

BIOSLURPER STATUS REPORT
FOR MARCH 2003 THROUGH MAY 2003
NAVAL WEAPONS STATION - EARLE
COLTS NECK, NEW JERSEY

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1.0 INTRODUCTION

Foster Wheeler Environmental Corporation (Foster Wheeler Environmental) was contracted by Engineering Field Activity Northeast to design, construct and operate bioslurper units for Site 16F at Naval Weapons Station (NWS) Earle located in Colts Neck, New Jersey. This system operational report is being submitted to satisfy the post-construction submittal requirements in paragraph 1.2.1, Pre-Post Construction Documentation of the Statement of Services for Contract Task Order No. 0049 under Remedial Action Contract No. N62472-99-D-0032.

This report summarizes the ongoing bioslurper operations at Site 16F at the Naval Weapons Station-Earle facility. The report summarizes the product recovered, groundwater treated, and the analytical results of the air and effluent discharges from the bioslurper systems. The operation period was from March 1, 2003 through May 31, 2003; however the recovery numbers for the entire operational time (February 1998 through May 2003) are summarized in this report.

Bioslurper Unit No. 1 (located adjacent to Building C-16) normally recovers product from the following product extraction wells: 16MW-13, 16MW-14, 16MW-15, 16MW-04, 16MW-25, 16MW-26, 16MW-27 and vapor extraction wells: 16MW-22 and 16MW-23. Bioslurper Unit No. 2 (located north of Building C-50) normally extracts from 16MW-20, 16MW-16, C17/20MW-07, 16MW-17 and 16MW-19.

2.0 PROJECT LOCATION AND DESCRIPTION

NWS-Earle is located in east-central Monmouth County in the town of Colts Neck, New Jersey as depicted in Figure 2-1. Site 16F is located in the north-central portion of NWS-Earle. The areas addressed with the bioslurper remediation system at Site 16F are the light non-aqueous phase liquid (LNAPL) plume southeast of Building C-16, the small LNAPL plume northwest of Building C-50, and a former gas station west of Building C-18.

An underground fuel line located in the area north of Building C-19 was used to transport diesel fuel from an underground storage tank (UST) located at the northeast corner of Building C-18 to a dispensing station north of Building C-50. A leak in the fuel line was discovered in 1977. All of the former USTs were removed from the former gas station in 1998. Part of the former underground diesel transfer line is still in place.

2.1 PREVIOUS INVESTIGATIONS

Between June and October of 1995, Brown and Root Environmental conducted a Remedial Investigation (RI) at Site 16F. The RI Report concluded that hydrocarbons detected in the subsurface impacted the groundwater. The groundwater contamination (primarily volatile organics and fuel constituents) is associated with a free-phase LNAPL layer. This floating product is the source of organics in the groundwater.

In 1995, the Navy conducted an investigation at Site 16F using a Site Characterization and Analysis Penetrometer System (SCAPS). SCAPS is a field screening technique, which detects polynuclear aromatic hydrocarbon (PAH) compounds using a Laser Induced Fluorescence (LIF)

system. The LIF is quantitative to a known matrix with a known contaminant. A soil sample collected at the site was used to calibrate the LIF using diesel fuel marine. The fluorescent mapping, obtained from the push samples, was used to gain a better understanding of the contaminant distribution. Twenty nine (29) SCAPS borings were completed in the area between Building C-16 and C-50.

The free-phase plume to the south and east of Building C-16 is suspected to have been the result of the leaking former underground diesel fuel line. As evidenced by laboratory analytical results of groundwater samples, there is also some residual gasoline contamination associated with the plume near Building C-16.

The free-phase plume north of Building C-50 is suspected to have been the result of minor spills at a former diesel dispensing station located between the railroad tracks, north of Building C-50.

2.2 GEOLOGY

Site 16F is located within the Outer Coastal Plain of the Atlantic Coastal Plain Physiographic Province, approximately nine miles inland from the Atlantic Ocean. The site is relatively flat with most of the topographic relief being the drainage swales located between the railroad tracks. According to regional mapping, the site is located on an outcropping of the Vincentown Formation and upper colluvium. The upper colluvium, where present, is shallow and consists of massive sand and silty sand, which may contain quartz or ironstone pebbles. The Vincentown Formation consists of grey and green glauconitic, fine to coarse-grained sand with silt.

According to the information obtained from the well installation logs and the SCAPS Investigation, the soil underlying the site is composed of fine to medium grained sand and silty sand.

3.0 BIOSLURPER OBJECTIVES AND PLUME CHARACTERISTICS

The objectives of the bioslurper systems operations are to conduct remedial operations in three separate areas: 1) the main free-phase plume located south and southeast of Building C-16; 2) a smaller free-phase plume northwest of Building C-50; and 3) the residual soil contamination associated with the former gas station site west of Building C-18.

The diesel fuel spills would have started out as free product or free phase oil. This phase is initially very mobile, and migrates downward through the unsaturated (vadose) zone due to gravitational forces until either the water table or a stratigraphic barrier is encountered. The viscosity of the light non-aqueous phase liquid (LNAPL), the groundwater gradient, and the permeability of the aquifer media control the rate of free product migration. A “smear zone” develops when the mobile LNAPL is smeared vertically through seasonal fluctuations in the water table. Once the smear zone develops, a portion of the LNAPL exists as a discontinuous non-wetting liquid phase (residual) that is relatively immobile except at seasonal low water table. An increased smear zone reduces the volume of the remaining mobile free-phase oil.

Based on previous data gathered from water level measurements obtained in the recovery wells, the elevations in the wells vary as much as 3.9 to 7.29-feet below grade, with the average groundwater fluctuation of 5.79-feet in a well. That means that the free-phase product is being smeared vertically across a smear zone of almost 6-feet. The main free product plume is located to the east and south of Building C-16. The free-phase plume area is overlain by drainage ditches and railroad tracks. Due to the topographic depressions of the drainage ditches, and the permeability of the ballast associated with the railroad tracks, the localized groundwater table is subject to excessive water table fluctuations from rain events, which cause an increase in the vertical distribution of the oil across the smear zone. According to Peargin, Ireland, and Stephenson (1997), the larger percentages of LNAPL occur within the smear zone versus the vadose zone.

As depicted in the latest product thickness maps (Figures 5-1 through 5-3) the majority of remaining oil is located in the southwest portion of the free-phase plume near former Building C-16. The concentration of the free-phase LNAPL appears to be underlying the parking lot area south of former Building C-16. Free-phase LNAPL is also concentrated east of former Building C-16, in the area between the railroad tracks. Based on the present location of the wells, the western extent of the free-phase plume cannot be completely defined. The estimated boundaries of the free-phase plume generated from the SCAPS Investigation (dashed line in figures) have been used to define the original free-phase plume boundary. Current data shows that the extent of the LNAPL plume has decreased significantly with treatment overtime.

The extent of the free-phase plume located north of Building C-50 has not been verified with additional wells. The free-phase boundary depicted is based on the SCAPS Investigation. One extraction well (16MW-20) is being used to extract product from the central portion of the suspected plume. While extraction well 16MW-20 has consistently recovered free-phase oil, the oil thickness in the well is minimal. Measurements from an extraction well located at the hydraulically downgradient edge of the suspected free-phase plume north of Building C-50 have not detected any free-phase oil.

The soil contamination associated with the former gas station site was from previously removed USTs. There is no free-phase oil present in the former gas station area. Two bioventing wells are situated in this area to aid in remediating the vadose zone soils.

4.0 BIOSLURPER SYSTEM OPERATION

The bioslurper systems are designed to de-water the smear zone and remove LNAPL through drainage, volatilization, and biodegradation. The high vacuum of the bioslurper system extracts LNAPL from the pore spaces where it was formerly held by capillary tension. Typically, a vacuum pressure of 2.1 to 4.6 inches of Hg is applied to each well. The velocity in the drop tube must be sufficient to lift water as an entrained fluid.

Unit No. 1, located adjacent to Building C-16, was operated utilizing seven product recovery wells (16MW-13, 16MW-04, 16MW-14, 16MW-15, 16MW-25, 16MW-26 and 16MW-27), and two bioventing wells (16MW-22 and 16MW-23). The product recovery wells were operated at a vacuum of approximately 5 to 8 inches of mercury, with the one-inch diameter drop tube set

immediately above the product level in the well. The bioventing wells were operated at a vacuum of 2 to 3 inches of mercury, and the one-inch diameter drop tube was placed several feet above the water table to minimize any water withdraw.

Unit No. 2, located north of Building C-50, was operated utilizing five product recovery wells (16MW-16, 16MW-17, 16MW-19, C17/20MW-07, and 16MW-20). The product recovery wells were operated at a vacuum of approximately 5 to 8 inches of mercury, with the one-inch diameter drop tube set right above the product level in the well. The pipe connections to Unit No. 2 were configured in order to allow extraction from the wells on the outer edge of the free-phase plume east of Building C-16, and the one recovery well north of Building C-50. The product thickness and product recovery rates of the wells were significantly less than the recovery wells connected to Unit No. 1; therefore Unit No. 2 was operated for a lesser amount of time.

5.0 OPERATIONS AND DIFFICULTIES ENCOUNTERED

The bioslurper units consist of two self-contained 8 ft. by 40 ft. by 8 ft high refurbished cargo boxes that house the bioslurper pumps, process equipment, and groundwater treatment units. The turnkey units are connected to the recovery wells via underground piping. Bioslurper Unit No. 1 is equipped with a vapor-phase knock out tank and vapor-phase activated carbon drums to treat the air discharge to comply with the NJDEP Air Discharge Permit. Unit No. 1 requires air treatment because of the suspected gasoline component of the LNAPL plume in the area around Building C-16. The air discharge from Bioslurper No. 2 does not require treatment prior to discharge because of the lower concentrations of volatile organics.

This section discusses the monthly operation of the units during this reporting period and any problems that were encountered. Appendix A contains graphs depicting the operational times and groundwater and oil extracted on a monthly basis.

MARCH 2003

Operations and maintenance during March 2003 were limited for both Bioslurpers No. 1 and No. 2. Both bioslurper units experienced significant down time due to operational difficulties. Bioslurper Unit No. 1 was operated for a total of 34.5 hours in March 2003. The total amount of groundwater extracted in March was approximately 14,682 gallons, with approximately 7.85 gallons of free-phase oil removed. Bioslurper Unit No. 2 operated for a total of 44 hours and extracted approximately 6,325 gallons of groundwater. Bioslurper Unit No. 2 produced a total of 2.75 gallons of free-phase oil. Appendix A provides a graphical representation of the amount of oil/groundwater extracted, and the operations hours for each unit.

During system inspection on March 18, 2003, it was determined that there was a leak in a double wall effluent pipe that transferred the treated effluent from Bioslurper Unit No. 2 to Unit No. 1 for discharge to groundwater. Although the pipe was heat-traced to prevent freezing, it appeared that water in the pipe froze during the extreme winter weather. Both units were shut down from March 18 through March 26 until repairs were completed. Minor excavation of the containment pad was completed in order to gain access to repair

the underground pipe. The damaged pipe and the portion of the containment pad were replaced. Normal operations resumed on March 28, 2003.

An unanticipated volatile organic compound (VOC), vinyl chloride, was detected in the air effluent from Bioslurper No. 2 during several previous sampling events. The vinyl chloride is not believed to be associated with the LNAPL plume at the site. Since the VOC is not associated with the LNAPL plume, and has only been detected recently, it may be possible that VOC contamination has migrated via the groundwater to the LNAPL plume area from an up-gradient location. Groundwater samples were collected from two wells up-gradient of the LNAPL plume to determine if the VOC contamination was migrating from an up-gradient location. Samples were collected from monitoring wells 16MW-19 and 16MW-20 and analyzed for the Target Compound List (TCL) of VOCs by USEPA Method SW-846, 8260. Analysis of the groundwater samples did not indicate the presence of vinyl chloride nor any other VOCs. However, detection limits were elevated. Air analysis is discussed in Section 6.1. The groundwater analytical data is discussed in more detail in the report included in Appendix E.

APRIL 2003

Operations and maintenance during April were normal for Bioslurper Units No. 1 and No. 2. Bioslurper Unit No. 1 was operated for a total of 125 hours in April 2003. The total amount of groundwater extracted in April was approximately 18,084 gallons, with approximately 3.6 gallons of free-phase oil removed. Bioslurper Unit No. 2 was operated for a total of 126 hours in April 2003. The total amount of groundwater treated through the system was 14,649 gallons, with a negligible amount of free-phase oil removed. Appendix A provides a graphical representation of the amount of oil/groundwater extracted, and the operations hours for each unit.

MAY 2003

Operations and maintenance during May were normal for Bioslurper Unit No. 1. However, Bioslurper Unit No. 2 was operated only intermittently because negligible amounts of free-phase oil were measured in the monitoring wells pumping to Unit No. 2. Bioslurper Unit No. 1 was operated for a total of 128 hours in May 2003. The total amount of groundwater extracted in May was approximately 20,199 gallons, with approximately 22.51 gallons of free-phase oil removed. Bioslurper Unit No. 2 operated for a total of 28 hours, extracted approximately 4,303 gallons of groundwater and approximately 0.05 gallons of free-phase oil.

Appendix A provides a graphical representation of the amount of oil/groundwater extracted, and the operations hours for each unit. Operations will continue at Unit No. 2 on an intermittent basis until free-phase oil is measured in the monitoring wells and is able to be recovered.

5.1 EVALUATION OF SITE CONDITIONS

Water level and product thickness measurements are obtained periodically to establish product thickness isopleths. Appendix B contains graphs depicting the depth to product and depth to

water in individual extraction wells. As demonstrated by Figures 5-1 through 5-3, it appears that the systems' operations have caused product thickness and the size of the plume to remain consistent or decrease over the operational history of the groundwater treatment. The product thickness isopleths are based on the corrected thickness, adjusted for exaggeration measured in the well. Appendix B provides a graphical representation of the adjusted water levels and product thickness in the extraction wells. As demonstrated by the graphs in Appendix B, the water table elevations appear to have reached the levels seen prior to the drought like conditions which occurred during the early part of 2002. It should be noted that the most effective product recovery occurs when the water table elevations are lower than normal, thus exposing any trapped product below the water table (smear zone). The current product thickness data confirms that the main portion of the product plume is underlying the southeastern corner of Building C-16.

5.2 PRODUCT RECOVERY DATA

Table 1 summarizes the amount of free-phase oil recovered from the Bioslurper Extraction Units. Appendix A provides a graphical representation of the amount of oil/groundwater extracted and the operational hours for each Unit. Table 2 summarizes the groundwater extracted/treated to date. Table 3 summarizes the volume of total petroleum hydrocarbons (TPH) removed via the groundwater treatment component of bioslurper systems. The TPH removal rate for the groundwater discharges was calculated using laboratory analytical data and the volume of water processed.

The product recovery operations from March 2003 through May 2003 have been somewhat inconsistent due to operational difficulties in both bioslurpers and due to the reduction of free-phase oil available in Unit No. 2 for recovery.

6.0 EFFLUENT AND AIR ANALYSIS

6.1 AIR ANALYSIS

The air discharges from the bioslurper units are routinely sampled to ensure discharges are in compliance with the NJDEP air discharge permit. The air discharge is sampled for total VOCs (including benzene). Appendix C summarizes the analytical results of the air discharge samples and the permit limits. Appendix C also contains the laboratory analytical results of the air samples. As indicated by the analytical results, both bioslurper units are operating within the permit requirements established for air discharge.

Vinyl chloride has been detected frequently in Bioslurper Unit No. 2 air effluent samples. Concentrations of vinyl chloride have ranged from 0.004 to 0.5 ppm(v) in the Unit No. 2 air samples. Vinyl chloride has not been detected in Bioslurper Unit No. 1 air discharge samples. Based on past historical and analytical data, contamination from vinyl chloride or other chlorinated solvents was not anticipated in this area of the site. Additional investigation is warranted to determine the source of the vinyl chloride contamination in the air effluent of Bioslurper Unit No. 2. A final report detailing the vinyl chloride contamination and recommendations for further action is included in Appendix E.

Air effluent samples from Bioslurper Unit No. 2 will continue to be monitored for trends or increases in vinyl chloride. Vinyl chloride was included in the monthly air emission calculations in order to determine that the total VOCs emissions were below the permitted emission of 0.035 lbs/hour. The total VOC emissions, including vinyl chloride, for March, April and May 2003, were below the permit emission limit. The calculated values are included in Appendix C.

6.2 EFFLUENT ANALYSIS

The effluent from Bioslurper Unit No.1 is processed through one bag filter (equipped with a 75-micron filter), three modified bentonite clay vessels (operating in series), and two liquid-phase granular activated carbon vessels (operating in series). The bag filter removes particulates (mainly precipitated iron), the clay units remove the higher molecular weight volatile organic compounds (VOCs) and TPH, and the activated carbon removes the remaining VOC and TPH compounds. The effluent from Bioslurper Unit No. 2 is processed in the same manner, except that only two bentonite vessels in series are used instead of three. Unit No. 2 is configured in this manner because of the lower TPH concentrations of the effluent.

The groundwater effluent from the bioslurper units is routinely sampled to ensure the discharges are in compliance with the requirements set forth by the Naval Weapons Station-Earle Sewer Treatment Plant (< 10 ppm TPH).

Table 4 summarizes the TPH results of the effluent samples. Appendix D contains the laboratory analytical results of the effluent samples. As demonstrated by the laboratory analytical results, all effluent discharged (after treatment) to the NWS-Earle Sewer Treatment Plant contained TPH concentrations less than 10 ppm.

7.0 CONCLUSIONS

The bioslurper units continued to operate within the design limits with some operational and maintenance problems. The bioslurper units were operated at a vacuum of approximately 25 inches of mercury. A vacuum of between 3 to 5 inches of mercury was applied to each extraction well. As demonstrated by the analytical results of air and effluent discharge samples, the system was adequately treating the air and effluent to the limits established by the NJDEP Air Discharge Permit and the restrictions of the NWS-Earle Sewer Treatment Plant.

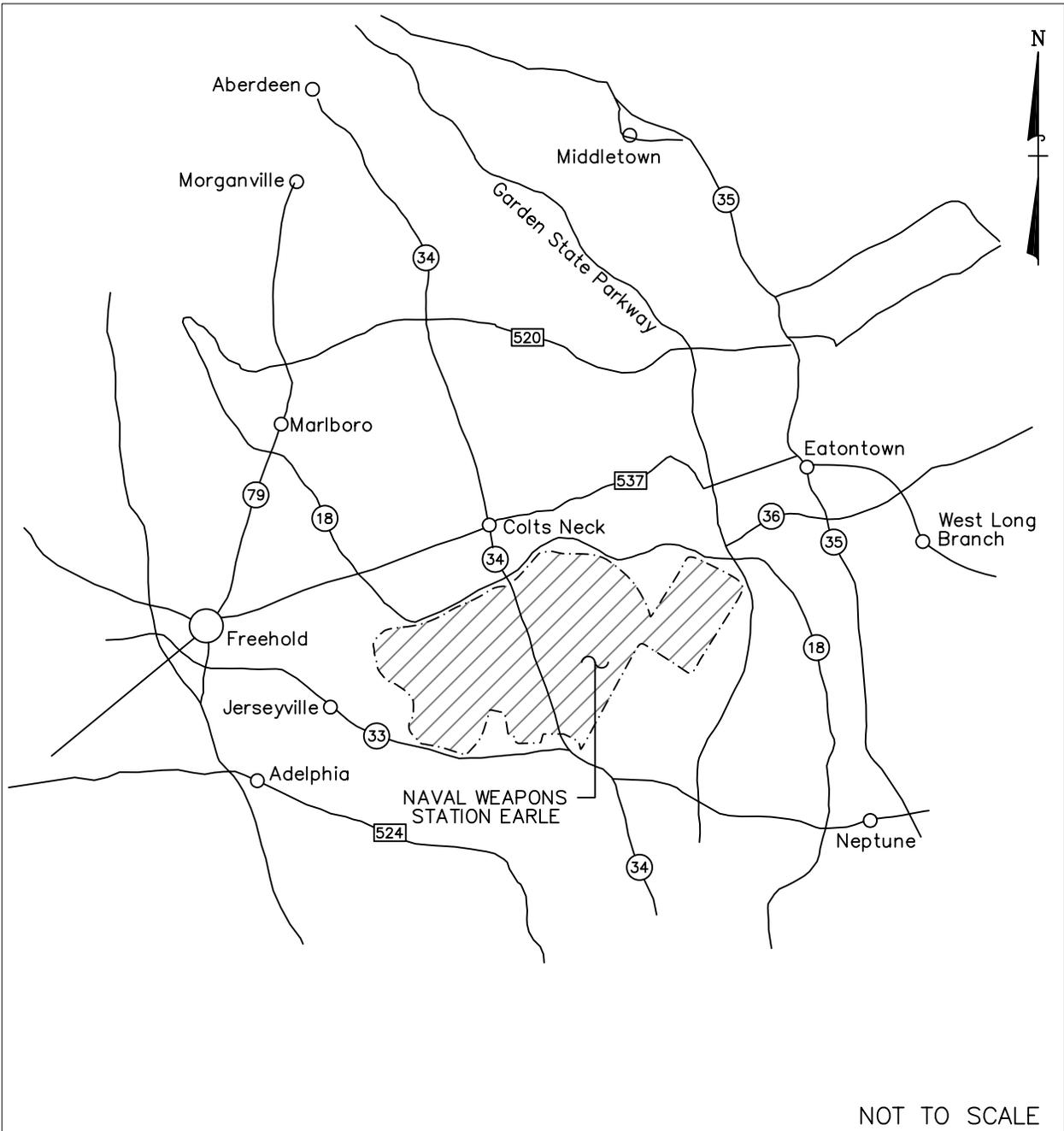
The source(s) of the vinyl chloride in the air discharge of Bioslurper Unit No. 2 is not presently known. Refer to Appendix E for detailed information and recommendations regarding the vinyl chloride contamination in the air effluent of Bioslurper No. 2.

The effluent of both bioslurper systems is discharged to the NWS-Earle Sewer Treatment Plant. Based on agreements with NWS-Earle prior to the start-up of the systems, the effluent discharge from the systems was to meet the NJPDES Discharge Permit criteria for their discharge. The effluent discharge has met the applicable discharge criteria of 10 ppm total petroleum hydrocarbons (TPH).

As demonstrated by the historical product thickness isopleths generated with site data, there has been a stabilization in product thickness and the LNAPL plume boundary south and east of former Building C-16. Product thickness is negligible in wells north of Building C-50. Data shows that product recoveries from March 2003 through May 2003 have been somewhat inconsistent due to operational and maintenance difficulties. Both units recovered lower volumes of oil because of limited operations due to maintenance requirements in March 2003 and the limited operation of Bioslurper No. 2 due to reduction of free product available for recovery. However, the systems are still recovering substantial amounts of product even though the volume of measurable free-product in the groundwater has decreased significantly during the operational history of the bioslurpers.

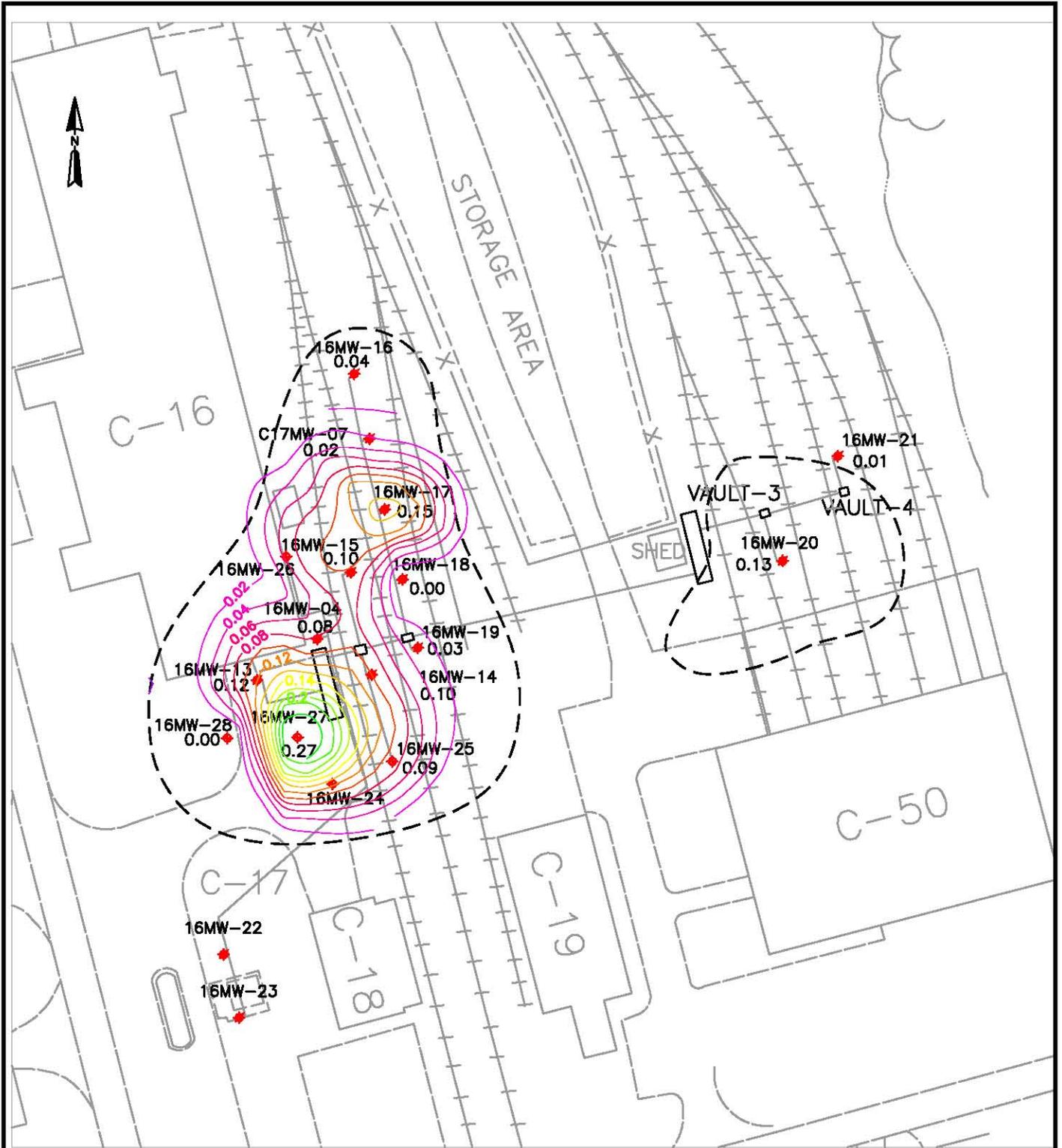
It is anticipated that product recovery rates will decrease as the systems continue to remove product from the groundwater. This is due to the decrease in the amount of free product that is in the wells and therefore recoverable by the treatment systems. The decreased product recoveries over the history of treatment are demonstrated by the existing historical recovery data. The decreased product recoveries over time is not a result of the system becoming less effective, but a function of diminished returns based upon the lessening availability of free product. Bioslurper No. 2 will be operated intermittently because of the low quantity of free product available for recovery.

FIGURES



**U.S. Navy RAC
NWS- Earle, Colts Neck, NJ**

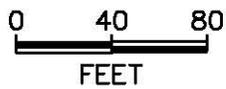
Figure 2-1
Vicinity Map



LEGEND

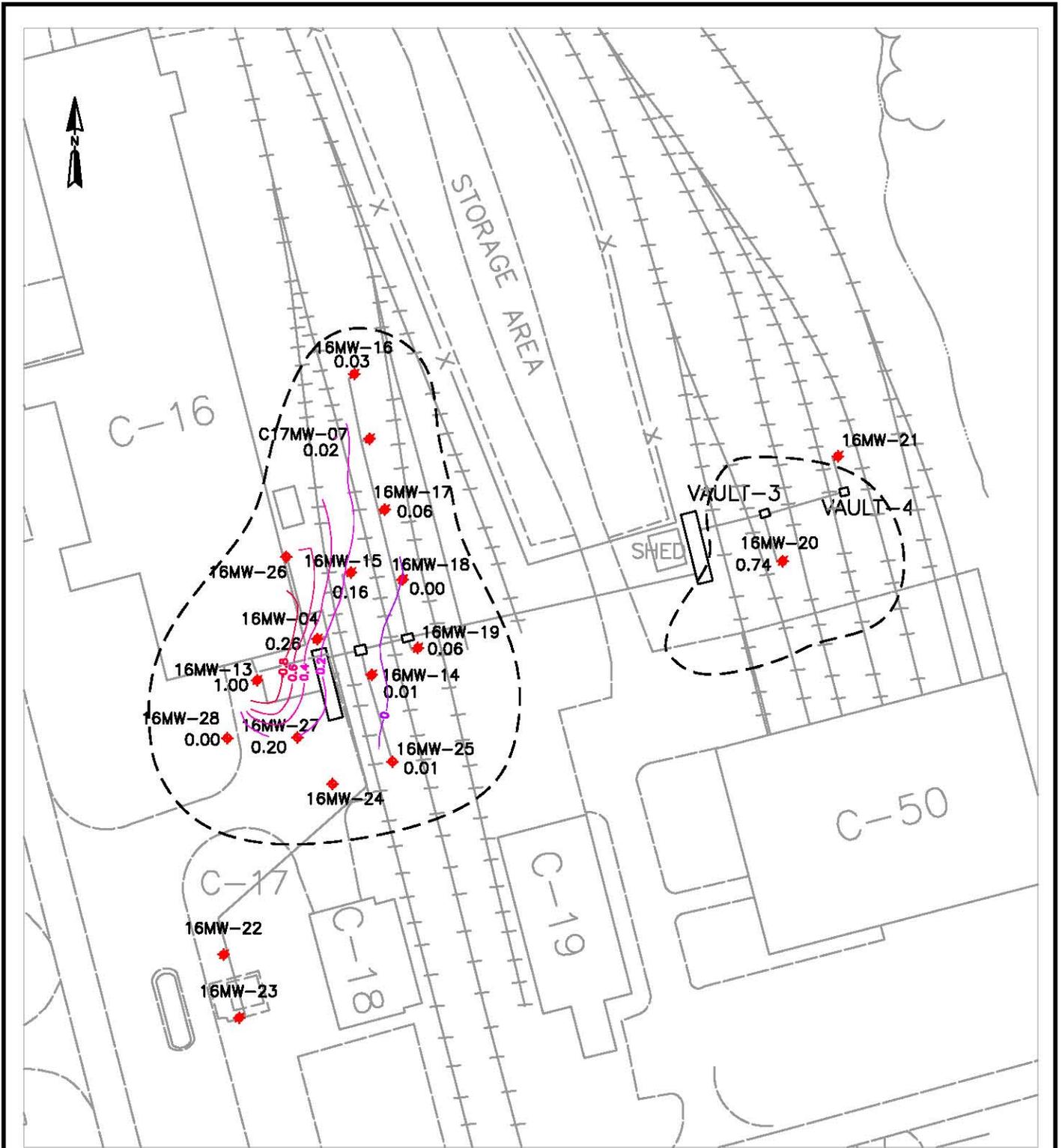


Product plume boundary based on former SCAPs Study



**U.S. Navy RAC
NWS - Earle, Colts Neck, NJ**

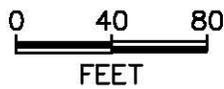
Figure 5-1
Product Thickness (ft.) Isopleth
03/31/2003



LEGEND



Product plume boundary based on former SCAPs Study

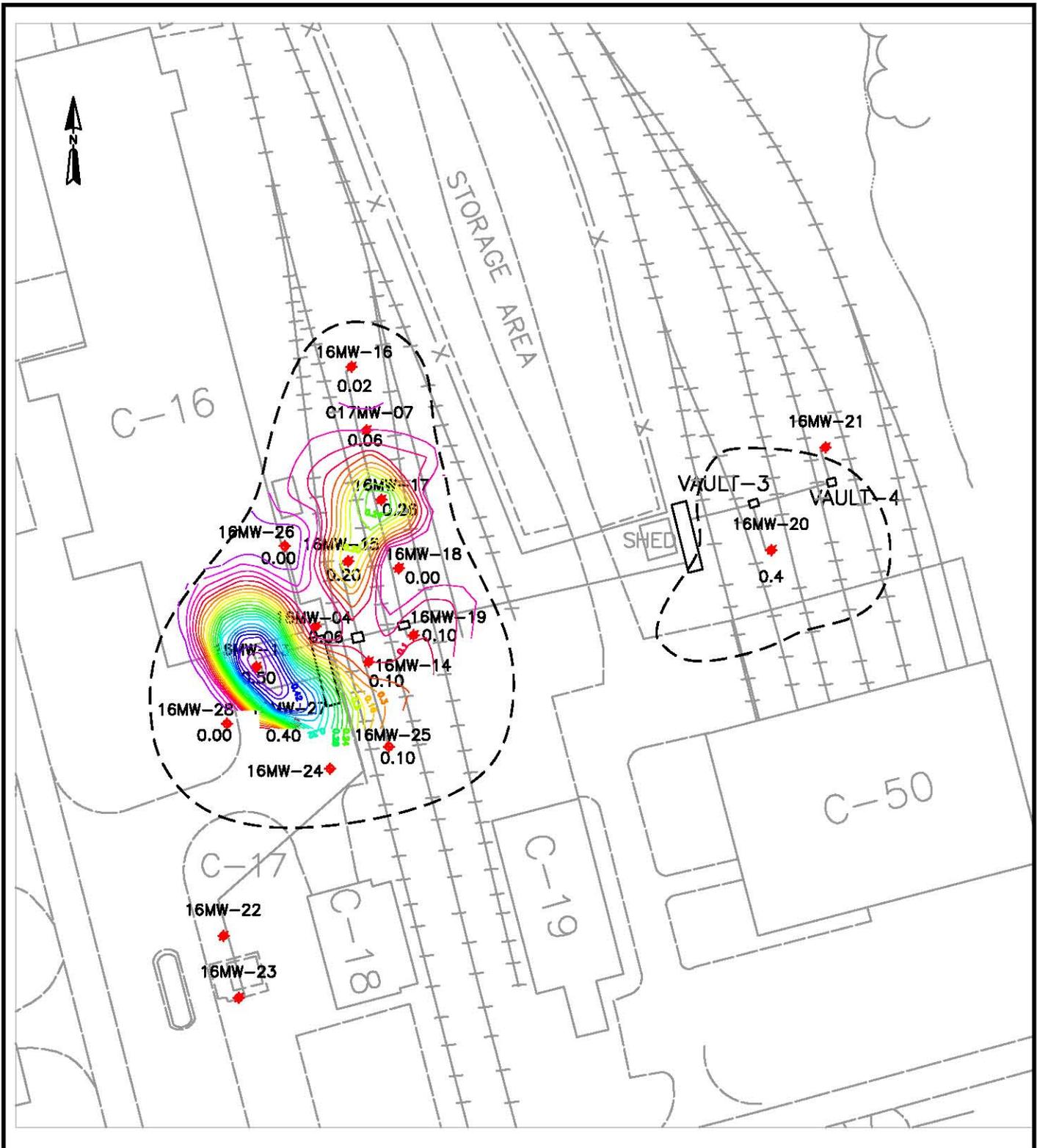


**U.S. Navy RAC
NWS - Earle, Colts Neck, NJ**

Figure 5-2
Product Thickness (ft.) Isopleth
04/29/2003



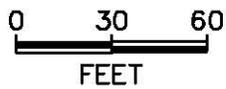
FOSTER WHEELER ENVIRONMENTAL CORPORATION



