



## FOSTER WHEELER ENVIRONMENTAL CORPORATION

August 31, 1998  
File #: 1284-0018-98-0425

Commanding Officer  
Northern Division  
Naval Facilities Engineering Command  
10 Industrial Highway, Mail Stop #82  
Lester, PA 19113  
Attn.: Code 4023 (S. Lehman)

Subject: US NAVY CONTRACT NO. N62472-94-D-0398  
DELIVERY ORDER NO. 0018-06, NAWC WARMINSTER, PA  
July, 1998 GROUNDWATER PUMP & TREAT SYSTEM  
MONTHLY REPORT

Dear Mr. Lehman:

This letter report provides the results of the July, 1998 sampling and the activities performed during the reporting period from July 1, 1998 through July 31, 1998. The groundwater treatment plant operated 42 % of the reporting period.

As of July 31, 1998 (2400 hours) a total of 532,227 gallons of groundwater had been treated during the period from July 1, 1998 through July 31, 1998. This brings the total amount of water treated to 30,439,261 gallons (July 31, 1998). During July, 1998 the average effluent flowrate was 28.3 gpm.

The process water was sampled on July 27, 1998. The results of this sampling are presented in the attached table. This data shows that no discharge limits were exceeded during the July, 1998 reporting period.

During the reporting period there was one system induced shutdown and one operator induced shutdowns:

### System Induced Shutdown -

07/23/98 - 0631 hours Shut down due to brief power outage due to electrical storms. One external modem was damaged. The system was restarted on July 24, 1998 at 0934 hours.

## Operator Induced Shutdown-

07/22/98 - 1045 to 1300 hours Operator shutdown system to remove the CMCS computer motherboard and I/O board, and to check the jumper placements with Comark technical staff.

### Additional maintenance items performed:

- 07/14/98 - The sand filter injection tube was pulled, the ports cleaned and controls reset to factory specifications. The moisture knock-out for the sand filter control valve was cleaned.
- 07/15/98 - The CMCS computer was received from Comark and remounted in the CMCS. The computer was not identifying the system key to run the Genesis software, so the system would not start.
- 07/17/98 - The system was restarted after making IRQ changes in the BIOS "chip set" set up. The LPT parallel port had been disabled. After re-enabling LPT1 the computer was able to read the system key properly. The system was restarted at 0930 hours.
- 07/29/98 - Installed telephone line surge protectors in the CMCS.

The Tetrachloroethene concentration in the groundwater influent to the system was 14.8 ug/l (Area C influent), with a total of 0.066 pounds of Tetrachloroethene removed during the July, 1998 reporting period. The total amount of Tetrachloroethene removed through July, 1998 is 2.696 pounds.

Calculation:
Average PCE concentration = 14.8 ug/l
Average water flowrate for month of June, 1998 = 28.3 gpm
Pounds of PCE removed = (28.3 gpm)( 18806 min)(14.8 ug/l)(3.785 l/gal) (1 g / 1,000,000 ug)(1 lb / 454 g) = 0.066lbs PCE

The scheduled dates which Foster Wheeler Environmental's operator will be on-site during the month of September, 1998 are presented in the attached schedule.

If you should have any questions or comments regarding the July, 1998 reporting period, please feel free to contact either me at 215-702-4020 or Dave DiCesare at 215-702-4074.

Sincerely,



John F. Magee, P.E.  
Project Manager



David J. DiCesare  
Project Engineer

cc: L. Monaco (NORTHDIV)  
T. Ames (CSO)  
N. Crickman (PADEP)  
M. Hunter (CSO)  
E. Beatty (ROICC)  
A. Flipse (PADEP)  
D. Ostrauskas (USEPA)  
A. Wills (Bucks Co. Dept. of Health)  
D. Fennimore (Earth Data Inc.)  
A. Holcomb (FWENC)  
File

**Foster Wheeler Environmental Corporation  
NAWC, Warminster Groundwater Pump and Treatment Plant  
Operator Schedule for September, 1998**

**Thursday, September 3, 1998**

**Tuesday, September 8, 1998**

**Thursday, September 10, 1998**

**Monday, September 14, 1998**

**Thursday, September 17, 1998**

**Tuesday, September 22, 1998**

**Thursday, September 24, 1998**

**Tuesday, September 29, 1998**

**Foster Wheeler Environmental Corporation**  
**NAWC, Warminster - Groundwater Pump and Treat Plant**  
**July, 1998 - Sampling Results**

