	Method: EPA 6010				Prep Method: EPA 3010		
Antimony	ND	mg/l	0.005	05/06/99	JML	7440-36-0	
Arsenic	ND	mg/l	0.005	05/06/99	JML	7440-38-2	
Barium	0.016	mg/l	0.005	05/06/99	JML	7440-39-3	
Beryllium	ND	mg/l	0.001	05/06/99	JML	7440-41-7	
Cadmium	ND	mg/l	0.001	05/06/99	JML	7440-43-9	
Chromium	ND	mg/l	0.002	05/06/99	JML	7440-47-3	
Cobalt	ND	mg/l	0.005	05/06/99	JML	7440-48-4	
Copper	0.0031	mg/l	0.002	05/06/99	JML	7440-50-8	
Lead	ND	mg/l	0.005	05/06/99	JML	7439-92-1	
Nickel	ND	mg/l	0.005	05/06/99	JML	7440-02-0	
Selenium	ND	mg/l	0.005	05/06/99	JML	7782-49-2	
Silver	ND	mg/l	0.002	05/06/99	JML	7440-22-4	
Vanadium	ND	mg/l	0.005	05/06/99	JML	7440-62-2	
Zinc	ND	mg/l	0.01	05/06/99	JML	7440-66-6	
Date Digested				04/30/99			
Mercury in Water	Method: EPA 7470				Prep Method: EPA 7470		
Mercury	ND	mg/l	0.0002	04/28/99	TYM	7439-97-6	
Thallium, AAS Furnace	Method: EPA 7841				Prep Method: EPA 3020		
Thallium	ND	mg/l	0.002	05/04/99	TYM	7440-28-0	
Date Digested				04/29/99			
GC/MS Volatiles							
GC/MS VOCs by 8260, low level	Method: EPA 8260				Prep Method: EPA 8260		
Chloromethane	ND	ug/l	1	05/05/99	JRS	74-87-3	
Vinyl Chloride	ND	ug/l	1	05/05/99	JRS	75-01-4	
Bromomethane	ND	ug/l	1	05/05/99	JRS	74-83-9	
Chloroethane	ND	ug/l	1	05/05/99	JRS	75-00-3	
Trichlorofluoromethane	ND	ug/l	1	05/05/99	JRS	75-69-4	
Acetone	ND	ug/l	10	05/05/99	JRS	67-64-1	
1,1-Dichloroethene	ND	ug/l	1	05/05/99	JRS	75-35-4	
Iodomethane	ND	ug/l	1	05/05/99	JRS	74-88-4	
Acrylonitrile	ND	ug/l	10	05/05/99	JRS	107-13-1	
Methylene Chloride	ND	ug/l	1	05/05/99	JRS	75-09-2	

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Pace Analytical

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Pace Sample No: 92426253 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: SW-1 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Carbon Disulfide	ND	ug/l	1	05/05/99	JRS	75-15-0	
trans-1,2-Dichloroethene	ND	ug/l	1	05/05/99	JRS	156-60-5	
1,1-Dichloroethane	ND	ug/l	1	05/05/99	JRS	75-34-3	
Vinyl Acetate	ND	ug/l	2	05/05/99	JRS	108-05-4	
2-Butanone	ND	ug/l	5	05/05/99	JRS	78-93-3	
cis-1,2-Dichloroethene	ND	ug/l	1	05/05/99	JRS	156-59-2	
Chloroform	ND	ug/l	1	05/05/99	JRS	67-66-3	
Bromochloromethane	ND	ug/l	1	05/05/99	JRS	74-97-5	
1,1,1-Trichloroethane	ND	ug/l	1	05/05/99	JRS	71-55-6	
1,2-Dichloroethane	ND	ug/l	1	05/05/99	JRS	107-06-2	
Carbon Tetrachloride	ND	ug/l	1	05/05/99	JRS	56-23-5	
Benzene	ND	ug/l	1	05/05/99	JRS	71-43-2	
Trichloroethene	ND	ug/l	1	05/05/99	JRS	79-01-6	
1,2-Dichloropropane	ND	ug/l	1	05/05/99	JRS	78-87-5	
Dibromomethane	ND	ug/l	1	05/05/99	JRS	74-95-3	
Bromodichloromethane	ND	ug/l	1	05/05/99	JRS	75-27-4	
4-Methyl-2-Pentanone	ND	ug/l	5	05/05/99	JRS	108-10-1	
cis-1,3-Dichloropropene	ND	ug/l	1	05/05/99	JRS	10061-01-5	
Toluene	ND	ug/l	1	05/05/99	JRS	108-88-3	
1,1,2-Trichloroethane	ND	ug/l	1	05/05/99	JRS	79-00-5	
2-Hexanone	ND	ug/l	5	05/05/99	JRS	591-78-6	
Dibromochloromethane	ND	ug/l	1	05/05/99	JRS	124-48-1	
Tetrachloroethene	ND	ug/l	1	05/05/99	JRS	127-18-4	
1,2-Dibromoethane	ND	ug/l	1	05/05/99	JRS	106-93-4	
Chlorobenzene	ND	ug/l	1	05/05/99	JRS	108-90-7	
1,1,1,2-Tetrachloroethane	ND	ug/l	1	05/05/99	JRS	630-20-6	
Ethylbenzene	ND	ug/l	1	05/05/99	JRS	100-41-4	
m&p-Xylene	ND	ug/l	2	05/05/99	JRS	7816-60-0	
Styrene	ND	ug/l	1	05/05/99	JRS	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	ND	ug/l	1	05/05/99	JRS	95-47-6	
Bromoform	ND	ug/l	1	05/05/99	JRS	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/l	1	05/05/99	JRS	79-34-5	
1,2,3-Trichloropropane	ND	ug/l	1	05/05/99	JRS	96-18-4	
trans-1,4-Dichloro-2-Butene	ND	ug/l	1	05/05/99	JRS	110-57-6	
1,4-Dichlorobenzene	ND	ug/l	1	05/05/99	JRS	106-46-7	
1,2-Dichlorobenzene	ND	ug/l	1	05/05/99	JRS	95-50-1	
1,2-Dibromo-3-Chloropropane	ND	ug/l	1	05/05/99	JRS	96-12-8	
Dibromofluoromethane (S)	106	%		05/05/99	JRS	1868-53-7	
1,2-Dichloroethane-d4 (S)	97	%		05/05/99	JRS	17060-07-0	
Toluene-d8 (S)	99	%		05/05/99	JRS	2037-26-5	