LEGEND



Product plume boundary based on former SCAPs Study



**U.S. Navy RAC
NWS - Earle, Colts Neck, NJ**

Figure 5-3
Product Thickness (ft.) Isopleth
05/23/2003



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TABLES

**TABLE 1
NAVAL WEAPONS STATION-EARLE
BIOSLURPER UNITS
FREE-PHASE OIL EXTRACTION TO DATE**

	1998 Free-Phase Oil Extracted (gallons)												Year Total
	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.	
Bioslurper System #1		400	375	275	300	ND	ND	225	250	250	140	225	2440.0
Bioslurper System #2		25	50	50	20	ND	ND	55	30	40	20	30	320.0
Total		425	425	325	320			280	280	290	160	255	2760.0
	1999 Free-Phase Oil Extracted (gallons)												Year Total
	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.	
Bioslurper System #1	220	50	125	65	ND	ND	ND	34	ND	ND	66	ND	560.0
Bioslurper System #2	20	15	15	10	ND	ND	ND	14	ND	ND	14	ND	88.0
Total	240	65	140	75				48			80		648.0
	2000 Free-Phase Oil Extracted (gallons)												Year Total
	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.	
Bioslurper System #1	30	60	78	57	10	15	32	43	57	55	33	32	502.0
Bioslurper System #2	ND	ND	ND	ND	ND	24	1	5	4	0	ND	0	34.0
Total	30	60	78	57	10	39	33	48	61	55	33	32	536.0
	2001 Free-Phase Oil Extracted (gallons)												Year Total
	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.	
Bioslurper System #1	31	45	35	ND	ND	ND	14	48	30	15	30	10	258.0
Bioslurper System #2	ND	4.5	4.5	ND	ND	ND			2	4	0.5	0	15.5
Total	31	49.5	39.5	0	0	0	14	48	32	19	30.5	10	273.5
	2002 Free-Phase Oil Extracted (gallons)												Year Total
	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.	
Bioslurper System #1	52	21	11	16	34	62	53	87	16	10	17	7	386.0
Bioslurper System #2	6	0.5	0.5	5	2	6	2	5	0	0	4	9	40.0
Total	58	21.5	11.5	21	36	68	55	92	16	10	21	16	426.0
	2003 Free-Phase Oil Extracted (gallons)												Year Total
	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.	
Bioslurper System #1	50.8	5.2	7.85	3.6	22.5								90.0
Bioslurper System #2	0.5	0.5	2.75	0	2.62								6.4
Total	51.3	5.7	10.6	3.6	25.12								96.3

Notes:

ND - no data due to system not in operation

Total Oil extracted to date (g): 4739.8

TABLE 2
NAVAL WEAPONS STATION-EARLE
BIOSLURPER UNITS
GROUNDWATER EXTRACTION TO DATE

	1998 Groundwater Extracted (gallons)												Year Total
	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.	
Bioslurper System #1		2675	26,169	23898	12799	ND	ND	16498	34612	29974	20503	40611	207739
Bioslurper System #2		5282	20,586	22607	6584	ND	ND	13537	14451	27850	16196	9141	136234
Total		7957	46755	46505	19383			30035	49063	57824	36699	49752	343973
	1999 Groundwater Extracted (gallons)												Year Total
	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.	
Bioslurper System #1	35078	6536	49834	40889	ND	ND	ND	7321	ND	ND	ND	ND	139658
Bioslurper System #2	8843	536	12956		ND	ND	ND		ND	ND	ND	ND	22335
Total	43921	7072	62790	40889	ND	ND	ND	7321	ND	ND	ND	ND	161993
	2000 Groundwater Extracted (gallons)												Year Total
	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.	
Bioslurper System #1	3393	4618	9842	10945	2764	14112	19758	23298	36900	31669	27785	30231	215315
Bioslurper System #2	ND	ND	ND	ND	ND	2976	5549	17704	21156	21588	ND	20848	89821
Total	3393	4618	9842	10945	2764	17088	25307	41002	58056	53257	27785	51079	305136
	2001 Groundwater Extracted (gallons)												Year Total
	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.	
Bioslurper System #1	25897	30981	33832	ND	ND	ND	2812	12136	7669	1665	4635	3080	122707
Bioslurper System #2	ND	15852	19914	ND	ND	ND			2967	6814	1277	345	47169
Total	25897	46833	53746	ND	ND	ND	2812	12136	10636	8479	5912	3425	169876
	2002 Groundwater Extracted (gallons)												Year Total
	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.	
Bioslurper System #1	13137	9292	16151	12749	24926	19641	24875	31129	10390	19562	4854	7694	194400
Bioslurper System #2	1095	1224	5726	7639	7727	6464	5362	5977	289	0	4771	4772	51046
Total	14232	10516	21877	20388	32653	26105	30237	37106	10679	19562	9625	12466	245446
	2003 Groundwater Extracted (gallons)												Year Total
	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.	
Bioslurper System #1	22799	28656	14682	18084	20199								104420
Bioslurper System #2	10546	1614	6325	14649	4303								37437
Total	33345	30270	21007	32733	24502								141857

Total Groundwater Extracted to Date = 1,368,281

TABLE 3
NAVAL WEAPONS STATION-EARLE
BIOSLURPER UNITS
TOTAL PETROLEUM HYDROCARBON (TPH)
REMOVED VIA GROUNDWATER TREATMENT

	1998 TPH Removed via Groundwater Treatment (pounds)												Year Total
	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.	
Bioslurper System #1		60.75	125.14	306.42	135.56	ND	ND	47.30	ND	175.99	179.16	192.96	1223.28
Bioslurper System #2		4.25	14.17	32.40	9.61	ND	ND	ND	13.99	2.37	4.26	11.48	92.53
Total		65.00	139.31	338.82	145.17	ND	ND	47.30	13.99	178.36	183.42	204.44	1315.81
	1999 TPH Removed via Groundwater Treatment (pounds)												Year Total
	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.	
Bioslurper System #1	60.48	56.18	394.28	285.29	ND	ND	ND	ND	ND	ND	0.29	ND	796.52
Bioslurper System #2	3.84	0.21	29.30	15.20	ND	ND	ND	ND	ND	ND	0.01	ND	48.56
Total	64.32	56.39	423.58	300.49	ND	ND	ND	ND	ND	ND	0.30	ND	845.08
	2000 TPH Removed via Groundwater Treatment (pounds)												Year Total
	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.	
Bioslurper System #1	8.58	ND	17.20	30.99	ND	31.80	18.14	ND	95.47	160.86	92.04	327.49	782.56
Bioslurper System #2	0.01	ND	ND	ND	ND	0.11	0.40	ND	2.63	37.55	ND	21.71	62.40
Total	8.59	ND	17.20	30.99	ND	31.91	18.53	ND	98.10	198.40	92.04	349.20	844.96
	2001 TPH Removed via Groundwater Treatment (pounds)												Year Total
	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.	
Bioslurper System #1	34.31	45.04	50.54	ND	ND	ND	0.07	52.80	2.61	2.25	2.97	10.82	201.42
Bioslurper System #2	ND	8.59	59.43	ND	ND	ND	ND	ND	1.12	3.73	0.13	0.01	73.01
Total	34.31	53.63	109.97				0.07	52.80	3.73	5.98	3.10	10.83	274.42
	2002 TPH Removed via Groundwater Treatment (pounds)												Year Total
	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.	
Bioslurper System #1	40.35	21.35	13.51	35.86	21.58	7.60	581.16	73.62	68.41	19.99	2.27	22.60	908.30
Bioslurper System #2	2.40	0.18	4.68	0.75	5.08	1.60	2.77	1.13	0.02	ND	1.43	3.54	23.58
Total	42.75	21.53	18.19	36.61	26.66	9.20	583.93	74.75	68.43	19.99	3.70	26.14	931.88
	2003 TPH Removed via Groundwater Treatment (pounds)												Year Total
	Jan.	Feb.	March	April	May	June	July	August	Sep.	Oct.	Nov.	Dec.	
Bioslurper System #1	95.99	135.13	53.06	25.56	39.69								349.43
Bioslurper System #2	ND	0.28	0.64	4.84	0.38								6.14
Total	95.99	135.41	53.70	30.40	40.07								355.57

Pounds of TPH Removed via Groundwater Treatment to Date = 4567.73

Notes:

ND - no data due to system not in operation

Pounds of TPH: Influent - effluent concentration (mg/l) x 3.785 l/gal x 0.001 g/mg x 0.002205 lb/g x monthly effluent (gal) = lbs TPH

TABLE 4
NAVAL WEAPONS STATION-EARLE
BIOSLURPER UNITS NO. 1 AND NO. 2
TOTAL PETROLEUM HYDROCARBON (TPH)
EFFLUENT CONCENTRATIONS (mg/l)

Effluent Sample Date	Unit No. 1		Unit No. 2	
	Before Clay/Carbon	After Clay/Carbon	Before Clay/Carbon	After Clay/Carbon
02/29/00	<0.5	<0.5	NA	NA
04/04/00	210	0.57	NA	NA
04/28/00	16(A)EW00W5	16(A)EW00W6		
	340	0.68	NA	NA
06/19/00	270	<1.0	4.4	<1.0
07/21/00	16(A)EW00W10	16(A)EW00W09	16(B)EW00W05	16(B)EW00W06
	110	<1.0	8.7	<1.0
09/07/00	16(A)EW11	16(A)EW12	16(B)EW07	16(B)EW08
	310	5.1	18	3.1
10/30/00	16(A)EW13	16(A)EW14	16(B)EW09	16(B)EW10
	610	1.4	210	1.6
11/30/00	16(A)EW15	16(A)EW16	16(B)EW11	16(B)EW12
	400	3.1	220	2
12/28/00	16(A)EW17	16(A)EW18	16(B)EW13	16(B)EW14
	1300	2.4	130	2.6
01/29/01	16(A)EW19	16(A)EW20	16(B)EW15	16(B)EW16
	210	1.6	75	1.6
02/27/01	16(A)EW21	16(A)EW22	16(B)EW17	16(B)EW18
	160	1.2	67	2.1
03/30/01	16(A)EW23	16(A)EW24	16(B)EW19	16(B)EW20
	180	1	360	2.4
07/31/01	16(A)EW24	16(A)EW25	NA	NA
	3.1	0.018	NA	NA
08/29/01	16(A)EW27	16(A)EW28	NA	NA
	187	<0.068	NA	NA
09/30/01	16(A)EW27	16(A)EW28	16(B)EW19	16(B)EW20
	40.8	<0.068	45.3	<0.067
10/31/01	16(A)EW31	16(A)EW32	16(B)EW01	16(B)EW02
	50	<0.07	65.7	<0.066
11/30/01	16(A)EW33	16(A)EW34	16(B)EW05	16(B)EW06
	76.9	0.18	12	<.20

Notes:

All units are mg/L.

The NWS-Earle Sewer Treatment Plant NJPDES Permit Discharge Limit for TPH is 10 ppm.

ND - not detected above laboratory detection limit

NA - not available (no sample collected)

TABLE 4
NAVAL WEAPONS STATION-EARLE
BIOSLURPER UNITS NO. 1 AND NO. 2
TOTAL PETROLEUM HYDROCARBON (TPH)
EFFLUENT CONCENTRATIONS (mg/l)

Effluent Sample Date	Unit No. 1		Unit No. 2	
	Before Clay/Carbon	After Clay/Carbon	Before Clay/Carbon	After Clay/Carbon
01/09/02	16(A)EW35 421	16(A)EW36 <0.066	16(B)EW07 2.3	16(B)EW08 <0.066
01/31/02	16(A)EW31 368	16(A)EW32 <0.066	16(B)EW01 22.1	16(B)EW02 <0.066
02/27/02	16(A)EW39 276	16(A)EW40 0.7	16(B)EW11 17.6	16(B)EW12
02/28/02	16(A)EW41 101	16(A)EW42 0.81	16(B)EW13 98.1	16(B)EW14 0.19
03/29/02	16(A)EW41 101	16(A)EW42 0.81	16(B)EW13 98.1	16(B)EW14 0.24
04/23/02	16(A)EW43 338	16(A)EW44 0.96	16(B)EW15 12	0.24 0.19
05/29/02	16(A)EW45 104	16(A)EW46 0.28	16(B)EW17 78.9	16(B)EW18 0.076
06/28/02	16(A)EW47 46.6	16(A)EW48 0.23	16(B)EW19 29.7	16(B)EW20 0.11
07/29/02	16(A)EW49 2800	16(A)EW50 0.63	16(B)EW21 62.5	16(B)EW22 0.54
08/28/02	16(A)EW51 284	16(A)EW52 0.61	16(B)EW23 23.3	16(B)EW24 0.74
09/30/02	16(A)EW53 790	16(A)EW54 1.09	16(B)EW25 8.8	16(B)EW26 0.5
10/29/02	16(A)EW55 124	16(A)EW56 1.57	16(B)EW27 97	16(B)EW28 3.12
11/26/02	16(A)EW57 56	16(A)EW58 <0.16	16(B)EW29 36	16(B)EW30 <0.17
12/30/02	16(A)EW59 352	16(A)EW60 <0.16	16(B)EW31 89	16(B)EW32 <0.16
02/03/03	16(A)EW61 506	16(A)EW62 1.52	16(B)EW31 NA	16(B)EW32 NA
02/26/03	16(A)EW63 565	16(A)EW64 <0.17	16(B)EW33 20.9	16(B)EW34 <0.16
03/31/03	16(A)EW67 433	16(A)EW68 <0.18	16(B)EW33 12.2	16(B)EW34 <0.16
04/29/03	16(A)EW69 176	16(A)EW70 <0.16	16(B)EW35 39.6	16(B)EW36 <0.16
05/23/03	16(A)EW71 235.61	16(A)EW72 0.17	16(B)EW37 10.56	16(B)EW38 0.03

Notes:

All units are mg/L.

The NWS-Earle Sewer Treatment Plant NJPDES Permit Discharge Limit for TPH is 10 ppm.

ND - not detected above laboratory detection limit

NA - not available (no sample collected)

APPENDIX A
GRAPHS OF OIL/WATER EXTRACTED TO DATE

BIOSLURPER UNIT 1 OIL/WATER RECOVERED VERSUS OPERATIONAL TIME

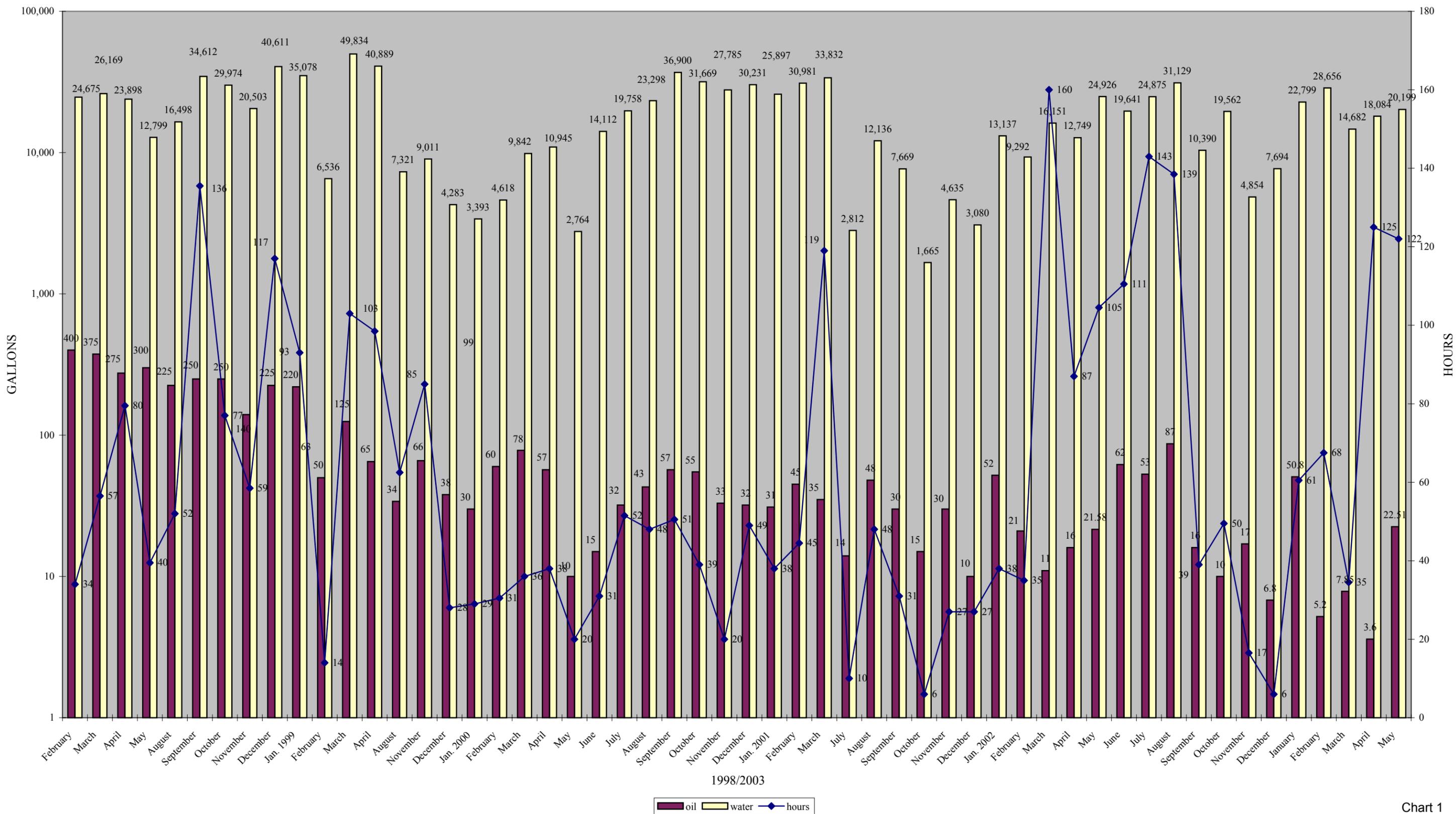


Chart 1
BIOS 1 Chart

BIOSLURPER UNIT 2 OIL/WATER RECOVERED VERSUS OPERATIONAL TIME

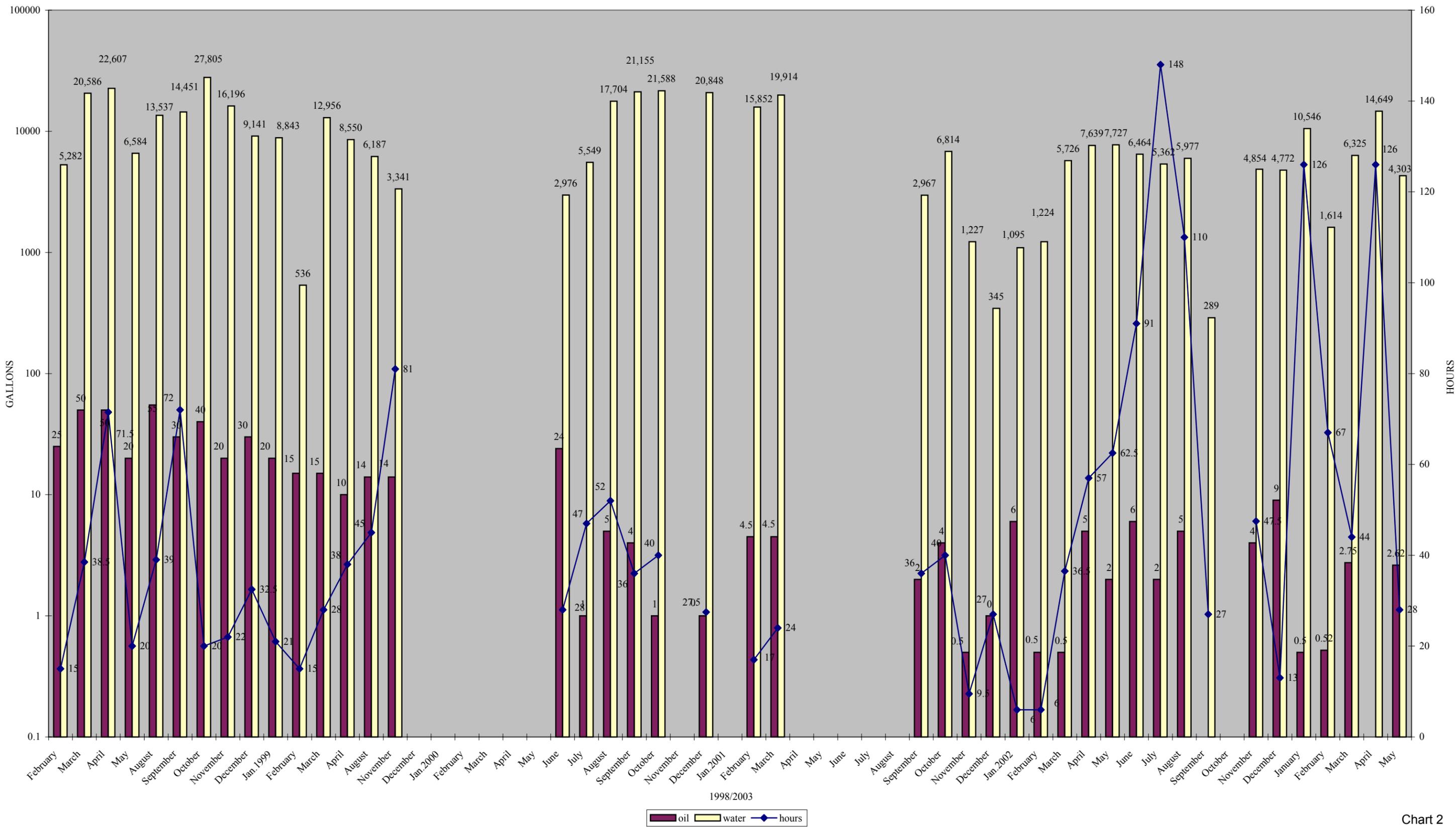
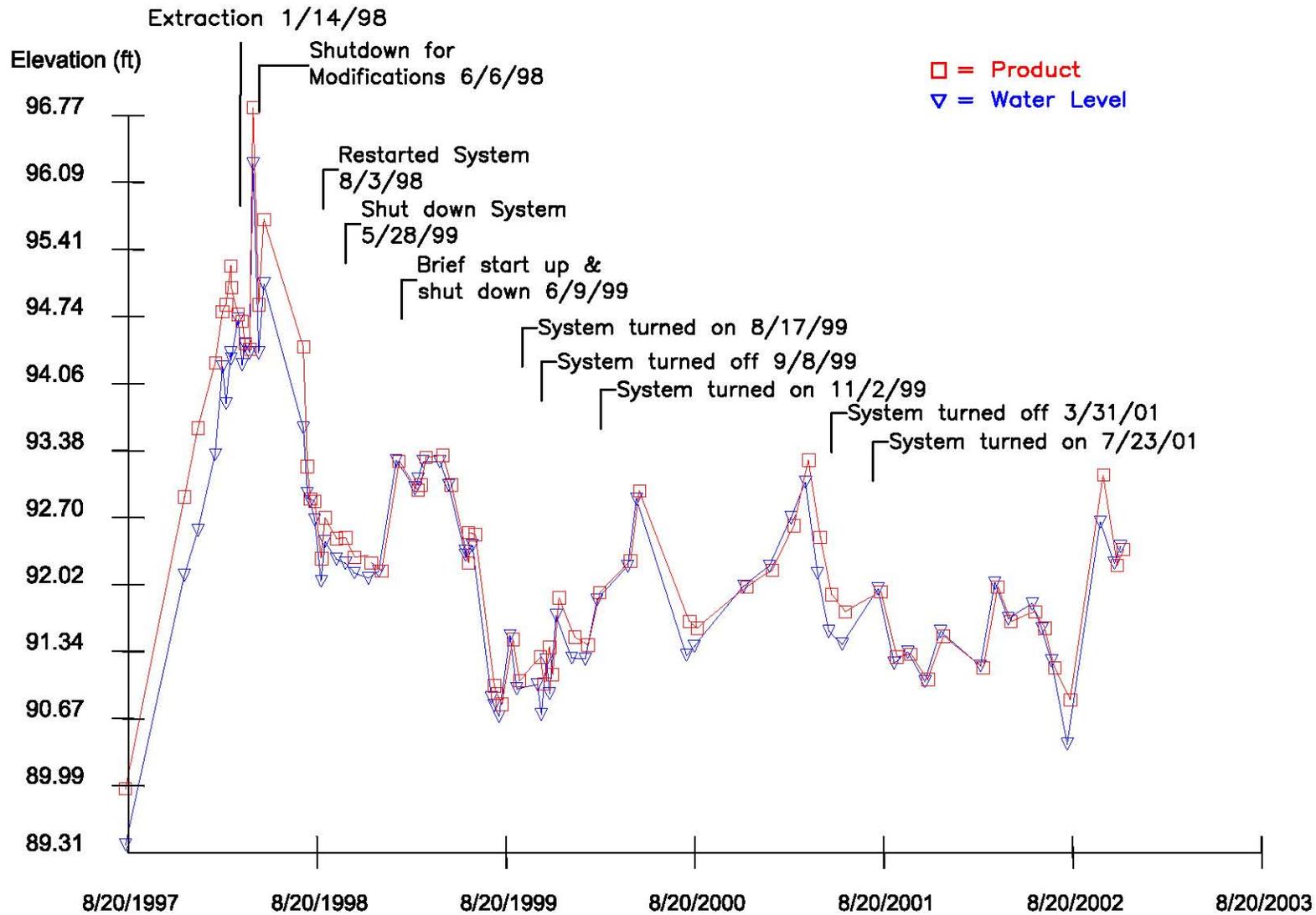


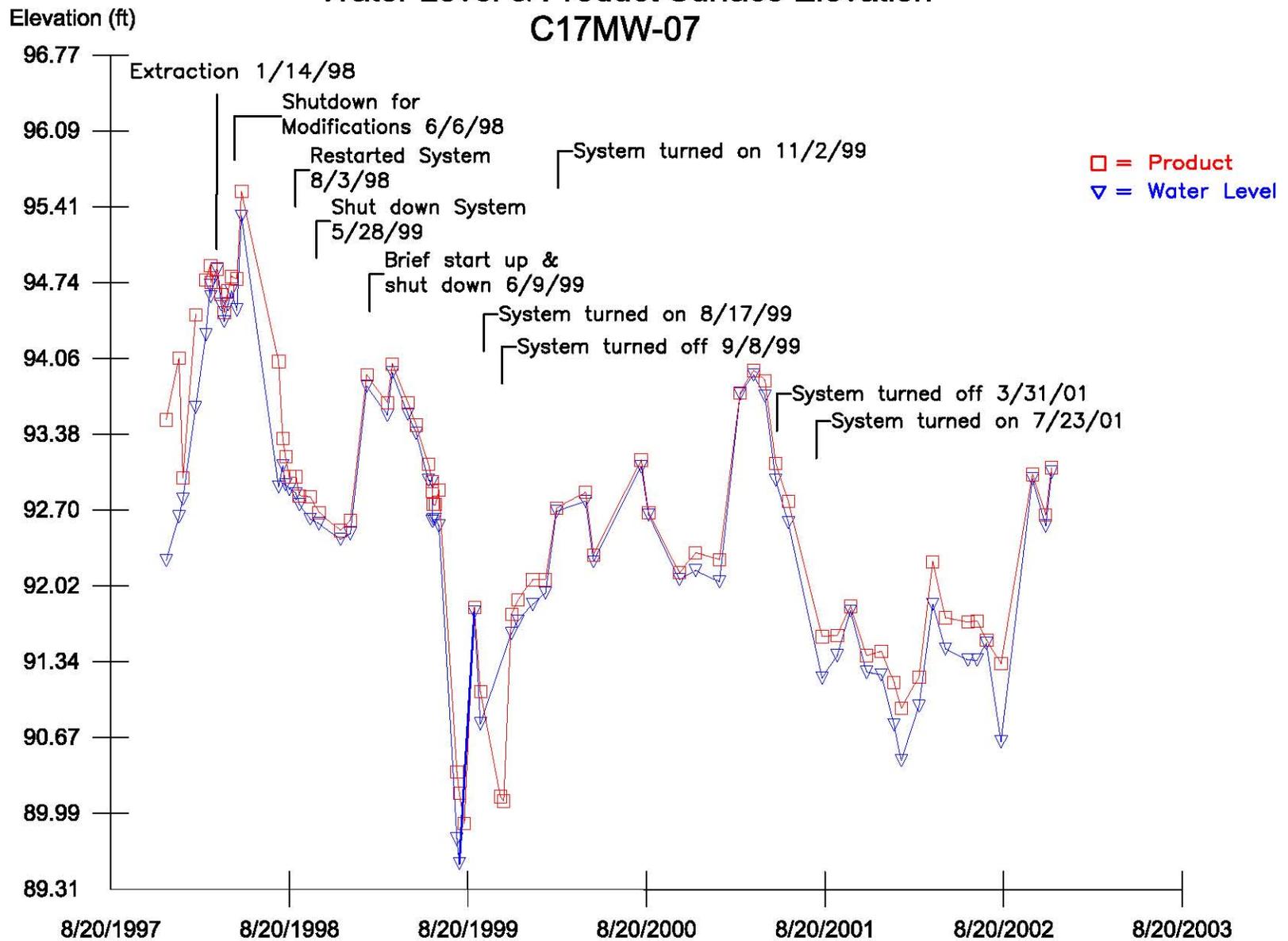
Chart 2
BIOS 2 Chart

APPENDIX B
GRAPHS OF WATER LEVELS FROM EXTRACTION WELLS

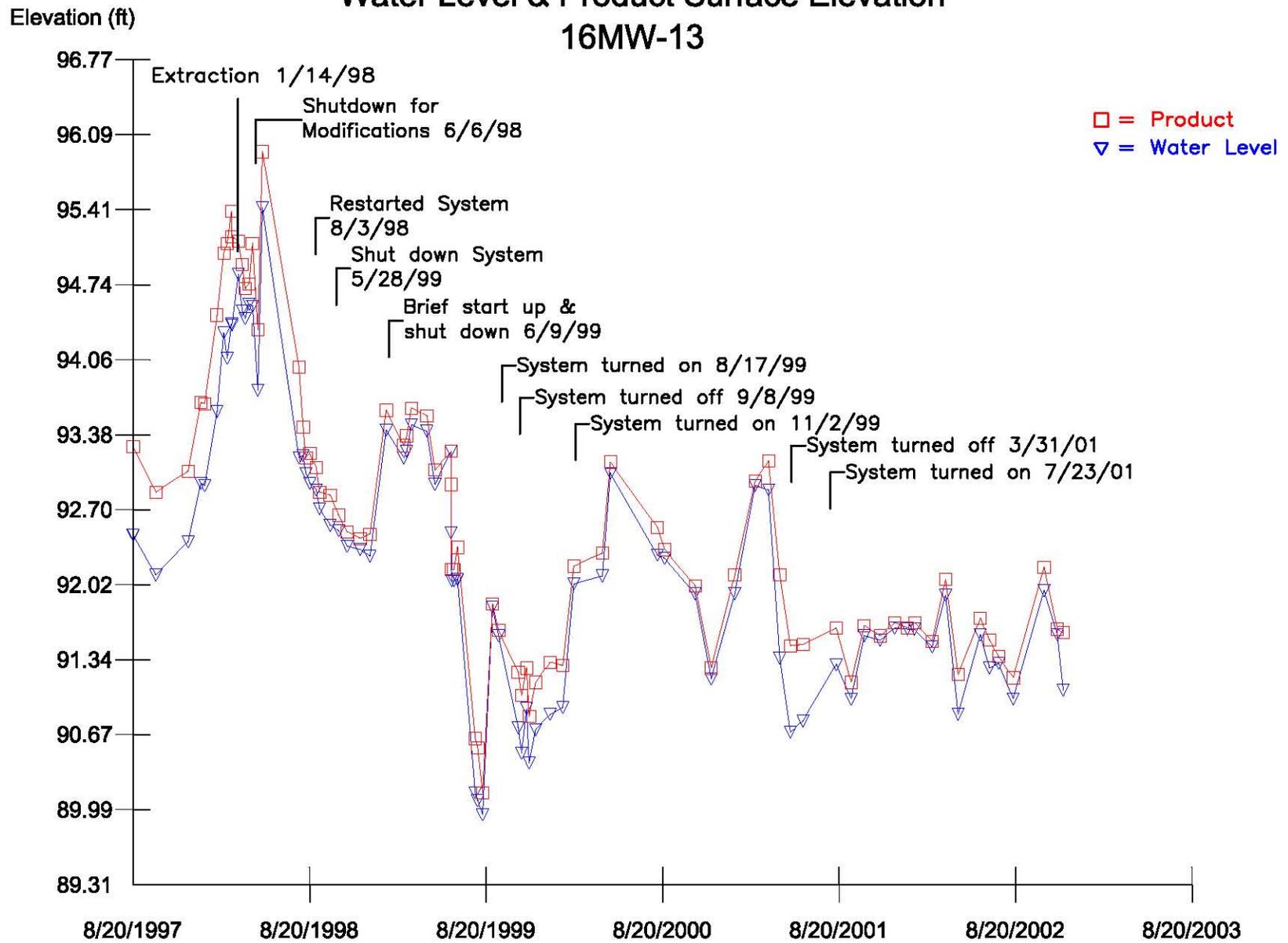
Water Level & Product Surface Elevation 16MW-04



