

546IHSSF4070



DocumentID NONCD0002874

Site Name MOHAWK-KARASTAN

DocumentType Progress/Monitoring Rpt (PRGMON)

RptSegment 1

DocDate 11/15/1993

DocRcvd 8/19/2008

Box SF4070

AccessLevel PUBLIC

Division WASTE MANAGEMENT

Section SUPERFUND

Program IHS (IHS)

DocCat FACILITY

GROUNDWATER MONITORING
QUARTERLY SAMPLING RESULTS

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BIGELOW-KARASTAN MILL
GREENVILLE, NORTH CAROLINA

prepared for:

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Engineering Department
P.O. Box 107
Kannapolis, North Carolina

November 15, 1993

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COPY

TABLE OF CONTENTS

- 1.0 - INTRODUCTION
- 2.0 RESULTS
- 3.0 CONCLUSION

FIGURES

- 1. Site Location
- 2. Monitoring Well Location

APPENDICES

- I. Sampling Procedure
- II. Laboratory Results and Chain of Custody

GROUNDWATER MONITORING WELL SAMPLING
 QUARTERLY RESULTS
 BIGELOW-KARASTAN MILL
 GREENVILLE, NORTH CAROLINA

1.0 INTRODUCTION

In July 1993, Pyramid Environmental, Inc. completed an Underground Storage Tank (UST) Closure Assessment. As part of this Assessment, three monitoring wells were installed at the Bigelow-Karastan Mill (Figure 1) to determine the existence and possible extent of groundwater contamination. Initial results from June 10, 1993 did not indicate groundwater contamination.

On September 24, 1993, three monitoring wells installed at the Bigelow-Karastan Mill in Greenville, North Carolina, were sampled and analyzed for polynuclear aromatic hydrocarbons by EPA laboratory Methods 602 and 625. The approximate location of the wells are shown on Figure 2.

2.0 RESULTS

Results of laboratory analysis show that all three of the monitoring wells remain below detectable levels for all parameters except Di-N-Butyl Phthalate. The tables on the following pages illustrate the analytical results.

TABLE I - EPA Method 602

Well #	MW-1	MW-2	MW-3	Exc.*	State Maximum Allowable
	9/93	9/93	9/93	9/93	
Benzene	BDL	BDL	BDL	BDL	1
Toluene	BDL	BDL	BDL	BDL	1000
Chlorobenzene	BDL	BDL	BDL	BDL	50
Ethylbenzene	BDL	BDL	BDL	BDL	29
Xylenes	BDL	BDL	BDL	BDL	530
1,3 Dichlorobenzene	BDL	BDL	BDL	BDL	No Standard
1,4 Dichlorobenzene	BDL	BDL	BDL	BDL	No Standard
1,2 Dichlorobenzene	BDL	BDL	BDL	BDL	No Standard

BDL = Below Detection Level

Note: Concentrations in Parts per Billion (ppb)