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Pace Analytical

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Pace Sample No: 92426253 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: SW-1 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
4-Bromofluorobenzene (S)	101	%		05/05/99	JRS	460-00-4	

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Pace Analytical

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Pace Sample No: 92426261 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: SW-2 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Metals							
Metals by Trace ICP	Method: EPA 6010				Prep Method: EPA 3010		
Antimony	ND	mg/l	0.005	05/06/99	JML	7440-36-0	
Arsenic	ND	mg/l	0.005	05/06/99	JML	7440-38-2	
Barium	0.013	mg/l	0.005	05/06/99	JML	7440-39-3	
Beryllium	ND	mg/l	0.001	05/06/99	JML	7440-41-7	
Cadmium	ND	mg/l	0.001	05/06/99	JML	7440-43-9	
Chromium	ND	mg/l	0.002	05/06/99	JML	7440-47-3	
Cobalt	ND	mg/l	0.005	05/06/99	JML	7440-48-4	
Copper	0.0037	mg/l	0.002	05/06/99	JML	7440-50-8	
Lead	ND	mg/l	0.005	05/06/99	JML	7439-92-1	
Nickel	ND	mg/l	0.005	05/06/99	JML	7440-02-0	
Selenium	ND	mg/l	0.005	05/06/99	JML	7782-49-2	
Silver	ND	mg/l	0.002	05/06/99	JML	7440-22-4	
Vanadium	ND	mg/l	0.005	05/06/99	JML	7440-62-2	
Zinc	ND	mg/l	0.01	05/06/99	JML	7440-66-6	
Date Digested				04/30/99			
Mercury in Water	Method: EPA 7470				Prep Method: EPA 7470		
Mercury	ND	mg/l	0.0002	04/28/99	TYM	7439-97-6	
Thallium, AAS Furnace	Method: EPA 7841				Prep Method: EPA 3020		
Thallium	ND	mg/l	0.002	05/04/99	TYM	7440-28-0	
Date Digested				04/29/99			
GC/MS Volatiles							
GC/MS VOCs by 8260, low level	Method: EPA 8260				Prep Method: EPA 8260		
Chloromethane	ND	ug/l	1	05/05/99	JRS	74-87-3	
Vinyl Chloride	ND	ug/l	1	05/05/99	JRS	75-01-4	
Bromomethane	ND	ug/l	1	05/05/99	JRS	74-83-9	
Chloroethane	ND	ug/l	1	05/05/99	JRS	75-00-3	
Trichlorofluoromethane	ND	ug/l	1	05/05/99	JRS	75-69-4	
Acetone	ND	ug/l	10	05/05/99	JRS	67-64-1	
1,1-Dichloroethene	ND	ug/l	1	05/05/99	JRS	75-35-4	
Iodomethane	ND	ug/l	1	05/05/99	JRS	74-88-4	
Acrylonitrile	ND	ug/l	10	05/05/99	JRS	107-13-1	
Methylene Chloride	ND	ug/l	1	05/05/99	JRS	75-09-2	

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Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Pace Sample No: 92426261 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: SW-2 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
Carbon Disulfide	ND	ug/l	1	05/05/99	JRS	75-15-0	
trans-1,2-Dichloroethene	ND	ug/l	1	05/05/99	JRS	156-60-5	
1,1-Dichloroethane	ND	ug/l	1	05/05/99	JRS	75-34-3	
Vinyl Acetate	ND	ug/l	2	05/05/99	JRS	108-05-4	
2-Butanone	ND	ug/l	5	05/05/99	JRS	78-93-3	
cis-1,2-Dichloroethene	ND	ug/l	1	05/05/99	JRS	156-59-2	
Chloroform	ND	ug/l	1	05/05/99	JRS	67-66-3	
Bromochloromethane	ND	ug/l	1	05/05/99	JRS	74-97-5	
1,1,1-Trichloroethane	ND	ug/l	1	05/05/99	JRS	71-55-6	
1,2-Dichloroethane	ND	ug/l	1	05/05/99	JRS	107-06-2	
Carbon Tetrachloride	ND	ug/l	1	05/05/99	JRS	56-23-5	
Benzene	ND	ug/l	1	05/05/99	JRS	71-43-2	
Trichloroethene	ND	ug/l	1	05/05/99	JRS	79-01-6	
1,2-Dichloropropane	ND	ug/l	1	05/05/99	JRS	78-87-5	
Dibromomethane	ND	ug/l	1	05/05/99	JRS	74-95-3	
Bromodichloromethane	ND	ug/l	1	05/05/99	JRS	75-27-4	
4-Methyl-2-Pentanone	ND	ug/l	5	05/05/99	JRS	108-10-1	
cis-1,3-Dichloropropene	ND	ug/l	1	05/05/99	JRS	10061-01-5	
Toluene	ND	ug/l	1	05/05/99	JRS	108-88-3	
1,1,2-Trichloroethane	ND	ug/l	1	05/05/99	JRS	79-00-5	
2-Hexanone	ND	ug/l	5	05/05/99	JRS	591-78-6	
Dibromochloromethane	ND	ug/l	1	05/05/99	JRS	124-48-1	
Tetrachloroethene	ND	ug/l	1	05/05/99	JRS	127-18-4	
1,2-Dibromoethane	ND	ug/l	1	05/05/99	JRS	106-93-4	
Chlorobenzene	ND	ug/l	1	05/05/99	JRS	108-90-7	
1,1,1,2-Tetrachloroethane	ND	ug/l	1	05/05/99	JRS	630-20-6	
Ethylbenzene	ND	ug/l	1	05/05/99	JRS	100-41-4	
m&p-Xylene	ND	ug/l	2	05/05/99	JRS	7816-60-0	
Styrene	ND	ug/l	1	05/05/99	JRS	100-42-5	
o-Xylene (1,2-Dimethylbenzene)	ND	ug/l	1	05/05/99	JRS	95-47-6	
Bromoform	ND	ug/l	1	05/05/99	JRS	75-25-2	
1,1,2,2-Tetrachloroethane	ND	ug/l	1	05/05/99	JRS	79-34-5	
1,2,3-Trichloropropane	ND	ug/l	1	05/05/99	JRS	96-18-4	
trans-1,4-Dichloro-2-Butene	ND	ug/l	1	05/05/99	JRS	110-57-6	
1,4-Dichlorobenzene	ND	ug/l	1	05/05/99	JRS	106-46-7	
1,2-Dichlorobenzene	ND	ug/l	1	05/05/99	JRS	95-50-1	
1,2-Dibromo-3-Chloropropane	ND	ug/l	1	05/05/99	JRS	96-12-8	
Dibromofluoromethane (S)	104	%		05/05/99	JRS	1868-53-7	
1,2-Dichloroethane-d4 (S)	100	%		05/05/99	JRS	17060-07-0	
Toluene-d8 (S)	97	%		05/05/99	JRS	2037-26-5	