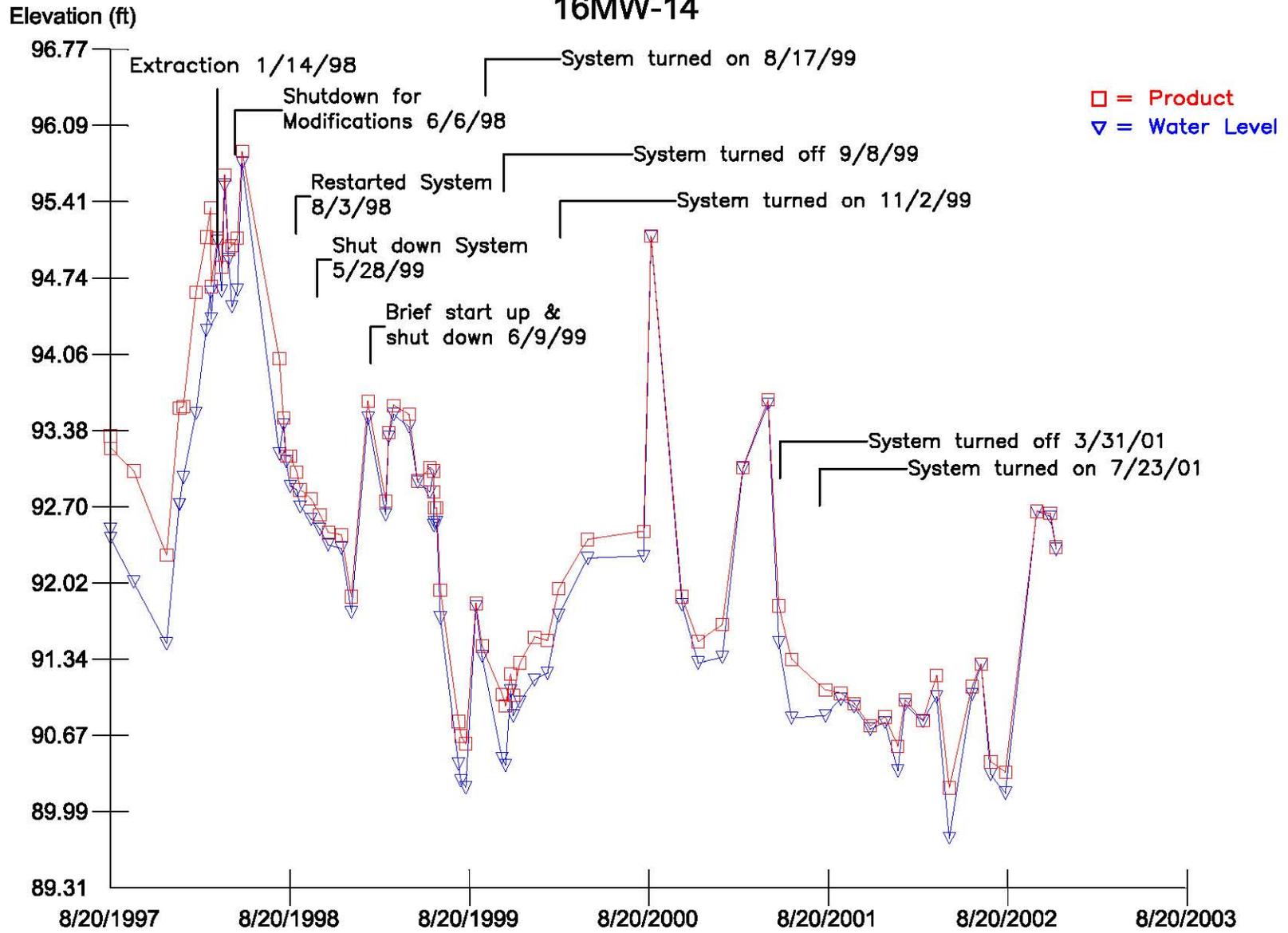
Water Level & Product Surface Elevation C17MW-07



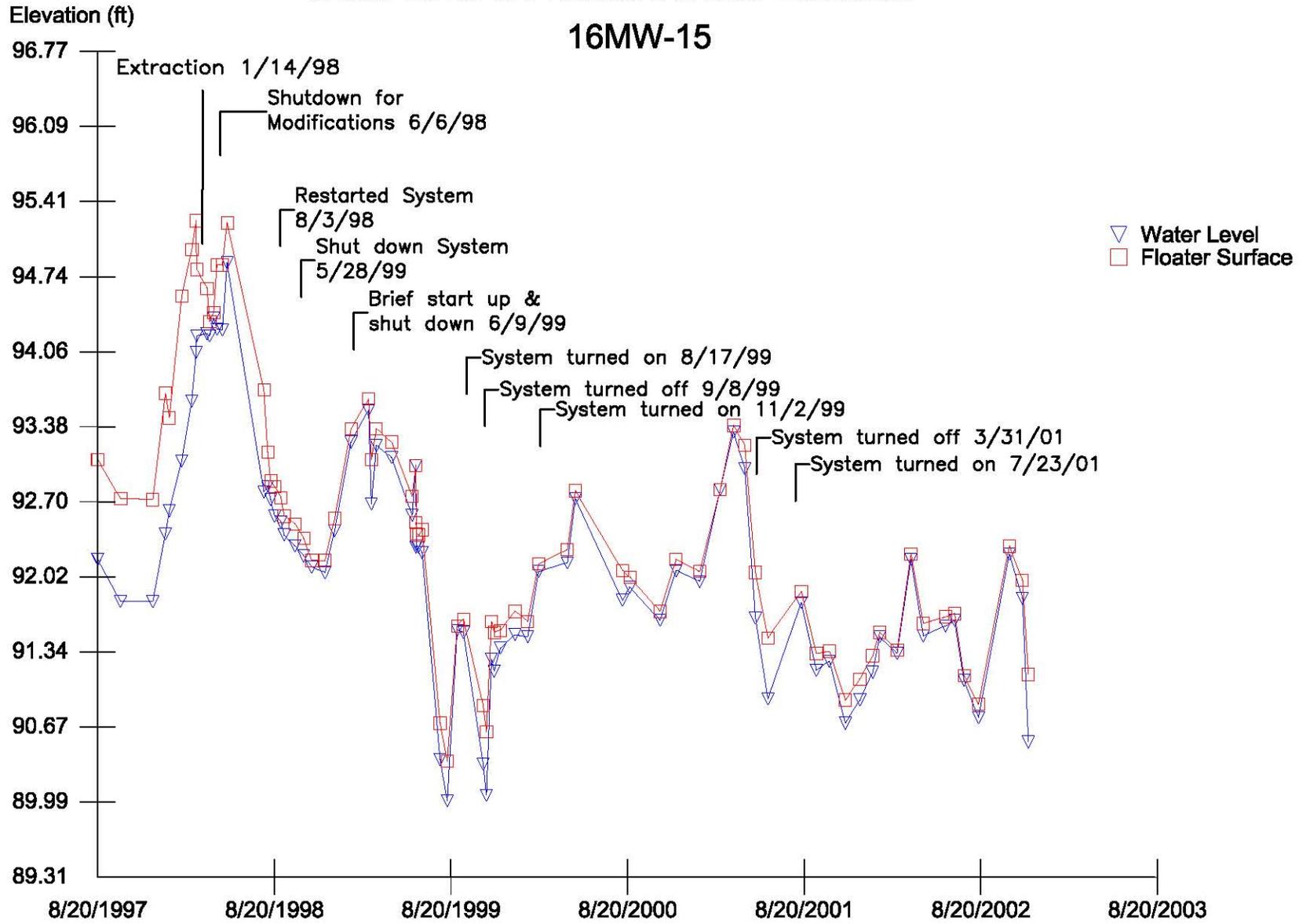
Water Level & Product Surface Elevation 16MW-13



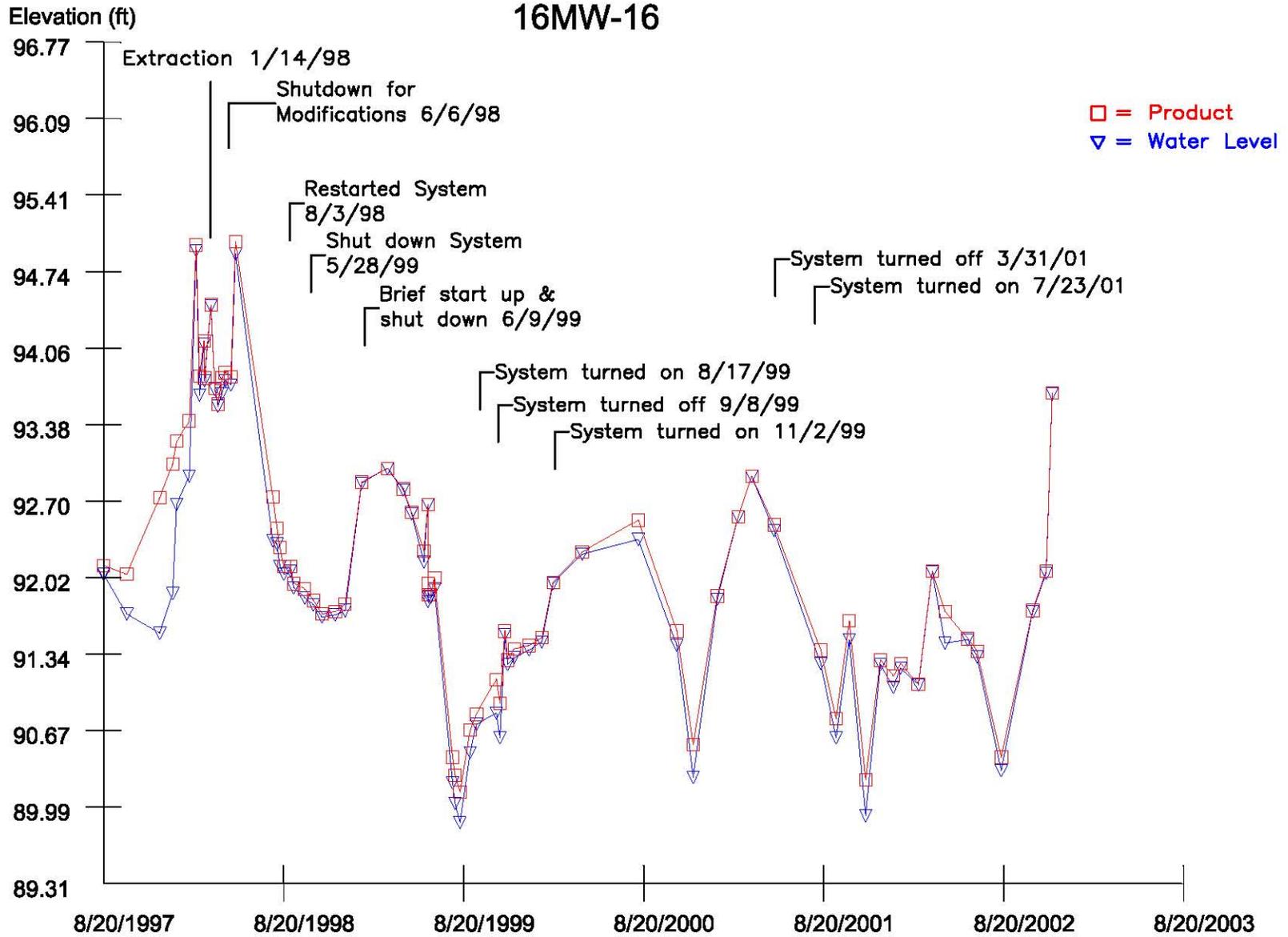
Water Level & Product Surface Elevation 16MW-14



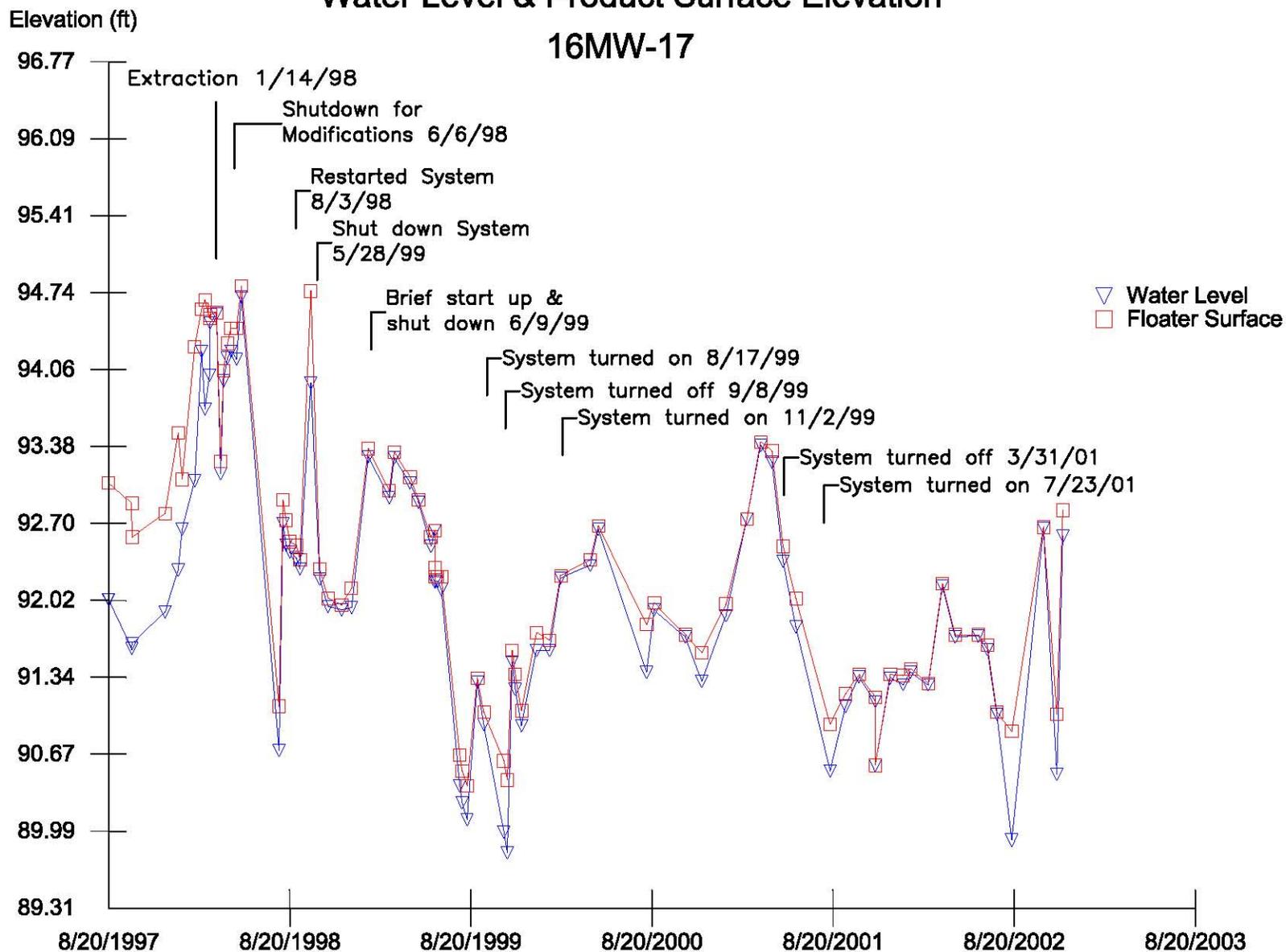
Water Level & Product Surface Elevation 16MW-15



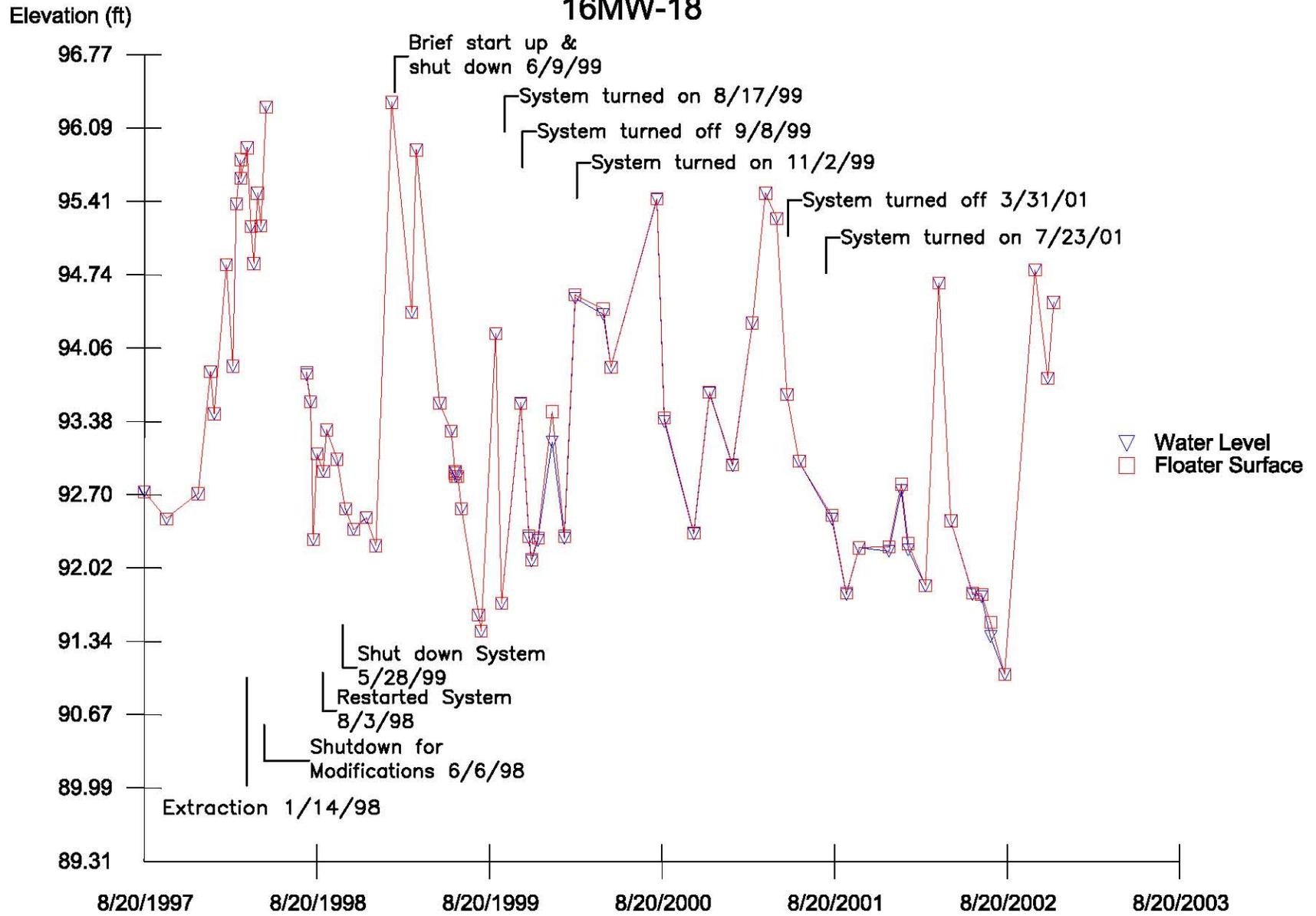
Water Level & Product Surface Elevation 16MW-16



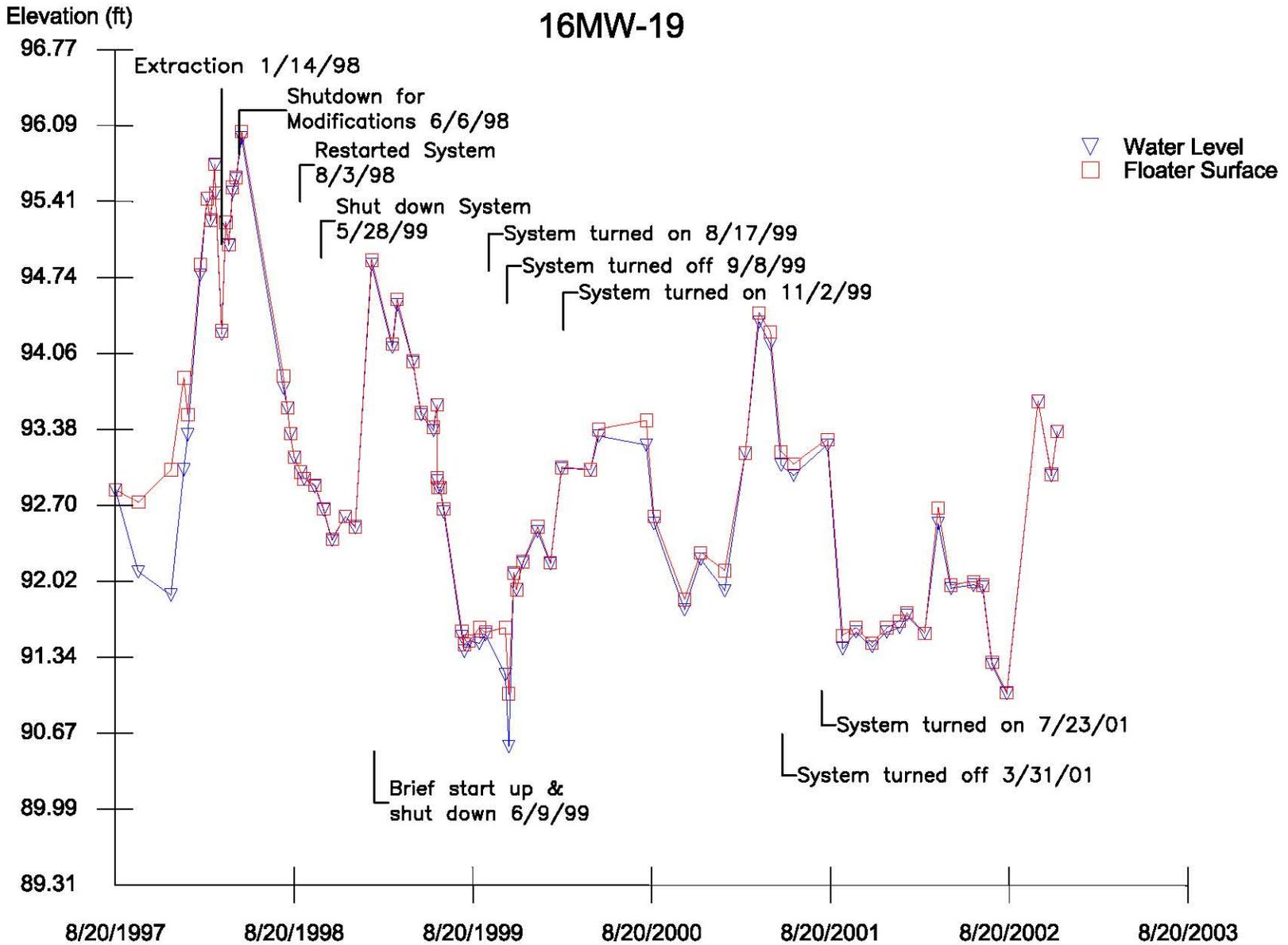
Water Level & Product Surface Elevation 16MW-17



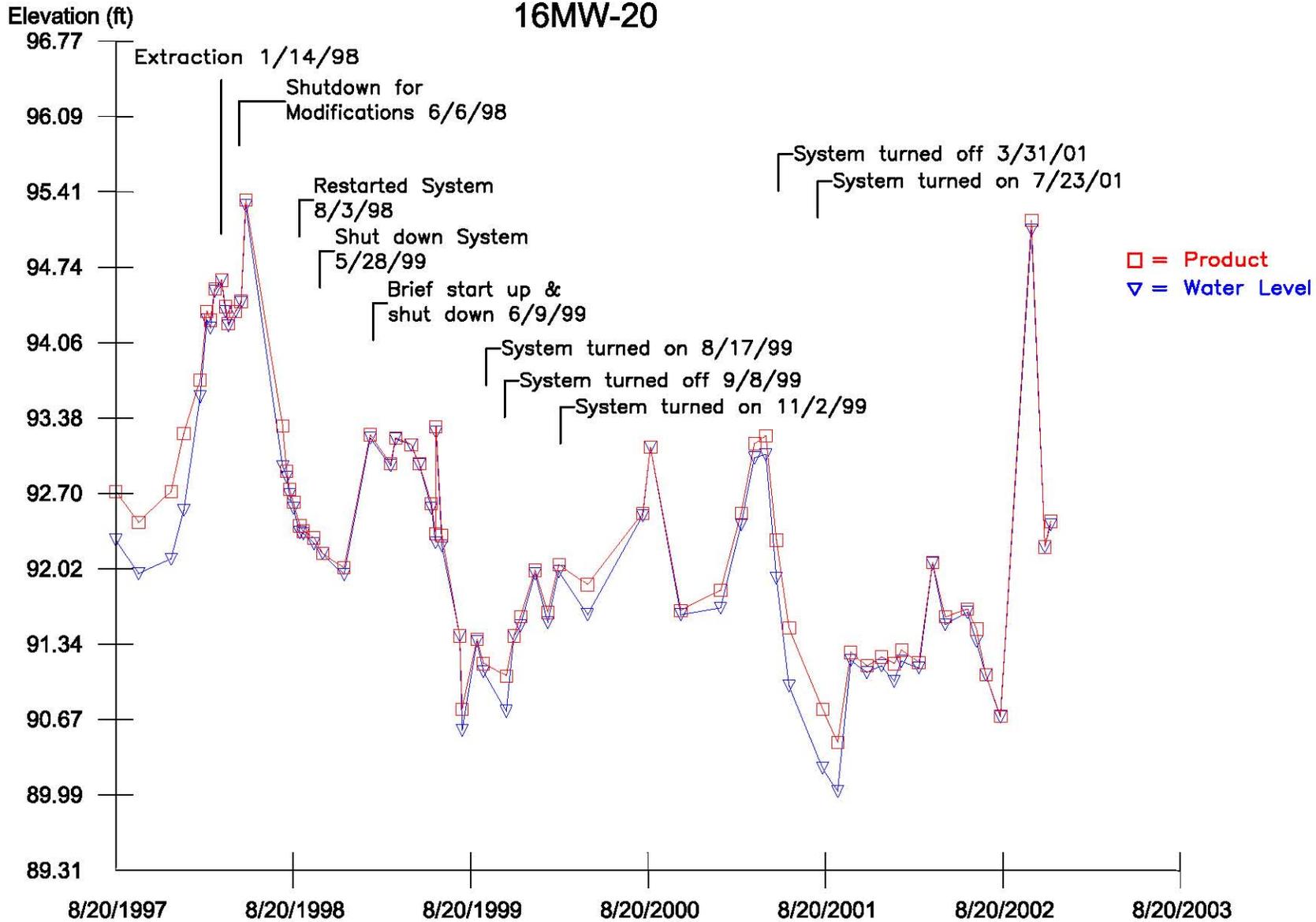
Water Level & Product Surface Elevation 16MW-18