FWENC - Sample ID		DO-0018-06-001	DO-0018-06-02	DO-0018-06-003	DO-0018-06-004	DO-0018-06-05	DO-0018-06-06	DO-0018-06-007	
Sample Location		Area C Influent	Equalization Tank Effluent	Inclined Plate Separator Effluent	Sand Filter Effluent	Air Stripper Effluent	Lead Carbon Unit Effluent	Treatment Plant Effluent	Discharge Limits
Sample Date	Method	27-Jul-98	27-Jul-98	27-Jul-98	27-Jul-98	27-Jul-98	27-Jul-98	27-Jul-98	Instantaneous Maximum
Total Discharge (gal.) thru 7/31/98									532,227
Average Discharge Flowrate (gpm) for July, 1998									28.3
pH	EPA 150.1	7.5	7.8	N/A	7.7	N/A	N/A	7.7	6.0-9.0
Total Suspended Solids (mg/l)	EPA 160.2	BDL	BDL	BDL	BDL	N/A	N/A	BDL	75 mg/l
Total Organic Carbon (mg/l)	415.1/EPA600	N/A	BDL	N/A	N/A	N/A	BDL	BDL	-
Carbon Tetrachloride	EPA 8260A	BDL	BDL	N/A	N/A	BDL	BDL	BDL	4.2 ug/l
Tetrachloroethene	EPA 8260A	BDL	BDL	N/A	N/A	BDL	BDL	BDL	10.0 ug/l
Trichloroethene	EPA 8260A	14.8	7.9	N/A	N/A	BDL	BDL	BDL	42.5 ug/l
Vinyl Chloride	EPA 8260A	BDL	BDL	N/A	N/A	BDL	BDL	BDL	0.27 ug/l
1,1-Dichloroethene	EPA 8260A	BDL	BDL	N/A	N/A	BDL	BDL	BDL	0.85 ug/l
Cadmium	SW846	N/A	BDL	N/A	BDL	N/A	N/A	BDL	4.0 ug/l
Copper	SW846	N/A	BDL	N/A	11	N/A	N/A	BDL	24.0 ug/l
Lead	SW846	N/A	BDL	N/A	BDL	N/A	N/A	BDL	11.0 ug/l
Zinc	SW846	N/A	96	N/A	17	N/A	N/A	37	157 ug/l
Arsenic	SW846	N/A	BDL	N/A	BDL	N/A	N/A	BDL	0.27 ug/l
Aluminum	SW846	N/A	101	N/A	96	N/A	N/A	113	1875 ug/l
Total Iron	SW846	N/A	172	N/A	156	N/A	N/A	94	3600 ug/l
Total Manganese	SW846	N/A	BDL	N/A	BDL	N/A	N/A	BDL	3750 ug/l
Mercury	SW846	N/A	BDL	N/A	BDL	N/A	N/A	BDL	0.045 ug/l
Total Cyanide (mg/l)	SW846 335.3	N/A	BDL	N/A	BDL	N/A	N/A	BDL	-
Chromium (+6) - (mg/l)	SW846 7196	N/A	BDL	N/A	BDL	N/A	N/A	BDL	23.2 ug/l

**NOTES:**

1 - All concentrations are in ug/l unless otherwise noted.  
N/A - indicates compound was not analyzed for.  
BDL - Below Detection Limits

Received: 07/28/98

08/10/98 14:14:39

REPORT FOSTER & WHEELER  
TO 1 OXFORD VALLEY, SUITE 200  
LANGHORNE, PA. 19047  
215-702-4007 FAX: 4045

ATTEN DAVE DICESARE

PREPARED TOXIKON CORPORATION  
BY 15 WIGGINS AVE  
BEDFORD, MA 01730

ATTEN PAUL LEZBERG  
PHONE (617)275-3330

  
CERTIFIED BY

CONTACT CHUCKC

CLIENT FOSTER SAMPLES 8  
COMPANY FOSTER & WHEELER  
FACILITY 1 OXFORD VALLEY, SUITE 200  
LANGHORNE, PA. 19047

MA CERT # M-MA064: TRACE METALS, SULFATE, CYANIDE, RES. FREE  
CHLORINE, Ca, TOTAL ALK., TDS, pH, THMs, VOC, PEST., NUTRIENTS.  
DEMAND, O&G, PHENOLICS, PCBs . CT DHS #PH-0563, NY #10778  
FL HRS E87143, NJ DEP 59538, NC DNR286, SC 88002, NH 204091-C.