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Pace Analytical

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Pace Sample No: 92426261 Date Collected: 04/22/99 Matrix: Water
Client Sample ID: SW-2 Date Received: 04/23/99

Parameters	Results	Units	PRL	Analyzed	Analyst	CAS#	Footnotes
4-Bromofluorobenzene (S)	101	%		05/05/99	JRS	460-00-4	

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Pace Analytical

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

PARAMETER FOOTNOTES

ND	Not Detected
NC	Not Calculable
PRL	Pace Reporting Limit
(S)	Surrogate
[1]	Possible laboratory contaminant.

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Pace Analytical

QUALITY CONTROL DATA

The Fletcher Group
48 Patton Ave.
Suite 303
Asheville, NC 28801

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Attn: Mr. Jim McElduff
Phone: (828)281-3350

QC Batch ID: 12003
QC Batch Method: EPA 3020
Analysis Method: EPA 7841
Analysis Description: Thallium, AAS Furnace
Associated Pace Samples: 92426204

METHOD BLANK: 92426709
Associated Pace Samples:
92426204

Parameter	Units	Method Blank Result	PRL	Footnotes
Thallium	mg/l	ND	0.002	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 92426717 92426725

Parameter	Units	92421965	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Thallium	mg/l	0	0.0250	0.01560	62.4	0.01410	56.4	10	1.1

LABORATORY CONTROL SAMPLE & LCSD: 92426741 92426758

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Thallium	mg/l	0.0250	0.02570	103	0.02570	103	0	

SAMPLE DUPLICATE: 92426733

Parameter	Units	92421999	Dup. Result	RPD	Footnotes
Thallium	mg/l	ND	ND	NC	

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Pace Analytical

QUALITY CONTROL DATA

The Fletcher Group
48 Patton Ave.
Suite 303
Asheville, NC 28801

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Attn: Mr. Jim McElduff
Phone: (828)281-3350

QC Batch ID: 12043
Analysis Method: EPA 7470
Associated Pace Samples: 92426204 92426212

QC Batch Method: EPA 7470
Analysis Description: Mercury in Water

METHOD BLANK: 92428507
Associated Pace Samples: 92426204 92426212

Parameter	Units	Method Blank Result	PRL	Footnotes
Mercury	mg/l	ND	0.0002	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 92428515 92428523

Parameter	Units	92423920	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Mercury	mg/l	0	0.0050	0.005140	103	0.004950	99.0	4	

LABORATORY CONTROL SAMPLE & LCSD: 92428549 92428556

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Mercury	mg/l	0.0050	0.004410	88.2	0.004440	88.8	1	

SAMPLE DUPLICATE: 92428531

Parameter	Units	92423938	Dup. Result	RPD	Footnotes
Mercury	mg/l	ND	ND	NC	

Laboratory Certification IDs
NC Wastewater 12
NC Drinking Water 37706
SC 99006

REPORT OF LABORATORY ANALYSIS

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Laboratory Certification IDs
KY Drinking Water 90090
TN UST List
VA Drinking Water 213

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QUALITY CONTROL DATA

The Fletcher Group
48 Patton Ave.
Suite 303
Asheville, NC 28801

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Attn: Mr. Jim McElduff
Phone: (828)281-3350

QC Batch ID: 12044
Analysis Method: EPA 7470
Associated Pace Samples: 92426220 92426238 92426246 92426253 92426261

QC Batch Method: EPA 7470
Analysis Description: Mercury in Water

METHOD BLANK: 92428564
Associated Pace Samples:
92426220 92426238 92426246 92426253 92426261

Parameter	Units	Method Blank Result	PRL	Footnotes
Mercury	mg/l	ND	0.0002	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 92428572 92428580

Parameter	Units	92426220	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Mercury	mg/l	0.0002530	0.0050	0.005810	111	0.004770	90.3	21	

