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STORM SEWER INVESTIGATION NAS JACKSONVILLE FL
5/1/1999
BECHTEL

STORM SEWER INVESTIGATION

JACKSONVILLE, FLORIDA

Prepared for
DEPARTMENT OF THE NAVY
SOUTHERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND

Under Contract No. N62467-93-D-0936

Prepared by

BECHTEL ENVIRONMENTAL, INC.
OAK RIDGE, TENNESSEE
May 1999

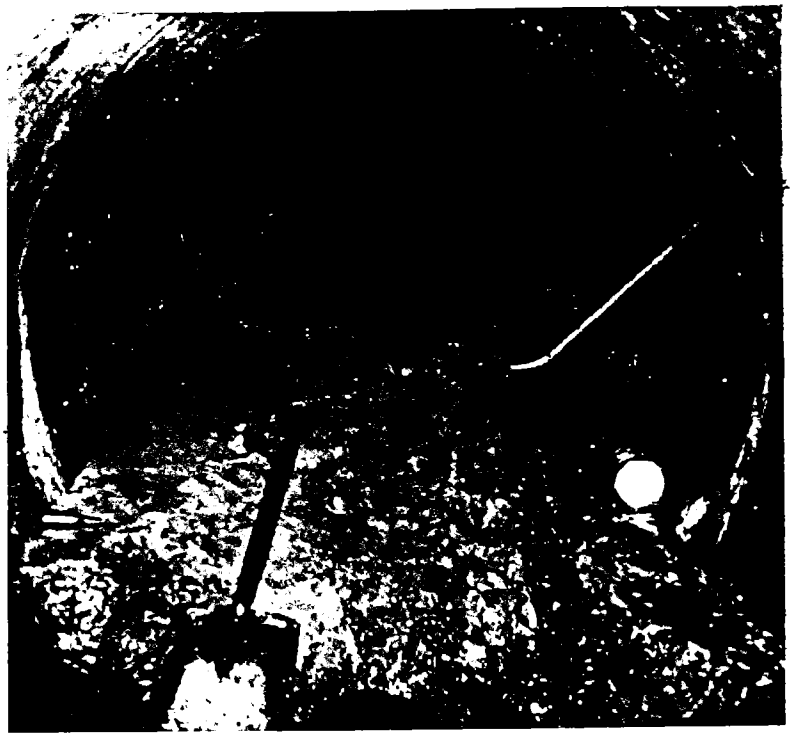
Bechtel Job No. 22567

EXECUTIVE SUMMARY

The Department of the Navy, Naval Facilities Command, Southern Division has contracted Bechtel Environmental, Inc.(BEI) to provide remedial services as the Navy's Environmental Response Action Contractor. BEI conducted a storm sewer investigation at NADEP, Jacksonville, Florida under Delivery Order 046, Task 1 of the Prime Contract N62467-93-D-0936. The site was suspect to possible intrusion of ground water contamination into the St. Johns River. The two lines were isolated using inflatable plugs. Sediment and debris from both lines were collected and placed in liquid container rolloffs at the site. The sediment and debris disposal was handled by base Public works. Personnel Protective Equipment was triple washed and disposed of as non-hazardous waste.

PROJECT DATA SHEET

NAVFAC South Div.



Project: Storm Sewer Investigation NADEP

Location: Jacksonville, Florida

Navy Contact: Larry Blackburn

Phone: (904) 542-5571 ext. 117

Bechtel Contact: Hermann Bauer

Phone: (904) 779-8900

Project Description:

Isolate two storm sewer lines. Clean lines of debris and sediment. Video tape both lines showing the condition of the pipe.

Project Innovations and Cost Savings:

Scheduled Completion: February 1999

Actual Completion: February 1999

Budget: $ 75,000.00

Cost:

Scope Additions:

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ACRONYMS

BEI	Bechtel Environmental, Inc.
CLEAN	Comprehensive Long-Term Environmental Action Navy
DOT	Department of Transportation
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
NAS	Naval Air Station
ppm	parts per million
PSC	potential source of contamination

1.0 PROBLEM STATEMENT

The U.S. Department of the Navy, through the Southern Division, Naval Facilities Engineering Command, performed a storm sewer investigation at NADEP, Jacksonville, Florida. This action was necessary asses the condition of the storm sewer lines.