* Standing water sampled from excavation site

TABLE II - Method 625

Test Parameter	MW-1	MW-2	MW-3	Excavation Sample*	State Max. Allowable (1)
Acenaphthene	BDL	BDL	BDL	BDL	NSL
Acenaphthylene	BDL	BDL	BDL	BDL	NSL
Anthracene	BDL	BDL	BDL	BDL	NSL
Benzidine	BDL	BDL	BDL	BDL	NSL
Benzo (a) Anthracene	BDL	BDL	BDL	BDL	NSL
Benzo (A) Pyrene	BDL	BDL	BDL	BDL	NSL
Benzo (b) Fluoranthene	BDL	BDL	BDL	BDL	NSL
Benzo (ghi) Perylene	BDL	BDL	BDL	BDL	NSL
Benzo (k) Fluoranthene	BDL	BDL	BDL	BDL	NSL
Benzyl Butyl Phthalate	BDL	BDL	BDL	BDL	NSL
Bis (2-Chloroethoxy) Methane	BDL	BDL	BDL	BDL	NSL
Bis (2-Chloroethyl) Ether	BDL	BDL	BDL	BDL	NSL
Bis (2-Chloroisopropyl) Ether	BDL	BDL	BDL	BDL	NSL
Bis (2-Ethylhexyl) Phthalate	BDL	BDL	BDL	BDL	NSL
4-Bromophenyl Phenyl Ether	BDL	BDL	BDL	BDL	NSL
2-Chlorophenol	BDL	BDL	BDL	BDL	0.1
4-Chloro-3-methylphenol	BDL	BDL	BDL	BDL	NSL
2-Chloronaphthalene	BDL	BDL	BDL	BDL	NSL
4-Chlorophenyl Phenyl Ether	BDL	BDL	BDL	BDL	NSL
Chrysene	BDL	BDL	BDL	BDL	NSL
Dibenzo (a,h) Anthracene	BDL	BDL	BDL	BDL	NSL
Di-n-butyl Phthalate	146	131	150	125	700
1,2-Dichlorobenzene	BDL	BDL	BDL	BDL	NSL
1,3-Dichlorobenzene	BDL	BDL	BDL	BDL	NSL
1,4-Dichlorobenzene	BDL	BDL	BDL	BDL	NSL
3,3'-Dichlorobenzidine	BDL	BDL	BDL	BDL	NSL
2,4-Dichlorophenol	BDL	BDL	BDL	BDL	NSL
Diethyl Phthalate	BDL	BDL	BDL	BDL	5000
Dimethyl Phthalate	BDL	BDL	BDL	BDL	NSL
2,4-Dimethylphenol	BDL	BDL	BDL	BDL	NSL
2,4-Dinitrotoluene	BDL	BDL	BDL	BDL	NSL
2,6-Dinitrotoluene	BDL	BDL	BDL	BDL	NSL
4,6-Dinitro-2-methylphenol	BDL	BDL	BDL	BDL	NSL
Dioctyl Phthalate	BDL	BDL	BDL	BDL	NSL
Fluoranthene	BDL	BDL	BDL	BDL	NSL
Fluorene	BDL	BDL	BDL	BDL	NSL
Hexachlorobenzene	BDL	BDL	BDL	BDL	0.02
Hexachlorobutadiene	BDL	BDL	BDL	BDL	NSL
Hexachlorocyclopentadiene	BDL	BDL	BDL	BDL	NSL
Hexachloroethane	BDL	BDL	BDL	BDL	NSL
Indeno (1,2,3-CD) Pyrene	BDL	BDL	BDL	BDL	NSL
Isophorone	BDL	BDL	BDL	BDL	NSL
2-Methylphenol	BDL	BDL	BDL	BDL	NSL
4-Methylphenol	BDL	BDL	BDL	BDL	NSL
Naphthalene	BDL	BDL	BDL	BDL	NSL

insect repellent for rodents

TABLE II (Continued)

Nitrobenzene	BDL	BDL	BDL	BDL	NSL
N-Nitrophenol	BDL	BDL	BDL	BDL	NSL
4-Nitrophenol	BDL	BDL	BDL	BDL	NSL
N-Nitrosodimethylamine	BDL	BDL	BDL	BDL	NSL
N-Nitrosodipropylamine	BDL	BDL	BDL	BDL	NSL
N-Nitrosodiphenylamine	BDL	BDL	BDL	BDL	NSL
Pentachlorophenol	BDL	BDL	BDL	BDL	0.3
Phenol	BDL	BDL	BDL	BDL	NSL
Phenanthrene	BDL	BDL	BDL	BDL	NSL
Pyrene	BDL	BDL	BDL	BDL	NSL
1,2,4-Trichlorobenzene	BDL	BDL	BDL	BDL	NSL
2,4,6-Trichlorophenol	BDL	BDL	BDL	BDL	NSL