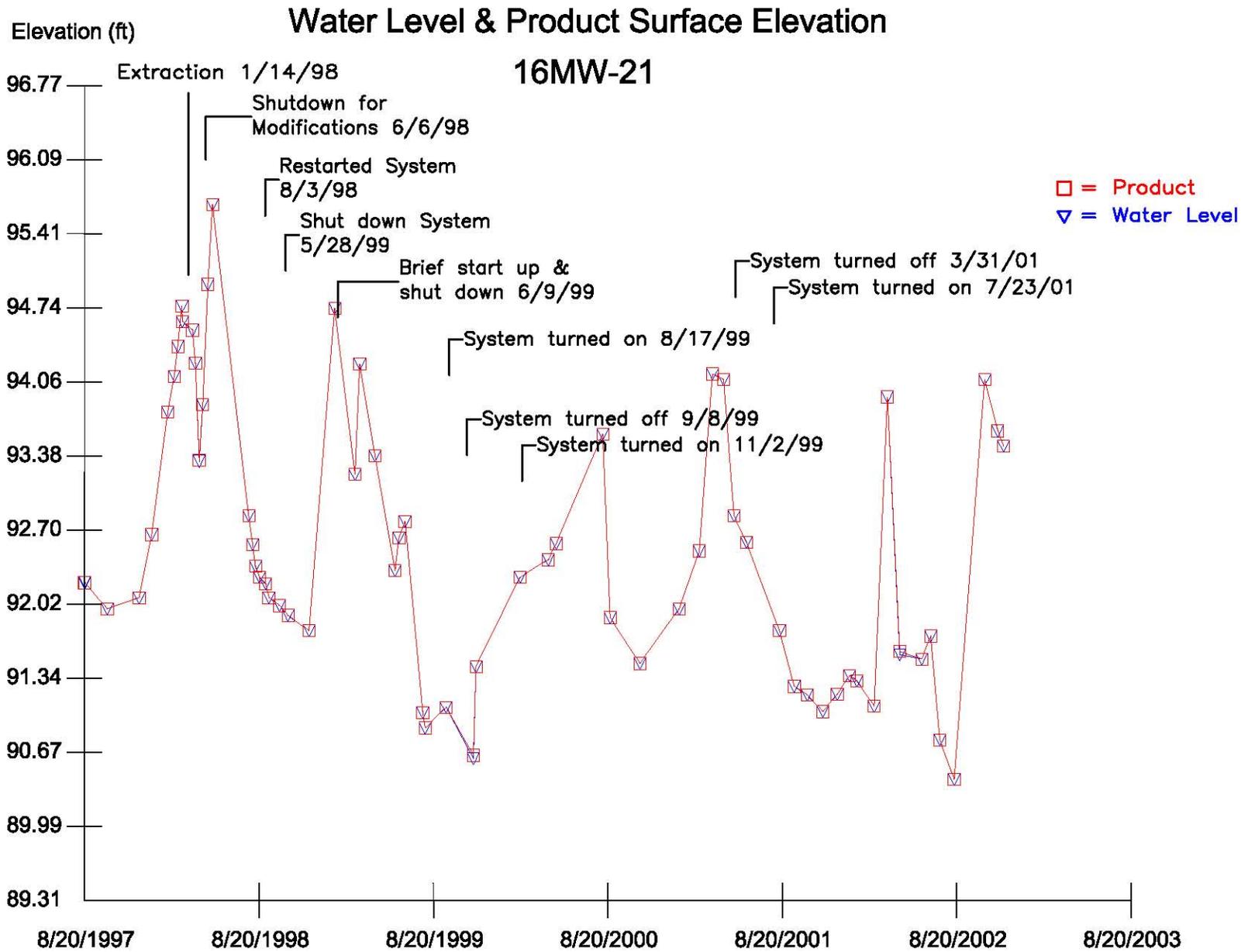


Water Level & Product Surface Elevation 16MW-19

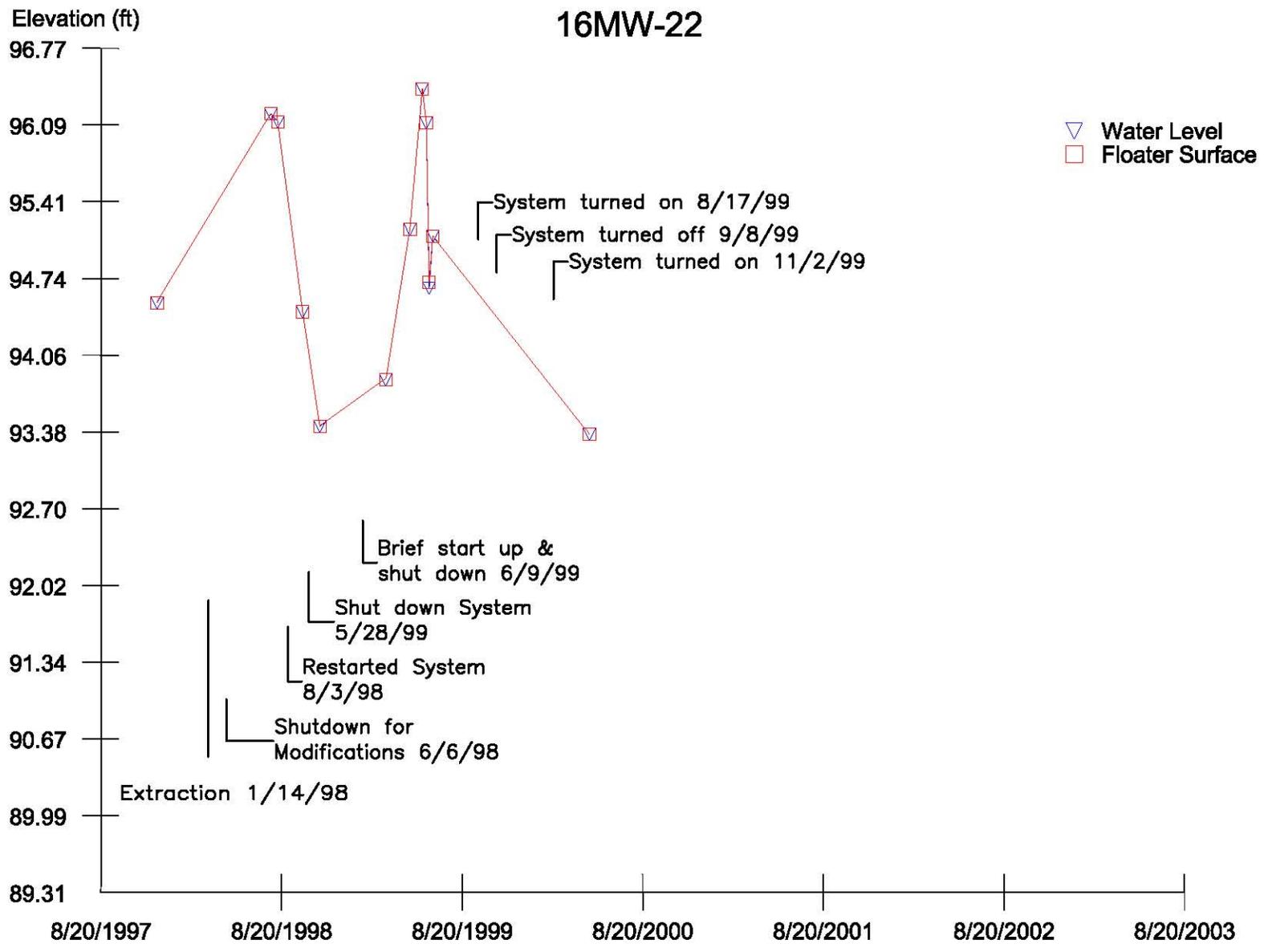


Water Level & Product Surface Elevation 16MW-20

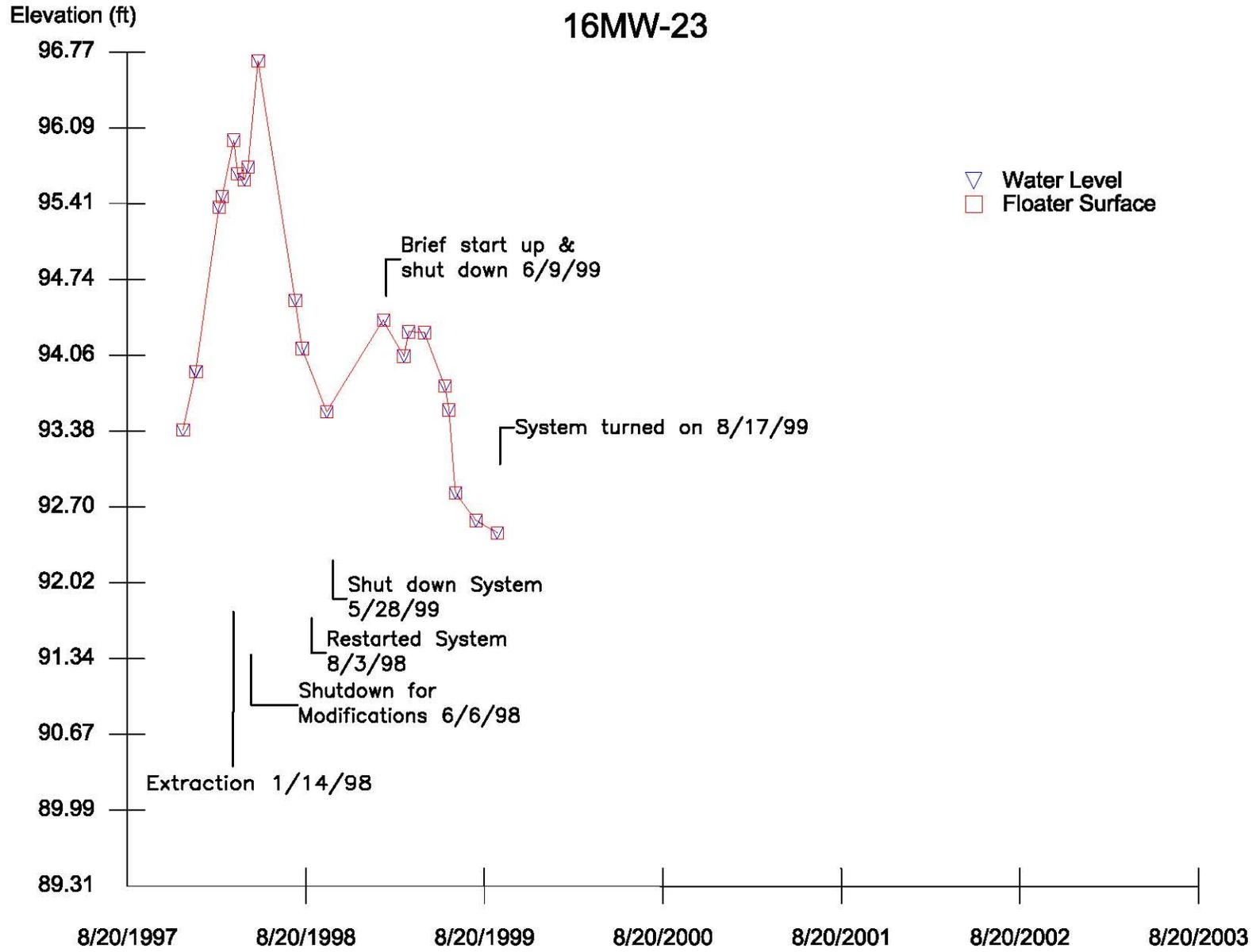




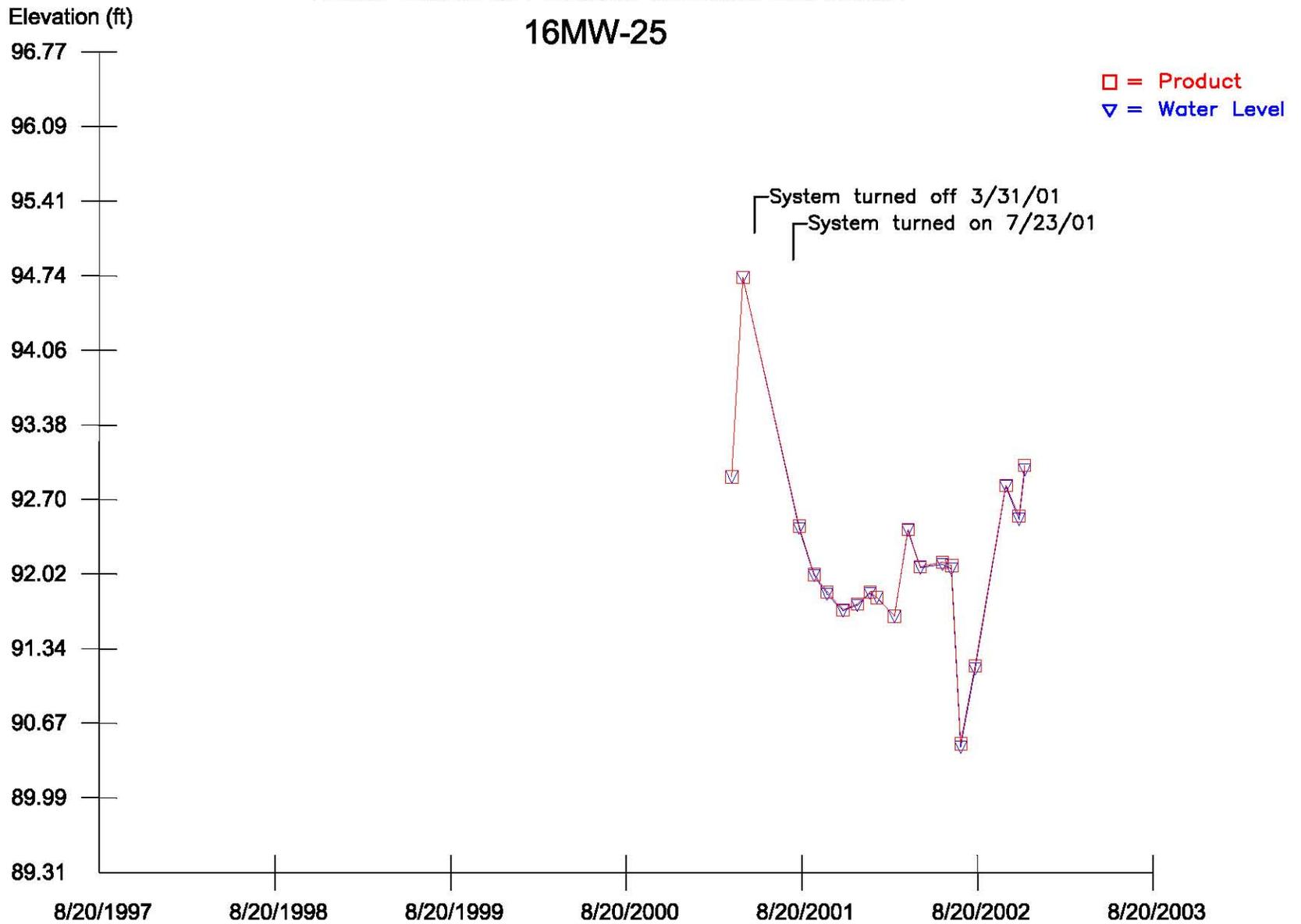
Water Level & Product Surface Elevation 16MW-22



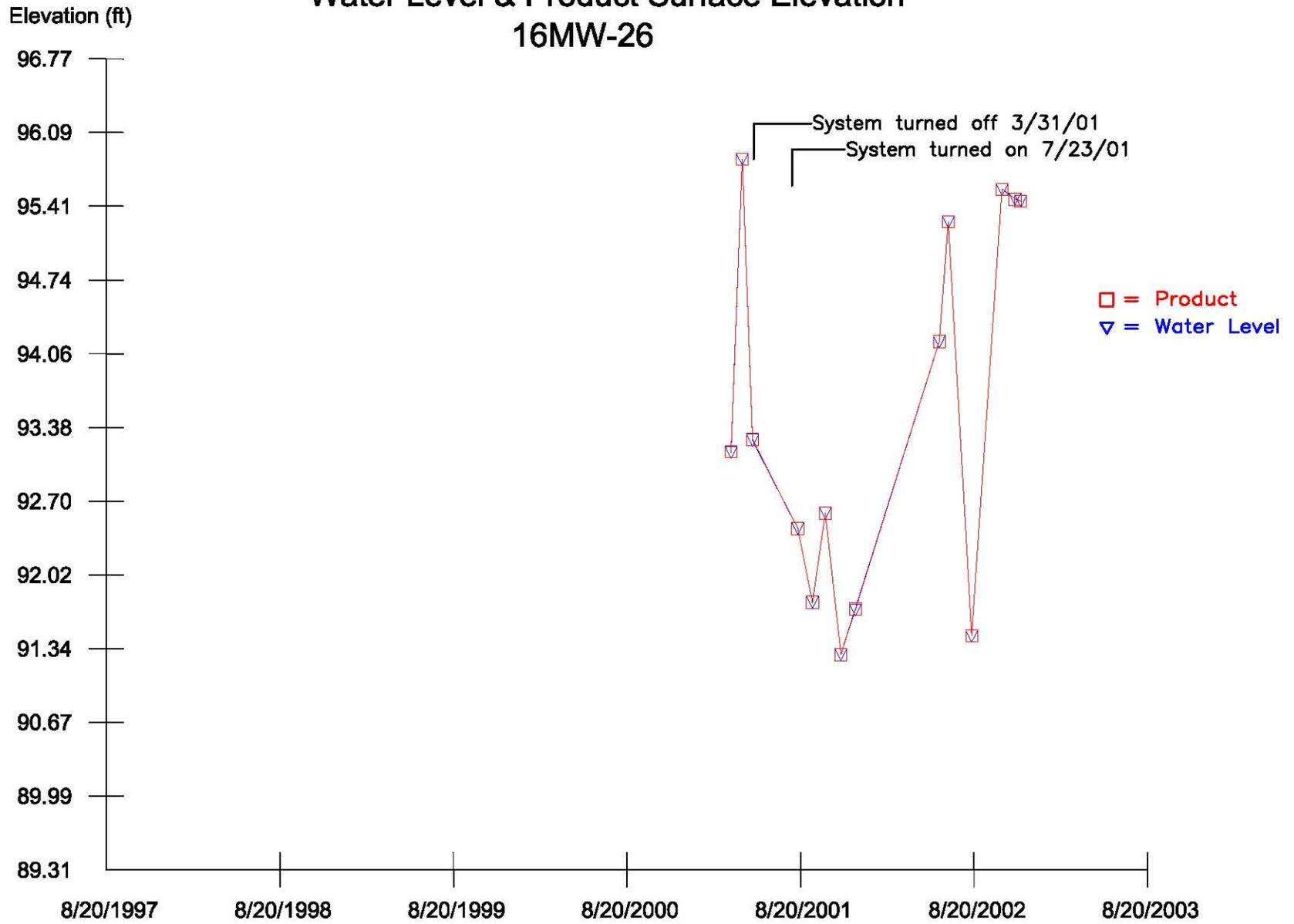
Water Level & Product Surface Elevation 16MW-23



Water Level & Product Surface Elevation 16MW-25



Water Level & Product Surface Elevation 16MW-26



Water Level & Product Surface Elevation 16MW-27

Elevation (ft)

96.77

96.09

95.41

94.74

94.06

93.38

92.70

92.02

91.34

90.67

89.99

89.31

□ = Product

▽ = Water Level

System turned off 3/31/01

System turned on 7/23/01

8/20/1997

8/20/1998

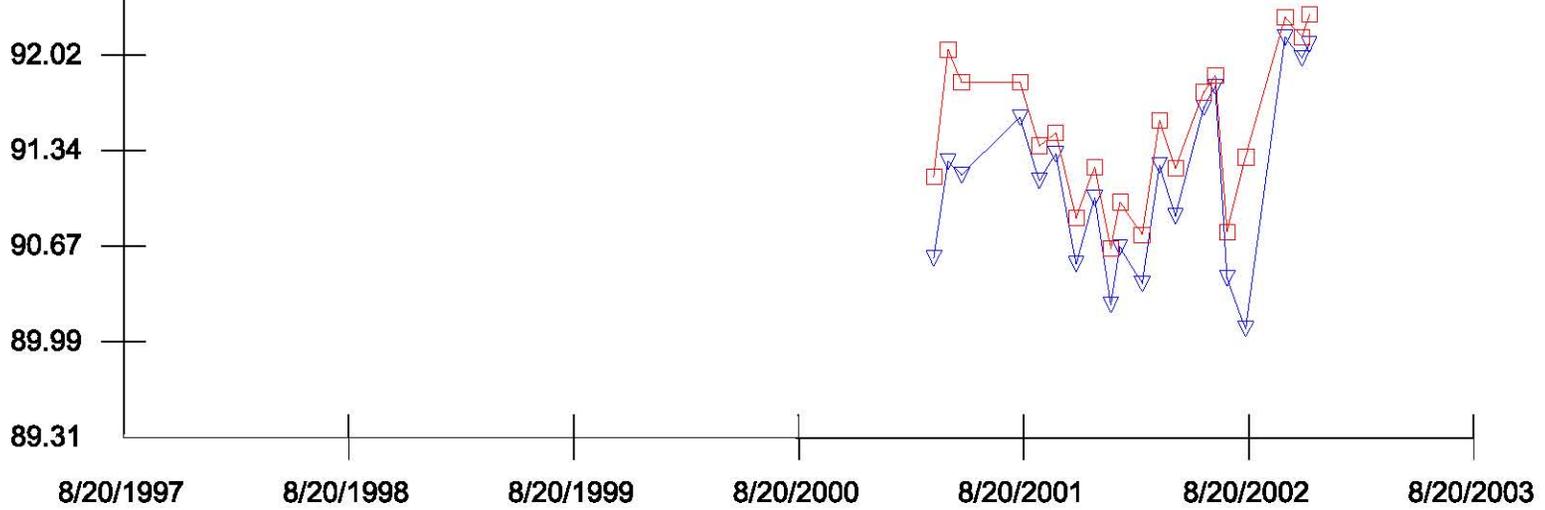
8/20/1999

8/20/2000

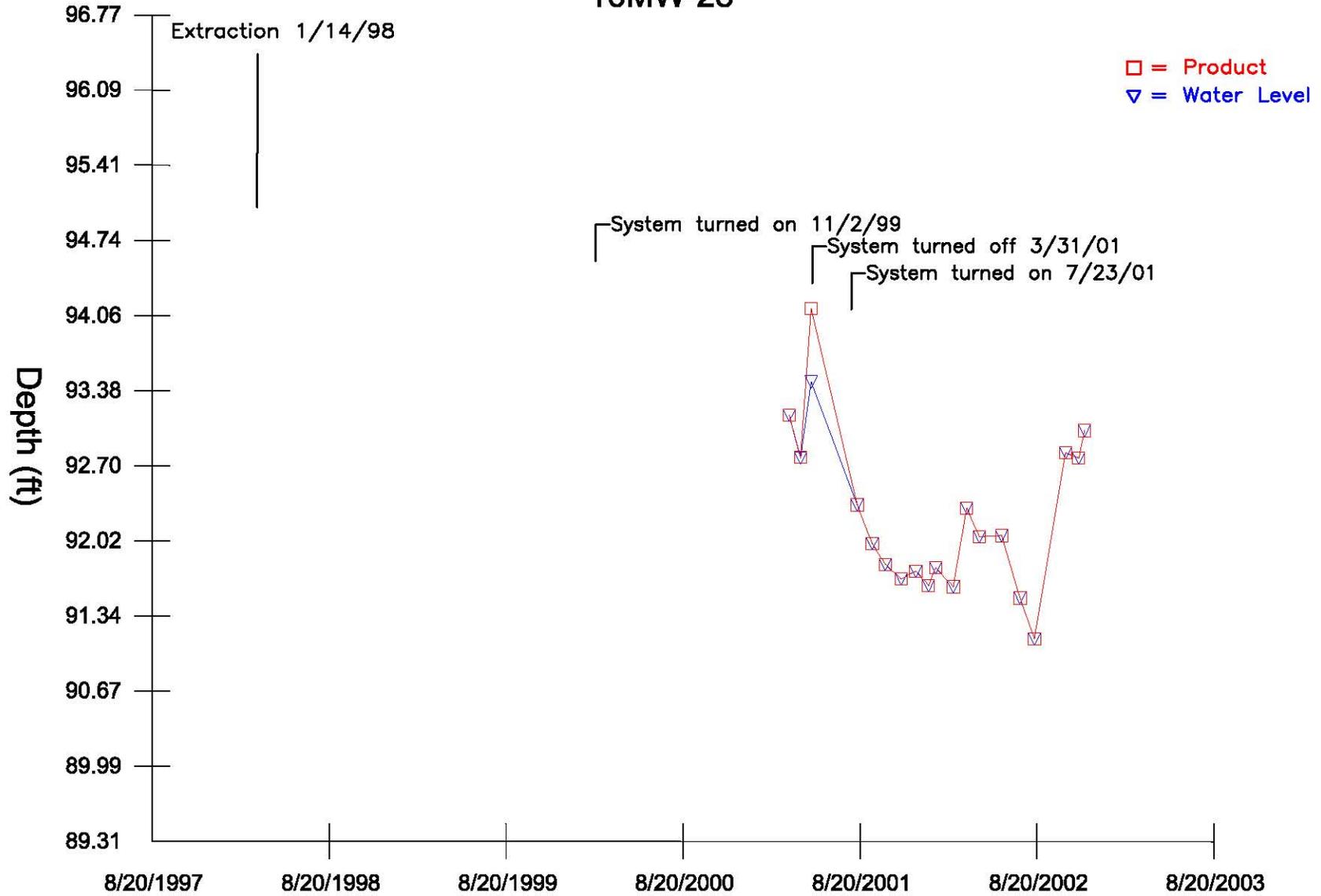
8/20/2001

8/20/2002

8/20/2003



Water Level & Product Surface Elevation 16MW-28



APPENDIX C
ANALYTICAL SUMMARY TABLES FOR AIR DISCHARGES
AND ASSOCIATED DATA

U.S. Navy RAC Contract No. N62472-99-D-0032
 Naval Weapons Station-Earle: Bioslurper Unit No. 1
 Analytical Results of Air Samples

Bioslurper Unit #1

SAMPLE NO. 16(A)VD(03)-43 Sample Date: 3/31/2003								
Compound	Molecular Weight (lbs/lbs-mol)	Conversion Constant (cu. ft/lbs-mol)	Time Conversion (min/hr)	Weekly Flow Rate (cu. ft/min)	Compound Conc. (ppm(v))	Compound Emission Limit ppm(v)	Output Rate (lbs/hr)	Emission Limits (lbs/hr)
Acetone	58.1	384.6	60.0	35.0	0.014	N/A	4.44E-06	
Benzene	78.0	384.6	60.0	35.0	0.000	7.0	0.00E+00	8.00E-03
Toluene	92.0	384.6	60.0	35.0	0.000	N/A	0.00E+00	
Ethylbenzene	106.0	384.6	60.0	35.0	0.000	N/A	0.00E+00	
m,p-Xylenes	106.0	384.6	60.0	35.0	0.000	N/A	0.00E+00	
o-Xylene	106.0	384.6	60.0	35.0	0.000	N/A	0.00E+00	
Vinyl Chloride	62.5	384.6	60.0	35.0	0.000	N/A	0.00E+00	
1,3,5-Trimethylbenzene	120.0	384.6	60.0	35.0	0.000	N/A	0.00E+00	
1,2,4-Trimethylbenzene	120.0	384.6	60.0	35.0	0.000	N/A	0.00E+00	
Total Emissions:					0.01	27.5	4.44E-06	3.50E-02

Formula: Output Rate per Compound = $\frac{(\text{Mol. Wt.}) \times (\text{Time Conv.}) \times (\text{Concentration}) \times (\text{Flow Rate})}{(\text{Conv. Constant}) \times 10^6}$

Note: Sample collected after carbon treatment.

U.S. Navy RAC Contract No. N62472-99-D-0032
 Naval Weapons Station-Earle: Bioslurper Unit No. 2
 Analytical Results of Air Samples

Bioslurper Unit #2

SAMPLE NO. 16(B)VD(03)-20 Sample Date: 3/31/2003								
Compound	Molecular Weight (lbs/lbs-mol)	Conversion Constant (cu. ft/lbs-mol)	Time Conversion (min/hr)	Weekly Flow Rate (cu. ft/min)	Compound Conc. (ppm(v))	Compound Emission Limit ppm(v)	Output Rate (lbs/hr)	Emission Limits (lbs/hr)
Acetone	58.1	384.6	60.0	48.0	0.000	N/A	0.00E+00	
Benzene	78.0	384.6	60.0	48.0	0.190	7.0	1.11E-04	8.00E-03
Toluene	92.0	384.6	60.0	48.0	0.029	N/A	2.00E-05	
Ethylbenzene	106.0	384.6	60.0	48.0	0.640	N/A	5.08E-04	
m,p-Xylenes	106.0	384.6	60.0	48.0	1.900	N/A	1.51E-03	
o-Xylene	106.0	384.6	60.0	48.0	0.570	N/A	4.52E-04	
Vinyl Chloride	62.5	384.6	60.0	48.0	0.000	N/A	0.00E+00	
1,3,5-Trimethylbenzene	120.0	384.6	60.0	48.0	0.760	N/A	6.83E-04	
1,2,4-Trimethylbenzene	120.0	384.6	60.0	48.0	2.500	N/A	2.25E-03	
Total Emissions:					6.59	27.5	5.53E-03	3.50E-02

Formula: Output Rate per Compound = $\frac{(\text{Mol. Wt.}) \times (\text{Time Conv.}) \times (\text{Concentration}) \times (\text{Flow Rate})}{(\text{Conv. Constant}) \times 10^6}$

Note: Sample collected after carbon treatment.

U.S. Navy RAC Contract No. N62472-99-D-0032
 Naval Weapons Station-Earle: Bioslurper Unit No. 1
 Analytical Results of Air Samples

Bioslurper Unit #1

SAMPLE NO. 16(A)VD(03)-45								
Sample Date: 4/29/2003								
Compound	Molecular Weight (lbs/lbs-mol)	Conversion Constant (cu. ft/lbs-mol)	Time Conversion (min/hr)	Weekly Flow Rate (cu. ft/min)	Compound Conc. (ppm(v))	Compound Emission Limit ppm(v)	Output Rate (lbs/hr)	Emission Limits (lbs/hr)
Acetone	58.1	384.6	60.0	35.0	0.011	N/A	3.49E-06	
Benzene	78.0	384.6	60.0	35.0	0.001	7.0	5.54E-07	8.00E-03
Toluene	92.0	384.6	60.0	35.0	0.000	N/A	0.00E+00	
Ethylbenzene	106.0	384.6	60.0	35.0	0.000	N/A	0.00E+00	
m,p-Xylenes	106.0	384.6	60.0	35.0	0.000	N/A	0.00E+00	
o-Xylene	106.0	384.6	60.0	35.0	0.000	N/A	0.00E+00	
1,3,5-Trimethylbenzene	120.0	384.6	60.0	35.0	0.000	N/A	0.00E+00	
1,2,4-Trimethylbenzene	120.0	384.6	60.0	35.0	0.000	N/A	0.00E+00	
Total Emissions:					0.01	27.5	4.04E-06	3.50E-02

Formula: Output Rate per Compound = $\frac{(\text{Mol. Wt.}) \times (\text{Time Conv.}) \times (\text{Concentration}) \times (\text{Flow Rate})}{(\text{Conv. Constant}) \times 10^6}$

Note: Sample collected after carbon treatment.

U.S. Navy RAC Contract No. N62472-99-D-0032
 Naval Weapons Station-Earle: Bioslurper Unit No. 2
 Analytical Results of Air Samples

Bioslurper Unit #2

SAMPLE NO. 16(B)VD(03)-21								
Sample Date: 4/29/2003								
Compound	Molecular Weight (lbs/lbs-mol)	Conversion Constant (cu. ft/lbs-mol)	Time Conversion (min/hr)	Weekly Flow Rate (cu. ft/min)	Compound Conc. (ppm(v))	Compound Emission Limit ppm(v)	Output Rate (lbs/hr)	Emission Limits (lbs/hr)
Acetone	58.1	384.6	60.0	48.0	0.0	N/A	0.00E+00	
Benzene	78.0	384.6	60.0	48.0	0.080	7.0	4.67E-05	8.00E-03
Toluene	92.0	384.6	60.0	48.0	0.009	N/A	6.34E-06	
Ethylbenzene	106.0	384.6	60.0	48.0	0.160	N/A	1.27E-04	
m,p-Xylenes	106.0	384.6	60.0	48.0	0.280	N/A	2.22E-04	
o-Xylene	106.0	384.6	60.0	48.0	0.071	N/A	5.64E-05	
Vinyl Chloride	62.5	384.6	60.0	48.0	0.026	N/A	1.22E-05	
1,3,5-Trimethylbenzene	120.0	384.6	60.0	48.0	0.180	N/A	1.62E-04	
1,2,4-Trimethylbenzene	120.0	384.6	60.0	48.0	0.890	N/A	8.00E-04	
Total Emissions:					1.70	27.5	1.43E-03	3.50E-02

Formula: Output Rate per Compound = $\frac{(\text{Mol. Wt.}) \times (\text{Time Conv.}) \times (\text{Concentration}) \times (\text{Flow Rate})}{(\text{Conv. Constant}) \times 10^6}$

Note: Sample collected after carbon treatment.

U.S. Navy RAC Contract No. N62472-99-D-0032
 Naval Weapons Station-Earle: Bioslurper Unit No. 1
 Analytical Results of Air Samples

Bioslurper Unit #1

SAMPLE NO. 16(A)VD(03)-47 Sample Date: 6/3/2003								
Compound	Molecular Weight (lbs/lbs-mol)	Conversion Constant (cu. ft/lbs-mol)	Time Conversion (min/hr)	Weekly Flow Rate (cu. ft/min)	Compound Conc. (ppm(v))	Compound Emission Limit ppm(v)	Output Rate (lbs/hr)	Emission Limits (lbs/hr)
Acetone	58.1	384.6	60.0	35.0	0.000	N/A	0.00E+00	
Benzene	78.0	384.6	60.0	35.0	0.000	7.0	0.00E+00	8.00E-03
Toluene	92.0	384.6	60.0	35.0	2.000	N/A	1.00E-03	
Ethylbenzene	106.0	384.6	60.0	35.0	6.000	N/A	3.47E-03	
m,p-Xylenes	106.0	384.6	60.0	35.0	0.001	N/A	6.95E-07	
o-Xylene	106.0	384.6	60.0	35.0	0.000	N/A	0.00E+00	
1,3,5-Trimethylbenzene	120.0	384.6	60.0	35.0	0.000	N/A	0.00E+00	
1,2,4-Trimethylbenzene	120.0	384.6	60.0	35.0	0.001	N/A	9.17E-07	
Total Emissions:					8.00	27.5	4.48E-03	3.50E-02

Formula: Output Rate per Compound = $\frac{(\text{Mol. Wt.}) \times (\text{Time Conv.}) \times (\text{Concentration}) \times (\text{Flow Rate})}{(\text{Conv. Constant}) \times 10^6}$

Note: Sample collected after carbon treatment.

U.S. Navy RAC Contract No. N62472-99-D-0032
 Naval Weapons Station-Earle: Bioslurper Unit No. 2
 Analytical Results of Air Samples

Bioslurper Unit #2

SAMPLE NO. 16(B)VD(03)-22 Sample Date: 5/23/2003								
Compound	Molecular Weight (lbs/lbs-mol)	Conversion Constant (cu. ft/lbs-mol)	Time Conversion (min/hr)	Weekly Flow Rate (cu. ft/min)	Compound Conc. (ppm(v))	Compound Emission Limit ppm(v)	Output Rate (lbs/hr)	Emission Limits (lbs/hr)
Acetone	58.1	384.6	60.0	48.0	0.100	N/A	4.35E-05	
Benzene	78.0	384.6	60.0	48.0	0.170	7.0	9.93E-05	8.00E-03
Toluene	92.0	384.6	60.0	48.0	0.140	N/A	9.64E-05	
Ethylbenzene	106.0	384.6	60.0	48.0	2.100	N/A	1.67E-03	
m,p-Xylenes	106.0	384.6	60.0	48.0	5.700	N/A	4.52E-03	
o-Xylene	106.0	384.6	60.0	48.0	0.000	N/A	0.00E+00	
Vinyl Chloride	62.5	384.6	60.0	48.0	0.100	N/A	4.68E-05	
1,3,5-Trimethylbenzene	120.0	384.6	60.0	48.0	1.300	N/A	1.17E-03	
1,2,4-Trimethylbenzene	120.0	384.6	60.0	48.0	4.100	N/A	3.68E-03	
Total Emissions:					13.71	27.5	1.13E-02	3.50E-02

Formula: Output Rate per Compound = $\frac{(\text{Mol. Wt.}) \times (\text{Time Conv.}) \times (\text{Concentration}) \times (\text{Flow Rate})}{(\text{Conv. Constant}) \times 10^6}$

Note: Sample collected after carbon treatment.

NWS-EARLE
 BIOSLURPER UNIT #1 AND #2
 TPH REMOVED VIA VAPOR EXTRACTION

7/18/03

BIOSLURPER UNIT 1	
OPERATED (hours):	34.5
AVERAGE FLOW RATE (cfm):	35
TPH CONCENTRATION (mg/m ³):	750
(as per analytical)	3/31/2003
	3.39 = POUNDS OF TPH

BIOSLURPER UNIT 2	
OPERATED (hours):	44
AVERAGE FLOW RATE (cfm):	48
TPH CONCENTRATION (mg/m ³):	450
(as per analytical)	3/31/2003
	3.56 = POUNDS OF TPH

POUNDS OF TPH= _____
AVERAGE FLOW RATE (cfm) * 0.02832m³/ft³ * **TPH CONC**(mg/m³) * 0.001g/mg * 0.002205 lbs/g * 60 min/hr * **OPERATED** (hours)

NWS-EARLE
 BIOSLURPER UNIT #1 AND #2
 TPH REMOVED VIA VAPOR EXTRACTION

7/18/03

BIOSLURPER UNIT 1	
OPERATED (hours):	125
AVERAGE FLOW RATE (cfm):	35
TPH CONCENTRATION (mg/m ³):	870
(as per analytical)	4/29/2003
	14.26 = POUNDS OF TPH

BIOSLURPER UNIT 2	
OPERATED (hours):	126
AVERAGE FLOW RATE (cfm):	48
TPH CONCENTRATION (mg/m ³):	140
(as per analytical)	4/29/2003
	3.17 = POUNDS OF TPH

POUNDS OF TPH= _____
AVERAGE FLOW RATE (cfm) * 0.02832m³/ft³ * **TPH CONC**(mg/m³) * 0.001g/mg * 0.002205 lbs/g * 60 min/hr * **OPERATED** (hours)

BIOSLURPER UNIT 1	
OPERATED (hours):	122
AVERAGE FLOW RATE (cfm):	35
TPH CONCENTRATION (mg/m ³):	9.6
(as per analytical)	5/23/2003
	0.15 = POUNDS OF TPH

BIOSLURPER UNIT 2	
OPERATED (hours):	28
AVERAGE FLOW RATE (cfm):	48
TPH CONCENTRATION (mg/m ³):	1000
(as per analytical)	5/23/2003
	5.04 = POUNDS OF TPH

POUNDS OF TPH= _____
AVERAGE FLOW RATE (cfm) * 0.02832m³/ft³ * **TPH CONC**(mg/m³) * 0.001g/mg * 0.002205 lbs/g * 60 min/hr * **OPERATED** (hours)

eCVP

**Electronic Comprehensive
Validation Package**

WO# 0304049A



Air Toxics Ltd.

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COMPREHENSIVE VALIDATION PACKAGE

Modified TO-14A

INVENTORY SHEET

Work Order #: 0304049A

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Comments:

Completed by:

Laura Overmyer

(Signature)

Laura Overmyer / Document Control

(Print Name & Title)

4/8/03

(Date)



AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0304049A

Work Order Summary

CLIENT:	Mr. Mike Heffron Foster Wheeler Environmental Corporation 1 Oxford Valley #200 2300 Lincoln Highway Langhorne, PA 19047 215-702-4000	BILL TO:	Ms. Sonya Staten Foster Wheeler Environmental Corporation 1 Oxford Valley #200 2300 Lincoln Highway
PHONE:	215-702-4000	P.O. #	044014
FAX:	215-702-4045	PROJECT #	2282-0491 NWS EARLE
DATE RECEIVED:	4/2/2003	CONTACT:	Betty Chu
DATE COMPLETED:	4/7/2003		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>
01A	26AS43	Modified TO-14A	0.0 "Hg
02A	26AS42	Modified TO-14A	0.4 psi
03A	16AVD03-42	Modified TO-14A	0.2 psi
04A	16AVD03-43	Modified TO-14A	0.0 "Hg
05A	16BVD03-20	Modified TO-14A	1.0 "Hg
06A	Lab Blank	Modified TO-14A	NA
07A	CCV	Modified TO-14A	NA
08A	LCS	Modified TO-14A	NA

CERTIFIED BY: *Sinda J. Freeman*

DATE: 04/07/03

Laboratory Director

Certification numbers: AR DEQ, CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892

Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/02, Expiration date: 06/30/03

Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

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LABORATORY NARRATIVE
Modified Method TO-14A
Foster Wheeler Environmental Corporation
Workorder# 0304049A

Five 6 Liter Summa Canister samples were received on April 02, 2003. The laboratory performed analysis via modified EPA Method TO-14A using GC/MS in the full scan mode. The method involves concentrating up to 0.5 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis. See the data sheets for the reporting limits for each compound.

Method modifications taken to run these samples include:

<i>Requirement</i>	<i>TO-14A</i>	<i>ATL Modifications</i>
Continuing Calibration criteria	70-130% recovery	70-130% recovery with two allowed out to 60-140%; flag and narrate outliers
Initial Calibration criteria	RSD<30%	RSD</=30%, two compounds allowed up to 40%.
Moisture control	Nafion Dryer	Multisorbent trap
Blank acceptance criteria	<0.20 ppbv	<Reporting Limit
Primary ions for Quantification	Freon 114: 85, Carbon Tetrachloride: 117, Trichloroethene: 130, Ethyl Benzene, m,p- and o-Xylene: 91	Freon 114: 135, Carbon Tetrachloride: 119, Trichloroethene: 95, Ethyl Benzene, m,p- and o-Xylene: 106

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

The recovery of surrogate 4-Bromofluorobenzene in samples 16AVD03-42 and 16BVD03-20 was outside control limits due to high level hydrocarbon matrix interference. Data is reported as qualified.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

- B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).
- J - Estimated value.
- E - Exceeds instrument calibration range.
- S - Saturated peak.
- Q - Exceeds quality control limits.
- U - Compound analyzed for but not detected above the reporting limit.
- UJ- Non-detected compound associated with low bias in the CCV
- N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

- a-File was requantified

b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

AIR TOXICS LTD.