The following were the objectives at the Storm Sewer site as defined in the BEI action:

- to isolate two storm sewer lines;
- remove debris and sediment deposited in the lines; and
- video tape both lines showing the condition of the pipes.

2.0 SCOPE OF WORK

During a sampling event conducted by the Navy's Comprehensive Long-Term Environmental Action Navy (CLEAN) Contractor, contamination was found to be present in the storm sewer line manholes. A total of 1,720 feet of storm sewer line was suspected to contain cracks that would allow intrusion of contaminated groundwater into the lines. An investigation of the lines to assess the condition of the storm sewer lines was conducted.

To accomplish this scope of work, the following services were performed:

- mobilization;
- pipe isolation;
- debris and sediment removal;
- video taping of both lines, final disposal of debris, sediment, and water;
- provide copy of video tapes to the U. S. Navy; and
- site restoration.

2.1 MOBILIZATION

Mobilization activities were initiated on February 9, 1999. Mobilization included delivering all construction equipment, tools, materials, supplies, and miscellaneous articles to the jobsite and establishing a subcontractor work force sufficient to commence and sustain construction activities.

2.2 PIPE ISOLATION

The downstream pipes were plugged first during a low tide. The upstream pipes were then plugged. Inflatable plugs were used to accomplish this task.

2.3 SEDIMENT REMOVAL

Subsequent to pipe isolation, the water trapped in the pipes was pumped down using a four-inch pump. Manhole covers were removed to allow ventilation of lines. One manhole had to be hand dug to be uncovered. The subcontactor utilized a vacuum truck to remove the sediment and then scraped the lines clean. Debris too large to be vacuumed out of the pipes was hand carried to a manhole where it could be removed and placed in 55-gallon drums. The vacuum truck was emptied into rolloffs placed at the site.

2.4 VIDEO TAPING

Both storm sewer lines were video taped to show the condition of the reinforced concrete pipe. The seams and any intrusive cracks where possible infiltration might be present were video taped more extensively. Pipes that intersected the manholes were also filmed. The middle portion of both lines had extensive intrusion of groundwater in the seams of the pipe joints. The western storm line had one area, located approximately 756 feet downstream from the entry point, that was noticeably allowing groundwater into the line. An area located approximately 635 feet downstream from the entry point on the eastern storm line was also noticeably allowing groundwater into the line. There were numerous intersecting storm sewer lines at the manholes. The majority of these pipes were not plugged.

2.5 WASTE DISPOSAL

One soil and one liquid sample were taken from the two rolloffs for characterization. Results of the analyses were provided to base Public Works. Two rolloffs and ten 55-gallon drums were then disposed of by base Public Works. Analytical results and manifests are included in Appendix A.

2.6 SITE RESTORATION

After site investigation, the surface area was returned to existing conditions.

APPENDIX A

SAMPLE RESULTS AND MANIFEST

Environmental Conservation Laboratories
4810 Executive Park Court, Suite 211
Jacksonville, Florida 32216-6069
904 / 296-3007
Fax 904 / 296-6210
www.encolabs.com

ENCO Laboratories

DHRS Certification No. E82277

CLIENT : Bechtel Environmental, Inc.
ADDRESS: NAS Jacksonville
P.O. Box 171
Jacksonville, FL 32215

REPORT # : JR5799
DATE SUBMITTED: March 10, 1999
DATE REPORTED : March 24, 1999

ATTENTION: Mr. Tom Rountree

SAMPLE IDENTIFICATION

Samples submitted and
identified by client as:

WO # JX056

NADEP
STORM SEWER

Rolloff Characterization Sampling

03/09/99

#1 - JX01297 @ 10:15
#2 - JX01298 @ 10:00

PROJECT MANAGER Scott D Martin
Scott D. Martin

ENCO LABORATORIES
REPORT # : JR5799
DATE REPORTED: March 24, 1999
REFERENCE : WO # JX056
PROJECT NAME : Rolloff Characterization Sampling