WORK ID NAWC WARMINSTER  
TAKEN 7/27/98  
TRANS \_\_\_\_\_  
TYPE WATER  
P.O. # \_\_\_\_\_  
INVOICE under separate cover

VERIFIED BY: 

**SAMPLE IDENTIFICATION**

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

- 01 DO-0018-06-001
- 02 DO-0018-06-002
- 02 DO-0018-06-002 DISSOLVED
- 03 DO-0018-06-003
- 04 DO-0018-06-004
- 04 DO-0018-06-004 DISSOLVED
- 05 DO-0018-06-005
- 06 DO-0018-06-006
- 07 DO-0018-06-007
- 07 DO-0018-06-007 DISSOLVED
- 08 DO-0018-06-FIELD BLANK
- 08 DO-0018-06-FIELD BLANK DIS

- AL ALUMINUM
- AS ARSENIC
- CD CADMIUM
- CN TOT CYANIDE TOTAL
- CR HEX CHROMIUM HEXAVALENT
- CU COPPER
- FE IRON
- GENERC GENERIC TEST METHOD
- HG MERCURY
- MEX DW METALS, DIS. EXT., WATER
- MEX HG METALS, EXT. FOR MERCURY
- MEX TW METALS, TOTAL EXT., WATER
- MN MANGANESE
- PB LEAD
- PH W PH - AQUEOUS
- TOC TOC
- TSS TOTAL SUSPENDEED SOLIDS
- TTOVOA PURGEABLE ORGANICS VOA
- ZN ZINC

SAMPLE ID	<u>DO-0018-06-001</u>	SAMPLE #	<u>01</u>	FRACTIONS:	<u>A</u>
		Date & Time Collected	<u>07/27/98 13:26:00</u>	Category	<u>WATER</u>
PH	<u>7.5</u>	TSS	<u>ND</u>		
	PH UNITS		mg/L	DL=4.0	



Received: 07/28/98

Results by Sample

SAMPLE ID DO-0018-06-001FRACTION 01A TEST CODE TTOVOA NAME PURGEABLE ORGANICS VOADate & Time Collected 07/27/98 13:26:00Category WATERPURGEABLE ORGANICS VOA

	RESULT	LIMIT		RESULT	LIMIT
Acrolein	ND	100	Trichloroethene	ND	2.0
Acrylonitrile	ND	10	Dibromochloromethane	ND	2.0
Chloromethane	ND	2.0	1,1,2-Trichloroethane	ND	2.0
Bromomethane	ND	2.0	Benzene	ND	2.0
Vinyl Chloride	ND	10	cis-1,3-Dichloropropene	ND	2.0
Chloroethane	ND	2.0	2-Chloroethylvinylether	ND	2.0
Methylene Chloride	ND	10	Bromoform	ND	2.0
Dichlorodifluoromethane	ND	5.0	Tetrachloroethene	14.8	2.0
1,1-Dichloroethene	ND	2.0	1,1,2,2-Tetrachloroethane	ND	2.0
Trichlorofluoromethane	ND	2.0	Toluene	ND	2.0
1,1-Dichloroethane	ND	2.0	Chlorobenzene	ND	2.0
Trans 1,2-Dichloroethene	ND	2.0	Ethyl Benzene	ND	2.0
Chloroform	ND	2.0	TOTAL TTO	14.8	
1,2-Dichloroethane	ND	2.0			
1,1,1-Trichloroethane	ND	2.0			
Carbon Tetrachloride	ND	2.0			
Bromodichloromethane	ND	2.0			
1,2-Dichloropropane	ND	2.0			

## Notes and Definitions for this Report:

DATE RUN: 08/06/98ANALYST: JPMINSTRUMENT: DDIL. FACTOR: 1

COMMENTS: \_\_\_\_\_

UNITS: ug/L

ND = not detected at detection limit

Received: 07/28/98

Results by Sample

SAMPLE ID <u>DO-0018-06-002</u>		SAMPLE # <u>02</u>		FRACTIONS: <u>A</u>							
Date & Time Collected <u>07/27/98 13:21:00</u>				Category <u>WATER</u>							
AL	<u>0.101</u>	AS	<u>ND</u>	CO	<u>ND</u>	CN_TOT	<u>ND</u>	CR_HEX	<u>ND</u>	CJ	<u>ND</u>
mg/L	DL=0.050	mg/L	DL=0.005	mg/L	DL=0.005	mg/L	DL=0.01	mg/L	DL=0.05	mg/L	DL=0.005
FE	<u>0.172</u>	HG	<u>ND</u>	MN	<u>ND</u>	PB	<u>ND</u>	PH_W	<u>7.8</u>	TOC	<u>ND</u>
mg/L	DL=0.010	mg/L	DL=0.0005	mg/L	DL=0.005	mg/L	DL=0.005	PH UNITS		mg/L	DL=1.0
TSS	<u>ND</u>	ZN	<u>0.096</u>								
mg/L	DL=4.0	mg/L	DL=0.005								



SAMPLE ID DO-0018-06-002 FRACTION 02A TEST CODE TTOVOA NAME PURGEABLE ORGANICS VOA  
Date & Time Collected 07/27/98 13:21:00 Category WATER