SAMPLE NAME: 16AVD03-42

ID#: 0304049A-03A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	S040412	Date of Collection: 3/31/03
Dil. Factor:	33.0	Date of Analysis: 4/4/03

Compound	Rot. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	16	83	Not Detected	Not Detected
Freon 114	16	120	Not Detected	Not Detected
Chloromethane	16	35	Not Detected	Not Detected
Vinyl Chloride	16	43	Not Detected	Not Detected
Bromomethane	16	65	Not Detected	Not Detected
Chloroethane	16	44	Not Detected	Not Detected
Freon 11	16	94	Not Detected	Not Detected
1,1-Dichloroethene	16	66	Not Detected	Not Detected
Freon 113	16	130	Not Detected	Not Detected
Methylene Chloride	16	58	Not Detected	Not Detected
1,1-Dichloroethane	16	68	Not Detected	Not Detected
cis-1,2-Dichloroethene	16	66	Not Detected	Not Detected
Chloroform	16	82	Not Detected	Not Detected
1,1,1-Trichloroethane	16	92	Not Detected	Not Detected
Carbon Tetrachloride	16	100	Not Detected	Not Detected
Benzene	16	54	1200	3700
1,2-Dichloroethane	16	68	Not Detected	Not Detected
Trichloroethene	16	90	Not Detected	Not Detected
1,2-Dichloropropane	16	78	Not Detected	Not Detected
cis-1,3-Dichloropropene	16	76	Not Detected	Not Detected
Toluene	16	63	230	870
trans-1,3-Dichloropropene	16	76	Not Detected	Not Detected
1,1,2-Trichloroethane	16	92	Not Detected	Not Detected
Tetrachloroethene	16	110	Not Detected	Not Detected
1,2-Dibromoethane (EDB)	16	130	Not Detected	Not Detected
Chlorobenzene	16	77	Not Detected	Not Detected
Ethyl Benzene	16	73	1400	6100
m,p-Xylene	16	73	4100	18000
o-Xylene	16	73	1000	4500
Styrene	16	71	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	16	120	Not Detected	Not Detected
1,3,5-Trimethylbenzene	16	82	990	4900
1,2,4-Trimethylbenzene	16	82	3000	15000
1,3-Dichlorobenzene	16	100	Not Detected	Not Detected
1,4-Dichlorobenzene	16	100	Not Detected	Not Detected
alpha-Chlorotoluene	16	87	Not Detected	Not Detected
1,2-Dichlorobenzene	16	100	Not Detected	Not Detected
1,2,4-Trichlorobenzene	66	500	Not Detected	Not Detected
Hexachlorobutadiene	66	720	Not Detected	Not Detected
Propylene	66	120	Not Detected	Not Detected
1,3-Butadiene	66	150	Not Detected	Not Detected
Acetone	66	160	Not Detected	Not Detected

AIR TOXICS LTD.

SAMPLE NAME: 16AVD03-42

ID#: 0304049A-03A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	s040412	Date of Collection:	3/31/03
Dil. Factor:	33.0	Date of Analysis:	4/4/03

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	66	210	Not Detected	Not Detected
2-Propanol	66	160	Not Detected	Not Detected
trans-1,2-Dichloroethene	66	260	Not Detected	Not Detected
Vinyl Acetate	66	240	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	66	200	Not Detected	Not Detected
Hexane	66	240	1900	6800
Tetrahydrofuran	66	200	Not Detected	Not Detected
Cyclohexane	66	230	1100	3700
1,4-Dioxane	66	240	Not Detected	Not Detected
Bromodichloromethane	66	450	Not Detected	Not Detected
4-Methyl-2-pentanone	66	270	Not Detected	Not Detected
2-Hexanone	66	270	Not Detected	Not Detected
Dibromochloromethane	66	570	Not Detected	Not Detected
Bromoform	66	690	Not Detected	Not Detected
4-Ethyltoluene	66	330	2200	11000
Ethanol	66	130	Not Detected	Not Detected
Methyl tert-butyl ether	66	240	Not Detected	Not Detected
Heptane	66	270	2000	8300

Q = Exceeds Quality Control limits of 70% to 130%, due to matrix effects.

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	107	70-130
Toluene-d8	106	70-130
4-Bromofluorobenzene	131 Q	70-130

AIR TOXICS LTD.

SAMPLE NAME: 16AVD03-43

ID#: 0304049A-04A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	5040413	Date of Collection: 3/31/03
Dil. Factor:	1.34	Date of Analysis: 4/4/03

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.67	3.4	Not Detected	Not Detected
Freon 114	0.67	4.8	Not Detected	Not Detected
Chloromethane	0.67	1.4	Not Detected	Not Detected
Vinyl Chloride	0.67	1.7	Not Detected	Not Detected
Bromomethane	0.67	2.6	Not Detected	Not Detected
Chloroethane	0.67	1.8	Not Detected	Not Detected
Freon 11	0.67	3.8	Not Detected	Not Detected
1,1-Dichloroethene	0.67	2.7	Not Detected	Not Detected
Freon 113	0.67	5.2	Not Detected	Not Detected
Methylene Chloride	0.67	2.4	Not Detected	Not Detected
1,1-Dichloroethane	0.67	2.8	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.67	2.7	Not Detected	Not Detected
Chloroform	0.67	3.3	Not Detected	Not Detected
1,1,1-Trichloroethane	0.67	3.7	Not Detected	Not Detected
Carbon Tetrachloride	0.67	4.3	Not Detected	Not Detected
Benzene	0.67	2.2	Not Detected	Not Detected
1,2-Dichloroethane	0.67	2.8	Not Detected	Not Detected
Trichloroethene	0.67	3.6	Not Detected	Not Detected
1,2-Dichloropropane	0.67	3.1	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.67	3.1	Not Detected	Not Detected
Toluene	0.67	2.6	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.67	3.1	Not Detected	Not Detected
1,1,2-Trichloroethane	0.67	3.7	Not Detected	Not Detected
Tetrachloroethene	0.67	4.6	Not Detected	Not Detected
1,2-Dibromoethane (EDB)	0.67	5.2	Not Detected	Not Detected
Chlorobenzene	0.67	3.1	Not Detected	Not Detected
Ethyl Benzene	0.67	3.0	Not Detected	Not Detected
m,p-Xylene	0.67	3.0	Not Detected	Not Detected
o-Xylene	0.67	3.0	Not Detected	Not Detected
Styrene	0.67	2.9	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.67	4.7	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.67	3.3	Not Detected	Not Detected
1,2,4-Trimethylbenzene	0.67	3.3	Not Detected	Not Detected
1,3-Dichlorobenzene	0.67	4.1	Not Detected	Not Detected
1,4-Dichlorobenzene	0.67	4.1	Not Detected	Not Detected
alpha-Chlorotoluene	0.67	3.5	Not Detected	Not Detected
1,2-Dichlorobenzene	0.67	4.1	Not Detected	Not Detected
1,2,4-Trichlorobenzene	2.7	20	Not Detected	Not Detected
Hexachlorobutadiene	2.7	29	Not Detected	Not Detected
Propylene	2.7	4.7	Not Detected	Not Detected
1,3-Butadiene	2.7	6.0	Not Detected	Not Detected
Acetone	2.7	6.5	14	34

AIR TOXICS LTD.

SAMPLE NAME: 16AVD03-43

ID#: 0304049A-04A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	s040413	Date of Collection:	3/31/03
Dil. Factor:	1.34	Date of Analysis:	4/4/03

Compound	Rot. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	2.7	8.5	Not Detected	Not Detected
2-Propanol	2.7	6.7	Not Detected	Not Detected
trans-1,2-Dichloroethene	2.7	11	Not Detected	Not Detected
Vinyl Acetate	2.7	9.6	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.7	8.0	3.1	9.3
Hexane	2.7	9.6	Not Detected	Not Detected
Tetrahydrofuran	2.7	8.0	Not Detected	Not Detected
Cyclohexane	2.7	9.4	Not Detected	Not Detected
1,4-Dioxane	2.7	9.8	Not Detected	Not Detected
Bromodichloromethane	2.7	18	Not Detected	Not Detected
4-Methyl-2-pentanone	2.7	11	Not Detected	Not Detected
2-Hexanone	2.7	11	Not Detected	Not Detected
Dibromochloromethane	2.7	23	Not Detected	Not Detected
Bromoform	2.7	28	Not Detected	Not Detected
4-Ethyltoluene	2.7	13	Not Detected	Not Detected
Ethanol	2.7	5.1	Not Detected	Not Detected
Methyl tert-butyl ether	2.7	9.8	Not Detected	Not Detected
Heptane	2.7	11	Not Detected	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	101	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	97	70-130

AIR TOXICS LTD.

SAMPLE NAME: 16BVD03-20

ID#: 0304049A-05A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	S040414	Date of Collection:	3/31/03
Dil. Factor:	18.5	Date of Analysis:	4/4/03

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	9.2	46	Not Detected	Not Detected
Freon 114	9.2	66	Not Detected	Not Detected
Chloromethane	9.2	19	Not Detected	Not Detected
Vinyl Chloride	9.2	24	Not Detected	Not Detected
Bromomethane	9.2	36	Not Detected	Not Detected
Chloroethane	9.2	25	Not Detected	Not Detected
Freon 11	9.2	53	Not Detected	Not Detected
1,1-Dichloroethene	9.2	37	Not Detected	Not Detected
Freon 113	9.2	72	Not Detected	Not Detected
Methylene Chloride	9.2	33	Not Detected	Not Detected
1,1-Dichloroethane	9.2	38	Not Detected	Not Detected
cis-1,2-Dichloroethene	9.2	37	Not Detected	Not Detected
Chloroform	9.2	46	Not Detected	Not Detected
1,1,1-Trichloroethane	9.2	51	Not Detected	Not Detected
Carbon Tetrachloride	9.2	59	Not Detected	Not Detected
Benzene	9.2	30	190	610
1,2-Dichloroethane	9.2	38	Not Detected	Not Detected
Trichloroethene	9.2	50	Not Detected	Not Detected
1,2-Dichloropropane	9.2	43	Not Detected	Not Detected
cis-1,3-Dichloropropene	9.2	43	Not Detected	Not Detected
Toluene	9.2	35	29	110
trans-1,3-Dichloropropene	9.2	43	Not Detected	Not Detected
1,1,2-Trichloroethane	9.2	51	Not Detected	Not Detected
Tetrachloroethene	9.2	64	Not Detected	Not Detected
1,2-Dibromoethane (EDB)	9.2	72	Not Detected	Not Detected
Chlorobenzene	9.2	43	Not Detected	Not Detected
Ethyl Benzene	9.2	41	640	2800
m,p-Xylene	9.2	41	1900	8200
o-Xylene	9.2	41	570	2500
Styrene	9.2	40	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	9.2	64	Not Detected	Not Detected
1,3,5-Trimethylbenzene	9.2	46	760	3800
1,2,4-Trimethylbenzene	9.2	46	2500	12000
1,3-Dichlorobenzene	9.2	56	Not Detected	Not Detected
1,4-Dichlorobenzene	9.2	56	Not Detected	Not Detected
alpha-Chlorotoluene	9.2	49	Not Detected	Not Detected
1,2-Dichlorobenzene	9.2	56	Not Detected	Not Detected
1,2,4-Trichlorobenzene	37	280	Not Detected	Not Detected
Hexachlorobutadiene	37	400	Not Detected	Not Detected
Propylene	37	65	Not Detected	Not Detected
1,3-Butadiene	37	83	Not Detected	Not Detected
Acetone	37	89	Not Detected	Not Detected

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SAMPLE NAME: 16BVD03-20

ID#: 0304049A-05A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name	6040414	Date of Collection	3/31/03
DIL Factor	18.5	Date of Analysis	4/4/03

Compound	Rot. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	37	120	Not Detected	Not Detected
2-Propanol	37	92	Not Detected	Not Detected
trans-1,2-Dichloroethene	37	150	Not Detected	Not Detected
Vinyl Acetate	37	130	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	37	110	Not Detected	Not Detected
Hexane	37	130	210	760
Tetrahydrofuran	37	110	Not Detected	Not Detected
Cyclohexane	37	130	270	950
1,4-Dioxane	37	140	Not Detected	Not Detected
Bromodichloromethane	37	250	Not Detected	Not Detected
4-Methyl-2-pentanone	37	150	Not Detected	Not Detected
2-Hexanone	37	150	Not Detected	Not Detected
Dibromochloromethane	37	320	Not Detected	Not Detected
Bromoform	37	390	Not Detected	Not Detected
4-Ethyltoluene	37	180	1600	8000
Ethanol	37	71	Not Detected	Not Detected
Methyl tert-butyl ether	37	140	Not Detected	Not Detected
Heptane	37	150	420	1800

Q = Exceeds Quality Control limits of 70% to 130%, due to matrix effects.

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	107	70-130
4-Bromofluorobenzene	147.Q	70-130

ECVP

**Electronic Comprehensive
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WO# 0304049B



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COMPREHENSIVE VALIDATION PACKAGE

Modified TO-3

INVENTORY SHEET

Work Order #: 0304049B

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b. Target Compound Raw Data		
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-Surrogate Recovery Summary (If Applicable)		
-Chromatogram(s) and Ion Profiles (If Applicable)		
3. QC Results and Raw Data		
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d. Duplicate Results Summary Sheet	--	--
e. Matrix Spike/Matrix Spike Duplicate (Results + Raw Data)	--	--
f. Initial Calibration Data (Summary Sheet + Raw Data)	24	78
g. MDL Study (If Applicable)	--	--
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5. Other Records (describe or list)		
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b. <u>Manual Integrations</u>	94	96
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d. <u>Canister Dilution Factors</u>	97	98
e. <u>Laboratory Corrective Action Request</u>	--	--
f. <u>CAS Number Reference</u>	99	99
g. <u>Variance Table</u>	--	--
h. <u>Canister Certification</u>	--	--
i. <u>Data Review Check Sheet</u>	100	100

Comments:

Completed by:

Laura Overmyer

(Signature)

Laura Overmyer / Document Control

(Print Name & Title)

4/7/03

(Date)



AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0304049B

Work Order Summary

CLIENT:	Mr. Mike Heffron Foster Wheeler Environmental Corporation 1 Oxford Valley #200 2300 Lincoln Highway Langhorne, PA 19047 215-702-4000	BILL TO:	Ms. Sonya Staten Foster Wheeler Environmental Corporation 1 Oxford Valley #200 2300 Lincoln Highway
PHONE:	215-702-4045	P.O. #	044014
FAX:	215-702-4045	PROJECT #	2282-0491 NWS EARLE
DATE RECEIVED:	4/2/2003	CONTACT:	Betty Chu
DATE COMPLETED:	4/7/2003		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>
03A	16AVD03-42	Modified TO-3	0.2 psi
04A	16AVD03-43	Modified TO-3	0.0 "Hg
05A	16BVD03-20	Modified TO-3	1.0 "Hg
06A	Lab Blank	Modified TO-3	NA
07A	LCS	Modified TO-3	NA

CERTIFIED BY: *Sinda D. Freeman*

Laboratory Director

DATE: 04/07/03

Certification numbers: AR DEQ, CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892

Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/02, Expiration date: 06/30/03

Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

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LABORATORY NARRATIVE
Modified TO-3
Foster Wheeler Environmental Corporation
Workorder# 0304049B

Three 6 Liter Summa Canister samples were received on April 02, 2003. The laboratory performed analysis via modified EPA Method TO-3 for Total Petroleum Hydrocarbons (TPH). TPH was analyzed via GC/FID. The TPH results are calculated using the response of Gasoline. A molecular weight of 100 is used to convert the TPH ppmv result to ug/L. The method involves concentrating up to 200 mL of sample. The concentrated aliquot is then dry purged to remove water vapor prior to entering the chromatographic system. See the data sheets for the reporting limits for TPH.

<i>Requirement</i>	<i>TO-3</i>	<i>ATL Modifications</i>
Daily Calibration Standard Frequency	Prior to sample analysis and every 4 - 6 hrs	Prior to sample analysis and after the analytical batch ≤ 20 samples.
Initial Calibration Calculation	4-point calibration using a linear regression model	5-point calibration using average Response Factor
Initial Calibration Frequency	Weekly	When daily calibration standard recovery is outside 75 - 125 %, or upon significant changes to procedure or instrumentation
Moisture Control	Nafion system	Sorbent system
Minimum Detection Limit (MDL)	Calculated using the equation $DL = A + 3.3S$, where A is intercept of calibration line and S is the standard deviation of at least 3 reps of low level standard	40 CFR Pt. 136 App. B
Preparation of Standards	Levels achieved through dilution of gas mixture	Levels achieved through loading various volumes of the gas mixture

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:

- B - Compound present in laboratory blank greater than reporting limit.
- J - Estimated value.
- E - Exceeds instrument calibration range.
- S - Saturated peak.
- Q - Exceeds quality control limits.
- U - Compound analyzed for but not detected above the detection limit.
- M - Reported value may be biased due to apparent matrix interferences.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

Table 1

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Extracted	Sample	Sample Extract		
					Holding Time (Days)	Date Analyzed	Holding Time (Days)	Sample Condition
16AVD03-42	0304049B-03A	3/31/2003	4/ 2/2003	NA	3	4/ 3/2003	NA	Good
16AVD03-43	0304049B-04A	3/31/2003	4/ 2/2003	NA	3	4/ 3/2003	NA	Good
16BVD03-20	0304049B-05A	3/31/2003	4/ 2/2003	NA	3	4/ 3/2003	NA	Good
Lab Blank	0304049B-06A	NA	NA	NA	NA	4/ 3/2003	NA	Good
LCS	0304049B-07A	NA	NA	NA	NA	4/ 4/2003	NA	Good

Sample Results and Raw Data

AIR TOXICS LTD.

SAMPLE NAME: 16AVD03-42

ID#: 0304049B-03A

MODIFIED EPA METHOD TO-3 GC/FID

File Name:	d040312	Date of Collection:	3/31/03
Dil. Factor:	26.4	Date of Analysis:	4/3/03

Compound	Rpt. Limit (ppmv)	Rpt. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH (C2+ Hydrocarbons) ref. to Gasoline	0.66	2.7	180	750

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Fluorobenzene (FID)	118	75-125

AIR TOXICS LTD.

SAMPLE NAME: 16AVD03-43

ID#: 0304049B-04A

MODIFIED EPA METHOD TO-3 GC/FID

File Name:	d040313	Date of Collection:	3/31/03
Dil. Factor:	1.34	Date of Analysis:	4/3/03

Compound	Rpt. Limit (ppmv)	Rpt. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH (C2+ Hydrocarbons) ref. to Gasoline	0.034	0.14	0.064	0.26

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Fluorobenzene (FID)	102	75-125

AIR TOXICS LTD.

SAMPLE NAME: 16BVD03-20

ID#: 0304049B-05A

MODIFIED EPA METHOD TO-3 GC/FID

File Name	d040317	Date of Collection	3/31/03
Dil. Factor	13.9	Date of Analysis	4/3/03

Compound	Rpt. Limit (ppmv)	Rpt. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH (C2+ Hydrocarbons) ref. to Gasoline	0.35	1.4	110	450

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Fluorobenzene (FID)	103	75-125

ECVP

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WO# 0304611A



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COMPREHENSIVE VALIDATION PACKAGE

Modified TO-14A

INVENTORY SHEET

Work Order #: 0304611A

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b. Target Compound Raw Data		
-Internal Standard Area and Retention Time Summary		
-Surrogate Recovery Summary (If Applicable)		
-Chromatogram(s) and Ion Profiles (If Applicable)		
3. QC Results and Raw Data		
a. Method Blank (Results+ Raw Data)	92	105
b. Surrogate Recover Summary Form (If Applicable)	106	106
c. Internal Standard Summary Form (If Applicable)	--	--
d. Duplicate Results Summary Sheet	107	108
e. Matrix Spike/Matrix Spike Duplicate (Results + Raw Data)	--	--
f. Initial Calibration Data (Summary Sheet + Raw Data)	109	361
g. MDL Study (If Applicable)	--	--
h. Continuing Calibration Verification Data (Summary Sheet)	362	388
i. Second Source LCS(Summary + Raw Data)	389	415
j. Extraction Logs	--	--
k. Instrument Run Logs/Software Verification	416	417
l. GC/MS Tune (Results + Raw Data)	418	437
4. Shipping/Receiving Documents		
a. Login Receipt Summary Sheet	439	439
b. Chain-of-Custody Records	440	440
c. Sample Log-In Sheet	441	441
d. Misc Shipping/Receiving Records (list of individual records) <u>Sample Receipt Discrepancy Report</u>	--	--
5. Other Records (describe or list)		
a. <u>Manual Spectral Defense</u>	443	450
b. <u>Manual Integrations</u>	--	--
c. <u>Manual Calculations</u>	--	--
d. <u>Canister Dilution Factors</u>	451	452
e. <u>Laboratory Corrective Action Request</u>	--	--
f. <u>CAS Number Reference</u>	453	454
g. <u>Variance Table</u>	--	--
h. <u>Canister Certification</u>	--	--
i. <u>Data Review Check Sheet</u>	455	455

Comments:

Completed by:

Laura Overmyer

(Signature)

Laura Overmyer / Document Control

(Print Name & Title)

5/7/03

(Date)



AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0304611A

Work Order Summary

CLIENT:	Mr. Mike Heffron Foster Wheeler/Tetra Tech, Inc. 1 Oxford Valley #200 2300 Lincoln Highway Langhorne, PA 19047	BILL TO:	Ms. Sonya Staten Foster Wheeler/Tetra Tech, Inc. 1 Oxford Valley #200 2300 Lincoln Highway Langhorne, PA 19047
PHONE:	215-702-4000	P.O. #	044014
FAX:	215-702-4045	PROJECT #	2282.0491 NWS Earle
DATE RECEIVED:	4/30/2003	CONTACT:	Betty Chu
DATE COMPLETED:	5/5/2003		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>
01A	26AS44	Modified TO-14A	0.0 "Hg
02A	26AS45	Modified TO-14A	2.0 "Hg
03A	16AVD03-44	Modified TO-14A	1.0 "Hg
04A	16AVD03-45	Modified TO-14A	2.0 "Hg
05A	16BVD03-21	Modified TO-14A	2.0 "Hg
05AA	16BVD03-21 Duplicate	Modified TO-14A	2.0 "Hg
06A	Lab Blank	Modified TO-14A	NA
06B	Lab Blank	Modified TO-14A	NA
07A	CCV	Modified TO-14A	NA
07B	CCV	Modified TO-14A	NA
08A	LCS	Modified TO-14A	NA
08B	LCS	Modified TO-14A	NA

CERTIFIED BY:

Linda J. Freeman

Laboratory Director

DATE: 05/05/03

Certification numbers: AR DEQ, CA NELAP - 02110CA, LA NELAP/LELAP - AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892

Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/02, Expiration date: 06/30/03

Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

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LABORATORY NARRATIVE
Modified Method TO-14A
Foster Wheeler Environmental Corporation
Workorder# 0304611A

Five 6 Liter Summa Canister samples were received on April 30, 2003. The laboratory performed analysis via modified EPA Method TO-14A using GC/MS in the full scan mode. The method involves concentrating up to 0.5 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis. See the data sheets for the reporting limits for each compound.

Method modifications taken to run these samples include:

<i>Requirement</i>	<i>TO-14A</i>	<i>ATL Modifications</i>
Continuing Calibration criteria	70-130% recovery	70-130% recovery with two allowed out to 60-140%; flag and narrate outliers
Initial Calibration criteria	RSD<30%	RSD<=30%, two compounds allowed up to 40%.
Moisture control	Nafion Dryer	Multisorbent trap
Blank acceptance criteria	<0.20 ppbv	<Reporting Limit
Primary ions for Quantification	Freon 114: 85, Carbon Tetrachloride: 117, Trichloroethene: 130, Ethyl Benzene, m,p- and o-Xylene: 91	Freon 114: 135, Carbon Tetrachloride: 119, Trichloroethene: 95, Ethyl Benzene, m,p- and o-Xylene: 106

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

Table 1

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Extracted	Sample	Sample Extract		
					Holding Time (Days)	Date Analyzed	Holding Time (Days)	Sample Condition
26AS44	0304611A-01A	4/29/2003	4/30/2003	NA	2	5/ 1/2003	NA	Good
26AS45	0304611A-02A	4/29/2003	4/30/2003	NA	2	5/ 1/2003	NA	Good
16AVD03-44	0304611A-03A	4/29/2003	4/30/2003	NA	6	5/ 5/2003	NA	Good
16AVD03-45	0304611A-04A	4/29/2003	4/30/2003	NA	2	5/ 1/2003	NA	Good
16BVD03-21	0304611A-05A	4/29/2003	4/30/2003	NA	6	5/ 5/2003	NA	Good
16BVD03-21 Duplicate	0304611A-05AA	4/29/2003	4/30/2003	NA	6	5/ 5/2003	NA	Good
Lab Blank	0304611A-06A	NA	NA	NA	NA	5/ 1/2003	NA	Good
Lab Blank	0304611A-06B	NA	NA	NA	NA	5/ 5/2003	NA	Good
CCV	0304611A-07A	NA	NA	NA	NA	5/ 1/2003	NA	Good
CCV	0304611A-07B	NA	NA	NA	NA	5/ 5/2003	NA	Good
LCS	0304611A-08A	NA	NA	NA	NA	5/ 1/2003	NA	Good
LCS	0304611A-08B	NA	NA	NA	NA	5/ 5/2003	NA	Good

Sample Results and Raw Data

AIR TOXICS LTD.

SAMPLE NAME: 16AVD03-44

ID#: 0304611A-03A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	6050505	Date of Collection:	4/29/03
Dil Factor:	34.8	Date of Analysis:	5/5/03

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	17	87	Not Detected	Not Detected
Freon 114	17	120	Not Detected	Not Detected
Chloromethane	17	36	Not Detected	Not Detected
Vinyl Chloride	17	45	Not Detected	Not Detected
Bromomethane	17	69	Not Detected	Not Detected
Chloroethane	17	47	Not Detected	Not Detected
Freon 11	17	99	Not Detected	Not Detected
1,1-Dichloroethene	17	70	Not Detected	Not Detected
Freon 113	17	140	Not Detected	Not Detected
Methylene Chloride	17	61	Not Detected	Not Detected
1,1-Dichloroethane	17	72	Not Detected	Not Detected
cis-1,2-Dichloroethene	17	70	Not Detected	Not Detected
Chloroform	17	86	Not Detected	Not Detected
1,1,1-Trichloroethane	17	96	Not Detected	Not Detected
Carbon Tetrachloride	17	110	Not Detected	Not Detected
Benzene	17	56	1100	3600
1,2-Dichloroethane	17	72	Not Detected	Not Detected
Trichloroethene	17	95	Not Detected	Not Detected
1,2-Dichloropropane	17	82	Not Detected	Not Detected
cis-1,3-Dichloropropene	17	80	Not Detected	Not Detected
Toluene	17	67	260	1000
trans-1,3-Dichloropropene	17	80	Not Detected	Not Detected
1,1,2-Trichloroethane	17	96	Not Detected	Not Detected
Tetrachloroethene	17	120	Not Detected	Not Detected
1,2-Dibromoethane (EDB)	17	140	Not Detected	Not Detected
Chlorobenzene	17	81	Not Detected	Not Detected
Ethyl Benzene	17	77	1700	7600
m,p-Xylene	17	77	3800	17000
o-Xylene	17	77	1100	5000
Styrene	17	75	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	17	120	Not Detected	Not Detected
1,3,5-Trimethylbenzene	17	87	1400	6800
1,2,4-Trimethylbenzene	17	87	2600	13000
1,3-Dichlorobenzene	17	110	Not Detected	Not Detected
1,4-Dichlorobenzene	17	110	Not Detected	Not Detected
alpha-Chlorotoluene	17	92	Not Detected	Not Detected
1,2-Dichlorobenzene	17	110	Not Detected	Not Detected
1,2,4-Trichlorobenzene	70	520	Not Detected	Not Detected
Hexachlorobutadiene	70	750	Not Detected	Not Detected
Propylene	70	120	Not Detected	Not Detected
1,3-Butadiene	70	160	Not Detected	Not Detected
Acetone	70	170	Not Detected	Not Detected

AIR TOXICS LTD.

SAMPLE NAME: 16AVD03-44

ID#: 0304611A-03A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	6050505	Date of Collection:	4/29/03
Dil. Factor:	34.8	Date of Analysis:	5/5/03

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	70	220	Not Detected	Not Detected
2-Propanol	70	170	Not Detected	Not Detected
trans-1,2-Dichloroethene	70	280	Not Detected	Not Detected
Vinyl Acetate	70	250	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	70	210	Not Detected	Not Detected
Hexane	70	250	1400	5200
Tetrahydrofuran	70	210	Not Detected	Not Detected
Cyclohexane	70	240	910	3200
1,4-Dioxane	70	250	Not Detected	Not Detected
Bromodichloromethane	70	470	Not Detected	Not Detected
4-Methyl-2-pentanone	70	290	Not Detected	Not Detected
2-Hexanone	70	290	Not Detected	Not Detected
Dibromochloromethane	70	600	Not Detected	Not Detected
Bromoform	70	730	Not Detected	Not Detected
4-Ethyltoluene	70	350	2400	12000
Ethanol	70	130	Not Detected	Not Detected
Methyl tert-butyl ether	70	260	Not Detected	Not Detected
Heptane	70	290	1700	6900

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	107	70-130
Toluene-d8	106	70-130
4-Bromofluorobenzene	124	70-130

AIR TOXICS LTD.

SAMPLE NAME: 16AVD03-45

ID#: 0304611A-04A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	5050112	Date of Collection:	4/29/03
DIL. Factor:	1.44	Date of Analysis:	5/1/03

Compound	Rot. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.72	3.6	Not Detected	Not Detected
Freon 114	0.72	5.1	Not Detected	Not Detected
Chloromethane	0.72	1.5	Not Detected	Not Detected
Vinyl Chloride	0.72	1.9	Not Detected	Not Detected
Bromomethane	0.72	2.8	Not Detected	Not Detected
Chloroethane	0.72	1.9	Not Detected	Not Detected
Freon 11	0.72	4.1	Not Detected	Not Detected
1,1-Dichloroethene	0.72	2.9	Not Detected	Not Detected
Freon 113	0.72	5.6	Not Detected	Not Detected
Methylene Chloride	0.72	2.5	Not Detected	Not Detected
1,1-Dichloroethane	0.72	3.0	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.72	2.9	Not Detected	Not Detected
Chloroform	0.72	3.6	Not Detected	Not Detected
1,1,1-Trichloroethane	0.72	4.0	Not Detected	Not Detected
Carbon Tetrachloride	0.72	4.6	Not Detected	Not Detected
Benzene	0.72	2.3	1.3	4.1
1,2-Dichloroethane	0.72	3.0	Not Detected	Not Detected
Trichloroethene	0.72	3.9	Not Detected	Not Detected
1,2-Dichloropropane	0.72	3.4	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.72	3.3	Not Detected	Not Detected
Toluene	0.72	2.8	Not Detected	Not Detected
trans-1,3-Dichloropropene	0.72	3.3	Not Detected	Not Detected
1,1,2-Trichloroethane	0.72	4.0	Not Detected	Not Detected
Tetrachloroethene	0.72	5.0	Not Detected	Not Detected
1,2-Dibromoethane (EDB)	0.72	5.6	Not Detected	Not Detected
Chlorobenzene	0.72	3.4	Not Detected	Not Detected
Ethyl Benzene	0.72	3.2	Not Detected	Not Detected
m,p-Xylene	0.72	3.2	Not Detected	Not Detected
o-Xylene	0.72	3.2	Not Detected	Not Detected
Styrene	0.72	3.1	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.72	5.0	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.72	3.6	Not Detected	Not Detected
1,2,4-Trimethylbenzene	0.72	3.6	Not Detected	Not Detected
1,3-Dichlorobenzene	0.72	4.4	Not Detected	Not Detected
1,4-Dichlorobenzene	0.72	4.4	Not Detected	Not Detected
alpha-Chlorotoluene	0.72	3.8	Not Detected	Not Detected
1,2-Dichlorobenzene	0.72	4.4	Not Detected	Not Detected
1,2,4-Trichlorobenzene	2.9	22	Not Detected	Not Detected
Hexachlorobutadiene	2.9	31	Not Detected	Not Detected
Propylene	2.9	5.0	210	360
1,3-Butadiene	2.9	6.5	Not Detected	Not Detected
Acetone	2.9	7.0	11	26

AIR TOXICS LTD.

SAMPLE NAME: 16AVD03-45

ID#: 0304611A-04A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	050112	Date of Collection:	4/29/03
Dil. Factor:	1.44	Date of Analysis:	5/1/03

Compound	Rot. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	2.9	9.1	Not Detected	Not Detected
2-Propanol	2.9	7.2	Not Detected	Not Detected
trans-1,2-Dichloroethene	2.9	12	Not Detected	Not Detected
Vinyl Acetate	2.9	10	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.9	8.6	Not Detected	Not Detected
Hexane	2.9	10	Not Detected	Not Detected
Tetrahydrofuran	2.9	8.6	Not Detected	Not Detected
Cyclohexane	2.9	10	Not Detected	Not Detected
1,4-Dioxane	2.9	10	Not Detected	Not Detected
Bromodichloromethane	2.9	20	Not Detected	Not Detected
4-Methyl-2-pentanone	2.9	12	Not Detected	Not Detected
2-Hexanone	2.9	12	Not Detected	Not Detected
Dibromochloromethane	2.9	25	Not Detected	Not Detected
Bromoform	2.9	30	Not Detected	Not Detected
4-Ethyltoluene	2.9	14	Not Detected	Not Detected
Ethanol	2.9	5.5	Not Detected	Not Detected
Methyl tert-butyl ether	2.9	10	Not Detected	Not Detected
Heptane	2.9	12	Not Detected	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	105	70-130
Toluene-d8	99	70-130
4-Bromofluorobenzene	98	70-130

AIR TOXICS LTD.

SAMPLE NAME: 16BVD03-21

ID#: 0304611A-05A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name	6050506	Date of Collection: 4/29/03
Dil. Factor	11.5	Date of Analysis: 5/5/03

Compound	Rot. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	5.8	29	Not Detected	Not Detected
Freon 114	5.8	41	Not Detected	Not Detected
Chloromethane	5.8	12	Not Detected	Not Detected
Vinyl Chloride	5.8	15	26	66
Bromomethane	5.8	23	Not Detected	Not Detected
Chloroethane	5.8	15	Not Detected	Not Detected
Freon 11	5.8	33	1400	7800
1,1-Dichloroethene	5.8	23	Not Detected	Not Detected
Freon 113	5.8	45	Not Detected	Not Detected
Methylene Chloride	5.8	20	Not Detected	Not Detected
1,1-Dichloroethane	5.8	24	Not Detected	Not Detected
cis-1,2-Dichloroethene	5.8	23	Not Detected	Not Detected
Chloroform	5.8	28	Not Detected	Not Detected
1,1,1-Trichloroethane	5.8	32	Not Detected	Not Detected
Carbon Tetrachloride	5.8	37	Not Detected	Not Detected
Benzene	5.8	19	80	260
1,2-Dichloroethane	5.8	24	Not Detected	Not Detected
Trichloroethene	5.8	31	Not Detected	Not Detected
1,2-Dichloropropane	5.8	27	Not Detected	Not Detected
cis-1,3-Dichloropropene	5.8	26	Not Detected	Not Detected
Toluene	5.8	22	Not Detected	Not Detected
trans-1,3-Dichloropropene	5.8	26	Not Detected	Not Detected
1,1,2-Trichloroethane	5.8	32	Not Detected	Not Detected
Tetrachloroethene	5.8	40	Not Detected	Not Detected
1,2-Dibromoethane (EDB)	5.8	45	Not Detected	Not Detected
Chlorobenzene	5.8	27	Not Detected	Not Detected
Ethyl Benzene	5.8	25	160	710
m,p-Xylene	5.8	25	280	1200
o-Xylene	5.8	25	69	310
Styrene	5.8	25	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	5.8	40	Not Detected	Not Detected
1,3,5-Trimethylbenzene	5.8	29	180	910
1,2,4-Trimethylbenzene	5.8	29	870	4400
1,3-Dichlorobenzene	5.8	35	Not Detected	Not Detected
1,4-Dichlorobenzene	5.8	35	Not Detected	Not Detected
alpha-Chlorotoluene	5.8	30	Not Detected	Not Detected
1,2-Dichlorobenzene	5.8	35	Not Detected	Not Detected
1,2,4-Trichlorobenzene	23	170	Not Detected	Not Detected
Hexachlorobutadiene	23	250	Not Detected	Not Detected
Propylene	23	40	Not Detected	Not Detected
1,3-Butadiene	23	52	Not Detected	Not Detected
Acetone	23	56	Not Detected	Not Detected

AIR TOXICS LTD.