RESULTS OF ANALYSIS

EPA METHOD 8260 - VOLATILE ORGANICS	JX01297			Units
Dichlorodifluoromethane	250	U	D1	µg/Kg
Chloromethane	120	U	D1	µg/Kg
Vinyl Chloride	120	U	D1	µg/Kg
Bromomethane	120	U	D1	µg/Kg
Chloroethane	120	U	D1	µg/Kg
Trichlorofluoromethane	120	U	D1	µg/Kg
1,1-Dichloroethene	120	U	D1	µg/Kg
Acetone	2500	U	D1	µg/Kg
Methylene Chloride	620	U	D1	µg/Kg
t-1,2-Dichloroethene	120	U	D1	µg/Kg
Methyl tert-butyl ether	750	U	D1	µg/Kg
1,1-Dichloroethane	120	U	D1	µg/Kg
2,2-Dichloropropane	250	U	D1	µg/Kg
c-1,2-Dichloroethene	120	U	D1	µg/Kg
2-Butanone	2500	U	D1	µg/Kg
Chloroform	120	U	D1	µg/Kg
1,1,1-Trichloroethane	120	U	D1	µg/Kg
Carbon tetrachloride	120	U	D1	µg/Kg
1,1-Dichloropropene	120	U	D1	µg/Kg
Benzene	120	U	D1	µg/Kg
1,2-Dichloroethane	120	U	D1	µg/Kg
Trichloroethene	120	U	D1	µg/Kg
1,2-Dichloropropane	120	U	D1	µg/Kg
Dibromomethane	120	U	D1	µg/Kg
Bromodichloromethane	120	U	D1	µg/Kg

U = Compound was analyzed for but not detected to the level shown.
DW = Analysis is reported on a "dry weight" basis.
D1 = Analyte value determined from a 1:100 dilution.

ENCO LABORATORIES
REPORT # : JR5799
DATE REPORTED: March 24, 1999
REFERENCE : WO # JX056
PROJECT NAME : Rolloff Characterization Sampling

RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) - VOLATILE ORGANICS

	JX01297			Units
2-Chloroethyl vinyl ether	750	U	D1	µg/Kg
c-1,3-Dichloropropene	120	U	D1	µg/Kg
4-Methyl-2-pentanone	2500	U	D1	µg/Kg
Toluene	120	U	D1	µg/Kg
t-1,3-Dichloropropene	120	U	D1	µg/Kg
1,1,2-Trichloroethane	120	U	D1	µg/Kg
Tetrachloroethene	380	U	D1	µg/Kg
1,3-Dichloropropane	120	U	D1	µg/Kg
2-Hexanone	2500	U	D1	µg/Kg
Dibromochloromethane	120	U	D1	µg/Kg
1,2-Dibromoethane	120	U	D1	µg/Kg
Chlorobenzene	120	U	D1	µg/Kg
1,1,1,2-Tetrachloroethane	120	U	D1	µg/Kg
Ethylbenzene	120	U	D1	µg/Kg
m-Xylene & p-Xylene	250	U	D1	µg/Kg
o-Xylene	120	U	D1	µg/Kg
Styrene	120	U	D1	µg/Kg
Bromoform	120	U	D1	µg/Kg
Isopropylbenzene	120	U	D1	µg/Kg
1,1,2,2-Tetrachloroethane	120	U	D1	µg/Kg
Bromobenzene	120	U	D1	µg/Kg
1,2,3-Trichlorobenzene	120	U	D1	µg/Kg
n-Propylbenzene	120	U	D1	µg/Kg
2-Chlorotoluene	120	U	D1	µg/Kg
1,3,5-Trimethylbenzene	120	U	D1	µg/Kg
4-Chlorotoluene	680		D1	µg/Kg
	120	U	D1	µg/Kg

U = Compound was analyzed for but not detected to the level shown.
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D1 = Analyte value determined from a 1:100 dilution.

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RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) - VOLATILE ORGANICS	**JX01297**			**Units**
tert-Butylbenzene	120	U	D1	µg/Kg
1,2,4-Trimethylbenzene	**540**		D1	µg/Kg
s-Butylbenzene	**580**		D1	µg/Kg
1,3-Dichlorobenzene	**900**		D1	µg/Kg
p-Isopropyltoluene	**340**		D1	µg/Kg
1,4-Dichlorobenzene	**1200**		D1	µg/Kg
n-Butylbenzene	**1100**		D1	µg/Kg
1,2-Dichlorobenzene	**320**		D1	µg/Kg
1,2-Dibromo-3-chloropropane	120	U	D1	µg/Kg
1,2,4-Trichlorobenzene	120	U	D1	µg/Kg
Hexachlorobutadiene	120	U	D1	µg/Kg
Naphthalene	120	U	D1	µg/Kg
1,2,3-Trichloropropane	120	U	D1	µg/Kg
Bromochloromethane	120	U	D1	µg/Kg

Surrogate:	**% RECOV**	**LIMITS**
Dibromofluoromethane	86	59-143
D8-Toluene	100	60-115
Bromofluorobenzene	106	55-144
Date Analyzed	03/17/99	

U = Compound was analyzed for but not detected to the level shown.
DW = Analysis is reported on a "dry weight" basis.
D1 = Analyte value determined from a 1:100 dilution.