PURGEABLE ORGANICS VOA

	RESULT	LIMIT		RESULT	LIMIT
Acrolein	ND	100	Trichloroethene	ND	2.0
Acrylonitrile	ND	10	Dibromochloromethane	ND	2.0
Chloromethane	ND	2.0	1,1,2-Trichloroethane	ND	2.0
Bromomethane	ND	2.0	Benzene	ND	2.0
Vinyl Chloride	ND	10	cis-1,3-Dichloropropene	ND	2.0
Chloroethane	ND	2.0	2-Chloroethylvinylether	ND	2.0
Methylene Chloride	ND	10	Bromoform	ND	2.0
Dichlorodifluoromethane	ND	5.0	Tetrachloroethene	7.9	2.0
1,1-Dichloroethene	ND	2.0	1,1,2,2-Tetrachloroethane	ND	2.0
Trichlorofluoromethane	ND	2.0	Toluene	ND	2.0
1,1-Dichloroethane	ND	2.0	Chlorobenzene	ND	2.0
Trans 1,2-Dichloroethene	ND	2.0	Ethyl Benzene	ND	2.0
Chloroform	ND	2.0	TOTAL TTO	7.9	
1,2-Dichloroethane	ND	2.0			
1,1,1-Trichloroethane	ND	2.0			
Carbon Tetrachloride	ND	2.0			
Bromodichloromethane	ND	2.0			
1,2-Dichloropropane	ND	2.0			

Notes and Definitions for this Report:

DATE RUN: 08/06/98  
ANALYST: JPM  
INSTRUMENT: D  
DIL. FACTOR: 1  
COMMENTS: \_\_\_\_\_  
UNITS: ug/L

ND = not detected at detection limit

SAMPLE ID DO-0018-06-002 DISSOLVED SAMPLE # 02 FRACTIONS: B  
Date & Time Collected 07/27/98 13:21:00 Category WATER  
  
FE ND  
mg/L DL=0.020

SAMPLE ID DO-0018-06-003 SAMPLE # 03 FRACTIONS: A  
Date & Time Collected 07/27/98 13:17:00 Category WATER  
  
TSS ND  
mg/L DL=4.0

SAMPLE ID DO-0018-06-004 SAMPLE # 04 FRACTIONS: A  
Date & Time Collected 07/27/98 13:13:00 Category WATER  
  
AL 0.096 AS ND CD ND CN\_TOT ND CR\_HEX ND CU 0.011  
mg/L DL=0.050 mg/L DL=0.005 mg/L DL=0.005 mg/L DL=0.01 mg/L DL=0.05 mg/L DL=0.005  
  
FE 0.156 HG ND MN ND PB ND PH\_W 7.7 TSS ND  
mg/L DL=0.010 mg/L DL=0.0005 mg/L DL=0.005 mg/L DL=0.005 PH UNITS mg/L DL=4.0  
  
ZN 0.017  
mg/L DL=0.005

SAMPLE ID DO-0018-06-004 DISSOLVED SAMPLE # 04 FRACTIONS: B  
Date & Time Collected 07/27/98 13:13:00 Category WATER  
  
FE ND  
mg/L DL=0.020



Received: 07/28/98

Results by Sample

SAMPLE ID DO-0018-06-005FRACTION 05A TEST CODE TTOVOA NAME PURGEABLE ORGANICS VOADate & Time Collected 07/27/98 13:10:00Category WATER**PURGEABLE ORGANICS VOA**

	RESULT	LIMIT		RESULT	LIMIT
Acrolein	ND	100	Trichloroethene	ND	2.0
Acrylonitrile	ND	10	Dibromochloromethane	ND	2.0
Chloromethane	ND	2.0	1,1,2-Trichloroethane	ND	2.0
Bromomethane	ND	2.0	Benzene	ND	2.0
Vinyl Chloride	ND	10	cis-1,3-Dichloropropene	ND	2.0
Chloroethane	ND	2.0	2-Chloroethylvinylether	ND	2.0
Methylene Chloride	ND	10	Bromoform	ND	2.0
Dichlorodifluoromethane	ND	5.0	Tetrachloroethene	ND	2.0
1,1-Dichloroethene	ND	2.0	1,1,2,2-Tetrachloroethane	ND	2.0
Trichlorofluoromethane	ND	2.0	Toluene	ND	2.0
1,1-Dichloroethane	ND	2.0	Chlorobenzene	ND	2.0
Trans 1,2-Dichloroethene	ND	2.0	Ethyl Benzene	ND	2.0
Chloroform	ND	2.0	TOTAL TTO	ND	
1,2-Dichloroethane	ND	2.0			
1,1,1-Trichloroethane	ND	2.0			
Carbon Tetrachloride	ND	2.0			
Bromodichloromethane	ND	2.0			
1,2-Dichloropropane	ND	2.0			