SAMPLE NAME: 16BVD03-21

ID#: 0304611A-05A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	1050506	Date of Collection:	4/29/03
Dil. Factor:	1.5	Date of Analysis:	5/5/03

Compound	Rot. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	23	73	Not Detected	Not Detected
2-Propanol	23	57	Not Detected	Not Detected
trans-1,2-Dichloroethene	23	93	Not Detected	Not Detected
Vinyl Acetate	23	82	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	23	69	Not Detected	Not Detected
Hexane	23	82	29	100
Tetrahydrofuran	23	69	Not Detected	Not Detected
Cyclohexane	23	80	39	140
1,4-Dioxane	23	84	Not Detected	Not Detected
Bromodichloromethane	23	160	Not Detected	Not Detected
4-Methyl-2-pentanone	23	96	Not Detected	Not Detected
2-Hexanone	23	96	Not Detected	Not Detected
Dibromochloromethane	23	200	Not Detected	Not Detected
Bromoform	23	240	Not Detected	Not Detected
4-Ethyltoluene	23	110	360	1800
Ethanol	23	44	Not Detected	Not Detected
Methyl tert-butyl ether	23	84	Not Detected	Not Detected
Heptane	23	96	47	200

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	103	70-130
Toluene-d8	103	70-130
4-Bromofluorobenzene	119	70-130

AIR TOXICS LTD.

SAMPLE NAME: 16BVD03-21 Duplicate

ID#: 0304611A-05AA

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	6050507	Date of Collection:	4/29/03
Dil. Factor:	11.5	Date of Analysis:	5/5/03

Compound	Rot. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	5.8	29	Not Detected	Not Detected
Freon 114	5.8	41	Not Detected	Not Detected
Chloromethane	5.8	12	Not Detected	Not Detected
Vinyl Chloride	5.8	15	25	65
Bromomethane	5.8	23	Not Detected	Not Detected
Chloroethane	5.8	15	Not Detected	Not Detected
Freon 11	5.8	33	1400	8000
1,1-Dichloroethene	5.8	23	Not Detected	Not Detected
Freon 113	5.8	45	Not Detected	Not Detected
Methylene Chloride	5.8	20	Not Detected	Not Detected
1,1-Dichloroethane	5.8	24	Not Detected	Not Detected
cis-1,2-Dichloroethene	5.8	23	Not Detected	Not Detected
Chloroform	5.8	28	Not Detected	Not Detected
1,1,1-Trichloroethane	5.8	32	Not Detected	Not Detected
Carbon Tetrachloride	5.8	37	Not Detected	Not Detected
Benzene	5.8	19	80	260
1,2-Dichloroethane	5.8	24	Not Detected	Not Detected
Trichloroethene	5.8	31	Not Detected	Not Detected
1,2-Dichloropropane	5.8	27	Not Detected	Not Detected
cis-1,3-Dichloropropene	5.8	26	Not Detected	Not Detected
Toluene	5.8	22	Not Detected	Not Detected
trans-1,3-Dichloropropene	5.8	26	Not Detected	Not Detected
1,1,2-Trichloroethane	5.8	32	Not Detected	Not Detected
Tetrachloroethene	5.8	40	Not Detected	Not Detected
1,2-Dibromoethane (EDB)	5.8	45	Not Detected	Not Detected
Chlorobenzene	5.8	27	Not Detected	Not Detected
Ethyl Benzene	5.8	25	160	730
m,p-Xylene	5.8	25	280	1200
o-Xylene	5.8	25	71	310
Styrene	5.8	25	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	5.8	40	Not Detected	Not Detected
1,3,5-Trimethylbenzene	5.8	29	180	930
1,2,4-Trimethylbenzene	5.8	29	890	4400
1,3-Dichlorobenzene	5.8	35	Not Detected	Not Detected
1,4-Dichlorobenzene	5.8	35	Not Detected	Not Detected
alpha-Chlorotoluene	5.8	30	Not Detected	Not Detected
1,2-Dichlorobenzene	5.8	35	Not Detected	Not Detected
1,2,4-Trichlorobenzene	23	170	Not Detected	Not Detected
Hexachlorobutadiene	23	250	Not Detected	Not Detected
Propylene	23	40	Not Detected	Not Detected
1,3-Butadiene	23	52	Not Detected	Not Detected
Acetone	23	56	Not Detected	Not Detected

AIR TOXICS LTD.

SAMPLE NAME: 16BVD03-21 Duplicate

ID#: 0304611A-05AA

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	5050507	Date of Collection:	4/29/03
Dil. Factor:	11.5	Date of Analysis:	5/5/03

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	23	73	Not Detected	Not Detected
2-Propanol	23	57	Not Detected	Not Detected
trans-1,2-Dichloroethene	23	93	Not Detected	Not Detected
Vinyl Acetate	23	82	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	23	69	Not Detected	Not Detected
Hexane	23	82	30	110
Tetrahydrofuran	23	69	Not Detected	Not Detected
Cyclohexane	23	80	39	140
1,4-Dioxane	23	84	Not Detected	Not Detected
Bromodichloromethane	23	160	Not Detected	Not Detected
4-Methyl-2-pentanone	23	96	Not Detected	Not Detected
2-Hexanone	23	96	Not Detected	Not Detected
Dibromochloromethane	23	200	Not Detected	Not Detected
Bromoform	23	240	Not Detected	Not Detected
4-Ethyltoluene	23	110	360	1800
Ethanol	23	44	Not Detected	Not Detected
Methyl tert-butyl ether	23	84	Not Detected	Not Detected
Heptane	23	96	46	190

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	106	70-130
Toluene-d8	104	70-130
4-Bromofluorobenzene	120	70-130

ECVP

**Electronic Comprehensive
Validation Package**

WO# 0304611B



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AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

COMPREHENSIVE VALIDATION PACKAGE

Modified TO-3

INVENTORY SHEET

Work Order #: 0304611B

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Comments:

Completed by:

Laura Overmyer

(Signature)

Laura Overmyer / Document Control

(Print Name & Title)

5/5/03

(Date)



AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0304611B

Work Order Summary

CLIENT:	Mr. Mike Heffron Foster Wheeler/Tetra Tech, Inc. 1 Oxford Valley #200 2300 Lincoln Highway Langhorne, PA 19047	BILL TO:	Ms. Sonya Staten Foster Wheeler/Tetra Tech, Inc. 1 Oxford Valley #200 2300 Lincoln Highway Langhorne, PA 19047
PHONE:	215-702-4000	P.O. #	044014
FAX:	215-702-4045	PROJECT #	2282.0491 NWS Earle
DATE RECEIVED:	4/30/2003	CONTACT:	Betty Chu
DATE COMPLETED:	5/5/2003		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT</u> <u>VAC./PRES.</u>
03A	16AVD03-44	Modified TO-3	1.0 "Hg
03AA	16AVD03-44 Duplicate	Modified TO-3	1.0 "Hg
04A	16AVD03-45	Modified TO-3	2.0 "Hg
05A	16BVD03-21	Modified TO-3	2.0 "Hg
06A	Lab Blank	Modified TO-3	NA
07A	LCS	Modified TO-3	NA

CERTIFIED BY: *Linda J. Fruman*

DATE: 05/05/03

Laboratory Director

Certification numbers: AR DEQ, CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892

Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/02, Expiration date: 06/30/03

Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

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LABORATORY NARRATIVE
Modified TO-3
Foster Wheeler Environmental Corporation
Workorder# 0304611B

Three 6 Liter Summa Canister samples were received on April 30, 2003. The laboratory performed analysis for TPH via modified EPA Method TO-3 using gas chromatography with flame ionization detection. The method involves concentrating up to 200 mL of sample. The concentrated aliquot is then dry purged to remove water vapor prior to entering the chromatographic system. The TPH (Gasoline Range) results are calculated using the response factor of Gasoline and correspond to the range of hydrocarbons from C5 to C10. A molecular weight of 100 is used to convert the TPH (Gasoline Range) ppmv result to ug/L. See the data sheets for the reporting limits for TPH.

Method modifications taken to run these samples include:

<i>Requirement</i>	<i>TO-3</i>	<i>ATL Modifications</i>
Daily Calibration Standard Frequency	Prior to sample analysis and every 4 - 6 hrs	Prior to sample analysis and after the analytical batch \leq 20 samples
Initial Calibration Calculation	4-point calibration using a linear regression model	5-point calibration using average Response Factor
Initial Calibration Frequency	Weekly	When daily calibration standard recovery is outside 75 - 125 %, or upon significant changes to procedure or instrumentation
Moisture Control	Nafion system	Sorbent system
Minimum Detection Limit (MDL)	Calculated using the equation $DL = A + 3.3S$, where A is intercept of calibration line and S is the standard deviation of at least 3 reps of low level standard	40 CFR Pt. 136 App. B
Preparation of Standards	Levels achieved through dilution of gas mixture	Levels achieved through loading various volumes of the gas mixture

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

System peaks were subtracted from the TPH results of sample 16AVD03-45 prior to reporting.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:

- B - Compound present in laboratory blank greater than reporting limit.
- J - Estimated value.
- E - Exceeds instrument calibration range.
- S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the detection limit.

M - Reported value may be biased due to apparent matrix interferences.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

Table 1

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Extracted	Sample	Sample Extract		Sample Condition
					Holding Time (Days)	Date Analyzed	Holding Time (Days)	
16AVD03-44	0304611B-03A	4/29/2003	4/30/2003	NA	3	5/ 2/2003	NA	Good
16AVD03-44 Duplicate	0304611B-03AA	4/29/2003	4/30/2003	NA	3	5/ 2/2003	NA	Good
16AVD03-45	0304611B-04A	4/29/2003	4/30/2003	NA	3	5/ 2/2003	NA	Good
16BVD03-21	0304611B-05A	4/29/2003	4/30/2003	NA	3	5/ 2/2003	NA	Good
Lab Blank	0304611B-06A	NA	NA	NA	NA	5/ 2/2003	NA	Good
LCS	0304611B-07A	NA	NA	NA	NA	5/ 3/2003	NA	Good

Sample Results and Raw Data

AIR TOXICS LTD.

SAMPLE NAME: 16AVD03-44

ID#: 0304611B-03A

MODIFIED EPA METHOD TO-3 GC/FID

File Name:	6050219	Date of Collection:	4/29/03
Dil. Factor:	46.3	Date of Analysis:	5/2/03

Compound	Rpt. Limit (ppmv)	Rpt. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH (Gasoline Range)	1.2	4.8	190	790

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Fluorobenzene (FID)	104	75-125

AIR TOXICS LTD.

SAMPLE NAME: 16AVD03-44 Duplicate

ID#: 0304611B-03AA

MODIFIED EPA METHOD TO-3 GC/FID

File Name:	6050218	Date of Collection:	4/29/03
Dil Factor:	232	Date of Analysis:	5/2/03

Compound	Rpt. Limit (ppmv)	Rpt. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH (Gasoline Range)	5.8	24	210	870

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Fluorobenzene (FID)	98	75-125

AIR TOXICS LTD.

SAMPLE NAME: 16AVD03-45

ID#: 0304611B-04A

MODIFIED EPA METHOD TO-3 GC/FID

File Name:	6050215	Date of Collection:	4/29/03
Dil. Factor:	1.44	Date of Analysis:	5/2/03

Compound	Rpt. Limit (ppmv)	Rpt. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH (Gasoline Range)	0.036	0.15	0.036	0.15

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Fluorobenzene (FID)	97	75-125

AIR TOXICS LTD.

SAMPLE NAME: 16BVD03-21

ID#: 0304611B-05A

MODIFIED EPA METHOD TO-3 GC/FID

File Name:	6050221	Date of Collection:	4/29/03
Dil Factor:	334	Date of Analysis:	5/2/03

Compound	Rpt. Limit (ppmv)	Rpt. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH (Gasoline Range)	0.096	0.40	33	140

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Fluorobenzene (FID)	96	75-125

eCVP

**Electronic Comprehensive
Validation Package**

WO# 0305494A



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**COMPREHENSIVE VALIDATION PACKAGE**

Modified TO-14A

INVENTORY SHEET

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Comments:

Completed by:

Laura Overmyer

(Signature)

Laura Overmyer / Document Control

(Print Name & Title)

6/2/03

(Date)



AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0305494A

Work Order Summary

CLIENT:	Mr. Mike Heffron Tetra Tech FW/Foster Wheeler 1 Oxford Valley #200 2300 Lincoln Highway Langhorne, PA 19047	BILL TO:	Ms. Sonya Staten Tetra Tech FW/Foster Wheeler 1 Oxford Valley #200 2300 Lincoln Highway Langhorne, PA 19047
PHONE:	215-702-4000	P.O. #	044014
FAX:	215-702-4045	PROJECT #	
DATE RECEIVED:	5/27/2003	CONTACT:	Betty Chu
DATE COMPLETED:	5/30/2003		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>
01A	16A(VD)03-46	Modified TO-14A	0.0 "Hg
02A	16B(VD)03-22	Modified TO-14A	4.0 "Hg
03A	26AS46	Modified TO-14A	2.2 psi
04A	26AS47	Modified TO-14A	0.2 psi
04AA	26AS47 Duplicate	Modified TO-14A	0.2 psi
05A	Lab Blank	Modified TO-14A	NA
06A	CCV	Modified TO-14A	NA
07A	LCS	Modified TO-14A	NA

CERTIFIED BY: *Sinda J. Freeman*

DATE: 05/30/03

Laboratory Director

Certification numbers: AR DEQ, CA NELAP - 02110CA, LA NELAP/LELAP - AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892

Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,

Accreditation number: E87680, Effective date: 07/01/02, Expiration date: 06/30/03

Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

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LABORATORY NARRATIVE
Modified Method TO-14A
Foster Wheeler Environmental Corporation
Workorder# 0305494A

Four 6 Liter Summa Canister samples were received on May 27, 2003. The laboratory performed analysis via modified EPA Method TO-14A using GC/MS in the full scan mode. The method involves concentrating up to 0.5 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis. See the data sheets for the reporting limits for each compound.

Method modifications taken to run these samples include:

<i>Requirement</i>	<i>TO-14A</i>	<i>ATL Modifications</i>
Continuing Calibration criteria	70-130% recovery	70-130% recovery with two allowed out to 60-140%; flag and narrate outliers
Initial Calibration criteria	RSD<30%	RSD<=30%, two compounds allowed up to 40%.
Moisture control	Nafion Dryer	Multisorbent trap
Blank acceptance criteria	<0.20 ppbv	<Reporting Limit
Primary ions for Quantification	Freon 114: 85, Carbon Tetrachloride: 117, Trichloroethene: 130, Ethyl Benzene, m,p- and o-Xylene: 91	Freon 114: 135, Carbon Tetrachloride: 119, Trichloroethene: 95, Ethyl Benzene, m,p- and o-Xylene: 106

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

The recovery of surrogate 4-Bromofluorobenzene in sample 16B(VD)03-22 was outside control limits due to high level hydrocarbon matrix interference. Data is reported as qualified.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

- B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).
- J - Estimated value.
- E - Exceeds instrument calibration range.
- S - Saturated peak.
- Q - Exceeds quality control limits.
- U - Compound analyzed for but not detected above the reporting limit.
- UJ- Non-detected compound associated with low bias in the CCV
- N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

- a-File was requantified

b-File was quantified by a second column and detector
r1-File was requantified for the purpose of reissue

Table 1

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Sample		Sample Extract		Sample Condition
				Date Extracted	Holding Time (Days)	Date Analyzed	Holding Time (Days)	
16A(VD)03-46	0305494A-01A	5/23/2003	5/27/2003	NA	6	5/29/2003	NA	Good
16B(VD)03-22	0305494A-02A	5/23/2003	5/27/2003	NA	6	5/29/2003	NA	Good
26AS46	0305494A-03A	5/23/2003	5/27/2003	NA	6	5/29/2003	NA	Good
26AS47	0305494A-04A	5/23/2003	5/27/2003	NA	6	5/29/2003	NA	Good
26AS47 Duplicate	0305494A-04AA	5/23/2003	5/27/2003	NA	6	5/29/2003	NA	Good
Lab Blank	0305494A-05A	NA	NA	NA	NA	5/29/2003	NA	Good
CCV	0305494A-06A	NA	NA	NA	NA	5/29/2003	NA	Good
LCS	0305494A-07A	NA	NA	NA	NA	5/29/2003	NA	Good

Sample Results and Raw Data

AIR TOXICS LTD.

SAMPLE NAME: 16A(VD)03-46

ID#: 0305494A-01A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	s052914	Date of Collection:	5/23/03
Dil. Factor:	1.34	Date of Analysis:	5/29/03

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.67	3.4	Not Detected	Not Detected
Freon 114	0.67	4.8	Not Detected	Not Detected
Chloromethane	0.67	1.4	Not Detected	Not Detected
Vinyl Chloride	0.67	1.7	Not Detected	Not Detected
Bromomethane	0.67	2.6	Not Detected	Not Detected
Chloroethane	0.67	1.8	Not Detected	Not Detected
Freon 11	0.67	3.8	Not Detected	Not Detected
1,1-Dichloroethene	0.67	2.7	Not Detected	Not Detected
Freon 113	0.67	5.2	Not Detected	Not Detected
Methylene Chloride	0.67	2.4	Not Detected	Not Detected
1,1-Dichloroethane	0.67	2.8	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.67	2.7	Not Detected	Not Detected
Chloroform	0.67	3.3	Not Detected	Not Detected
1,1,1-Trichloroethane	0.67	3.7	Not Detected	Not Detected
Carbon Tetrachloride	0.67	4.3	Not Detected	Not Detected
Benzene	0.67	2.2	7.9	26
1,2-Dichloroethane	0.67	2.8	Not Detected	Not Detected
Trichloroethene	0.67	3.6	Not Detected	Not Detected
1,2-Dichloropropane	0.67	3.1	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.67	3.1	Not Detected	Not Detected
Toluene	0.67	2.6	2.6	9.8
trans-1,3-Dichloropropene	0.67	3.1	Not Detected	Not Detected
1,1,2-Trichloroethane	0.67	3.7	Not Detected	Not Detected
Tetrachloroethene	0.67	4.6	Not Detected	Not Detected
1,2-Dibromoethane (EDB)	0.67	5.2	Not Detected	Not Detected
Chlorobenzene	0.67	3.1	Not Detected	Not Detected
Ethyl Benzene	0.67	3.0	12	53
m,p-Xylene	0.67	3.0	36	160
o-Xylene	0.67	3.0	8.6	38
Styrene	0.67	2.9	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.67	4.7	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.67	3.3	5.9	30
1,2,4-Trimethylbenzene	0.67	3.3	15	75
1,3-Dichlorobenzene	0.67	4.1	Not Detected	Not Detected
1,4-Dichlorobenzene	0.67	4.1	Not Detected	Not Detected
alpha-Chlorotoluene	0.67	3.5	Not Detected	Not Detected
1,2-Dichlorobenzene	0.67	4.1	Not Detected	Not Detected
1,2,4-Trichlorobenzene	2.7	20	Not Detected	Not Detected
Hexachlorobutadiene	2.7	29	Not Detected	Not Detected
Propylene	2.7	4.7	Not Detected	Not Detected
1,3-Butadiene	2.7	6.0	Not Detected	Not Detected
Acetone	2.7	6.5	5.9	14

AIR TOXICS LTD.

SAMPLE NAME: 16A(VD)03-46

ID#: 0305494A-01A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	s052914	Date of Collection:	5/23/03
Dil. Factor:	1.34	Date of Analysis:	5/29/03

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	2.7	8.5	Not Detected	Not Detected
2-Propanol	2.7	6.7	Not Detected	Not Detected
trans-1,2-Dichloroethene	2.7	11	Not Detected	Not Detected
Vinyl Acetate	2.7	9.6	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.7	8.0	7.6	23
Hexane	2.7	9.6	31	110
Tetrahydrofuran	2.7	8.0	8.5	25
Cyclohexane	2.7	9.4	14	48
1,4-Dioxane	2.7	9.8	Not Detected	Not Detected
Bromodichloromethane	2.7	18	Not Detected	Not Detected
4-Methyl-2-pentanone	2.7	11	Not Detected	Not Detected
2-Hexanone	2.7	11	Not Detected	Not Detected
Dibromochloromethane	2.7	23	Not Detected	Not Detected
Bromoform	2.7	28	Not Detected	Not Detected
4-Ethyltoluene	2.7	13	14	71
Ethanol	2.7	5.1	Not Detected	Not Detected
Methyl tert-butyl ether	2.7	9.8	Not Detected	Not Detected
Heptane	2.7	11	19	81

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	108	70-130
Toluene-d8	100	70-130
4-Bromofluorobenzene	105	70-130

AIR TOXICS LTD.

SAMPLE NAME: 16B(VD)03-22

ID#: 0305494A-02A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	s052919	Date of Collection:	5/23/03
Dil. Factor:	38.8	Date of Analysis:	5/29/03

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	19	98	Not Detected	Not Detected
Freon 114	19	140	Not Detected	Not Detected
Chloromethane	19	41	Not Detected	Not Detected
Vinyl Chloride	19	50	100	270
Bromomethane	19	76	Not Detected	Not Detected
Chloroethane	19	52	Not Detected	Not Detected
Freon 11	19	110	730	4200
1,1-Dichloroethene	19	78	Not Detected	Not Detected
Freon 113	19	150	Not Detected	Not Detected
Methylene Chloride	19	68	Not Detected	Not Detected
1,1-Dichloroethane	19	80	Not Detected	Not Detected
cis-1,2-Dichloroethene	19	78	Not Detected	Not Detected
Chloroform	19	96	Not Detected	Not Detected
1,1,1-Trichloroethane	19	110	Not Detected	Not Detected
Carbon Tetrachloride	19	120	Not Detected	Not Detected
Benzene	19	63	170	550
1,2-Dichloroethane	19	80	Not Detected	Not Detected
Trichloroethene	19	100	Not Detected	Not Detected
1,2-Dichloropropane	19	91	Not Detected	Not Detected
cis-1,3-Dichloropropene	19	89	Not Detected	Not Detected
Toluene	19	74	140	520
trans-1,3-Dichloropropene	19	89	Not Detected	Not Detected
1,1,2-Trichloroethane	19	110	Not Detected	Not Detected
Tetrachloroethene	19	130	Not Detected	Not Detected
1,2-Dibromoethane (EDB)	19	150	Not Detected	Not Detected
Chlorobenzene	19	91	Not Detected	Not Detected
Ethyl Benzene	19	86	2100	9400
m,p-Xylene	19	86	5700	25000
o-Xylene	19	86	1600	7300
Styrene	19	84	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	19	140	Not Detected	Not Detected
1,3,5-Trimethylbenzene	19	97	1300	6500
1,2,4-Trimethylbenzene	19	97	4100	20000
1,3-Dichlorobenzene	19	120	Not Detected	Not Detected
1,4-Dichlorobenzene	19	120	Not Detected	Not Detected
alpha-Chlorotoluene	19	100	Not Detected	Not Detected
1,2-Dichlorobenzene	19	120	Not Detected	Not Detected
1,2,4-Trichlorobenzene	78	580	Not Detected	Not Detected
Hexachlorobutadiene	78	840	Not Detected	Not Detected
Propylene	78	140	Not Detected	Not Detected
1,3-Butadiene	78	170	Not Detected	Not Detected
Acetone	78	190	100	250

AIR TOXICS LTD.

SAMPLE NAME: 16B(VD)03-22

ID#: 0305494A-02A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	s052919	Date of Collection:	5/23/03
Dil. Factor:	38.8	Date of Analysis:	5/29/03

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	78	240	Not Detected	Not Detected
2-Propanol	78	190	Not Detected	Not Detected
trans-1,2-Dichloroethene	78	310	Not Detected	Not Detected
Vinyl Acetate	78	280	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	78	230	Not Detected	Not Detected
Hexane	78	280	320	1100
Tetrahydrofuran	78	230	Not Detected	Not Detected
Cyclohexane	78	270	620	2200
1,4-Dioxane	78	280	Not Detected	Not Detected
Bromodichloromethane	78	530	Not Detected	Not Detected
4-Methyl-2-pentanone	78	320	Not Detected	Not Detected
2-Hexanone	78	320	Not Detected	Not Detected
Dibromochloromethane	78	670	Not Detected	Not Detected
Bromoform	78	820	Not Detected	Not Detected
4-Ethyltoluene	78	390	3200	16000
Ethanol	78	150	Not Detected	Not Detected
Methyl tert-butyl ether	78	280	Not Detected	Not Detected
Heptane	78	320	1400	5800

Q = Exceeds Quality Control limits of 70% to 130%, due to matrix effects.

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	105	70-130
Toluene-d8	105	70-130
4-Bromofluorobenzene	158 Q	70-130

eCVP

**Electronic Comprehensive
Validation Package**

WO# 0305494B

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COMPREHENSIVE VALIDATION PACKAGE

Modified TO-3

INVENTORY SHEET

Work Order #: 0305494B

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-Internal Standard Area and Retention Time Summary		
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d. Duplicate Results Summary Sheet	--	--
e. Matrix Spike/Matrix Spike Duplicate (Results + Raw Data)	--	--
f. Initial Calibration Data (Summary Sheet + Raw Data)	20	58
g. MDL Study (If Applicable)	--	--
h. Continuing Calibration Verification Data (Summary Sheet	59	62
i. Second Source LCS(Summary + Raw Data)	63	66
j. Extraction Logs	--	--
k. Instrument Run Logs/Software Verification	67	67
l. GC/MS Tune (Results + Raw Data)	--	--
4. Shipping/Receiving Documents		
a. Login Receipt Summary Sheet	69	69
b. Chain-of-Custody Records	70	70
c. Sample Log-In Sheet	71	71
d. Misc Shipping/Receiving Records (list of individual records) <u>Sample Receipt Discrepancy Report</u>	--	--
5. Other Records (describe or list)		
a. <u>Manual Spectral Defense</u>	--	--
b. <u>Manual Integrations</u>	--	--
c. <u>Manual Calculations</u>	--	--
d. <u>Canister Dilution Factors</u>	73	74
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g. <u>Variance Table</u>	--	--
h. <u>Canister Certification</u>	--	--
i. <u>Data Review Check Sheet</u>	76	76

Comments:

Completed by:

Laura Overmyer

(Signature)

Laura Overmyer / Document Control

(Print Name & Title)

6/2/03

(Date)



AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0305494B

Work Order Summary

CLIENT: Mr. Mike Heffron
Tetra Tech FW/Foster Wheeler
1 Oxford Valley #200
2300 Lincoln Highway
Langhorne, PA 19047

BILL TO: Ms. Sonya Staten
Tetra Tech FW/Foster Wheeler
1 Oxford Valley #200
2300 Lincoln Highway
Langhorne, PA 19047

PHONE: 215-702-4000

P.O. # 044014

FAX: 215-702-4045

PROJECT #

DATE RECEIVED: 5/27/2003

CONTACT: Betty Chu

DATE COMPLETED: 5/29/2003

Table with 4 columns: FRACTION #, NAME, TEST, RECEIPT VAC./PRES.
01A 16A(VD)03-46 Modified TO-3 0.0 "Hg
02A 16B(VD)03-22 Modified TO-3 4.0 "Hg
03A Lab Blank Modified TO-3 NA
04A LCS Modified TO-3 NA

CERTIFIED BY: Linda D. Freeman

DATE: 05/30/03

Laboratory Director

Certification numbers: AR DEQ, CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892

Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/02, Expiration date: 06/30/03

Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

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LABORATORY NARRATIVE
Modified TO-3
Foster Wheeler Environmental Corporation
Workorder# 0305494B

Two 6 Liter Summa Canister samples were received on May 27, 2003. The laboratory performed analysis for volatile organic compounds in air via modified EPA Method TO-3 using gas chromatography with flame ionization detection. The method involves concentrating up to 200 mL of sample. The concentrated aliquot is then dry purged to remove water vapor prior to entering the chromatographic system. The TPH (Gasoline Range) results are calculated using the response factor of Gasoline and correspond to the range of hydrocarbons from C5 to C10. A molecular weight of 100 is used to convert the TPH (Gasoline Range) ppmv result to ug/L. See the data sheets for the reporting limits for TPH (Gasoline Range).

Method modifications taken to run these samples include:

<i>Requirement</i>	<i>TO-3</i>	<i>ATL Modifications</i>
Daily Calibration Standard Frequency	Prior to sample analysis and every 4 - 6 hrs	Prior to sample analysis and after the analytical batch <=/= 20 samples
Initial Calibration Calculation	4-point calibration using a linear regression model	5-point calibration using average Response Factor
Initial Calibration Frequency	Weekly	When daily calibration standard recovery is outside 75 - 125 %, or upon significant changes to procedure or instrumentation
Moisture Control	Nafion system	Sorbent system
Minimum Detection Limit (MDL)	Calculated using the equation $DL = A + 3.3S$, where A is intercept of calibration line and S is the standard deviation of at least 3 reps of low level standard	40 CFR Pt. 136 App. B
Preparation of Standards	Levels achieved through dilution of gas mixture	Levels achieved through loading various volumes of the gas mixture

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:

B - Compound present in laboratory blank greater than reporting limit.

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

- U - Compound analyzed for but not detected above the detection limit
- M - Reported value may be biased due to apparent matrix interferences.

File extensions may have been used on the data analysis sheets and indicates as follows:

- a-File was requantified
- b-File was quantified by a second column and detector
- r1-File was requantified for the purpose of reissue

Table 1

Client Sample ID	Lab Sample ID	Date Collected	Date Received	Date Extracted	Sample	Sample Extract		Sample Condition
					Holding Time (Days)	Date Analyzed	Holding Time (Days)	
16A(VD)03-46	0305494B-01A	5/23/2003	5/27/2003	NA	5	5/28/2003	NA	Good
16B(VD)03-22	0305494B-02A	5/23/2003	5/27/2003	NA	5	5/28/2003	NA	Good
Lab Blank	0305494B-03A	NA	NA	NA	NA	5/28/2003	NA	Good
LCS	0305494B-04A	NA	NA	NA	NA	5/29/2003	NA	Good

Sample Results and Raw Data

AIR TOXICS LTD.

SAMPLE NAME: 16A(VD)03-46

ID#: 0305494B-01A

MODIFIED EPA METHOD TO-3

File Name:	6052816	Date of Collection:	5/23/03
Dil. Factor:	1.34	Date of Analysis:	5/28/03

Compound	Rpt. Limit (ppmv)	Rpt. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH (Gasoline Range)	0.034	0.14	2.3	9.6

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Fluorobenzene (FID)	98	75-150

AIR TOXICS LTD.

SAMPLE NAME: 16B(VD)03-22

ID#: 0305494B-02A

MODIFIED EPA METHOD TO-3

File Name:	6052820	Date of Collection:	5/23/03
Dil. Factor:	41.3	Date of Analysis:	5/28/03

Compound	Rpt. Limit (ppmv)	Rpt. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH (Gasoline Range)	1.0	4.3	240	1000

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Fluorobenzene (FID)	100	75-150



AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

Air Toxics Ltd. Introduces the Electronic Report

Thank you for choosing Air Toxics Ltd. To better serve our customers, we are providing your report by e-mail. This document is provided in Portable Document Format which can be viewed with Acrobat Reader by Adobe.

This electronic report includes the following:

- Work order Summary;
- Laboratory Narrative;
- Results; and
- Chain of Custody (copy).

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630

(916) 985-1000 .FAX (916) 985-1020

Hours 8:00 A.M to 6:00 P.M. Pacific

E-mail to: samplerceiving@airtoxics.com

WORK ORDER #: 0306070B

Work Order Summary

CLIENT: Mr. Mike Heffron
Tetra Tech FW/Foster Wheeler
1 Oxford Valley #200
2300 Lincoln Highway
Langhorne, PA 19047

BILL TO: Ms. Sonya Staten
Tetra Tech FW/Foster Wheeler
1 Oxford Valley #200
2300 Lincoln Highway
Langhorne, PA 19047

PHONE: 215-702-4000
FAX: 215-702-4045
DATE RECEIVED: 6/4/03
DATE COMPLETED: 6/8/03

P.O. # 044014
PROJECT # NWS EARLE
CONTACT: Betty Chu

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>
01A	16A (VO) 03-47	Modified TO-3	0.0 "Hg
02A	Lab Blank	Modified TO-3	NA
03A	LCS	Modified TO-3	NA

CERTIFIED BY:

Sinda J. Freeman

Laboratory Director

DATE: 06/09/03

Certification numbers: AR DEQ, CA NELAP - 02110CA, LA NELAP/LELAP - AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892

Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,
Accreditation number: E87680, Effective date: 07/01/02, Expiration date: 06/30/03

Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

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180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 985-1020

LABORATORY NARRATIVE
Modified TO-3
Foster Wheeler Environmental Corporation
Workorder# 0306070B

One 6 Liter Summa Canister sample was received on June 04, 2003. The laboratory performed analysis for volatile organic compounds in air via modified EPA Method TO-3 using gas chromatography with flame ionization detection. The method involves concentrating up to 200 mL of sample. The concentrated aliquot is then dry purged to remove water vapor prior to entering the chromatographic system. The TPH (Gasoline Range) results are calculated using the response factor of Gasoline and correspond to the range of hydrocarbons from C5 to C10. A molecular weight of 100 is used to convert the TPH (Gasoline Range) ppmv result to ug/L. See the data sheets for the reporting limits for TPH.

Method modifications taken to run these samples include:

<i>Requirement</i>	<i>TO-3</i>	<i>ATL Modifications</i>
Daily Calibration Standard Frequency	Prior to sample analysis and every 4 - 6 hrs	Prior to sample analysis and after the analytical batch <= 20 samples
Initial Calibration Calculation	4-point calibration using a linear regression model	5-point calibration using average Response Factor
Initial Calibration Frequency	Weekly	When daily calibration standard recovery is outside 75 - 125 %, or upon significant changes to procedure or instrumentation
Moisture Control	Nafion system	Sorbent system
Minimum Detection Limit (MDL)	Calculated using the equation $DL = A + 3.3S$, where A is intercept of calibration line and S is the standard deviation of at least 3 reps of low level standard	40 CFR Pt. 136 App. B
Preparation of Standards	Levels achieved through dilution of gas mixture	Levels achieved through loading various volumes of the gas mixture

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

Definition of Data Qualifying Flags

Seven qualifiers may have been used on the data analysis sheets and indicate as follows:

- B - Compound present in laboratory blank greater than reporting limit.
- J - Estimated value.
- E - Exceeds instrument calibration range.
- S - Saturated peak.
- Q - Exceeds quality control limits.