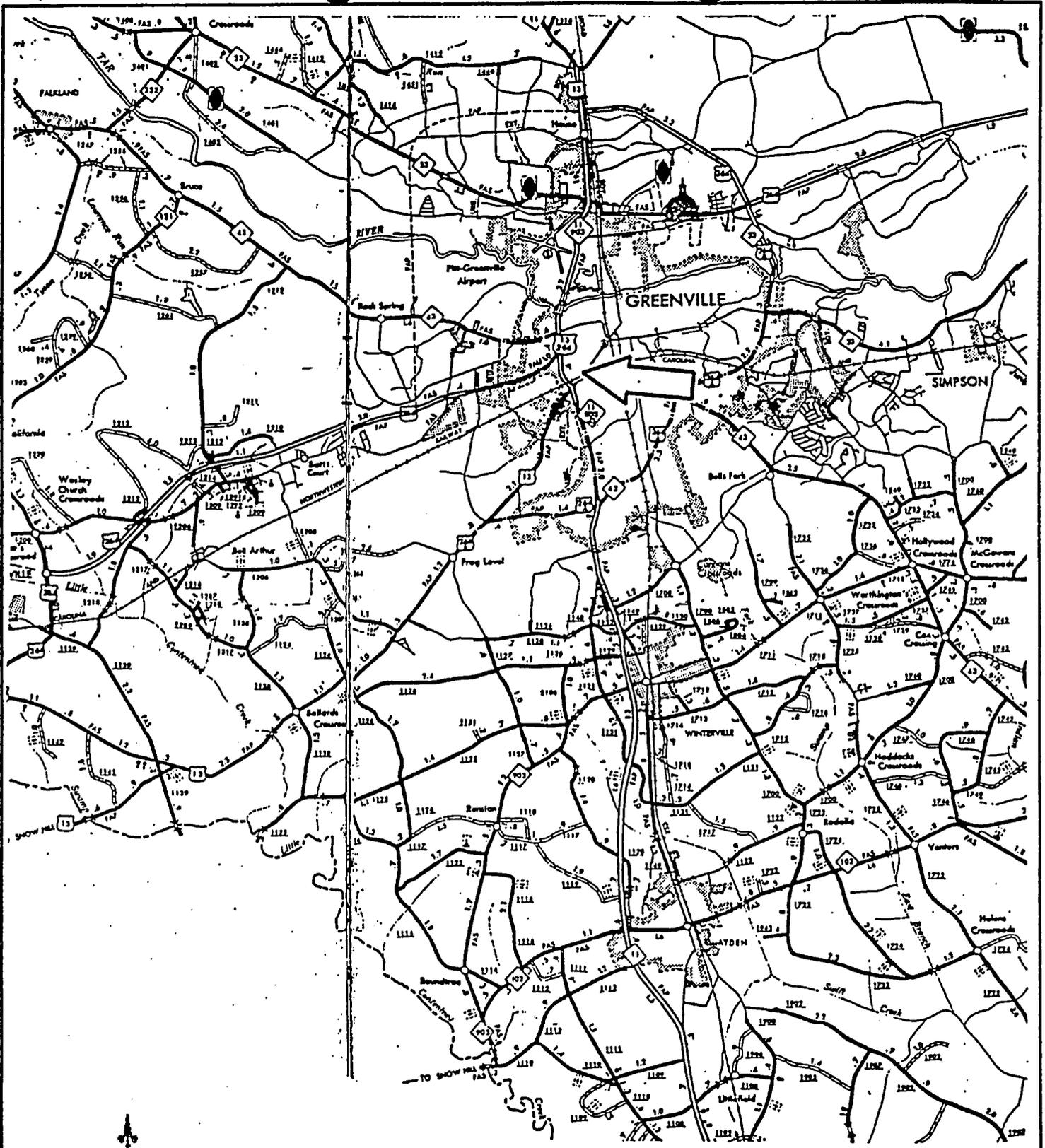
BDL - Below Detection Level NSL - No State Level

*Standing water sampled from the excavation site

Note: Concentrations in parts per billion (ppb)

3.0 CONCLUSION

On September 24, 1993, Pyramid Environmental, Inc. sampled three monitoring wells installed at the Bigelow-Karastan Mill in Greenville, North Carolina. These samples were tested by EPA Methods 602 and 625. Di-N-Butyl Phthalate was the only parameter that was detected by these laboratory analyses. We believe the detecting of this substance is caused by laboratory contamination, however, the detected concentrations are below North Carolina allowable limits.