LABORATORY CONTROL SAMPLE & LCSD: 92428606 92428614

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Mercury	mg/l	0.0050	0.004370	87.4	0.004290	85.8	2	

SAMPLE DUPLICATE: 92428598

Parameter	Units	92426238	Dup. Result	RPD	Footnotes
Mercury	mg/l	ND	ND	NC	

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DATE: 05/07/99
PAGE: 26

The Fletcher Group
48 Patton Ave.
Suite 303
Asheville, NC 28801

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Attn: Mr. Jim McElduff
Phone: (828)281-3350

QC Batch ID: 12133
Analysis Method: EPA 6010
QC Batch Method: EPA 3010
Analysis Description: Metals by Trace ICP
Associated Pace Samples: 92426204 92426212 92426220 92426238

METHOD BLANK: 92430339
Associated Pace Samples:
92426204 92426212 92426220 92426238

Parameter	Units	Method Blank Result	PRL	Footnotes
Antimony	mg/l	ND	0.005	
Arsenic	mg/l	ND	0.005	
Barium	mg/l	ND	0.005	
Beryllium	mg/l	ND	0.001	
Cadmium	mg/l	ND	0.001	
Chromium	mg/l	ND	0.002	
Cobalt	mg/l	ND	0.005	
Copper	mg/l	ND	0.002	
Lead	mg/l	ND	0.005	
Nickel	mg/l	ND	0.005	
Selenium	mg/l	ND	0.005	
Silver	mg/l	ND	0.002	
Vanadium	mg/l	ND	0.005	
Zinc	mg/l	ND	0.01	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 92430347 92430354

Parameter	Units	92424118	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Antimony	mg/l	0.003420	0.2500	0.2560	101	0.2520	99.4	2	
Arsenic	mg/l	0	0.2500	0.2480	99.2	0.2420	96.8	2	
Barium	mg/l	0.04970	0.2500	0.3090	104	0.3010	100	3	
Beryllium	mg/l	0.0001770	0.2500	0.2570	103	0.2510	100	2	
Cadmium	mg/l	0.000008000	0.2500	0.2480	99.2	0.2420	96.8	2	

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Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 92430347 92430354

Parameter	Units	92424118	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Chromium	mg/l	0.0009280	0.2500	0.2480	98.8	0.2420	96.4	2	
Cobalt	mg/l	0.0005510	0.2500	0.2420	96.6	0.2360	94.2	3	
Copper	mg/l	0	0.2500	0.2730	109	0.2660	106	3	
Lead	mg/l	0.0006950	0.2500	0.2470	98.5	0.2430	96.9	2	
Nickel	mg/l	0.0007600	0.2500	0.2580	103	0.2520	100	2	
Selenium	mg/l	0.001910	0.2500	0.2440	96.8	0.2390	94.8	2	
Silver	mg/l	0.0008600	0.2500	0.2610	104	0.2550	102	2	
Vanadium	mg/l	0.001420	0.2500	0.2520	100	0.2460	97.8	2	
Zinc	mg/l	0.003440	0.2500	0.2500	98.6	0.2440	96.2	2	

LABORATORY CONTROL SAMPLE & LCSD: 92430370 92430388

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Antimony	mg/l	0.2500	0.2570	103	0.2700	108	5	
Arsenic	mg/l	0.2500	0.2500	100	0.2590	104	4	
Barium	mg/l	0.2500	0.2580	103	0.2710	108	5	
Beryllium	mg/l	0.2500	0.2560	102	0.2690	108	6	
Cadmium	mg/l	0.2500	0.2480	99.2	0.2600	104	5	
Chromium	mg/l	0.2500	0.2480	99.2	0.2600	104	5	
Cobalt	mg/l	0.2500	0.2420	96.8	0.2540	102	5	
Copper	mg/l	0.2500	0.2700	108	0.2850	114	5	
Lead	mg/l	0.2500	0.2480	99.2	0.2610	104	5	
Nickel	mg/l	0.2500	0.2580	103	0.2690	108	5	
Selenium	mg/l	0.2500	0.2440	97.6	0.2560	102	4	
Silver	mg/l	0.2500	0.2590	104	0.2720	109	5	
Vanadium	mg/l	0.2500	0.2500	100	0.2630	105	5	
Zinc	mg/l	0.2500	0.2470	98.8	0.2580	103	4	

SAMPLE DUPLICATE: 92430362

Parameter	Units	92424126	Dup. Result	RPD	Footnotes
Antimony	mg/l	ND	ND	NC	
Arsenic	mg/l	ND	ND	NC	
Barium	mg/l	0.2800	0.2900	4	
Beryllium	mg/l	ND	ND	NC	
Cadmium	mg/l	ND	0.006600	NC	
Chromium	mg/l	0.01800	0.01800	4	

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Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

SAMPLE DUPLICATE: 92430362

Parameter	Units	92424126	Dup. Result	RPD	Footnotes
Cobalt	mg/l	0.07000	0.07300	3	
Copper	mg/l	ND	0.03700	NC	
Lead	mg/l	0.006000	0.009200	43	2
Nickel	mg/l	0.02400	0.04200	53	2
Selenium	mg/l	ND	ND	NC	
Silver	mg/l	ND	ND	NC	
Vanadium	mg/l	0.01100	0.01100	6	
Zinc	mg/l	0.2200	0.3000	30	2

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QUALITY CONTROL DATA

The Fletcher Group
48 Patton Ave.
Suite 303
Asheville, NC 28801

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Attn: Mr. Jim McElduff
Phone: (828)281-3350

QC Batch ID: 12197
QC Batch Method: EPA 3010
Analysis Method: EPA 6010
Analysis Description: Metals by Trace ICP
Associated Pace Samples: 92426246 92426253 92426261