- U - Compound analyzed for but not detected above the detection limit.
- M - Reported value may be biased due to apparent matrix interferences.

File extensions may have been used on the data analysis sheets and indicates as follows:

- a-File was requantified
- b-File was quantified by a second column and detector
- r1-File was requantified for the purpose of reissue

AIR TOXICS LTD.

SAMPLE NAME: 16A (VO) 03-47

ID#: 0306070B-01A

MODIFIED EPA METHOD TO-3

File Name:	6060607	Date of Collection:	6/3/03
Dil. Factor:	1.34	Date of Analysis:	6/6/03

Compound	Rpt. Limit (ppmv)	Rpt. Limit (uG/L)	Amount (ppmv)	Amount (uG/L)
TPH (Gasoline Range)	0.034	0.14	Not Detected	Not Detected

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
Fluorobenzene (FID)	97	75-150



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Air Toxics Ltd. Introduces the Electronic Report

Thank you for choosing Air Toxics Ltd. To better serve our customers, we are providing your report by e-mail. This document is provided in Portable Document Format which can be viewed with Acrobat Reader by Adobe.

This electronic report includes the following:

- Work order Summary;
- Laboratory Narrative;
- Results; and
- Chain of Custody (copy).

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(916) 985-1000 .FAX (916) 985-1020

Hours 8:00 A.M to 6:00 P.M. Pacific

E-mail to:samplereceiving@airtoxics.com



AIR TOXICS LTD.

AN ENVIRONMENTAL ANALYTICAL LABORATORY

WORK ORDER #: 0306070A

Work Order Summary

CLIENT:	Mr. Mike Heffron Tetra Tech FW/Foster Wheeler 1 Oxford Valley #200 2300 Lincoln Highway Langhorne, PA 19047	BILL TO:	Ms. Sonya Staten Tetra Tech FW/Foster Wheeler 1 Oxford Valley #200 2300 Lincoln Highway Langhorne, PA 19047
PHONE:	215-702-4000	P.O. #	044014
FAX:	215-702-4045	PROJECT #	NWS EARLE
DATE RECEIVED:	6/4/03	CONTACT:	Betty Chu
DATE COMPLETED:	6/9/03		

<u>FRACTION #</u>	<u>NAME</u>	<u>TEST</u>	<u>RECEIPT VAC./PRES.</u>
01A	16A (VO) 03-47	Modified TO-14A	0.0 "Hg
02A	Lab Blank	Modified TO-14A	NA
03A	CCV	Modified TO-14A	NA
04A	LCS	Modified TO-14A	NA

CERTIFIED BY: *Sinda D. Freeman*

DATE: 06/09/03

Laboratory Director

Certification numbers: AR DEQ, CA NELAP - 02110CA, LA NELAP/LELAP- AI 30763, NJ NELAP - CA004
NY NELAP - 11291, UT NELAP - 9166389892

Name of Accrediting Agency: NELAP/Florida Department of Health, Scope of Application: Clean Air Act,

Accreditation number: E87680, Effective date: 07/01/02, Expiration date: 06/30/03

Air Toxics Ltd. certifies that the test results contained in this report meet all requirements of the NELAC standards

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LABORATORY NARRATIVE
Modified Method TO-14A
Foster Wheeler Environmental Corporation
Workorder# 0306070A

One 6 Liter Summa Canister sample was received on June 04, 2003. The laboratory performed analysis via modified EPA Method TO-14A using GC/MS in the full scan mode. The method involves concentrating up to 0.5 liters of air. The concentrated aliquot is then flash vaporized and swept through a water management system to remove water vapor. Following dehumidification, the sample passes directly into the GC/MS for analysis. See the data sheets for the reporting limits for each compound.

Method modifications taken to run these samples include:

<i>Requirement</i>	<i>TO-14A</i>	<i>ATL Modifications</i>
Continuing Calibration criteria	70-130% recovery	70-130% recovery with two allowed out to 60-140%; flag and narrate outliers
Initial Calibration criteria	RSD<30%	RSD<=30%, two compounds allowed up to 40%.
Moisture control	Nafion Dryer	Multisorbent trap
Blank acceptance criteria	<0.20 ppbv	<Reporting Limit
Primary ions for Quantification	Freon 114: 85, Carbon Tetrachloride: 117, Trichloroethene: 130, Ethyl Benzene, m,p- and o-Xylene: 91	Freon 114: 135, Carbon Tetrachloride: 119, Trichloroethene: 95, Ethyl Benzene, m,p- and o-Xylene: 106

Receiving Notes

There were no receiving discrepancies.

Analytical Notes

There were no analytical discrepancies.

All samples were received with a Chain of Custody that specified Method TO-14. QA/QC and technical parameters were in compliance with Compendium Method TO-15 for all samples included in this report.

Definition of Data Qualifying Flags

Eight qualifiers may have been used on the data analysis sheets and indicates as follows:

B - Compound present in laboratory blank greater than reporting limit (background subtraction not performed).

J - Estimated value.

E - Exceeds instrument calibration range.

S - Saturated peak.

Q - Exceeds quality control limits.

U - Compound analyzed for but not detected above the reporting limit.

UJ- Non-detected compound associated with low bias in the CCV

N - The identification is based on presumptive evidence.

File extensions may have been used on the data analysis sheets and indicates as follows:

a-File was requantified

b-File was quantified by a second column and detector

r1-File was requantified for the purpose of reissue

AIR TOXICS LTD.

SAMPLE NAME: 16A (VO) 03-47

ID#: 0306070A-01A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	s060809	Date of Collection:	6/3/03
Dil. Factor:	1.34	Date of Analysis:	6/8/03

Compound	Rpt. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Freon 12	0.67	3.4	Not Detected	Not Detected
Freon 114	0.67	4.8	Not Detected	Not Detected
Chloromethane	0.67	1.4	Not Detected	Not Detected
Vinyl Chloride	0.67	1.7	Not Detected	Not Detected
Bromomethane	0.67	2.6	Not Detected	Not Detected
Chloroethane	0.67	1.8	Not Detected	Not Detected
Freon 11	0.67	3.8	Not Detected	Not Detected
1,1-Dichloroethene	0.67	2.7	Not Detected	Not Detected
Freon 113	0.67	5.2	Not Detected	Not Detected
Methylene Chloride	0.67	2.4	Not Detected	Not Detected
1,1-Dichloroethane	0.67	2.8	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.67	2.7	Not Detected	Not Detected
Chloroform	0.67	3.3	Not Detected	Not Detected
1,1,1-Trichloroethane	0.67	3.7	Not Detected	Not Detected
Carbon Tetrachloride	0.67	4.3	Not Detected	Not Detected
Benzene	0.67	2.2	Not Detected	Not Detected
1,2-Dichloroethane	0.67	2.8	Not Detected	Not Detected
Trichloroethene	0.67	3.6	Not Detected	Not Detected
1,2-Dichloropropane	0.67	3.1	Not Detected	Not Detected
cis-1,3-Dichloropropene	0.67	3.1	Not Detected	Not Detected
Toluene	0.67	2.6	2.0	7.6
trans-1,3-Dichloropropene	0.67	3.1	Not Detected	Not Detected
1,1,2-Trichloroethane	0.67	3.7	Not Detected	Not Detected
Tetrachloroethene	0.67	4.6	Not Detected	Not Detected
1,2-Dibromoethane (EDB)	0.67	5.2	Not Detected	Not Detected
Chlorobenzene	0.67	3.1	Not Detected	Not Detected
Ethyl Benzene	0.67	3.0	Not Detected	Not Detected
m,p-Xylene	0.67	3.0	Not Detected	Not Detected
o-Xylene	0.67	3.0	Not Detected	Not Detected
Styrene	0.67	2.9	Not Detected	Not Detected
1,1,2,2-Tetrachloroethane	0.67	4.7	Not Detected	Not Detected
1,3,5-Trimethylbenzene	0.67	3.3	Not Detected	Not Detected
1,2,4-Trimethylbenzene	0.67	3.3	Not Detected	Not Detected
1,3-Dichlorobenzene	0.67	4.1	Not Detected	Not Detected
1,4-Dichlorobenzene	0.67	4.1	Not Detected	Not Detected
alpha-Chlorotoluene	0.67	3.5	Not Detected	Not Detected
1,2-Dichlorobenzene	0.67	4.1	Not Detected	Not Detected
1,2,4-Trichlorobenzene	2.7	20	Not Detected	Not Detected
Hexachlorobutadiene	2.7	29	Not Detected	Not Detected
Propylene	2.7	4.7	Not Detected	Not Detected
1,3-Butadiene	2.7	6.0	Not Detected	Not Detected
Acetone	2.7	6.5	Not Detected	Not Detected

AIR TOXICS LTD.

SAMPLE NAME: 16A (VO) 03-47

ID#: 0306070A-01A

MODIFIED EPA METHOD TO-14A GC/MS FULL SCAN

File Name:	s060809	Date of Collection: 6/3/03
Dil. Factor:	1.34	Date of Analysis: 6/8/03

Compound	Rot. Limit (ppbv)	Rpt. Limit (uG/m3)	Amount (ppbv)	Amount (uG/m3)
Carbon Disulfide	2.7	8.5	Not Detected	Not Detected
2-Propanol	2.7	6.7	Not Detected	Not Detected
trans-1,2-Dichloroethene	2.7	11	Not Detected	Not Detected
Vinyl Acetate	2.7	9.6	Not Detected	Not Detected
2-Butanone (Methyl Ethyl Ketone)	2.7	8.0	Not Detected	Not Detected
Hexane	2.7	9.6	Not Detected	Not Detected
Tetrahydrofuran	2.7	8.0	Not Detected	Not Detected
Cyclohexane	2.7	9.4	Not Detected	Not Detected
1,4-Dioxane	2.7	9.8	Not Detected	Not Detected
Bromodichloromethane	2.7	18	Not Detected	Not Detected
4-Methyl-2-pentanone	2.7	11	Not Detected	Not Detected
2-Hexanone	2.7	11	Not Detected	Not Detected
Dibromochloromethane	2.7	23	Not Detected	Not Detected
Bromoform	2.7	28	Not Detected	Not Detected
4-Ethyltoluene	2.7	13	Not Detected	Not Detected
Ethanol	2.7	5.1	2.7 J	5.1 J
Methyl tert-butyl ether	2.7	9.8	Not Detected	Not Detected
Heptane	2.7	11	Not Detected	Not Detected

J = Estimated value.

Container Type: 6 Liter Summa Canister

Surrogates	%Recovery	Method Limits
1,2-Dichloroethane-d4	105	70-130
Toluene-d8	101	70-130
4-Bromofluorobenzene	102	70-130

APPENDIX D
ANALYTICAL RESULTS FOR EFFLUENT SAMPLES

NWS-EARLE
 BIOSLURPER UNIT #1 AND #2
 TPH REMOVED VIA VAPOR EXTRACTION

7/18/03

BIOSLURPER UNIT 1	
TPH INFLUENT* (mg/L):	433
TPH EFFLUENT* (mg/L):	0
GALLONS GROUNDWATER TREATED:	14682
* as per analytical average if more than one sample	3/31/2003
	53.06 = POUNDS OF TPH

BIOSLURPER UNIT 2	
TPH INFLUENT* (mg/L):	12.2
TPH EFFLUENT* (mg/L):	0
GALLONS GROUNDWATER TREATED:	6325
* as per analytical average if more than one sample	3/31/2003
	0.64 = POUNDS OF TPH

POUNDS OF TPH =

$$\frac{\text{Gallons Groundwater Treated} * (3.785 \text{ L/gal}) * (\text{TPH INFLUENT (mg/L)} - \text{TPH EFFLUENT (mg/l)}) * 0.001 \text{g/mg} * 0.002205 \text{ pounds/g}}{1}$$

NWS-EARLE
 BIOSLURPER UNIT #1 AND #2
 TPH REMOVED VIA VAPOR EXTRACTION

7/18/03

BIOSLURPER UNIT 1	
TPH INFLUENT* (mg/L):	176
TPH EFFLUENT* (mg/L):	0
GALLONS GROUNDWATER TREATED:	18084
* as per analytical average if more than one sample	4/29/2003
	26.56 =POUNDS OF TPH

BIOSLURPER UNIT 2	
TPH INFLUENT* (mg/L):	39.6
TPH EFFLUENT* (mg/L):	0
GALLONS GROUNDWATER TREATED:	14649
* as per analytical average if more than one sample	4/29/2003
	4.84 =POUNDS OF TPH

POUNDS OF TPH=

$$\text{Gallons Groundwater Treated} * (3.785 \text{ L/gal}) * (\text{TPH INFLUENT (mg/L)} - \text{TPH EFFLUENT (mg/l)}) * 0.001\text{g/mg} * 0.002205 \text{ pounds/g}$$

NWS-EARLE
 BIOSLURPER UNIT #1 AND #2
 TPH REMOVED VIA VAPOR EXTRACTION

7/18/03

BIOSLURPER UNIT 1	
TPH INFLUENT* (mg/L):	235.6
TPH EFFLUENT* (mg/L):	0.17
GALLONS GROUNDWATER TREATED:	20199
* as per analytical average if more than one sample	5/23/2003
	39.69 =POUNDS OF TPH

BIOSLURPER UNIT 2	
TPH INFLUENT* (mg/L):	10.6
TPH EFFLUENT* (mg/L):	0.03
GALLONS GROUNDWATER TREATED:	4303
* as per analytical average if more than one sample	5/23/2003
	0.38 =POUNDS OF TPH

POUNDS OF TPH=

$$\text{Gallons Groundwater Treated} * (3.785 \text{ L/gal}) * (\text{TPH INFLUENT (mg/L)} - \text{TPH EFFLUENT (mg/l)}) * 0.001\text{g/mg} * 0.002205 \text{ pounds/g}$$



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Certificate of Analysis

April 4, 2003

Cris Joblon
Tetra Tech FW, Inc.
2300 E. Lincoln Highway
Suite 200
Langhorne, PA 19047

Lab ID#: 231708

Project Name: **DRO Project**

PO#:

This report relates only to the sample(s) as received by the laboratory. Laboratory reports may not be reproduced, except in full, without the written approval of the laboratory.

Qualifier Flags - These flags may follow individual results for a specific analyte

- U - Indicates that the analyte was not detected
- J - Indicates an estimated value between method detection limit and the practical quantitation limit for the analyte
- E - Indicates an estimated value outside of the calibration range of the analysis
- B - Indicates that the analyte was found in the method blank associated with the sample

A result of ND indicates that the analyte was Not Detected at the Reporting Detection Limit (RDL).

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If you have any questions in reference to this laboratory report, please contact your ALSI project coordinator or the laboratory manager listed at the bottom of this report at 717-944-5541.

Note: This document is included as part of the Analytical Report and must be retained as a permanent record thereof.

Raymond J. Martrano
Laboratory Manager



Certificate of Analysis

April 4, 2003

Cris Joblon
Tetra Tech FW, Inc.
2300 E. Lincoln Highway
Suite 200
Langhorne, PA 19047

Lab ID #: 231708001
Received: 04/01/03 20:30
Discard: 04/18/03

Page: 1 Of 1

Project Name: **DRO Project**

PO#:

Sample ID: **16BEW03-34**

Matrix: **Ground Water**

Date Collected: **03/31/03 15:10**

Collected by: **Collected by Customer**

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
PETROLEUM HC's							
Diesel Range Organics ¹	ND	mg/L	0.16	SW846 8015M	04/03/03 16:07	04/02/03	JJH
Surrogates							
o-Terphenyl	.0333	mg/L	81.6%		(51 - 135)		

Comments:

The pH of the petroleum hydrocarbon bottle was adjusted to - pH < 2 by the addition of sulfuric acid upon receipt at the - laboratory.

¹ - The DRO value reported is for petroleum hydrocarbons eluting between n-C10 and n-C28.

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.

Raymond J. Martrano
Laboratory Manager



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Certificate of Analysis

April 4, 2003

Cris Joblon
Tetra Tech FW, Inc.
2300 E. Lincoln Highway
Suite 200
Langhorne, PA 19047

Lab ID #: 231708002
Received: 04/01/03 20:30
Discard: 04/18/03

Page: 1 Of 1

Project Name: DRO Project

PO#:

Sample ID: 16BEW03-33

Matrix: Ground Water

Date Collected: 03/31/03 15:05

Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
PETROLEUM HC's							
Diesel Range Organics ¹	12.2	mg/L	3.39	SW846 8015M	04/03/03 13:23	04/02/03	JJH
Surrogates							
o-Terphenyl	.0523	mg/L	124.0%		(51 - 135)		

1 - The DRO value reported is for petroleum hydrocarbons eluting between n-C10 and n-C28.

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.

Raymond J. Martrano
Laboratory Manager



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Certificate of Analysis

April 4, 2003

Cris Joblon
Tetra Tech FW, Inc.
2300 E. Lincoln Highway
Suite 200
Langhorne, PA 19047

Lab ID #: 231708003
Received: 04/01/03 20:30
Discard: 04/18/03

Page: 1 Of 1

Project Name: DRO Project

PO#:

Sample ID: 16AEW03-67

Matrix: Ground Water

Date Collected: 03/31/03 14:30

Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
PETROLEUM HC's							
Diesel Range Organics ¹	433	mg/L	178	SW846 8015M	04/03/03 15:05	04/02/03	JJH
Surrogates							
o-Terphenyl	0	mg/L	0.0%		(51 - 135)		

Comments:

This sample was analyzed at a dilution in the 8015 diesel range organics analysis of this sample due to the level of analyte native to the sample. Ortho-terphenyl surrogate recovery could not be evaluated as a result of the dilution.

1 - The DRO value reported is for petroleum hydrocarbons eluting between n-C10 and n-C28.

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.

Raymond J. Martrano
Laboratory Manager



Certificate of Analysis

April 4, 2003

Cris Joblon
Tetra Tech FW, Inc.
2300 E. Lincoln Highway
Suite 200
Langhorne, PA 19047

Lab ID #: 231708004
Received: 04/01/03 20:30
Discard: 04/18/03

Page: 1 Of 1

Project Name: DRO Project

PO#:

Sample ID: 16AEW03-68

Matrix: Ground Water

Date Collected: 03/31/03 14:35

Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
PETROLEUM HC's							
Diesel Range Organics ¹	ND	mg/L	0.18	SW846 8015M	04/03/03 17:09	04/02/03	JJH
Surrogates							
o-Terphenyl	.0368	mg/L	83.7%		(51 - 135)		

1 - The DRO value reported is for petroleum hydrocarbons eluting between n-C10 and n-C28.

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.

Raymond J. Martrano
Laboratory Manager



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34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-1430

Certificate of Analysis

May 5, 2003

Cris Joblon
Tetra Tech FW, Inc.
2300 E. Lincoln Highway
Suite 200
Langhorne, PA 19047

Lab ID#: 234105

Project Name: DRO Project

PO#:

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Qualifier Flags - These flags may follow individual results for a specific analyte

- U - Indicates that the analyte was not detected
- J - Indicates an estimated value between method detection limit and the practical quantitation limit for the analyte
- E - Indicates an estimated value outside of the calibration range of the analysis
- B - Indicates that the analyte was found in the method blank associated with the sample

A result of ND indicates that the analyte was Not Detected at the Reporting Detection Limit (RDL).

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If you have any questions in reference to this laboratory report, please contact your ALSI project coordinator or the laboratory manager listed at the bottom of this report at 717-944-5541.

Note: This document is included as part of the Analytical Report and must be retained as a permanent record thereof.

Raymond J. Martrano
Laboratory Manager



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Certificate of Analysis

May 5, 2003

Cris Joblon
Tetra Tech FW, Inc.
2300 E. Lincoln Highway
Suite 200
Langhorne, PA 19047

Lab ID #: 234105001
Received: 04/30/03 18:45
Discard: 05/19/03

Page: 1 Of 1

Project Name: DRO Project

PO#:

Sample ID: 16AEW03-69

Matrix: Ground Water

Date Collected: 04/29/03 11:30

Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
PETROLEUM HC's							
Diesel Range Organics ¹	176	mg/L	34.2	SW846 8015M	05/04/03 23:43	05/01/03	JJH
Surrogates							
o-Terphenyl	0	mg/L	0.0%	(51 - 135)			

Comments:

This sample was analyzed at a dilution in the 8015 diesel range organics analysis of this sample due to the level of analyte detected in the sample. Ortho-terphenyl surrogate recovery could not be evaluated as a result of the dilution.

1 - The DRO value reported is for petroleum hydrocarbons eluting between n-C10 and n-C28.

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.

Raymond J. Martrano
Laboratory Manager



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34 Dogwood Lane - Middletown, PA 17057 Phone: 717-944-5541 Fax: 717-944-1430

Certificate of Analysis

May 5, 2003

Cris Joblon
Tetra Tech FW, Inc.
2300 E. Lincoln Highway
Suite 200
Langhorne, PA 19047

Lab ID #: 234105002
Received: 04/30/03 18:45
Discard: 05/19/03

Page: 1 Of 1

Project Name: DRO Project

PO#:

Sample ID: 16AEW70-20

Matrix: Ground Water

Date Collected: 04/29/03 11:40

Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
PETROLEUM HC's							
Diesel Range Organics ¹	ND	mg/L	0.16	SW846 8015M	05/03/03 00:31	05/01/03	JJH
Surrogates							
o-Terphenyl	.0351	mg/L	85.1%		(51 - 135)		

1 - The DRO value reported is for petroleum hydrocarbons eluting between n-C10 and n-C28.

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Laboratory Manager



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Certificate of Analysis

May 5, 2003

Cris Joblon
Tetra Tech FW, Inc.
2300 E. Lincoln Highway
Suite 200
Langhorne, PA 19047

Lab ID #: 234105003
Received: 04/30/03 18:45
Discard: 05/19/03

Page: 1 Of 1

Project Name: DRO Project

PO#:

Sample ID: 16BEW03-35

Matrix: Ground Water

Date Collected: 04/29/03 12:00

Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
PETROLEUM HC's							
Diesel Range Organics ¹	39.6	mg/L	8.12	SW846 8015M	05/05/03 00:45	05/01/03	JJH
Surrogates							
o-Terphenyl	0	mg/L	0.0%		(51 - 135)		

Comments:

This sample was analyzed at a dilution in the 8015 diesel range organics analysis of this sample due to the level of analyte detected in the sample. Ortho-terphenyl surrogate recovery could not be evaluated as a result of the dilution.

1 - The DRO value reported is for petroleum hydrocarbons eluting between n-C10 and n-C28.

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.

Raymond J. Martrano
Laboratory Manager



Certificate of Analysis

May 5, 2003

Cris Joblon
Tetra Tech FW, Inc.
2300 E. Lincoln Highway
Suite 200
Langhorne, PA 19047

Lab ID #: 234105004
Received: 04/30/03 18:45
Discard: 05/19/03

Page: 1 Of 1

Project Name: DRO Project

PO#:

Sample ID: 16BEW03-36

Matrix: Ground Water

Date Collected: 04/29/03 12:10

Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
PETROLEUM HC's							
Diesel Range Organics ¹	ND	mg/L	0.16	SW846 8015M	05/03/03 02:35	05/01/03	JJH
Surrogates							
o-Terphenyl	.0375	mg/L	91.0%	(51 - 135)			

¹ - The DRO value reported is for petroleum hydrocarbons eluting between n-C10 and n-C28.

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Raymond J. Martrano
Laboratory Manager



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Middletown, PA 17057
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FAX: 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Please print. See back of COC for directions

COC #: 04193

Sample Date: 4 1 29 103

Client Name: Tetra Tech FW
Address: One Ox Road Valley Suite 200
Langhorne Pa 19047
Contact: Mike Heaman
Phone #: (215) 702-4015
Project Name/ #: NWS Earle
Quote/PO #: 043498
TAT: Normal *Rush *Rush TAT subject to approval and surcharges
Date Required: _____
Approved by: _____
Fax Results? Y or N #: _____

ANALYSES REQUESTED											
TPH PRO											
Amber											
Heaman											

RECEIVING INFO
(Lab use only)

COOLER TEMP: _____

COC SEAL INTACT:
Y or N

SHIPPING CARRIER:

SHIPPING NO:

Container Type
Preservative

SAMPLE DESCRIPTION//LOCATION	G/C	TIME 00:00	MATRIX	NO. OF CONTAINERS PER ANALYSIS REQUESTED								COMMENTS/FIELD DATA	
				1	2	3	4	5	6	7	8		
1 16 A FW 03-69	G	1130	GW	2									
2 16 A FW 03-70	G	1140	GW	2									
3 11 B FW 03-35	G	1200	GW	2									
4 11 B FW 03-36	G	1210	GW	2									
5													
6													
7													
8													
9													
10													
11													
12													

Print Name and Company	Signature	Date/Time	Remarks
Sampled by: <u>William Geigley Tetra Tech FW</u>	<u>William Geigley</u>	<u>4/29/03 1100</u>	<u>72 hrs. turnaround</u>
Received by:			
Relinquished by: <u>William Geigley Tetra Tech FW</u>	<u>William Geigley</u>	<u>4/29/03 1600</u>	METHOD PROTOCOL: SW846 <input type="checkbox"/> CFR136 <input type="checkbox"/> DRINKING WATER <input type="checkbox"/> OTHER: _____ REPORTING REQUIREMENTS: PADEP <input type="checkbox"/> OTHER: _____ PWSID: _____
Received by: <u>CHAD RANSOM</u>	<u>Chad Ransom</u>	<u>4-30-03 13:00</u>	
Relinquished by: <u>CHAD RANSOM</u>	<u>Chad Ransom</u>	<u>4-30-03</u>	
Received by: <u>Mike Heaman</u>	<u>Mike Heaman</u>	<u>4/30/03 1845</u>	

Handwritten notes:
JK 5/1/03
4/30/03
2/13

Composite **Matrix - SO=Soil; SD=Solid; DW=Drinking Water; WW=Wastewater; GW=Groundwater; SL=Sludge; OL=Oil



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Certificate of Analysis

June 2, 2003

Cris Joblon
Tetra Tech FW, Inc.
2300 E. Lincoln Highway
Suite 200
Langhorne, PA 19047

Lab ID#: 236098

Project Name: **DRO Project**

PO#:

This report relates only to the sample(s) as received by the laboratory. Laboratory reports may not be reproduced, except in full, without the written approval of the laboratory.

Qualifier Flags - These flags may follow individual results for a specific analyte

- U - Indicates that the analyte was not detected
- J - Indicates an estimated value between method detection limit and the practical quantitation limit for the analyte
- E - Indicates an estimated value outside of the calibration range of the analysis
- B - Indicates that the analyte was found in the method blank associated with the sample

A result of ND indicates that the analyte was Not Detected at the Reporting Detection Limit (RDL).

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If you have any questions in reference to this laboratory report, please contact your ALSI project coordinator or the laboratory manager listed at the bottom of this report at 717-944-5541.

Note: This document is included as part of the Analytical Report and must be retained as a permanent record thereof.

Raymond J. Martrano
Laboratory Manager



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Certificate of Analysis

June 2, 2003

Cris Joblon
Tetra Tech FW, Inc.
2300 E. Lincoln Highway
Suite 200
Langhorne, PA 19047

Lab ID #: 236098001
Received: 05/27/03 10:00
Discard: 06/16/03
Page: 1 Of 1

Project Name: DRO Project

PO#:

Sample ID: 16A [EW] 03-71
Date Collected: 05/23/03 12:30

Matrix: Ground Water
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
PETROLEUM HC's							
Diesel Range Organics ¹	236	mg/L	34.6	SW846 8015M	05/29/03 13:24	05/27/03	JJH
Surrogates							
	Result	Units	Recovery	Limits			
o-Terphenyl	0	mg/L	0.0%	(51 - 135)			

Comments:

This sample was analyzed at a dilution in the 8015 diesel range organics analysis of this sample due to the level of analyte native to the sample. Ortho-terphenyl surrogate recovery could not be evaluated as a result of the dilution.

1 - The DRO value reported is for petroleum hydrocarbons eluting between n-C10 and n-C28.

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.

Raymond J. Martrano
Laboratory Manager



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Certificate of Analysis

June 2, 2003

Cris Joblon
Tetra Tech FW, Inc.
2300 E. Lincoln Highway
Suite 200
Langhorne, PA 19047

Lab ID #: 236098002
Received: 05/27/03 10:00
Discard: 06/16/03

Page: 1 Of 1

Project Name: DRO Project

PO#:

Sample ID: 16A[EW]03-72

Matrix: Ground Water

Date Collected: 05/23/03 12:35

Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
PETROLEUM HC's							
Diesel Range Organics ¹	ND	mg/L	0.17	SW846 8015M	05/29/03 16:54	05/27/03	JJH
Surrogates							
o-Terphenyl	.0383	mg/L	87.5%	Recovery Limits	(51 - 135)		

1 - The DRO value reported is for petroleum hydrocarbons eluting between n-C10 and n-C28.

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.

Raymond J. Martrano
Laboratory Manager



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June 2, 2003

Cris Joblon
Tetra Tech FW, Inc.
2300 E. Lincoln Highway
Suite 200
Langhorne, PA 19047

Lab ID #: 236098003
Received: 05/27/03 10:00
Discard: 06/16/03
Page: 1 Of 1

Project Name: **DRO Project**

PO#:

Sample ID: 16B [EW] 03-37
Date Collected: 05/23/03 13:00

Matrix: Ground Water
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
PETROLEUM HC's							
Diesel Range Organics ¹	10.6	mg/L	1.80	SW846 8015M	05/29/03 14:50	05/27/03	JJH
Surrogates							
o-Terphenyl	.053	mg/L	118.0%	(51 - 135)			

Comments:

This sample was analyzed at a dilution in the 8015 diesel range organics analysis due to the level of analyte detected. Reporting limits were adjusted accordingly. AJL 6/2/03

1 - The DRO value reported is for petroleum hydrocarbons eluting between n-C10 and n-C28.

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.

Raymond J. Martrano
Laboratory Manager



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Certificate of Analysis

June 2, 2003

Cris Joblon
Tetra Tech FW, Inc.
2300 E. Lincoln Highway
Suite 200
Langhorne, PA 19047

Lab ID #: 236098004
Received: 05/27/03 10:00
Discard: 06/16/03

Page: 1 Of 1

Project Name: DRO Project

PO#:

Sample ID: 16B[EW]03-38

Matrix: Ground Water

Date Collected: 05/23/03 13:10

Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
PETROLEUM HC's							
Diesel Range Organics ¹	ND	mg/L	0.17	SW846 8015M	05/29/03 18:50	05/27/03	JJH
Surrogates							
o-Terphenyl	.0341	mg/L	82.4%	(51 - 135)			

1 - The DRO value reported is for petroleum hydrocarbons eluting between n-C10 and n-C28.

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.

Raymond J. Martrano
Laboratory Manager



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Middletown, PA 17057
TEL: 717-944-5541
FAX: 717-944-1430

**CHAIN OF CUSTODY/
REQUEST FOR ANALYSIS**

Please print. See back of COC for directions

COC #:

1235098

Sample Date:

5 1 23 103

Client Name: TTFWI - FWENC
Address: 2300 Lincoln Highway, East
One Orchard Valley
Contact: Mike Helfron
Phone #: 215-702-4000
Project Name#: Earle
Quote/PO #:

ANALYSES REQUESTED											

RECEIVING INFO
(Lab use only)

COOLER TEMP: _____

COC SEAL INTACT:
Y or N

SHIPPING CARRIER:

SHIPPING NO:

TAT: Normal *Rush *Rush TAT subject to approval and surcharges

Date Required: _____

Approved by: _____

Fax Results Y or N #: 215 702 4045

Container Type: _____

Preservative: _____

SAMPLE DESCRIPTION/LOCATION	G/C	TIME 00:00	MATRIX **	NO. OF CONTAINERS PER ANALYSIS REQUESTED								COMMENTS/FIELD DATA			
				1	2	3	4	5	6	7	8				
1 10A(EW)03-71		1231	H ₂ O		2										
2 16A(EW)03-72		1235	H ₂ O		2										
3 16B(EW)03-37		1300	H ₂ O		2										
4 16B(EW)03-38		1300	H ₂ O		2										
5															
6															
7															
8															
9															
10															
11															
12															

5/22/03
B32

Print Name and Company	Signature	Date/Time	Remarks:
Sampled by: <u>S. S. ...</u>	<u>[Signature]</u>	<u>5/23/03 1400</u>	
Received by: <u>G. K...</u>	<u>[Signature]</u>	<u>5-27-03 1000</u>	
Relinquished by:			
Received by:			
Relinquished by:			
Received by:			

METHOD PROTOCOL: SW846 CFR136

DRINKING WATER OTHER: _____

REPORTING REQUIREMENTS: PADEP

OTHER: _____ PWSID: _____

* G=Grab; C=Composite ** Matrix SO=Soil; SD=Solid; DW=Drinking Water; WW=Wastewater; GW=Groundwater; SL=Sludge; OL=Oil

APPENDIX E
FINAL BIOSLURPER UNIT NO. 2 AIR PERMIT REPORT-VINYL CHLORIDE
EMISSIONS

FINAL

BIOSLURPER UNIT NO. 2 AIR PERMIT REPORT
VINYL CHLORIDE EMISSIONS

NAVAL WEAPONS STATION - EARLE
COLTS NECK, NEW JERSEY

Issued:

July 18, 2003

Prepared for:

Engineering Field Activity Northeast
10 Industrial Highway
Lester, PA 19113

Prepared by:

Foster Wheeler Environmental Corporation
2300 Lincoln Highway
One Oxford Valley - Suite 200
Langhorne, PA 19047 - 1829

REMEDIAL ACTION CONTRACT N62472-99-D-0032
CONTRACT TASK ORDER NO. 0049

INTRODUCTION/BACKGROUND

Vinyl chloride has been detected frequently in Bioslurper Unit No. 2 air discharge samples since February 2002. Concentrations of vinyl chloride have ranged from non-detect to 0.5 ppm(v) in the Unit No. 2 air samples. The maximum concentration of vinyl chloride was observed in the air sample collected in August 2002. This concentration triggered monitoring for trends or increases in the vinyl chloride as well as inclusion of vinyl chloride in the air emission calculations. Concentrations have decreased since August 2002 and were at very low levels during the winter months. The most recent data (April and May 2003) indicates that the vinyl chloride concentrations are beginning to increase. The graph in Attachment 1 illustrates the concentrations of vinyl chloride in the air stream of Bioslurper Unit No. 2 since July 2001.