## Notes and Definitions for this Report:

DATE RUN: 08/06/98ANALYST: JPMINSTRUMENT: DDIL. FACTOR: 1

COMMENTS: \_\_\_\_\_

UNITS: ug/L

ND = not detected at detection limit

Received: 07/28/98

Results by Sample

SAMPLE ID <u>DO-0018-06-006</u>	SAMPLE # <u>06</u> FRACTIONS: <u>A</u>
Date & Time Collected <u>07/27/98 13:07:00</u> Category <u>WATER</u>	
TOC <u>ND</u>	
mg/L DL=1.0	

SAMPLE ID DO-0018-06-006 FRACTION 06A TEST CODE GENERC NAME GENERIC TEST METHOD  
Date & Time Collected 07/27/98 13:07:00 Category WATER

### SPECIAL TEST REPORT

ANALYTE	RESULT	REPORTING LIMIT
<u>CIS-1,2-DICHLOROETHENE</u>	<u>ND</u>	<u>5.0</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Notes and definitions for this report:

EXTRACTED...  
DATE RUN.... 08/06/98  
ANALYST..... JPM  
EPA METHOD.. 8260  
UNITS..... ug/L

ND = not detected at detection limits

Date extracted included when applicable.

Received: 07/28/98

Results by Sample

SAMPLE ID DD-0018-06-006FRACTION 06ATEST CODE TTOVOANAME PURGEABLE ORGANICS VOADate & Time Collected 07/27/98 13:07:00Category WATERPURGEABLE ORGANICS VOA

	RESULT	LIMIT		RESULT	LIMIT
Acrolein	ND	100	Trichloroethene	ND	2.0
Acrylonitrile	ND	10	Dibromochloromethane	ND	2.0
Chloromethane	ND	2.0	1,1,2-Trichloroethane	ND	2.0
Bromomethane	ND	2.0	Benzene	ND	2.0
Vinyl Chloride	ND	10	cis-1,3-Dichloropropene	ND	2.0
Chloroethane	ND	2.0	2-Chloroethylvinylether	ND	2.0
Methylene Chloride	ND	10	Bromoform	ND	2.0
Dichlorodifluoromethane	ND	5.0	Tetrachloroethene	ND	2.0
1,1-Dichloroethene	ND	2.0	1,1,2,2-Tetrachloroethane	ND	2.0
Trichlorofluoromethane	ND	2.0	Toluene	ND	2.0
1,1-Dichloroethane	ND	2.0	Chlorobenzene	ND	2.0
Trans 1,2-Dichloroethene	ND	2.0	Ethyl Benzene	ND	2.0
Chloroform	ND	2.0	TOTAL TTO	ND	
1,2-Dichloroethane	ND	2.0			
1,1,1-Trichloroethane	ND	2.0			
Carbon Tetrachloride	ND	2.0			
Bromodichloromethane	ND	2.0			
1,2-Dichloropropane	ND	2.0			

## Notes and Definitions for this Report:

DATE RUN: 08/06/98ANALYST: JPMINSTRUMENT: DDIL. FACTOR: 1

COMMENTS: \_\_\_\_\_

UNITS: ug/L

ND = not detected at detection limit

Received: 07/28/98

Results by Sample

SAMPLE ID <u>DO-0018-06-007</u>		SAMPLE # <u>07</u>		FRACTIONS: <u>A</u>	
Date & Time Collected <u>07/27/98 13:00:00</u>				Category <u>WATER</u>	
AL	<u>0.113</u>	AS	<u>ND</u>	CD	<u>ND</u>
mg/L	DL=0.050	mg/L	DL=0.005	mg/L	DL=0.005
CN_TOT	<u>ND</u>	CR_HEX	<u>ND</u>	CU	<u>ND</u>
mg/L	DL=0.01	mg/L	DL=0.05	mg/L	DL=0.005
FE	<u>0.094</u>	HG	<u>ND</u>	MN	<u>ND</u>
mg/L	DL=0.010	mg/L	DL=0.0005	mg/L	DL=0.005
PB	<u>ND</u>	PH_W	<u>7.7</u>	TOC	<u>ND</u>
mg/L	DL=0.005	PH UNITS		mg/L	DL=1.0
TSS	<u>ND</u>	ZN	<u>0.037</u>		
mg/L	DL=4.0	mg/L	DL=0.005		