METHOD BLANK: 92432749
Associated Pace Samples:
92426246 92426253 92426261

Parameter	Units	Method Blank Result	PRL	Footnotes
Antimony	mg/l	ND	0.005	
Arsenic	mg/l	ND	0.005	
Barium	mg/l	ND	0.005	
Beryllium	mg/l	ND	0.001	
Cadmium	mg/l	ND	0.001	
Chromium	mg/l	0.012	0.002	
Cobalt	mg/l	ND	0.005	
Copper	mg/l	ND	0.002	
Lead	mg/l	ND	0.005	
Nickel	mg/l	ND	0.005	
Selenium	mg/l	ND	0.005	
Silver	mg/l	ND	0.002	
Vanadium	mg/l	ND	0.005	
Zinc	mg/l	ND	0.01	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 92432756 92432764

Parameter	Units	92426246	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Antimony	mg/l	0.0008570	0.2500	0.2610	104	0.2580	103	1	
Arsenic	mg/l	0	0.2500	0.2550	102	0.2550	102	0	
Barium	mg/l	0.02960	0.2500	0.2910	105	0.2860	103	2	
Beryllium	mg/l	0	0.2500	0.2620	105	0.2580	103	2	
Cadmium	mg/l	0.0002820	0.2500	0.2540	102	0.2510	100	1	

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QUALITY CONTROL DATA

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 92432756 92432764

Parameter	Units	92426246	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Chromium	mg/l	0	0.2500	0.2560	102	0.2530	101	1	
Cobalt	mg/l	0.0002520	0.2500	0.2550	102	0.2530	101	1	
Copper	mg/l	0.002490	0.2500	0.2800	111	0.2770	110	1	
Lead	mg/l	0.0002840	0.2500	0.2520	101	0.2490	99.5	1	
Nickel	mg/l	0.001540	0.2500	0.2640	105	0.2600	103	2	
Selenium	mg/l	0.001600	0.2500	0.2470	98.2	0.2460	97.8	0	
Silver	mg/l	0.00008800	0.2500	0.2650	106	0.2610	104	2	
Vanadium	mg/l	0.0004230	0.2500	0.2580	103	0.2550	102	1	
Zinc	mg/l	0.005110	0.2500	0.2540	99.6	0.2500	98.0	2	

LABORATORY CONTROL SAMPLE & LCSD: 92432780 92432798

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Antimony	mg/l	0.2500	0.2550	102	0.2550	102	0	
Arsenic	mg/l	0.2500	0.2510	100	0.2470	98.8	1	
Barium	mg/l	0.2500	0.2560	102	0.2530	101	1	
Beryllium	mg/l	0.2500	0.2570	103	0.2540	102	1	
Cadmium	mg/l	0.2500	0.2500	100	0.2470	98.8	1	
Chromium	mg/l	0.2500	0.2520	101	0.2490	99.6	1	
Cobalt	mg/l	0.2500	0.2500	100	0.2480	99.2	1	
Copper	mg/l	0.2500	0.2760	110	0.2720	109	1	
Lead	mg/l	0.2500	0.2500	100	0.2470	98.8	1	
Nickel	mg/l	0.2500	0.2580	103	0.2570	103	0	
Selenium	mg/l	0.2500	0.2450	98.0	0.2420	96.8	1	
Silver	mg/l	0.2500	0.2600	104	0.2560	102	2	
Vanadium	mg/l	0.2500	0.2540	102	0.2510	100	2	
Zinc	mg/l	0.2500	0.2450	98.0	0.2410	96.4	2	

SAMPLE DUPLICATE: 92432772

Parameter	Units	92426253	Dup. Result	RPD	Footnotes
Antimony	mg/l	ND	ND	NC	
Arsenic	mg/l	ND	ND	NC	
Barium	mg/l	0.01600	0.01600	1	
Beryllium	mg/l	ND	ND	NC	
Cadmium	mg/l	ND	ND	NC	
Chromium	mg/l	ND	ND	NC	

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QUALITY CONTROL DATA

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

SAMPLE DUPLICATE: 92432772

Parameter	Units	92426253	Dup. Result	RPD	Footnotes
Cobalt	mg/l	ND	ND	NC	
Copper	mg/l	0.003100	0.002600	18	2
Lead	mg/l	ND	ND	NC	
Nickel	mg/l	ND	ND	NC	
Selenium	mg/l	ND	ND	NC	
Silver	mg/l	ND	ND	NC	
Vanadium	mg/l	ND	ND	NC	
Zinc	mg/l	ND	ND	NC	

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QUALITY CONTROL DATA

The Fletcher Group
48 Patton Ave.
Suite 303
Asheville, NC 28801

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Attn: Mr. Jim McElduff
Phone: (828)281-3350

QC Batch ID: 12198
Analysis Method: EPA 7841
QC Batch Method: EPA 3020
Analysis Description: Thallium, AAS Furnace
Associated Pace Samples: 92426212 92426220 92426238 92426246 92426253 92426261

METHOD BLANK: 92432806
Associated Pace Samples: 92426212 92426220 92426238 92426246 92426253 92426261

Parameter	Units	Method Blank Result	PRL	Footnotes
Thallium	mg/l	ND	0.002	

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 92432814 92432822

Parameter	Units	92426212	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Thallium	mg/l	0	0.0250	0.006300	25.2	0.01290	51.6	69	1,1

LABORATORY CONTROL SAMPLE & LCSD: 92432848 92432855

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Thallium	mg/l	0.0250	0.02210	88.4	0.02210	88.4	0	

SAMPLE DUPLICATE: 92432830

Parameter	Units	92426220	Dup. Result	RPD	Footnotes
Thallium	mg/l	ND	ND	NC	

Laboratory Certification IDs
NC Wastewater 12
NC Drinking Water 37706
SC 99006

REPORT OF LABORATORY ANALYSIS

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Laboratory Certification IDs
KY Drinking Water 90090
TN UST List
VA Drinking Water 213