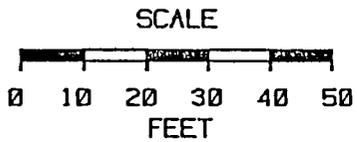
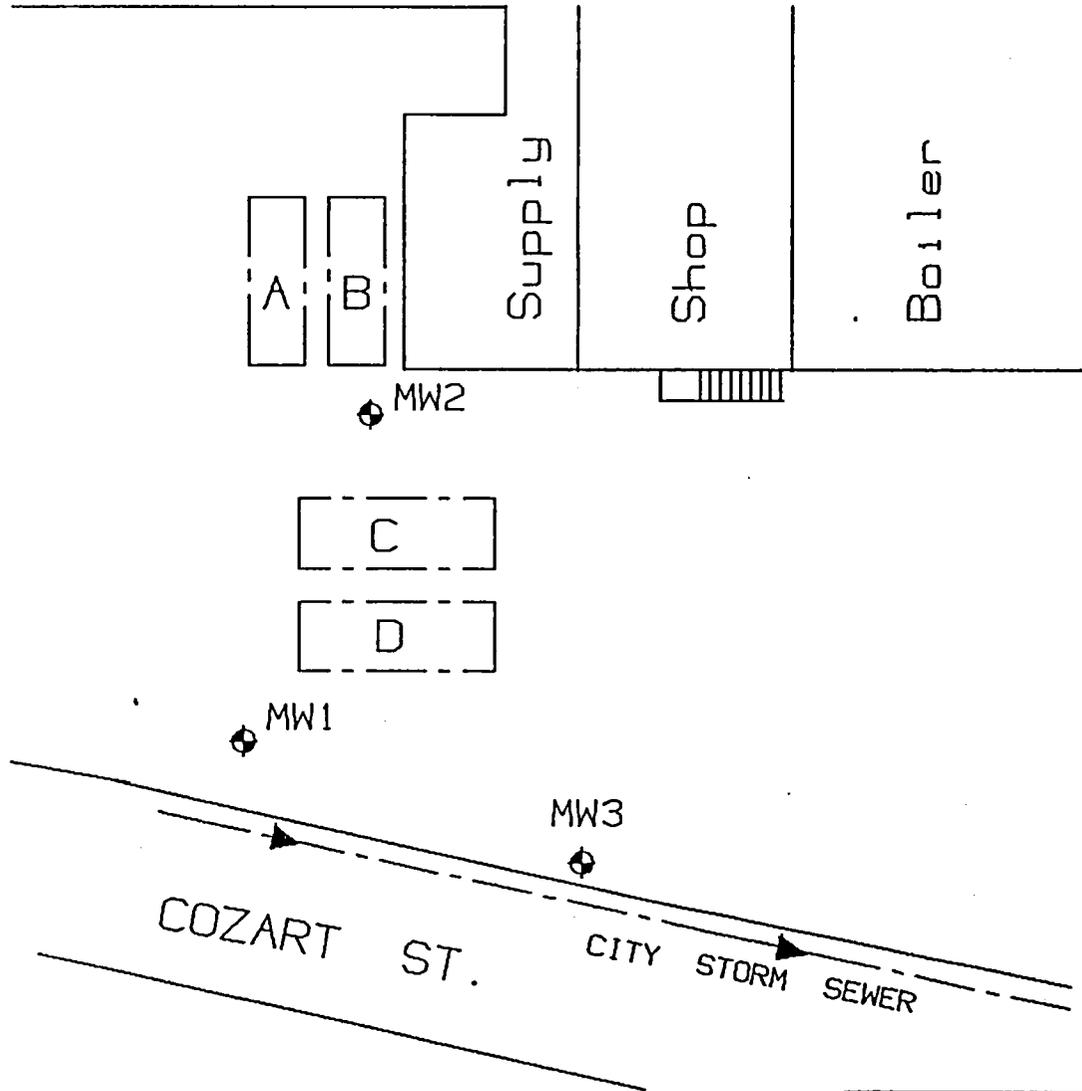


SCALE: 1" = 12,500'

PYRAMID ENVIRONMENTAL	
Fieldcrest Mill Greenville, NC	
Site Location Map	
July, 1993	Figure 1

KEY

- A - 10,000 gal UST (REMOVED)
- B - 10,000 gal UST (CLOSED IN PLACE)
- C - 20,000 gal UST (REMOVED)
- D - 20,000 gal UST (REMOVED)
-  - Monitoring Well



Pyramid Environmental	
Fieldcrest Mill Greenville, NC	
Boring Locations	
June 1993	Figure 2

APPENDIX I

Sampling Procedure

On September 24, 1993, groundwater samples were collected from monitoring wells MW-1, 2 and 3. The wells were sampled using a dedicated bailer after purging a minimum of three well volumes of water from the well. One (1) new disposable bailer was used for each well. A clean cord was attached to each bailer prior to use. Water samples were tightly sealed into clean 40 ml vials and 950 ml jars by a bottom loading device. Samples were preserved at approximately 4°C until laboratory analysis.

APPENDIX II

Laboratory Results and Chain of Custody



ACID AND BASE/NEUTRAL EXTRACTABLE ORGANICS
EPA METHOD 625 - LIQUID

WORK ORDER #: 93-09-435-04

EXTRACTED: 10/01/93 BY: MTT

ANALYZED: 10/07/93 BY: DYC

SAMPLE: Greenville
MW-1 Grab 9/24/93

QUANTITATION LIMIT MULTIPLIER: 1.05

ONLY ANALYTES THAT WERE DETECTED ARE REPORTED BELOW.