SAMPLE ID DO-0018-06-007 FRACTION 07A TEST CODE TTOVOA NAME PURGEABLE ORGANICS VOA  
 Date & Time Collected 07/27/98 13:00:00 Category WATER

**PURGEABLE ORGANICS VOA**

	RESULT	LIMIT		RESULT	LIMIT
Acrolein	ND	100	Trichloroethene	ND	2.0
Acrylonitrile	ND	10	Dibromochloromethane	ND	2.0
Chloromethane	ND	2.0	1,1,2-Trichloroethane	ND	2.0
Bromomethane	ND	2.0	Benzene	ND	2.0
Vinyl Chloride	ND	10	cis-1,3-Dichloropropene	ND	2.0
Chloroethane	ND	2.0	2-Chloroethylvinylether	ND	2.0
Methylene Chloride	ND	10	Bromoform	ND	2.0
Dichlorodifluoromethane	ND	5.0	Tetrachloroethene	ND	2.0
1,1-Dichloroethene	ND	2.0	1,1,2,2-Tetrachloroethane	ND	2.0
Trichlorofluoromethane	ND	2.0	Toluene	ND	2.0
1,1-Dichloroethane	ND	2.0	Chlorobenzene	ND	2.0
Trans 1,2-Dichloroethene	ND	2.0	Ethyl Benzene	ND	2.0
Chloroform	ND	2.0	TOTAL TTO	ND	
1,2-Dichloroethane	ND	2.0			
1,1,1-Trichloroethane	ND	2.0			
Carbon Tetrachloride	ND	2.0			
Bromodichloromethane	ND	2.0			
1,2-Dichloropropane	ND	2.0			

Notes and Definitions for this Report:

DATE RUN: 08/06/98  
 ANALYST: JPM  
 INSTRUMENT: D  
 DIL. FACTOR: 1  
 COMMENTS: \_\_\_\_\_  
 UNITS: ug/L

ND = not detected at detection limit

SAMPLE ID DO-0018-06-007 DISSOLVED SAMPLE # 07 FRACTIONS: B  
Date & Time Collected 07/27/98 13:00:00 Category WATER  
FE ND  
mg/L DL=0.020

SAMPLE ID DO-0018-06-FIELD BLANK SAMPLE # 08 FRACTIONS: A  
Date & Time Collected 07/27/98 12:50:00 Category WATER  
AL 0.094 AS ND CD ND CN\_TOT ND CR\_HEX ND CU ND  
mg/L DL=0.050 mg/L DL=0.005 mg/L DL=0.005 mg/L DL=0.01 mg/L DL=0.05 mg/L DL=0.005  
FE 0.023 HG ND MN ND PB ND PH\_W 7.3 TOC ND  
mg/L DL=0.010 mg/L DL=0.0005 mg/L DL=0.005 mg/L DL=0.005 PH UNITS mg/L DL=1.0  
TSS ND ZN 0.018  
mg/L DL=4.0 mg/L DL=0.005



SAMPLE ID DO-0018-06-FIELD BLANK FRACTION 08A TEST CODE TTOVOA NAME PURGEABLE ORGANICS VOA  
 Date & Time Collected 07/27/98 12:50:00 Category WATER

**PURGEABLE ORGANICS VOA**

	RESULT	LIMIT		RESULT	LIMIT
Acrolein	ND	100	Trichloroethene	ND	2.0
Acrylonitrile	ND	10	Dibromochloromethane	ND	2.0
Chloromethane	ND	2.0	1,1,2-Trichloroethane	ND	2.0
Bromomethane	ND	2.0	Benzene	ND	2.0
Vinyl Chloride	ND	10	cis-1,3-Dichloropropene	ND	2.0
Chloroethane	ND	2.0	2-Chloroethylvinylether	ND	2.0
Methylene Chloride	ND	10	Bromoform	ND	2.0
Dichlorodifluoromethane	ND	5.0	Tetrachloroethene	ND	2.0
1,1-Dichloroethene	ND	2.0	1,1,2,2-Tetrachloroethane	ND	2.0
Trichlorofluoromethane	ND	2.0	Toluene	ND	2.0
1,1-Dichloroethane	ND	2.0	Chlorobenzene	ND	2.0
Trans 1,2-Dichloroethene	ND	2.0	Ethyl Benzene	ND	2.0
Chloroform	ND	2.0	TOTAL TTO	ND	
1,2-Dichloroethane	ND	2.0			
1,1,1-Trichloroethane	ND	2.0			
Carbon Tetrachloride	ND	2.0			
Bromodichloromethane	ND	2.0			
1,2-Dichloropropane	ND	2.0			

Notes and Definitions for this Report:

DATE RUN: 08/06/98  
 ANALYST: JPM  
 INSTRUMENT: D  
 DIL. FACTOR: 1  
 COMMENTS: \_\_\_\_\_  
 UNITS: ug/L

ND = not detected at detection limit

Received: 07/28/98

Results by Sample

SAMPLE ID	<u>DO-0018-06-FIELD BLANK DIS</u>	SAMPLE #	<u>08</u>	FRACTIONS:	<u>B</u>
		Date & Time Collected	<u>07/27/98 12:50:00</u>	Category	<u>WATER</u>
FE	<u>ND</u>				
mg/L	<u>DL=0.020</u>				

TEST CODE CN TOT    NAME CYANIDE TOTAL \_\_\_\_\_

EPA METHOD: 335.3 for water sample

Reference: Methods for Chemical Analysis of Water and Wastes.  
EPA 600/4-79-020 (Revised, March 1983). EPA/EMSL.

EPA METHOD: 9010 for soil sample

Reference: Methods for Evaluating Solid Waste: Physical/Chemical Methods.  
EPA SW-846 (Third Edition) 1986. Office of Solid Waste, USEPA.

TEST CODE CR HEX    NAME CHROMIUM HEXAVALENT \_\_\_\_\_

EPA METHOD: 7196

Reference: Test Methods for Evaluating Solid Waste: Physical/Chemical Methods.  
EPA SW-846 (Third Edition) 1986. Office of Solid Waste, USEPA.

Received: 07/28/98

Test Methodology

TEST CODE GENERC NAME GENERIC TEST METHOD

METHOD REFERENCES ARE CONTAINED ON THE DATA PAGE

TEST CODE MEX DW NAME METALS, DIS. EXT., WATER

REFERENCE:

EPA METHOD 3005. Acid Digestion of Waters for Total Recoverable or Dissolved Metals for Analysis by Flame Atomic Absorption Spectroscopy or Inductively Coupled Plasma Spectroscopy. Test Methods for Evaluating Physical/Chemical Methods. SW 846, 3rd Edition.

TEST CODE MEX HG NAME METALS, EXT. FOR MERCURY

REFERENCE:

EPA METHOD 245.1 Mercury. Methods for Chemical Analysis of Water and Wastes. EPA 600/4-79-020.

EPA METHOD 7470. Mercury in Liquid Waste.

or

EPA METHOD 7471. Mercury in Solid or Semisolid Waste.  
Test Methods for Evaluating Solid Waste: Physical/Chemical Methods.  
EPA SW-846 (Third Edition) 1986. Office of Solid Waste, USEPA

TEST CODE MEX TW NAME METALS, TOTAL EXT., WATER

REFERENCE:

EPA METHOD 3005. Acid Digestion of Waters for Total Recoverable or Dissolved Metals for Analysis by Flame Atomic Absorption Spectroscopy or Inductively Coupled Plasma Spectroscopy. Test Methods for Evaluating Physical/Chemical Methods. SW 846, 3rd Edition.

Wastewater digestion

40CFR Part 136 Appendix C-Preparation for Inductively Coupled Plasma-Atomic Emission Spectrometric Method for Trace Element Analysis of Water and Wastes Method 200.7. Protection of Environment, 1991.

TEST CODE PH W NAME PH - AQUEOUS

EPA METHOD: 150.1

Reference: Methods for Chemical Analysis of Water and Wastes.  
EPA 600/4-79-020 (Revised, March 1983). EPA/EMSL.

TEST CODE TOC NAME TOC

EPA Method: 415.1 Total Organic Carbon.

Reference: Test Methods for Evaluating Solid Waste: Physical/Chemical Methods. EPA SW-846 (Third Edition) 1986.  
Office of Solid Waste, USEPA.

TEST CODE TSS NAME TOTAL SUSPENDED SOLIDS

EPA METHOD: 160.2

Reference: Methods for Chemical Analysis of Water and Wastes.  
EPA 600/4-79-020 (Revised, March 1983). EPA/EMSL.

Received: 07/28/98

Test Methodology

TEST CODE TTOVOA NAME PURGEABLE ORGANICS VOA

EPA METHOD: 8260B: Gas Chromatography/Mass Spectrometry for Volatile Organics.

Reference: Test Methods for Evaluating Solid Wastes: Physical/Chemical Methods.  
EPA SW-846 Final Update III, 1996. Office of Solid Waste, USEPA.

SOIL RESULTS ARE REPORTED ON A DRY WEIGHT BASIS.