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QUALITY CONTROL DATA

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Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

Attn: Mr. Jim McElduff
Phone: (828)281-3350

QC Batch ID: 12357
QC Batch Method: EPA 8260
Analysis Method: EPA 8260
Analysis Description: GC/MS VOCs by 8260, low level
Associated Pace Samples: 92426204 92426212 92426220 92426238 92426246 92426253 92426261

METHOD BLANK: 92438977
Associated Pace Samples: 92426204 92426212 92426220 92426238 92426246 92426253 92426261

Parameter	Units	Method Blank Result	PRL	Footnotes
Chloromethane	ug/l	ND	1	
Vinyl Chloride	ug/l	ND	1	
Bromomethane	ug/l	ND	1	
Chloroethane	ug/l	ND	1	
Trichlorofluoromethane	ug/l	ND	1	
Acetone	ug/l	ND	10	
1,1-Dichloroethene	ug/l	ND	1	
Iodomethane	ug/l	ND	1	
Acrylonitrile	ug/l	ND	10	
Methylene Chloride	ug/l	ND	1	
Carbon Disulfide	ug/l	ND	1	
trans-1,2-Dichloroethene	ug/l	ND	1	
1,1-Dichloroethane	ug/l	ND	1	
Vinyl Acetate	ug/l	ND	2	
2-Butanone	ug/l	ND	5	
cis-1,2-Dichloroethene	ug/l	ND	1	
Chloroform	ug/l	ND	1	
Bromochloromethane	ug/l	ND	1	
1,1,1-Trichloroethane	ug/l	ND	1	
1,2-Dichloroethane	ug/l	ND	1	
Carbon Tetrachloride	ug/l	ND	1	
Benzene	ug/l	ND	1	
Trichloroethene	ug/l	ND	1	
1,2-Dichloropropane	ug/l	ND	1	

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QUALITY CONTROL DATA

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

METHOD BLANK: 92438977
Associated Pace Samples: 92426204 92426212 92426220 92426238 92426246 92426253 92426261

Parameter	Units	Method Blank Result	PRL	Footnotes
Dibromomethane	ug/l	ND	1	
Bromodichloromethane	ug/l	ND	1	
4-Methyl-2-Pentanone	ug/l	ND	5	
cis-1,3-Dichloropropene	ug/l	ND	1	
Toluene	ug/l	ND	1	
1,1,2-Trichloroethane	ug/l	ND	1	
2-Hexanone	ug/l	ND	5	
Dibromochloromethane	ug/l	ND	1	
Tetrachloroethene	ug/l	ND	1	
1,2-Dibromoethane	ug/l	ND	1	
Chlorobenzene	ug/l	ND	1	
1,1,1,2-Tetrachloroethane	ug/l	ND	1	
Ethylbenzene	ug/l	ND	1	
m&p-Xylene	ug/l	ND	2	
Styrene	ug/l	ND	1	
o-Xylene (1,2-Dimethylbenzene)	ug/l	ND	1	
Bromoform	ug/l	ND	1	
1,1,2,2-Tetrachloroethane	ug/l	ND	1	
1,2,3-Trichloropropane	ug/l	ND	1	
trans-1,4-Dichloro-2-Butene	ug/l	ND	1	
1,4-Dichlorobenzene	ug/l	ND	1	
1,2-Dichlorobenzene	ug/l	ND	1	
1,2-Dibromo-3-Chloropropane	ug/l	ND	1	
Dibromofluoromethane (S)	%	103		
1,2-Dichloroethane-d4 (S)	%	98		
Toluene-d8 (S)	%	102		
4-Bromofluorobenzene (S)	%	102		

LABORATORY CONTROL SAMPLE & LCSD: 92438985 92438993

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Chloromethane	ug/l	10	7.320	73.2	36.20	72.4	1	
Vinyl Chloride	ug/l	10	7.830	78.3	42.40	84.8	8	
Bromomethane	ug/l	10	10.70	107	54.50	109	2	
Chloroethane	ug/l	10	8.690	86.9	47.00	94.0	8	
Trichlorofluoromethane	ug/l	10	7.840	78.4	44.50	89.0	13	