Based on past historical and analytical data, contamination from vinyl chloride or other chlorinated solvents was not anticipated at Site 16. Vinyl chloride has not been a contaminant of concern at Site 16; it was not detected in the initial groundwater analyses. Although the vinyl chloride is not believed to be associated with the LNAPL plume, a likely source of vinyl chloride in the air stream would be from groundwater contamination. Vinyl chloride, when found in groundwater, may be a result of either a release of the actual compound, or the chemical break-down of polyvinylchloride (PVC) or other chlorinated solvents (trichloroethene, trichloroethane, tetrachloroethene, etc). Many of these compounds have been used historically at NWS-Earle, but their historical use at Site 16 is unknown.

Chemical break-down of the PVC treatment system piping is not believed to be the source of the vinyl chloride. PVC piping is used for Bioslurper Unit No.1 and Unit No.2 and if the PVC piping was the source, vinyl chloride would have most likely been detected in the air effluent of both units. Vinyl chloride has not been detected in the air effluent (pre- or post-carbon) of Bioslurper Unit No. 1.

If the vinyl chloride contamination is not associated with the LNAPL plume, it is possible that the contamination has migrated to the LNAPL plume area from an up-gradient location via the groundwater. Based on the potential for an up-gradient source, groundwater samples were collected in March 2003. Two wells were selected for volatile organic compound (VOC) analysis to determine if the vinyl chloride contamination was migrating from an up-gradient location. Wells 16MW-19 and 16MW-20 were selected because they are located up-gradient of the LNAPL plume and are separate from the other extraction wells. The remaining extraction wells are clustered together and pump either to Bioslurper Unit No. 1 or Unit No. 2. It is likely if the vinyl chloride source was in the area of the other extraction wells, vinyl chloride would also have been detected in the air stream of Bioslurper No. 1.

The groundwater samples were analyzed for the Target Compound List (TCL) of VOCs by USEPA Method SW-846, 8260. Analysis of the groundwater samples did not indicate the presence of vinyl chloride nor any other TCL VOCs. However,

it should be noted that the detection limits of the analysis were high and lower concentrations of VOCs may not have been detected. The groundwater analytical data is included as Attachment 2. A second round of groundwater samples will be collected from these two wells during the month of June 2003.

Air effluent samples from Bioslurper Unit No. 2 will continue to be monitored for trends or increases in vinyl chloride. Vinyl chloride will be included in the monthly air emission calculations in order to determine that the total VOCs emissions are below the permitted emission of 0.035 lbs/hour. The total VOC emissions, including vinyl chloride, for March, April and May 2003, are below the permit emission limit. The yearly emission rate of vinyl chloride, at a maximum of 2.2 pounds per year, is also below its permitted de minimus emission rate of 20 pounds per year (June 2002 through May 2003). The calculated values are included in Attachment 3.

RECOMMENDATIONS

Several steps can be implemented to determine and to potentially delineate the source of the vinyl chloride contamination. Initially, a second round of groundwater samples will be collected from well 16MW-19 and 16MW-20 for VOC analysis with lower detection limits. This may indicate an up-gradient source. Additional process samples will be collected and analyzed for vinyl chloride and other chlorinated solvents to determine if the source is present in the groundwater influent as well as in the air stream. Next, groundwater samples may be collected from the extraction wells to determine the location or direction of the source. The findings of the source determination may lead to additional groundwater investigation, and potentially soil investigation, to delineate the source of the vinyl chloride contamination.

Source Determination

Process Samples- A sample will be collected from the groundwater influent of Bioslurper Unit No. 1 and Unit No. 2 and analyzed for TCL VOCs. Sample collection will occur while the monthly air effluent samples are collected from both bioslurpers. Groundwater data will be compared to the air data to determine if there is a correlation between concentrations of vinyl chloride in groundwater influent and the air stream effluent.

Groundwater Extraction Well Samples- If the analytical data indicates vinyl chloride contamination in the groundwater influent samples, groundwater samples will be collected from the extraction wells connected to Bioslurper Unit No. 1., Unit No. 2, or both units. This potentially may determine the location or direction of the vinyl chloride source.

Source Delineation

A report will be prepared for submission to the Navy detailing the findings of the source determination. If the findings determine the source is in the groundwater, additional groundwater and soil investigation may be an option. Direct-push drilling technology

would be used to collect soil and groundwater samples from the potential location and direction of the vinyl chloride source. This option would most likely be necessary in two situations: if the concentration of vinyl chloride in the air stream is above the yearly emission rate or causes an exceedance of total VOC air emission limit; or the groundwater concentrations of vinyl chloride are above the New Jersey Groundwater Quality Standards.

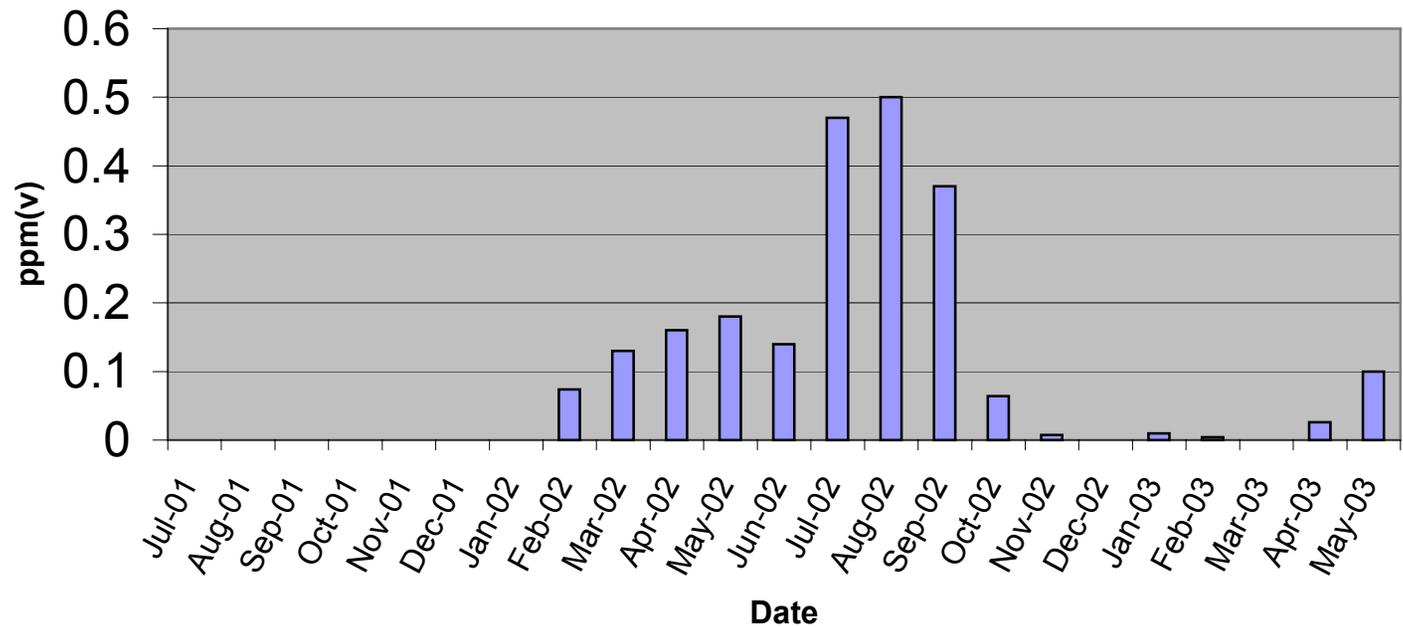
If neither air effluent nor groundwater is in exceedance of its respective limit, the monthly air effluent data will continue to be monitored to ensure that the system is operating within the permitted conditions.

ATTACHMENT 1

Vinyl Chloride Concentration Graph

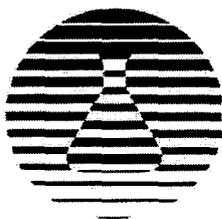
Vinyl Chloride Concentrations in Bioslurper Unit No. 2 Air Effluent

Sample Collection Date	Vinyl Chloride ppm(v)
July-01	no data
August-01	no data
September-01	non-detect
October-01	non-detect
November-01	non-detect
December-01	non-detect
January-02	no data
February-02	0.074
March-02	0.13
April-02	0.16
May-02	0.18
June-02	0.14
July-02	0.47
August-02	0.5
September-02	0.37
October-02	0.064
November-02	0.0074
December-02	non-detect
January-03	0.0099
February-03	0.0044
March-03	non-detect
April-03	0.026
May-03	0.1



ATTACHMENT 2

March 2003 Groundwater Data - 16MW-19 and 16MW-20



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Certificate of Analysis

April 17, 2003

Cris Joblon
Tetra Tech FW, Inc.
2300 E. Lincoln Highway
Suite 200
Langhorne, PA 19047

Lab ID#: 231734

Project Name: **DRO Project**

PO#:

This report relates only to the sample(s) as received by the laboratory. Laboratory reports may not be reproduced, except in full, without the written approval of the laboratory.

Qualifier Flags - These flags may follow individual results for a specific analyte

- U - Indicates that the analyte was not detected
- J - Indicates an estimated value between method detection limit and the practical quantitation limit for the analyte
- E - Indicates an estimated value outside of the calibration range of the analysis
- B - Indicates that the analyte was found in the method blank associated with the sample

A result of ND indicates that the analyte was Not Detected at the Reporting Detection Limit (RDL).

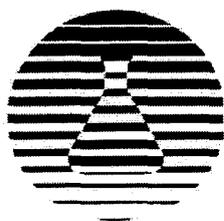
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If you have any questions in reference to this laboratory report, please contact your ALSI project coordinator or the laboratory manager listed at the bottom of this report at 717-944-5541.

Note: This document is included as part of the Analytical Report and must be retained as a permanent record thereof.

Raymond J. Martrano
Laboratory Manager

THIS IS AN ORIGINAL DOCUMENT.



Certificate of Analysis

April 17, 2003

Cris Joblon
Tetra Tech FW, Inc.
2300 E. Lincoln Highway
Suite 200
Langhorne, PA 19047

Lab ID #: **231734001**
Received: 04/01/03 20:30
Discard: 05/01/03

Page: 1 Of 2

Project Name: **DRO Project**

PO#:

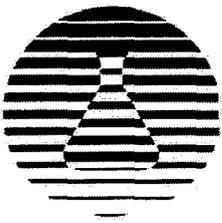
Sample ID: **MW-19**

Matrix: Ground Water

Date Collected: 03/31/03 11:45

Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
VOLATILE ORGANICS							
Acrolein	ND	ug/L	2000	SW846 8260B	04/11/03 14:14	04/11/03	JHD
Acrylonitrile	ND	ug/L	800	SW846 8260B	04/11/03 14:14	04/11/03	JHD
Benzene	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
Bromodichloromethane	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
Bromoform	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
Bromomethane	ND	ug/L	400	SW846 8260B	04/11/03 14:14	04/11/03	JHD
2-Butanone (MEK)	ND	ug/L	800	SW846 8260B	04/11/03 14:14	04/11/03	JHD
Carbon Tetrachloride	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
Chlorobenzene	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
Chlorodibromomethane	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
Chloroethane	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
2-Chloroethylvinyl ether	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
Chloroform	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
Chloromethane	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
1,1-Dichloroethane	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
1,2-Dichloroethane	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
1,1-Dichloroethene	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
trans-1,2-Dichloroethene	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
1,2-Dichloropropane	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
1,3-Dichloropropene, Total	ND	ug/L	400	SW846 8260B	04/11/03 14:14	04/11/03	JHD
Ethylbenzene	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
Methylene Chloride	ND	ug/L	400	SW846 8260B	04/11/03 14:14	04/11/03	JHD



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Certificate of Analysis

April 17, 2003

Cris Joblon
Tetra Tech FW, Inc.
2300 E. Lincoln Highway
Suite 200
Langhorne, PA 19047

Lab ID #: 231734001
Received: 04/01/03 20:30
Discard: 05/01/03

Page: 2 Of 2

Project Name: DRO Project

PO#:

Sample ID: MW-19

Matrix: Ground Water

Date Collected: 03/31/03 11:45

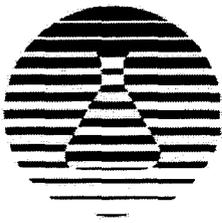
Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
VOLATILE ORGANICS (continued)							
1,1,2,2-Tetrachloroethane	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
Tetrachloroethene	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
Toluene	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
Total Xylenes	ND	ug/L	600	SW846 8260B	04/11/03 14:14	04/11/03	JHD
1,1,1-Trichloroethane	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
1,1,2-Trichloroethane	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
Trichloroethene	ND	ug/L	200	SW846 8260B	04/11/03 14:14	04/11/03	JHD
Vinyl Chloride	ND	ug/L	400	SW846 8260B	04/11/03 14:14	04/11/03	JHD
Surrogates							
	Result	Units	Recovery	Limits			
1,2-Dichloroethane-d4	7160	ug/L	119.0%	(70 - 134)			
Dibromofluoromethane	6440	ug/L	107.0%	(71 - 135)			
Toluene-d8	6080	ug/L	101.0%	(74 - 132)			
4-Bromofluorobenzene	5660	ug/L	94.3%	(84 - 116)			

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Raymond J. Martrano
Laboratory Manager

THIS IS AN ORIGINAL DOCUMENT.



Certificate of Analysis

April 17, 2003

Cris Joblon
Tetra Tech FW, Inc.
2300 E. Lincoln Highway
Suite 200
Langhorne, PA 19047

Lab ID #: **231734002**
Received: 04/01/03 20:30
Discard: 05/01/03

Page: 1 Of 2

Project Name: **DRO Project**

PO#:

Sample ID: **MW-20**

Matrix: Ground Water

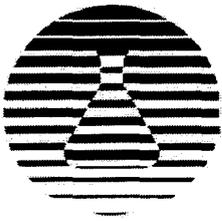
Date Collected: 03/31/03 12:30

Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
VOLATILE ORGANICS							
Acrolein ¹	ND	ug/L	1000	SW846 8260B	04/11/03 13:40	04/11/03	JHD
Acrylonitrile	ND	ug/L	400	SW846 8260B	04/11/03 13:40	04/11/03	JHD
Benzene	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
Bromodichloromethane	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
Bromoform	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
Bromomethane	ND	ug/L	200	SW846 8260B	04/11/03 13:40	04/11/03	JHD
2-Butanone (MEK)	ND	ug/L	400	SW846 8260B	04/11/03 13:40	04/11/03	JHD
Carbon Tetrachloride	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
Chlorobenzene	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
Chlorodibromomethane	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
Chloroethane ²	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
2-Chloroethylvinyl ether	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
Chloroform	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
Chloromethane	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
1,1-Dichloroethane	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
1,2-Dichloroethane	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
1,1-Dichloroethene	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
trans-1,2-Dichloroethene	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
1,2-Dichloropropane	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
1,3-Dichloropropene, Total	ND	ug/L	200	SW846 8260B	04/11/03 13:40	04/11/03	JHD
Ethylbenzene	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
Methylene Chloride	ND	ug/L	200	SW846 8260B	04/11/03 13:40	04/11/03	JHD

1 - Acrolein was recovered below quality control limits in the LCS, matrix spike, and matrix spike duplicate. The data user is cautioned that results may be biased low.

2 - Chloroethane was recovered below quality control limits in the LCS, matrix spike, and matrix spike duplicate. The data user is cautioned that results may be biased low.



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Certificate of Analysis

April 17, 2003

Cris Joblon
Tetra Tech FW, Inc.
2300 E. Lincoln Highway
Suite 200
Langhorne, PA 19047

Lab ID #: 231734002
Received: 04/01/03 20:30
Discard: 05/01/03

Page: 2 Of 2

Project Name: **DRO Project**

PO#:

Sample ID: **MW-20**

Matrix: Ground Water

Date Collected: 03/31/03 12:30

Collected by: Collected by Customer

Analysis Parameter	Result	Units	RDL	Method	Completed	Prep Date	By
VOLATILE ORGANICS (continued)							
1,1,2,2-Tetrachloroethane	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
Tetrachloroethene	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
Toluene	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
Total Xylenes	ND	ug/L	300	SW846 8260B	04/11/03 13:40	04/11/03	JHD
1,1,1-Trichloroethane	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
1,1,2-Trichloroethane	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
Trichloroethene	ND	ug/L	100	SW846 8260B	04/11/03 13:40	04/11/03	JHD
Vinyl Chloride	ND	ug/L	200	SW846 8260B	04/11/03 13:40	04/11/03	JHD
Surrogates							
	Result	Units	Recovery	Limits			
1,2-Dichloroethane-d4	35.2	ug/L	1.2%	(70 - 134)			
Dibromofluoromethane	31.8	ug/L	1.1%	(71 - 135)			
Toluene-d8	30.6	ug/L	1.0%	(74 - 132)			
4-Bromofluorobenzene	29	ug/L	1.0%	(84 - 116)			

Comments:

One or more of the method 8260 surrogates were recovered - outside of the control limits.

This report relates only to the sample as received by the laboratory, and may only be reproduced in full.

Raymond J. Martrano
Laboratory Manager



34 Dogwood Lane
 Middletown, PA 17057
 TEL: 717-944-5541
 FAX: 717-944-1430

CHAIN OF CUSTODY/ REQUEST FOR ANALYSIS

Please print. See back of COC for directions

COC #: 231734
 Sample Date: 3 / 31 / 03

Client Name: Tetra Tech FW
 Address: One Oxand Valley Suckers
Langhorne Pa 19047
 Contact: Mike H. P. u
 Phone #: (215) 702-4015
 Project Name#: NWS Fencle
 Quote/PO #: 043498
 TAT: Normal *Rush *Rush TAT subject to approval and surcharges
 Date Required: _____
 Approved by: _____
 Fax Results ? Y or N #: 2157024015

ANALYSES REQUESTED	
TPH PRO	Volatiles 8260 Chlorinated volatiles PP + Hydrocarbons
Ambio	VGA
HSCG	HCL

RECEIVING INFO
 (Lab use only)

COOLER TEMP: _____

COC SEAL INTACT: _____
 Y or N

SHIPPING CARRIER: _____

SHIPPING NO: _____

SAMPLE DESCRIPTION/LOCATION	G/C	TIME 00:00	MATRIX	NO. OF CONTAINERS PER ANALYSIS REQUESTED	COMMENTS/FIELD DATA
1 16BFW03-34	G	1510	GW	2	
2 16BFW03-35	G	1505	GW	2	
3 16AFW03-67	G	1430	GW	2	
4 16AEW03-68	G	1435	GW	2	
5 MW-19	G	1145	GW	2	From COL 231708
6 MW-20	G	1230	GW	2	SL 4-1-03
7					
8					
9					
10					
11					
12					

ENTERED
 UN 4/1/03
 Danny
 4/1/03
 1103

Print Name and Company	Signature	Date/Time	Remarks:
Sampled by: <u>William Geiger Tetra Tech FW</u>	<u>William Geiger</u>	<u>3/31/03 1600</u>	<u>72-hr. turn-around</u>
Received by:			
Relinquished by: <u>William Geiger Tetra Tech FW</u>	<u>William Geiger</u>	<u>4/1/03 0800</u>	METHOD PROTOCOL: SW846 <input type="checkbox"/> CFR136 <input type="checkbox"/>
Received by: <u>B. Sandra Jr.</u>	<u>B. Sandra Jr.</u>	<u>4/01/03 1205</u>	DRINKING WATER <input type="checkbox"/> OTHER: _____
Relinquished by: <u>B. Sandra Jr.</u>	<u>B. Sandra Jr.</u>	<u>4/01/03</u>	REPORTING REQUIREMENTS: PADEP <input type="checkbox"/>
Received by:		<u>1600</u>	OTHER: PWSID: _____

ATTACHMENT 3

Air Emission Permit Calculations

U.S. Navy RAC Contract No. N62472-99-D-0032
 Naval Weapons Station-Earle: Bioslurper Unit No. 2
 Analytical Results of Air Samples

Bioslurper Unit #2

SAMPLE NO. 16(B)VD(03)-20 Sample Date: 3/31/2003								
Compound	Molecular Weight (lbs/lbs-mol)	Conversion Constant (cu. ft/lbs-mol)	Time Conversion (min/hr)	Weekly Flow Rate (cu. ft/min)	Compound Conc. (ppm(v))	Compound Emission Limit ppm(v)	Output Rate (lbs/hr)	Emission Limits (lbs/hr)
Acetone	58.1	384.6	60.0	48.0	0.000	N/A	0.00E+00	
Benzene	78.0	384.6	60.0	48.0	0.190	7.0	1.11E-04	8.00E-03
Toluene	92.0	384.6	60.0	48.0	0.029	N/A	2.00E-05	
Ethylbenzene	106.0	384.6	60.0	48.0	0.640	N/A	5.08E-04	
m,p-Xylenes	106.0	384.6	60.0	48.0	1.900	N/A	1.51E-03	
o-Xylene	106.0	384.6	60.0	48.0	0.570	N/A	4.52E-04	
Vinyl Chloride	62.5	384.6	60.0	48.0	0.000	N/A	0.00E+00	
1,3,5-Trimethylbenzene	120.0	384.6	60.0	48.0	0.760	N/A	6.83E-04	
1,2,4-Trimethylbenzene	120.0	384.6	60.0	48.0	2.500	N/A	2.25E-03	
Total Emissions:					6.59	27.5	5.53E-03	3.50E-02

Formula: Output Rate per Compound = $\frac{(\text{Mol. Wt.}) \times (\text{Time Conv.}) \times (\text{Concentration}) \times (\text{Flow Rate})}{(\text{Conv. Constant}) \times 10^6}$

Note: Sample collected after carbon treatment.

U.S. Navy RAC Contract No. N62472-99-D-0032
 Naval Weapons Station-Earle: Bioslurper Unit No. 2
 Analytical Results of Air Samples

Bioslurper Unit #2

SAMPLE NO. 16(B)VD(03)-21 Sample Date: 4/29/2003								
Compound	Molecular Weight (lbs/lbs-mol)	Conversion Constant (cu. ft/lbs-mol)	Time Conversion (min/hr)	Weekly Flow Rate (cu. ft/min)	Compound Conc. (ppm(v))	Compound Emission Limit ppm(v)	Output Rate (lbs/hr)	Emission Limits (lbs/hr)
Acetone	58.1	384.6	60.0	48.0	0.0	N/A	0.00E+00	
Benzene	78.0	384.6	60.0	48.0	0.080	7.0	4.67E-05	8.00E-03
Toluene	92.0	384.6	60.0	48.0	0.009	N/A	6.34E-06	
Ethylbenzene	106.0	384.6	60.0	48.0	0.160	N/A	1.27E-04	
m,p-Xylenes	106.0	384.6	60.0	48.0	0.280	N/A	2.22E-04	
o-Xylene	106.0	384.6	60.0	48.0	0.071	N/A	5.64E-05	
Vinyl Chloride	62.5	384.6	60.0	48.0	0.026	N/A	1.22E-05	
1,3,5-Trimethylbenzene	120.0	384.6	60.0	48.0	0.180	N/A	1.62E-04	
1,2,4-Trimethylbenzene	120.0	384.6	60.0	48.0	<u>0.890</u>	<u>N/A</u>	<u>8.00E-04</u>	
Total Emissions:					1.70	27.5	1.43E-03	3.50E-02

Formula: Output Rate per Compound = $\frac{(\text{Mol. Wt.}) \times (\text{Time Conv.}) \times (\text{Concentration}) \times (\text{Flow Rate})}{(\text{Conv. Constant}) \times 10^6}$

Note: Sample collected after carbon treatment.

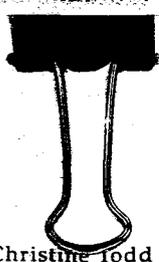
U.S. Navy RAC Contract No. N62472-99-D-0032
 Naval Weapons Station-Earle: Bioslurper Unit No. 2
 Analytical Results of Air Samples

Bioslurper Unit #2

SAMPLE NO. 16(B)VD(03)-22 Sample Date: 5/23/2003								
Compound	Molecular Weight (lbs/lbs-mol)	Conversion Constant (cu. ft/lbs-mol)	Time Conversion (min/hr)	Weekly Flow Rate (cu. ft/min)	Compound Conc. (ppm(v))	Compound Emission Limit ppm(v)	Output Rate (lbs/hr)	Emission Limits (lbs/hr)
Acetone	58.1	384.6	60.0	48.0	0.100	N/A	4.35E-05	
Benzene	78.0	384.6	60.0	48.0	0.170	7.0	9.93E-05	8.00E-03
Toluene	92.0	384.6	60.0	48.0	0.140	N/A	9.64E-05	
Ethylbenzene	106.0	384.6	60.0	48.0	2.100	N/A	1.67E-03	
m,p-Xylenes	106.0	384.6	60.0	48.0	5.700	N/A	4.52E-03	
o-Xylene	106.0	384.6	60.0	48.0	0.000	N/A	0.00E+00	
Vinyl Chloride	62.5	384.6	60.0	48.0	0.100	N/A	4.68E-05	
1,3,5-Trimethylbenzene	120.0	384.6	60.0	48.0	1.300	N/A	1.17E-03	
1,2,4-Trimethylbenzene	120.0	384.6	60.0	48.0	4.100	N/A	3.68E-03	
Total Emissions:					13.71	27.5	1.13E-02	3.50E-02

Formula: Output Rate per Compound = $\frac{(\text{Mol. Wt.}) \times (\text{Time Conv.}) \times (\text{Concentration}) \times (\text{Flow Rate})}{(\text{Conv. Constant}) \times 10^6}$

Note: Sample collected after carbon treatment.



State of New Jersey

Department of Environmental Protection

Christine Todd Whitman
Governor

Robert C. Shinn, Jr.
Commissioner

Air Pollution Control Pre-Construction Permit

Permit Activity ID Number:	PCP010001	Facility ID Number:	21328
Approval Date:	November 5 th , 2001	Expiration Date:	November 4 th , 2006

Mailing Address	Plant Location
Attention: Mr. A.L. Hermanni Naval Weapons Station Earle 201 Highway 34 South Colts Neck, New Jersey 07722-5001 Building C-2 Code N8E	NAVAL WEAPONS STATION EARLE SAIPAN RD BLDG C-16 Colts Neck Twp Monmouth County, New Jersey 07722-5014

Dear Mr. Hermanni:

The New Jersey Department of Environmental Protection (Department) has reviewed the referenced air pollution control permit application. On the basis of the information available, the Department concludes that the application satisfies all applicable requirements of the New Jersey Air Pollution Control regulations codified at N.J.A.C. 7:27 et seq.. This Air Pollution Control Permit shall supercede any existing Air Pollution Control Permits issued for the specified source. This permit allows for inspection and evaluation of the equipment by the Department to assure conformance with all provisions of N.J.A.C. 7:27 et seq. and any other applicable federal requirements codified at 40 CFR 52, 60, 61 and 63.

The equipment that is authorized to be installed and operated under this approval is described in Section A, Source Operations. Equipment at the facility referenced by this Permit shall be operated in accordance with the Conditions of Approval set forth in the attached document titled "Facility Specific Requirements" in Section E which also includes the "General Provisions."

This Air Pollution Control Pre-Construction Permit and Certificate to Operate is being issued as a 5-year operating certificate.

There are a total of 40 pages in this permit including this cover page. An electronic file version of this permit will be e-mailed to you. The electronic file should not be used to prepare a permit modification application if and when you need to submit one to the Department. A permit modification application should always be prepared using a new and blank RADIUS file.

If, in your judgement as an applicant for an air pollution control permit, the Department is imposing any unreasonable Condition of Approval, you may contest the Department's decision and request a contested case hearing pursuant to the Administrative Code at N.J.A.C. 1:1. All requests for contested case hearings must be received in writing by the Department within twenty (20) calendar days of the date you receive this permit approval and must contain the information specified in Section G (Permit Action Appeal Form).

If you have any questions on this matter, please call Dr. Negib Harfouche of the Bureau of Air Quality Engineering at (609) 984-3023.

Approved by:


 Joel Atay, Ph. D., Chief
 Bureau of Air Quality Engineering

Table I
BIOSLURPING STACK

EMISSION RATE CALCULATION

Compound	CAS No.	Molecular Weight	Measured ^(a)		Worst case ^(b)		Worst Case Emission Rate			De Minimis ^(d) (lb/yr)
			ppmv	ppmv	ppmv	ppmv	(lb/hr)	(lb/yr)	tons/yr	
Chloromethane	74873	50.49	nd	0.091	0.905	1.28E-04	1.12	5.62E-04	400	
Bromomethane	74839	94.94	nd	0.048	0.480	1.28E-04	1.12	5.61E-04	400	
Vinyl Chloride	75014	62.5	nd	0.073	0.730	1.28E-04	1.12	5.61E-04	20	
Chloroethane	75003	64.51	nd	0.071	0.705	1.28E-04	1.12	5.59E-04	400	
Freon 11	75694	137.37	nd	0.034	0.340	1.31E-04	1.15	5.74E-04	400	
1,1 - Dichloroethene	75354	96.94	nd	0.047	0.470	1.28E-04	1.12	5.60E-04	20	
Freon 113	76131	170.92	nd	0.025	0.245	1.18E-04	1.03	5.15E-04	400	
Methylene Chloride	75092	84.93	nd	0.054	0.535	1.28E-04	1.12	5.59E-04	400	
1,1-Dichloroethane	75343	98.96	nd	0.046	0.460	1.28E-04	1.12	5.60E-04	400	
trans-1,2-Dichloroethene	156605	96.94	nd	0.047	0.470	1.28E-04	1.12	5.60E-04	400	
cis-1,2-Dichloroethene	156592	96.94	nd	0.047	0.470	1.28E-04	1.12	5.60E-04	400	
Chloroform	67663	119.38	nd	0.038	0.380	1.27E-04	1.12	5.58E-04	20	
1,1,1-Trichloroethane	71556	133.4	nd	0.034	0.340	1.27E-04	1.12	5.58E-04	400	
Carbon Tetrachloride	56235	153.82	nd	0.030	0.295	1.27E-04	1.12	5.58E-04	20	
Benzene	71432	78.11		0.300	3.000	6.58E-04	5.76	2.88E-03	20	
1,2-Dichloroethane	107062	98.96	nd	0.046	0.460	1.28E-04	1.12	5.60E-04	20	
Trichloroethene	79016	131.39	nd	0.035	0.345	1.27E-04	1.12	5.58E-04	20	
1,2-Dichloropropane	78875	112.99	nd	0.041	0.405	1.29E-04	1.13	5.63E-04	400	
trans-1,3-Dichloropropane	10061026	110.97	nd	0.041	0.410	1.28E-04	1.12	5.60E-04	400	
Toluene	108883	92.14	nd	1.400	14.000	3.62E-03	31.73	1.59E-02	400	
cis-1,3-Dichloropropane	10061015	110.97	nd	0.041	0.410	1.28E-04	1.12	5.60E-04	400	
1,1-2-Trichloroethane	79005	133.4	nd	0.034	0.340	1.27E-04	1.12	5.58E-04	20	
Tetrachloroethene	127184	165.83	nd	0.028	0.275	1.28E-04	1.12	5.61E-04	20	
Ethylene Dibromide	106934	187.86	nd	0.025	0.245	1.29E-04	1.13	5.66E-04	20	
Chlorobenzene	108907	112.56	nd	0.041	0.405	1.28E-04	1.12	5.61E-04	400	
Ethylbenzene	100414	106.17		0.700	7.000	2.09E-03	18.28	9.14E-03	400	
m,p-Xylene	1330207	106.17		2.100	21.000	6.26E-03	54.85	2.74E-02	400	
o-Xylene	95476	106.17		0.700	7.000	2.09E-03	18.28	9.14E-03	400	
Styrene	100425	104.15	nd	0.044	0.440	1.29E-04	1.13	5.64E-04	400	
1,1,2,2-Tetrachloroethane	79345	167.85	nd	0.027	0.270	1.27E-04	1.11	5.57E-04	2	
1,3,5-Trimethyl Benzene	108678	120.19		0.400	4.000	1.35E-03	11.83	5.91E-03	400	
1,2,4-Trimethyl Benzene	95636	120.19		0.900	9.000	3.04E-03	26.61	1.33E-02	400	
1,3-Dichlorobenzene	541731	147	nd	0.031	0.310	1.28E-04	1.12	5.60E-04	400	
1,4-Dichlorobenzene	106467	147	nd	0.031	0.310	1.28E-04	1.12	5.60E-04	400	
Chlorotoluene	100447	126.59	nd	0.036	0.360	1.28E-04	1.12	5.61E-04	20	
1,2-Dichlorobenzene	95501	147	nd	0.031	0.310	1.28E-04	1.12	5.60E-04	400	
Acetone	67641	58.08	nd	0.079	0.785	1.28E-04	1.12	5.61E-04	400	
2-Butanone	78933	72.11	nd	0.064	0.635	1.29E-04	1.13	5.63E-04	400	
4-methyl-2-pentanone	108101	100.16	nd	0.046	0.455	1.28E-04	1.12	5.61E-04	400	
2-Hexanone	591786	100.16	nd	0.031	0.305	8.58E-05	0.75	3.76E-04	400	
Total VOC						0.021	185.76	0.09	0.05 lb/hr	

(a) Reference: Table I, "Volatile Organic Analysis Results," Apollo Analytics Inc., January 30, 1998.

(b) Worst case concentration = 10 x measured concentration

(c) Worst case emission rate (lbs/hr) = (ppmv / 10⁶) x (acfm) x (lb/lb-mole) x (lb-mole/384.6 ft³) x (60 min/hr)

(d) Reference NJAC 7:27-8, Appendix I, Table C, " Thresholds for De Minimis Emissions of Hazardous Air Pollutants."



10/3/01

Vinyl Chloride Emission Rate- Pounds per Year

Output Rate Calculation

$(\text{lb/lb-mole}/384.6 \text{ ft}^3) \times (60 \text{ min/hr}) \times (\text{acfm}) \times (\text{ppm(v)}/10000000) = \text{pounds per hour} \times \text{hours per year} = \text{lbs per year}$

molecular weight vinyl chloride = 62.5 lb/lb-mole

conversion constant = 384.6 cubic ft/lbs-mole

*average cubic feet per minute (acfm) = 51.8

maximum concentration vinyl chloride ppm(v) = 0.5 (August 2002)

Compound	Molecular Weight (lbs/lbs-mol)	Conversion Constant (cu. ft/lbs-mol)	Time Conversion (min/hr)	Average Flow Rate (cu. ft/min)	Maximum Compound Conc. (ppm(v))	Output Rate (lbs/hr)	Output Rate (lbs/yr)	Emission Limit (lbs/yr)
Vinyl Chloride	62.5	384.6	60.0	51.8	0.500	2.53E-04	2.21E+00	2.00E+01

June-02	68
July-02	68
August-02	68
September-02	43
October-02	43
November-02	43
December-02	48
January-03	48
February-03	48
March-03	48
April-03	48
May-03	48

*acfm= 51.75