# TOXIKON

15 Wiggins Ave., Bedford, MA 01730  
 Telephone: (781) 275-3330  
 Fax: (781) 275-7478

## CHAIN OF CUSTODY RECORD

WORK ORDER: 98-07-519

DUE DATE: 08-10-98

COMPANY: Foster Wheeler Corp  
 ADDRESS: 2300 ...  
 PHONE #: (215) 702-4044 FAX #: (215) 702-4045  
 P.O. #: \_\_\_\_\_  
 PROJECT MANAGER: \_\_\_\_\_  
 PROJECT ID/LOCATION: NAAC ...

SAMPLE TYPE  
 1. WASTEWATER  
 2. SOIL  
 3. SLUDGE  
 4. OIL  
 5. DRINKING WATER  
 6. WATER (GWM/WS)  
 7. OTHER (SPECIFY)

CONTAINER TYPE  
 P. PLASTIC  
 G. GLASS  
 V. VOA

### ANALYSES

TOXIKON #	SAMPLE IDENTIFICATION	SAMPLE TYPE	CONTAINER		SAMPLING		PRESERVATIVE	ANALYSES												SPECIAL INSTRUCTIONS/COMMENTS							
			SIZE	TYPE	#	DATE		TIME	1	2	3	4	5	6	7	8	9	10	11		12						
1	D0-0018-06-001	1					11/27/98	1326																			
2	D0-0018-06-002	1						1327																			
3	D0-0018-06-003	1						1327																			
4	D0-0018-06-004	1						1328																			
5	D0-0018-06-005	1						1329																			
6	D0-0018-06-006	1						1327																			
7	D0-0018-06-007	1						1300																			
8	D0-0018-06-008	1						1300																			

SAMPLED BY: [Signature] DATE: 7-27-98 QUOTATION: \_\_\_\_\_  
 TIME: 13:26  
 RELINQUISHED BY: [Signature] DATE: 7-27-98 RECEIVED BY: \_\_\_\_\_  
 TIME: 13:40 DATE: \_\_\_\_\_  
 RELINQUISHED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ RECEIVED FOR LAB BY: \_\_\_\_\_  
 TIME: \_\_\_\_\_ DATE: 07-28-98  
 METHOD OF SHIPMENT: \_\_\_\_\_ COOLER TEMPERATURE: \_\_\_\_\_  
 DATE: 7-28-98 TIME: 15:40

RUSH BUSINESS DAY TURN AROUND  
 ROUTINE  
 Sample disposal information  
 Are there any other, known or suspected contaminants in these samples other than those listed above?  
 No \_\_\_\_\_ If Yes, 1st Known \_\_\_\_\_

## CASE NARRATIVE

Work Order: 9807519

All samples were analyzed within the method holding times.

No target compounds were detected in the method blanks.

# TOXIKON

## QC SUMMARY - METALS

PROJECT : 9807519  
MATRIX : WATER

SPIKE SAMPLE: 9807519.4  
HG SPIKE SAMPLE: 9807519.4

ANALYTE	METHOD BLANK	LCS (% REC)	MS (% REC)	DUPLICATE (% RPD)
Al	ND	118	100	26
As	ND	103	104	0
Cd	ND	107	105	0
Cu	ND	104	104	15
Fe	ND	104	105	0
Mn	ND	109	106	0
Pb	ND	103	102	0
Zn	ND	107	106	64
Hg	ND	94	98	0

## ACCEPTANCE CRITERIA

ANALYTE	METHOD BLANK	MS (% REC)	LCS (% REC)	DUPLICATE (% RPD)
Ag	BDL	65 - 125	80 - 120	<25
Hg	BDL	75 - 125	80 - 120	<25
All Others	BDL	80 - 120	80 - 120	<25





TOXIKON CORP

VOLATILE MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

DATE RUN: Aug 06, 1998

METHOD: 8260

WORK ORDER#: 9807519

MATRIX: WATER

SAMPLE #: 9807519.1

UNITS: ug/L

DATA FILES: D3400  
D3401

TOXIKON PROJECT#: 9807519

COMPOUND	CONC. SPIKE ADDED (ug)	SAMPLE RESULT	CONC. MS	CONC. MSD	%REC MS	%REC MSD	RPD	QC LIMITS *	
								RPD	RECOVERY
1,1-Dichloroethene	50	0.00	49.60	49.21	99 OK	98 OK	1 OK	14	61 - 145
Benzene	50	0.00	48.94	49.63	98 OK	99 OK	1 OK	11	76 - 127
Trichloroethene	50	0.00	43.89	44.88	88 OK	90 OK	2 OK	14	71 - 120
Toluene	50	0.00	48.00	48.52	96 OK	97 OK	1 OK	13	76 - 125
Chlorobenzene	50	0.00	49.78	50.86	100 OK	102 OK	2 OK	13	75 - 130

RPD: 0 out of 5 outside limits  
Spike Recovery: 0 out of 10 outside limits

\* = Values outside of QC limits