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RESULTS OF ANALYSIS

EPA METHOD 8270 - PAH Compounds	JX01297	Units
Naphthalene	17000 U D2	µg/Kg
2-Methylnaphthalene	17000 U D2	µg/Kg
1-Methylnaphthalene	17000 U D2	µg/Kg
Acenaphthylene	17000 U D2	µg/Kg
Acenaphthene	17000 U D2	µg/Kg
Fluorene	17000 U D2	µg/Kg
Phenanthrene	17000 U D2	µg/Kg
Anthracene	17000 U D2	µg/Kg
Fluoranthene	17000 U D2	µg/Kg
Pyrene	17000 U D2	µg/Kg
Chrysene	17000 U D2	µg/Kg
Benzo(a)anthracene	17000 U D2	µg/Kg
Benzo(b)fluoranthene	17000 U D2	µg/Kg
Benzo(k)fluoranthene	17000 U D2	µg/Kg
Benzo(a)pyrene	17000 U D2	µg/Kg
Indeno(1,2,3-cd)pyrene	17000 U D2	µg/Kg
Dibenzo(a,h)anthracene	17000 U D2	µg/Kg
Benzo(g,h,i)perylene	17000 U D2	µg/Kg

Surrogate:	% RECOV	LIMITS
Nitrobenzene -D5	*	12-151
2-Fluorobiphenyl	*	14-146
Terphenyl -D14	*	15-148
Date Extracted	03/15/99	
Date Analyzed	03/18/99	

* = Surrogate recovery unavailable due to matrix interference.
U = Compound was analyzed for but not detected to the level shown.
DW = Analysis is reported on a "dry weight" basis.
D2 = Analyte value determined from a 1:20 dilution.

ENCO LABORATORIES
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RESULTS OF ANALYSIS

EPA METHOD 8015 MODIFIED - DIESEL RANGE ORGANICS

	JX01297	Units
DRO (C10-C24)	11000 D1	mg/Kg
Surrogate:	% RECOV	LIMITS
m-Terphenyl	*	D-183
Date Extracted	03/11/99	
Date Analyzed	03/16/99	

EPA METHOD 8082 - PCB/Aroclors

	JX01297	Units
PCB-1016/1242	4100 U D1	µg/Kg
PCB-1221	4100 U D1	µg/Kg
PCB-1232	4100 U D1	µg/Kg
PCB-1248	4100 U D1	µg/Kg
PCB-1254	4100 U D1	µg/Kg
PCB-1260	4100 U D1	µg/Kg
Surrogate:	% RECOV	LIMITS
2,4,5,6-TCMX	*	55-152
DBC	*	55-152
Date Extracted	03/12/99	
Date Analyzed	03/18/99	

* = Surrogate recovery unavailable due to matrix interference.
U = Compound was analyzed for but not detected to the level shown.
DW = Analysis is reported on a "dry weight" basis.
D1 = Analyte value determined from a 1:100 dilution.

ENCO LABORATORIES
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RESULTS OF ANALYSIS

MISCELLANEOUS	METHOD	JX01297	Units
Percent Solids	SM2540G	80	%
Date Analyzed		03/11/99	

TOTAL METALS	METHOD	JX01297	Units
Arsenic	6010	4.0	mg/Kg
Date Analyzed		03/18/99	
Barium	6010	490	mg/Kg
Date Analyzed		03/18/99	
Cadmium	6010	69	mg/Kg
Date Analyzed		03/18/99	
Chromium	6010	410	mg/Kg
Date Analyzed		03/18/99	
Lead	6010	2500	mg/Kg
Date Analyzed		03/23/99	
Mercury	7471	2.8	mg/Kg
Date Analyzed		03/15/99	
Selenium	6010	25 U	mg/Kg
Date Analyzed		03/23/99	
Silver	6010	25	mg/Kg
Date Analyzed		03/18/99	

U = Compound was analyzed for but not detected to the level shown.
DW = Analysis is reported on a "dry weight" basis.