ANALYTE	CONCENTRATION (ug/L)
37 DI-N-BUTYL PHTHALATE	146

SURROGATES	% RECOVERY
2-FLUOROPHENOL	26.3
PHENOL-d5	24.7
2,4,6-TRIBROMOPHENOL	22.7
2-FLUOROBIPHENYL	58.5
NITROBENZENE-d5	38.0
4-TERPHENYL-d14	72.5

A COMPLETE LIST OF TARGET ANALYTES AND THEIR QUANTITATION LIMITS ARE ATTACHED AT THE END OF THIS REPORT.



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PMN Aquatic Bioassay Evaluations

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EPA 602/8020 VOLATILE AROMATICS - LIQUID SAMPLE

BRI WORK ORDER NUMBER(S) : 93-09-435-04
METHOD QUANTITATION LIMIT : See Below

#	ANALYTE (EPA 602/8020)	QUANTITATION LIMIT (ug/ L)	CONCENTRATION (ug/ L)	#
1	BENZENE	1.0	*	1
2	CHLOROBENZENE	1.0	*	2
3	1,2-DICHLOROBENZENE	1.0	*	3
4	1,3-DICHLOROBENZENE	1.0	*	4
5	1,4-DICHLOROBENZENE	1.0	*	5
6	ETHYL BENZENE	1.0	*	6
7	TOLUENE	1.0	*	7
8	XYLENES	1.0	*	8

* BELOW QUANTITATION LIMIT

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ACID AND BASE/NEUTRAL EXTRACTABLE ORGANICS
EPA METHOD 625 - LIQUID

WORK ORDER #: 93-09-435-05

EXTRACTED: 10/01/93 BY: MTT

ANALYZED: 10/07/93 BY: DYC

SAMPLE: Greenville
MW-2 Grab 9/24/93

QUANTITATION LIMIT MULTIPLIER: 1.11

ONLY ANALYTES THAT WERE DETECTED ARE REPORTED BELOW.

ANALYTE	CONCENTRATION (ug/L)
37 DI-N-BUTYL PHTHALATE	131

SURROGATES	% RECOVERY
2-FLUOROPHENOL	21.3
PHENOL-d5	16.2
2,4,6-TRIBROMOPHENOL	14.9
2-FLUOROBIPHENYL	27.0
NITROBENZENE-d5	38.5
4-TERPHENYL-d14	61.5

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EPA 602/8020 VOLATILE AROMATICS - LIQUID SAMPLE

BRI WORK ORDER NUMBER(S) : 93-09-435-05
METHOD QUANTITATION LIMIT : See Below

#	ANALYTE (EPA 602/8020)	QUANTITATION LIMIT (ug/ L)	CONCENTRATION (ug/ L)	#
1	BENZENE	1.0	*	1
2	CHLOROBENZENE	1.0	*	2
3	1,2-DICHLOROBENZENE	1.0	*	3
4	1,3-DICHLOROBENZENE	1.0	*	4
5	1,4-DICHLOROBENZENE	1.0	*	5
6	ETHYL BENZENE	1.0	*	6
7	TOLUENE	1.0	*	7
8	XYLENES	1.0	*	8

* BELOW QUANTITATION LIMIT

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**ACID AND BASE/NEUTRAL EXTRACTABLE ORGANICS
 EPA METHOD 625 - LIQUID**

WORK ORDER #: 93-09-435-06

EXTRACTED: 10/01/93 BY: MTT
 ANALYZED: 10/07/93 BY: DYC

SAMPLE: Greenville
 MW-3 Grab 9/24/93

QUANTITATION LIMIT MULTIPLIER: 1.22

ONLY ANALYTES THAT WERE DETECTED ARE REPORTED BELOW.

ANALYTE	CONCENTRATION (ug/L)
37 DI-N-BUTYL PHTHALATE	150

SURROGATES	% RECOVERY
2-FLUOROPHENOL	24.2
PHENOL-d5	30.0
2,4,6-TRIBROMOPHENOL	33.7
2-FLUOROBIPHENYL	45.5
NITROBENZENE-d5	53.5
4-TERPHENYL-d14	80.5

A COMPLETE LIST OF TARGET ANALYTES AND THEIR QUANTITATION LIMITS ARE ATTACHED AT THE END OF THIS REPORT.