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QUALITY CONTROL DATA

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

LABORATORY CONTROL SAMPLE & LCSD: 92438985 92438993

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Acetone	ug/l	20	20.86	104	96.75	96.8	7	
,1-Dichloroethene	ug/l	10	10.04	100	54.70	109	9	
odomethane	ug/l	20	22.51	113	129.0	129	13	
Acrylonitrile	ug/l	100	116.2	116	566.4	113	3	
lethylene Chloride	ug/l	10	9.960	99.6	51.05	102	2	
arbon Disulfide	ug/l	20	21.30	107	114.5	115	7	
trans-1,2-Dichloroethene	ug/l	10	11.07	111	59.60	119	7	
1,1-Dichloroethane	ug/l	10	10.24	102	54.00	108	6	
inyl Acetate	ug/l	20	12.81	64.1	59.05	59.1	8	
2-Butanone	ug/l	20	24.87	124	125.5	126	2	
cis-1,2-Dichloroethene	ug/l	10	10.67	107	55.45	111	4	
hloroform	ug/l	10	10.94	109	56.80	114	4	
romochloromethane	ug/l	10	12.02	120	60.85	122	2	
1,1,1-Trichloroethane	ug/l	10	10.47	105	56.45	113	7	
,2-Dichloroethane	ug/l	10	10.87	109	55.60	111	2	
arbon Tetrachloride	ug/l	10	10.33	103	56.10	112	8	
Benzene	ug/l	10	10.62	106	56.75	114	7	
Trichloroethene	ug/l	10	12.62	126	68.20	136	8	3
,2-Dichloropropane	ug/l	10	11.26	113	58.30	117	3	
ibromomethane	ug/l	10	12.27	123	62.40	125	2	
Bromodichloromethane	ug/l	10	11.26	113	57.25	115	2	
-Methyl-2-Pentanone	ug/l	20	23.31	117	112.1	112	4	
is-1,3-Dichloropropene	ug/l	10	10.27	103	52.20	104	1	
Toluene	ug/l	10	10.70	107	55.85	112	5	
,1,2-Trichloroethane	ug/l	10	11.33	113	58.10	116	3	
-Hexanone	ug/l	20	24.20	121	118.2	118	3	
Dibromochloromethane	ug/l	10	11.75	118	61.00	122	3	
Tetrachloroethene	ug/l	10	11.73	117	63.40	127	8	
,2-Dibromoethane	ug/l	10	12.09	121	62.80	126	4	
hlorobenzene	ug/l	10	11.20	112	58.00	116	4	
1,1,1,2-Tetrachloroethane	ug/l	10	11.91	119	61.75	124	4	
thylbenzene	ug/l	10	10.16	102	53.90	108	6	
&p-Xylene	ug/l	20	20.16	101	107.5	108	7	
Styrene	ug/l	10	10.55	106	54.40	109	3	
o-Xylene (1,2-Dimethylbenzene)	ug/l	10	10.39	104	54.40	109	5	
romoform	ug/l	10	12.00	120	61.60	123	2	
,1,2,2-Tetrachloroethane	ug/l	10	9.980	99.8	47.75	95.5	4	
1,2,3-Trichloropropane	ug/l	10	11.80	118	59.45	119	1	
rans-1,4-Dichloro-2-Butene	ug/l	10	10.96	110	55.35	111	1	
,4-Dichlorobenzene	ug/l	10	10.84	108	56.60	113	5	
1,2-Dichlorobenzene	ug/l	10	11.11	111	56.75	114	3	

Pace Analytical Services, Inc.
9800 Kincey Avenue, Suite 100
Huntersville, NC 28078
Tel: 704-875-9092
Fax: 704-875-9091

Pace Analytical

QUALITY CONTROL DATA

Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

LABORATORY CONTROL SAMPLE & LCSD: 92438985 92438993

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
1,2-Dibromo-3-Chloropropane	ug/l	10	13.05	131	59.40	119	10	
Dibromofluoromethane (S)				105		104		
1,2-Dichloroethane-d4 (S)				102		102		
Toluene-d8 (S)				102		99		
4-Bromofluorobenzene (S)				103		104		

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Pace Project Number: 925851
Client Project ID: Jackson Co./2040.04

QUALITY CONTROL DATA PARAMETER FOOTNOTES

Consistent with EPA guidelines unrounded concentrations are displayed and have been used to calculate % Rec and RPD values.

ND	Not Detected
NC	Not Calculable
RL	Pace Reporting Limit
RPD	Relative Percent Difference
(S)	Surrogate
[1]	The spike recovery was outside acceptance limits for the MS and /or MSD due to matrix interference. The LCS and/or LCSD were within acceptance limits showing that the laboratory is in control and the data is acceptable.
[2]	The calculated RPD was outside QC acceptance limits.
[3]	Recovery outside of Q.C. limits, however, the LCS recovery is within limits.

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CHAIN-OF-CUSTODY / Analytical Request Document

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

469546

Page: of

Required Client Information: Section A

Company: The Fletcher Group
Address: 48 Patton Avenue
Suite 303
Asheville, NC 28801
Phone: 828/281-3350 Fax: 281-3351

Required Client Information: Section B

Report To: James McElduff
Invoice To: The Fletcher Group
P.O.
Project Name: Jackson Co.
Project Number: 2040.01

Client Information (Check quote/contract):
Requested Due Date: *TAT:

* Under 14 day turnaround subject to laboratory and contractual obligations and may result in a Rush Turnaround Surcharge.
Turn Around Time (TAT) in calender days.

To Be Completed by Pace Analytical and Client Section C

Quote Reference:
Project Manager: RDK
Project #: 925851
Profile #: 423
Requested Analysis:

Section D Required Client Information:

SAMPLE ID

One character per box.
(A–Z, 0–9 / ,–)
Sample IDs MUST BE UNIQUE

Valid Matrix Codes

MATRIX	CODE
WATER	WT
SOIL	SL
OIL	OL
WIPE	WP
AIR	AR
TISSUE	TS
OTHER	OT

ITEM #	SAMPLE ID	MATRIX CODE	DATE COLLECTED mm / dd / yy	TIME COLLECTED mm:hh a/p	# Containers	Preservatives: Unpreserved	H_2SO_4	HNO_3	HCl	NaOH	$Na_2S_2O_3$	8260 (see comments)	624.1 / 7200	Remarks / Lab ID
1	MW-1	WT	4-22-99	13:00	5			1	4			4	1	426204
2	MW-5	WT	4-22-99	14:20	5			1	4			4	1	426212
3	MW-4	WT	4-22-99	16:00	5			1	4			4	1	426220
4	MW-3	WT	4-22-99	16:30	5			1	4			4	1	426238
5	MW-2	WT	4-22-99	17:20	5			1	4			4	1	426246
6		~~WT~~	~~4-22-99~~											
7	SW-1	WT	4-22-99	15:00	5			1	4			4	1	426253
8	SW-2	WT	4-22-99	15:15	5			1	4			4	1	426261
9														
10														
11														
12														

Sample Condition		Sample Notes	Item No.	Relinquished By / Company	Date	Time	Accepted By / Company	Date	Time
Temp in °C:	4			John M. Chase	4-22	11:00	Shelby Martin	4/22	1020
Received on ICE:	(Y) / N								
Sealed Cooler:	(Y) N								
Samples Intact:	(Y) N								