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RESULTS OF ANALYSIS

TCLP METALS	METHOD	JX01297	Units
TCLP Arsenic	1311/6010	0.20 U	mg/L
Date Analyzed		03/16/99	
TCLP Barium	1311/6010	10 U	mg/L
Date Analyzed		03/16/99	
TCLP Cadmium	1311/6010	**0.50**	mg/L
Date Analyzed		03/16/99	
TCLP Chromium	1311/6010	1.0 U	mg/L
Date Analyzed		03/16/99	
TCLP Lead	1311/6010	**2.1**	mg/L
Date Analyzed		03/16/99	
TCLP Mercury	1311/7470	0.0050 U	mg/L
Date Analyzed		03/16/99	
TCLP Selenium	1311/6010	0.50 U	mg/L
Date Analyzed		03/16/99	
TCLP Silver	1311/6010	1.0 U	mg/L
Date Analyzed		03/16/99	

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RESULTS OF ANALYSIS

EPA METHOD 8260 - VOLATILE ORGANICS

	JX01298	Units
Dichlorodifluoromethane	2.0 U	µg/L
Chloromethane	1.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	2.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	1.0 U	µg/L
1,1-Dichloroethene	1.0 U	µg/L
Acetone	20 U	µg/L
Methylene Chloride	5.0 U	µg/L
t-1,2-Dichloroethene	1.0 U	µg/L
Methyl tert-butyl ether	6.0 U	µg/L
1,1-Dichloroethane	1.0 U	µg/L
2,2-Dichloropropane	2.0 U	µg/L
c-1,2-Dichloroethene	1.0 U	µg/L
2-Butanone	20 U	µg/L
Chloroform	1.0 U	µg/L
1,1,1-Trichloroethane	1.0 U	µg/L
Carbon tetrachloride	1.0 U	µg/L
1,1-Dichloropropene	1.0 U	µg/L
Benzene	1.0 U	µg/L
1,2-Dichloroethane	1.0 U	µg/L
Trichloroethene	1.0 U	µg/L
1,2-Dichloropropane	1.0 U	µg/L
Dibromomethane	1.0 U	µg/L
Bromodichloromethane	1.0 U	µg/L

U = Compound was analyzed for but not detected to the level shown.

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REPORT # : JR5799
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REFERENCE : WO # JX056
PROJECT NAME : Rolloff Characterization Sampling

RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) - VOLATILE ORGANICS	**JX01298**	**Units**
2-Chloroethyl vinyl ether	6.0 U	µg/L
c-1,3-Dichloropropene	1.0 U	µg/L
4-Methyl-2-pentanone	20 U	µg/L
Toluene	1.0 U	µg/L
t-1,3-Dichloropropene	1.0 U	µg/L
1,1,2-Trichloroethane	1.0 U	µg/L
Tetrachloroethene	3.0 U	µg/L
1,3-Dichloropropane	1.0 U	µg/L
2-Hexanone	20 U	µg/L
Dibromochloromethane	1.0 U	µg/L
1,2-Dibromoethane	1.0 U	µg/L
Chlorobenzene	**2.5**	µg/L
1,1,1,2-Tetrachloroethane	1.0 U	µg/L
Ethylbenzene	1.0 U	µg/L
m-Xylene & p-Xylene	2.0 U	µg/L
o-Xylene	1.0 U	µg/L
Styrene	1.0 U	µg/L
Bromoform	1.0 U	µg/L
Isopropylbenzene	1.0 U	µg/L
1,1,2,2-Tetrachloroethane	1.0 U	µg/L
Bromobenzene	1.0 U	µg/L
1,2,3-Trichlorobenzene	1.0 U	µg/L
n-Propylbenzene	1.0 U	µg/L
2-Chlorotoluene	1.0 U	µg/L
1,3,5-Trimethylbenzene	1.0 U	µg/L
4-Chlorotoluene	1.0 U	µg/L

U = Compound was analyzed for but not detected to the level shown.