EPA 602/8020 VOLATILE AROMATICS - LIQUID SAMPLE

BRI WORK ORDER NUMBER(S) : 93-09-435-06
METHOD QUANTITATION LIMIT : See Below

#	ANALYTE (EPA 602/8020)	QUANTITATION LIMIT (ug/ L)	CONCENTRATION (ug/ L)	#
1	BENZENE	1.0	*	1
2	CHLOROBENZENE	1.0	*	2
3	1,2-DICHLOROBENZENE	1.0	*	3
4	1,3-DICHLOROBENZENE	1.0	*	4
5	1,4-DICHLOROBENZENE	1.0	*	5
6	ETHYL BENZENE	1.0	*	6
7	TOLUENE	1.0	*	7
8	XYLENES	1.0	*	8

* BELOW QUANTITATION LIMIT



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ACID AND BASE/NEUTRAL EXTRACTABLE ORGANICS
EPA METHOD 625 - LIQUID

WORK ORDER #: 93-09-435-07

EXTRACTED: 10/01/93 BY: MTT
ANALYZED: 10/07/93 BY: DYC

SAMPLE: Greenville
Exc. #1 Grab 9/24/93

QUANTITATION LIMIT MULTIPLIER: 1.11

ONLY ANALYTES THAT WERE DETECTED ARE REPORTED BELOW.

ANALYTE	CONCENTRATION (ug/L)
---------	-------------------------

37	DI-N-BUTYL PHTHALATE
----	----------------------

125

SURROGATES

% RECOVERY

2-FLUOROPHENOL
PHENOL-d5
2,4,6-TRIBROMOPHENOL
2-FLUOROBIPHENYL
NITROBENZENE-d5
4-TERPHENYL-d14

23.0
24.8
13.9
37.5
26.5
64.5

A COMPLETE LIST OF TARGET ANALYTES AND THEIR QUANTITATION LIMITS ARE
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EPA 602/8020 VOLATILE AROMATICS - LIQUID SAMPLE

BRI WORK ORDER NUMBER(S) : 93-09-435-07
METHOD QUANTITATION LIMIT : See Below

#	ANALYTE (EPA 602/8020)-	QUANTITATION LIMIT (ug/ L)	CONCENTRATION (ug/ L)	#
1	BENZENE	1.0	*	1
2	CHLOROBENZENE	1.0	*	2
3	1,2-DICHLOROBENZENE	1.0	*	3
4	1,3-DICHLOROBENZENE	1.0	*	4
5	1,4-DICHLOROBENZENE	1.0	*	5
6	ETHYL BENZENE	1.0	*	6
7	TOLUENE	1.0	*	7
8	XYLENES	1.0	*	8

* BELOW QUANTITATION LIMIT

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Burlington Research
 5 Hullman Mill Road
 Burlington, NC 27215
 9) 584-5584
 x (919) 584-5584, Ext. 202

CHAIN OF CUSTODY RECORD

CLIENT: Fieldcrest Cannon
 Facility/Site: Greenville
 Sampler: (Print) J. Guarvello (Signature) [Signature]

CONTACT PERSON: Barbara Sifford
 Phone Number: (704) 939-2654
 Purchase Order #: 80-608590

SAMPLE ID	SAMPLE COLLECTION		SAMPLE TYPE			NO. OF CONTAINERS SENT	ANALYSES REQUIRED	FOR LAB USE ONLY		
			COMPOSITE		GRAB			SAMPLE INTEGRITY	TEMPERATURE (4°C)	PRESERVATION
	DATE TIME STARTED	DATE TIME ENDED	HAND	AUTO						
#1	9/24	10:30			✓	1	#5 Fuel Oil <u>24 Hour Turnaround</u>			
#2		1:30				1	Oil & Grease Normal Turn			
#3		10:30					#5 Fuel Oil Normal Turn <u>24 HOUR TURN</u>			
Comp 1 (South)		1:30					#5 Fuel Oil <u>24 HOUR TURN</u> NORMAL TURN			
Comp 2 (North)		1:30					#5 Fuel Oil <u>24 HOUR TURN</u> NORMAL TURN			
MW-1 through MW-3		1:30					625 for 1 liter & 602 & Xylenes NORMAL TURN			
Exc #1		1:30					625 for 1 liter & 602 & Xylenes NORMAL TURN			

OR CLIENT USE:

Relinquished by: (Signature) <u>[Signature]</u>	Received by: (Signature)	Date: <u>9/24</u>	Time: <u>9:15 PM</u>
Shipped by: (Signature)	Received by: (Signature)	Date:	Time:

Method of Shipment:

FOR LAB USE ONLY

Received in Lab FROM: (Signature)	Received for Lab BY: (Signature) <u>[Signature]</u>	Date: <u>9/25/93</u>	Time: <u>11:20</u>
Method of Shipment: <u>1/1/1/1</u>		Sample Integrity Comment:	