Additional Comments:

* Tentatively Identified Compounds by 8260 low level with Methylene Chloride and Vinyl Chloride

SAMPLER NAME AND SIGNATURE

PRINT Name of SAMPLER: John M. Chase
SIGNATURE of SAMPLER: John M. Chase
DATE Signed: (MM / DD / YY) 4-22-99

SEE REVERSE SIDE FOR INSTRUCTIONS

APPENDIX C

GROUNDWATER VELOCITY CALCULATION

APPENDIX C

GROUNDWATER VELOCITY CALCULATIONS
JACKSON COUNTY LANDFILL

April 22, 1999

JACKSON COUNTY, NORTH CAROLINA

K^a (cm/sec)	I (ft/ft)	n	Flow Rate V (cm/sec)	Flow Rate V (ft/sec)	Flow Rate V (ft/day)	Flow Rate V (ft/yr)
7.30E-04	0.1	0.35	2.09E-04	6.84E-06	0.59	215.8
7.30E-04	0.1	0.3	2.43E-04	7.98E-06	0.69	251.8
7.30E-04	0.15	0.35	3.13E-04	1.03E-05	0.89	323.7
7.30E-04	0.15	0.3	3.65E-04	1.20E-05	1.03	377.7

Notes: Ft = feet

K^a = Hydraulic Conductivity (Hvorslev method) from page 13 of the March 23, 1994 document "Portion of Transition Plan, Existing Jackson County MSWLF

I = Hydraulic gradient, as calculated by the three point method, using water level data from April 22, 1999 and survey data provided by Davenport & Assoc., Inc. from April 9, 1999

n = Perosity (percent) of 30% to 35% based on literature values for sand and silt mixtures

Flow rate (V) = (K*I)/n

APPENDIX D

ANOVA STATISTICAL ANALYSES

Summary of ANOVA Statistical Evaluation

Jackson County Landfill

April 22, 1999

Compound	Conclusion
1 1 1-trichloroethane	**Significant Deviation**
1 1-dichloroethane	**Significant Deviation**
1 4 dichlorobenzene	**Significant Deviation**
Antimony	No Significant Deviation
Arsenic	No Significant Deviation
Barium	**Significant Deviation**
Benzene	**Significant Deviation**
Cadmium	No Significant Deviation
Chlororbenzene	**Significant Deviation**
Chlorothane	**Significant Deviation**
Chromium	No Significant Deviation
cis-1 2-dichloroethene	**Significant Deviation**
Cobalt	**Significant Deviation**
Copper	No Significant Deviation
Ethylbenzene	No Significant Deviation
Lead	No Significant Deviation
Mercury	No Significant Deviation
Methylene Chloride	**Significant Deviation**
Nickel	No Significant Deviation
Tetrachloroethene	**Significant Deviation**
Tin	no new data
Toluene	No Significant Deviation
Trichloroethene	**Significant Deviation**
Vanadium	No Significant Deviation
Vinyl chloride	No Significant Deviation
Xylenes	**Significant Deviation**
Zinc	No Significant Deviation
1,1,1,2-Tetrachloroethane	No Significant Deviation
1,1,2,2-Tetrachloroethane	No Significant Deviation
1,1,2-Trichloroethane	No Significant Deviation
1,1-Dichloroethene	No Significant Deviation
1,2,3-Trichloropropane	No Significant Deviation
1,2-Dibromo-3-Chloropropane	No Significant Deviation
1,2-Dibromoethane	No Significant Deviation
1,2-Dichlorobenzene	No Significant Deviation
1,2-Dichloroethane	No Significant Deviation
1,2-Dichloropropane	No Significant Deviation
2-Butanone	No Significant Deviation
2-Hexanone	No Significant Deviation
4-Methyl-2-Pentanone	No Significant Deviation
Acetone	No Significant Deviation
Acrylonitrile	No Significant Deviation
Beryllium	No Significant Deviation
Bromochloromethane	No Significant Deviation
Bromodichloromethane	No Significant Deviation
Bromoform	No Significant Deviation
Bromomethane	No Significant Deviation
Carbon Disulfide	No Significant Deviation

Summary of ANOVA Statistical Evaluation

Jackson County Landfill

April 22, 1999

Compound	Conclusion
Carbon Tetrachloride	No Significant Deviation
Chloroform	No Significant Deviation
Chloromethane	No Significant Deviation
cis-1,3-Dichloropropene	No Significant Deviation
Dibromochloromethane	No Significant Deviation
Dibromomethane	No Significant Deviation
Iodomethane	No Significant Deviation
Selenium	No Significant Deviation
Silver	No Significant Deviation
Styrene	No Significant Deviation
Thallium	No Significant Deviation
trans-1,2-Dichloroethene	No Significant Deviation
trans-1,4-Dichloro-2-Butene	No Significant Deviation
Trichlorofluoromethane	No Significant Deviation
Vinyl Acetate	No Significant Deviation

THE FLETCHER GROUP
Engineering and Environmental Solutions

June 23, 1999

Mr. Mark Poindexter
Department of Environment and Natural Resources
Division of Waste Management
401 Oberlin Road; Suite 150
Raleigh, North Carolina 27065

Subject: Jackson County Landfill
Semi-Annual Groundwater Report

Dear Mr. Poindexter:

The Semi-Annual Groundwater Monitoring Report is attached. Sampling was conducted on April 22, 1999.

Thank you for your assistance with this project.

Sincerely,

James S. McElduff, P.E.
Project Engineer

enclosure

cc: Mr. Jay Denton/Jackson County

48 Patton Avenue, Suite 303, Asheville, North Carolina 28801 • (828) 281-3350 Fax (828) 281-3351