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REPORT # : JR5799
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RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) - VOLATILE ORGANICS	JX01298	Units
tert-Butylbenzene	1.0 U	µg/L
1,2,4-Trimethylbenzene	1.0 U	µg/L
s-Butylbenzene	1.0 U	µg/L
1,3-Dichlorobenzene	**2.6**	µg/L
p-Isopropyltoluene	1.0 U	µg/L
1,4-Dichlorobenzene	**4.1**	µg/L
n-Butylbenzene	1.0 U	µg/L
1,2-Dichlorobenzene	**2.0**	µg/L
1,2-Dibromo-3-chloropropane	1.0 U	µg/L
1,2,4-Trichlorobenzene	1.0 U	µg/L
Hexachlorobutadiene	1.0 U	µg/L
Naphthalene	2.0 U	µg/L
1,2,3-Trichloropropane	1.0 U	µg/L
Bromochloromethane	1.0 U	µg/L
Surrogate:	**% RECOV**	**LIMITS**
Dibromofluoromethane	100	38-143
D8-Toluene	100	78-126
Bromofluorobenzene	101	72-132
Date Analyzed	03/19/99	

U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
REPORT # : JR5799
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RESULTS OF ANALYSIS

EPA METHOD 8270 - SEMIVOLATILE ORGANICS

	JX01298	Units
Acenaphthene	10 U	µg/L
Acenaphthylene	10 U	µg/L
Anthracene	10 U	µg/L
Benzidine	10 U	µg/L
Benzo(a)anthracene	10 U	µg/L
Benzo(b)fluoranthene	10 U	µg/L
Benzo(k)fluoranthene	10 U	µg/L
Benzo(g,h,i)perylene	10 U	µg/L
Benzo(a)pyrene	10 U	µg/L
Benzylbutyl phthalate	10 U	µg/L
Bis(2-chloroethoxy)methane	10 U	µg/L
Bis(2-chloroethyl)ether	10 U	µg/L
Bis(2-chloroisopropyl)ether	10 U	µg/L
Bis(2-ethylhexyl)phthalate	10 U	µg/L
4-Bromophenylphenyl ether	10 U	µg/L
2-Chloronaphthalene	10 U	µg/L
4-Chlorophenyl phenyl ether	10 U	µg/L
Chrysene	10 U	µg/L
Dibenzo(a,h)anthracene	10 U	µg/L
1,2-Dichlorobenzene	10 U	µg/L
1,3-Dichlorobenzene	10 U	µg/L
1,4-Dichlorobenzene	10 U	µg/L
3,3'-Dichlorobenzidine	10 U	µg/L
Diethyl phthalate	20 U	µg/L
Dimethyl phthalate	10 U	µg/L
Di-n-butyl phthalate	10 U	µg/L
Di-n-octyl phthalate	10 U	µg/L
2,4-Dinitrotoluene	10 U	µg/L
2,6-Dinitrotoluene	10 U	µg/L

U = Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

EPA METHOD 8270 (cont.) - SEMIVOLATILE ORGANICS

	JX01298	Units
Fluoranthene	10 U	µg/L
Fluorene	10 U	µg/L
Hexachlorobenzene	10 U	µg/L
Hexachlorobutadiene	10 U	µg/L
Hexachlorocyclopentadiene	10 U	µg/L
Hexachloroethane	10 U	µg/L
Indeno(1,2,3-cd)pyrene	10 U	µg/L
Isophorone	10 U	µg/L
1-Methylnaphthalene	10 U	µg/L
2-Methylnaphthalene	10 U	µg/L
Naphthalene	10 U	µg/L
Nitrobenzene	10 U	µg/L
N-Nitrosodimethylamine	10 U	µg/L
N-Nitrosodi-n-propylamine	10 U	µg/L
N-Nitrosodiphenylamine	10 U	µg/L
Phenanthrene	10 U	µg/L
Pyrene	10 U	µg/L
1,2,4-Trichlorobenzene	10 U	µg/L
Benzyl Alcohol	10 U	µg/L
Benzoic Acid	10 U	µg/L
4-Chloroaniline	10 U	µg/L
2-Nitroaniline	10 U	µg/L
3-Nitroaniline	10 U	µg/L
4-Nitroaniline	10 U	µg/L
Dibenzofuran	10 U	µg/L

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REPORT # : JR5799
DATE REPORTED: March 24, 1999
REFERENCE : WO # JX056
PROJECT NAME : Rolloff Characterization Sampling

RESULTS OF ANALYSIS

EPA METHOD 8270 (cont.) - SEMIVOLATILE ORGANICS

	JX01298	Units
Pyridine	10 U	µg/L
4-Chloro-3-methylphenol	10 U	µg/L
2-Chlorophenol	10 U	µg/L
2,4-Dichlorophenol	10 U	µg/L
2,4-Dimethylphenol	10 U	µg/L
2,4-Dinitrophenol	50 U	µg/L
2-Methyl-4,6-dinitrophenol	30 U	µg/L
2-Nitrophenol	10 U	µg/L
4-Nitrophenol	10 U	µg/L
Pentachlorophenol	14	µg/L
Phenol	10 U	µg/L
2,4,6-Trichlorophenol	10 U	µg/L
2-Methylphenol	10 U	µg/L
3 & 4-Methylphenol	10 U	µg/L
2,4,5-Trichlorophenol	10 U	µg/L

Surrogate:	% RECOV	LIMITS
Nitrobenzene -D5	36	30-106
2-Fluorobiphenyl	35	38-107
Terphenyl -D14	38	29-131
Phenol -D5	30	12-87
2-Fluorophenol	33	19-115
2,4,6-Tribromophenol	61	35-126
Date Extracted	03/16/99	
Date Analyzed	03/18/99	

U = Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

TOTAL METALS	METHOD	JX01298	Units
Arsenic	200.7	0.010 U	mg/L
Date Analyzed		03/12/99	
Barium	200.7	0.10 U	mg/L
Date Analyzed		03/12/99	
Cadmium	200.7	**0.039**	mg/L
Date Analyzed		03/12/99	
Chromium	200.7	**0.14**	mg/L
Date Analyzed		03/12/99	
Lead	200.7	**1.6**	mg/L
Date Analyzed		03/16/99	
Mercury	245.1	**0.0011**	mg/L
Date Analyzed		03/16/99	
Selenium	200.7	0.010 U	mg/L
Date Analyzed		03/12/99	
Silver	200.7	**0.019**	mg/L
Date Analyzed		03/12/99	

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RESULTS OF ANALYSIS

EPA METHOD 8082 - PCB/Aroclors

	JX01298	Units
PCB-1016/1242	1.0 U	µg/L
PCB-1221	1.0 U	µg/L
PCB-1232	1.0 U	µg/L
PCB-1248	1.0 U	µg/L
PCB-1254	1.0 U	µg/L
PCB-1260	1.0 U	µg/L
Surrogate:	% RECOV	LIMITS
2,4,5,6-TCMX	*	55-152
DBC	76	55-152
Date Extracted	03/16/99	
Date Analyzed	03/23/99	

FL METHOD FLPRO - PETROL. RESIDUAL ORG.

	JX01298	Units
Hydrocarbons (C8-C40)	0.30	mg/L
Surrogate:	% RECOV	LIMITS
o-Terphenyl	92	65-140
Date Extracted	03/09/99	
Date Analyzed	03/16/99	

* = Surrogate recovery unavailable due to matrix interference.
U = Compound was analyzed for but not detected to the level shown.

ENCO LABORATORIES
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RESULTS OF ANALYSIS

EPA METHOD 8260 - VOLATILE ORGANICS	LAB BLANK	Units
Dichlorodifluoromethane	2.0 U	µg/L
Chloromethane	1.0 U	µg/L
Vinyl Chloride	1.0 U	µg/L
Bromomethane	2.0 U	µg/L
Chloroethane	2.0 U	µg/L
Trichlorofluoromethane	1.0 U	µg/L
1,1-Dichloroethene	1.0 U	µg/L
Acetone	20 U	µg/L
Methylene Chloride	5.0 U	µg/L
t-1,2-Dichloroethene	1.0 U	µg/L
Methyl tert-butyl ether	6.0 U	µg/L
1,1-Dichloroethane	1.0 U	µg/L
2,2-Dichloropropane	2.0 U	µg/L
c-1,2-Dichloroethene	1.0 U	µg/L
2-Butanone	20 U	µg/L
Chloroform	1.0 U	µg/L
1,1,1-Trichloroethane	1.0 U	µg/L
Carbon tetrachloride	1.0 U	µg/L
1,1-Dichloropropene	1.0 U	µg/L
Benzene	1.0 U	µg/L
1,2-Dichloroethane	1.0 U	µg/L
Trichloroethene	1.0 U	µg/L
1,2-Dichloropropane	1.0 U	µg/L
Dibromomethane	1.0 U	µg/L
Bromodichloromethane	1.0 U	µg/L

U = Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) - VOLATILE ORGANICS	LAB BLANK	Units
2-Chloroethyl vinyl ether	6.0 U	µg/L
c-1,3-Dichloropropene	1.0 U	µg/L
4-Methyl-2-pentanone	20 U	µg/L
Toluene	1.0 U	µg/L
t-1,3-Dichloropropene	1.0 U	µg/L
1,1,2-Trichloroethane	1.0 U	µg/L
Tetrachloroethene	3.0 U	µg/L
1,3-Dichloropropane	1.0 U	µg/L
2-Hexanone	20 U	µg/L
Dibromochloromethane	1.0 U	µg/L
1,2-Dibromoethane	1.0 U	µg/L
Chlorobenzene	1.0 U	µg/L
1,1,1,2-Tetrachloroethane	1.0 U	µg/L
Ethylbenzene	1.0 U	µg/L
m-Xylene & p-Xylene	2.0 U	µg/L
o-Xylene	1.0 U	µg/L
Styrene	1.0 U	µg/L
Bromoform	1.0 U	µg/L
Isopropylbenzene	1.0 U	µg/L
1,1,2,2-Tetrachloroethane	1.0 U	µg/L
Bromobenzene	1.0 U	µg/L
1,2,3-Trichlorobenzene	1.0 U	µg/L
n-Propylbenzene	1.0 U	µg/L
2-Chlorotoluene	1.0 U	µg/L
1,3,5-Trimethylbenzene	1.0 U	µg/L
4-Chlorotoluene	1.0 U	µg/L

U = Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

EPA METHOD 8260 (cont.) - VOLATILE ORGANICS	LAB BLANK	Units
tert-Butylbenzene	1.0 U	µg/L
1,2,4-Trimethylbenzene	1.0 U	µg/L
s-Butylbenzene	1.0 U	µg/L
1,3-Dichlorobenzene	1.0 U	µg/L
p-Isopropyltoluene	1.0 U	µg/L
1,4-Dichlorobenzene	1.0 U	µg/L
n-Butylbenzene	1.0 U	µg/L
1,2-Dichlorobenzene	1.0 U	µg/L
1,2-Dibromo-3-chloropropane	1.0 U	µg/L
1,2,4-Trichlorobenzene	1.0 U	µg/L
Hexachlorobutadiene	1.0 U	µg/L
Naphthalene	1.0 U	µg/L
1,2,3-Trichloropropane	2.0 U	µg/L
Bromochloromethane	1.0 U	µg/L
	1.0 U	µg/L

Surrogate:	% RECOV	LIMITS
Dibromofluoromethane	104	38-143
D8-Toluene	98	78-126
Bromofluorobenzene	102	72-132
Date Analyzed	03/19/99	

U = Compound was analyzed for but not detected to the level shown.

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RESULTS OF ANALYSIS

EPA METHOD 8260 - VOLATILE ORGANICS	LAB BLANK			Units
Dichlorodifluoromethane	200	U	D1	µg/Kg
Chloromethane	100	U	D1	µg/Kg
Vinyl Chloride	100	U	D1	µg/Kg
Bromomethane	100	U	D1	µg/Kg
Chloroethane	100	U	D1	µg/Kg
Trichlorofluoromethane	100	U	D1	µg/Kg
1,1-Dichloroethene	100	U	D1	µg/Kg
Acetone	2000	U	D1	µg/Kg
Methylene Chloride	500	U	D1	µg/Kg
t-1,2-Dichloroethene	100	U	D1	µg/Kg
Methyl tert-butyl ether	600	U	D1	µg/Kg
1,1-Dichloroethane	100	U	D1	µg/Kg
2,2-Dichloropropane	200	U	D1	µg/Kg
c-1,2-Dichloroethene	100	U	D1	µg/Kg
2-Butanone	2000	U	D1	µg/Kg
Chloroform	100	U	D1	µg/Kg
1,1,1-Trichloroethane	100	U	D1	µg/Kg
Carbon tetrachloride	100	U	D1	µg/Kg
1,1-Dichloropropene	100	U	D1	µg/Kg
Benzene	100	U	D1	µg/Kg
1,2-Dichloroethane	100	U	D1	µg/Kg
Trichloroethene	100	U	D1	µg/Kg
1,2-Dichloropropane	100	U	D1	µg/Kg
Dibromomethane	100	U	D1	µg/Kg
Bromodichloromethane	100	U	D1	µg/Kg

U = Compound was analyzed for but not detected to the level shown.
D1 = Analyte value determined from a 1:100 dilution.