FINAL REPORT
INVESTIGATIONS OF AREA B
BALLFIELDS
CHEVRON REFINERY
PHILADELPHIA, PENNSYLVANIA

AUGUST 30, 1988

Dames & Moore

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1.0 INTRODUCTION

Dames & Moore is pleased to present our final report entitled "Investigation of Area B - Ballfields, Chevron Refinery, Philadelphia, Pennsylvania." This investigation was conducted in accordance with our proposal dated October 26, 1987. The project was authorized on February 29, 1988, as Chevron Contract Number C-88-33-024. Site activities were planned and implemented in conjunction with Chevron representatives.

1.1 SITE LOCATION AND DESCRIPTION

The Chevron Refinery is located in South Philadelphia, approximately 1 mile north of the confluence of the Schuylkill and Delaware Rivers. The portion of the refinery known as the "Ballfields" is located east of the northern part of the Main Plant of the refinery (Figure 1).

Area B is a mound of soil 6 to 12 feet in height just east of the contractors' parking area at the Ballfields. The mound covers approximately 110,000 square feet of surface area and contains approximately 32,000 cubic yards of soil.

1.2 SITE BACKGROUND INFORMATION

Dames & Moore reviewed historical aerial photographs from 1959, 1965, 1970, 1973, 1975, 1979, 1980, and 1985 in order to evaluate the history of the Area B soils. The 1959 to 1970 photographs show that a railroad yard existed at the Ballfields and that a relatively large building existed at the present Area B. In the 1973 photograph, the railroad yard and the large building were being dismantled. The 1975 photograph shows that the Ballfields were cleared of most of the railroad yard debris, except for a concrete pad where the large building existed. The approximate location of the concrete pad is shown on Figure 2. The mound of Area B soils is not present in the 1975 photograph. The 1979 photograph is the oldest photograph reviewed that shows the mound of soil. Apparently, the mound was deposited on top of the concrete pad. Also noted on the 1979 photograph are four possible lagoons on the northern half of the mound (see Figure 2). These lagoons are not present in the photographs from 1980 and 1985. According to Chevron personnel, the purpose of these lagoons is not known but they are believed to have received refinery wastes.

2.0 OBJECTIVES AND SCOPE OF WORK

The objectives of this investigation were to:

- Identify and quantify compounds present in Area B soils
- Evaluate the areal and vertical extent of contaminated soil that requires remedial action

To accomplish these objectives, we performed a scope of work consisting of these tasks:

Task 1 - Acquisition and Review of Historical Aerial Photographs
Task 2 - Sampling Grid Preparation
Task 3 - Soil Sample Collection
Task 4 - Laboratory Analysis
Task 5 - Data Evaluation
Task 6 - Report Preparation

Task 1 has already been discussed under Section 1.2. Tasks 2 and 3 are discussed in Section 3.0, and the results of Tasks 4 and 5 are presented in Section 4.0. Section 5.0 presents our conclusions. Section 6.0 presents our recommendations.

3.0 FIELD PROCEDURES

This section describes the field procedures conducted during this investigation. Also presented are our field observations and measurements.

3.1 SAMPLING GRID PREPARATION

On March 18, 1988, Dames & Moore field personnel took measurements in order to draw a rough map of Area B (Figure 2). From this map, 19 test pit locations were measured and marked in the field.

Dames & Moore collected soil samples for laboratory analysis by excavating 19 test pits in Area B using a backhoe (see Figure 2). Excavation of the pits began on March 21, 1988, and was completed by March 22, 1988. The pits were approximately 3 to 6 feet wide and were excavated until concrete was encountered approximately 3 feet below the original ground surface. Excavated soil was placed adjacent to each pit.

3.2 SOIL SAMPLE COLLECTION

Soil samples were obtained for visual examination, photoionization detector (PID) headspace readings, and laboratory analysis from 17 of the 19 pits (see Tables 1 and 2). At each of the 17 locations, samples for visual examination and PID headspace analysis were taken at approximate 3-foot intervals. See Table 1 for sample depths. Composite soil samples for laboratory analysis were obtained from the pile of excavated soil adjacent to each pit.

Each of the 17 samples collected for chemical analyses was placed in a laboratory-prepared glass jar with a Teflon-lined cap, packed in a cooler with ice, and shipped to Century Laboratories of Thorofare, New Jersey, for analysis as discussed under Section 4.2. In addition, separate samples were placed in driller jars and transported to our soils laboratory in Trevose, Pennsylvania, where headspace measurements of volatile organic

compounds (VOCs) were obtained using a PID (see Table 1 for PID headspace readings). PID scans were also conducted throughout the piles of excavated soil (see Figure 3 and Section 3.3 for PID readings measured in field). Photographs were taken of all pits. The pits were backfilled with excavated soil and the area was graded to a level surface. Marker stakes were left at all locations.

3.3 FIELD OBSERVATIONS AND MEASUREMENTS

Observations and measurements were made during excavation and sampling of the pits. Our observations and measurements are:

- The Area B soil mound ranges in height from approximately 6 to 12 feet, with the highest part located in the east-central portion of the mound.
- The mound covers approximately 110,000 square feet of surface area.
- Approximately 32,000 cubic yards of soil exist in the mound.
- The mound was vegetated.
- No ponded water existed on top of the mound.
- In general, two soil types exist in Area B. The first and most abundant type of soil can be found in the northern three-quarters of the mound. This soil consists of black, oil-saturated silty clay with trace sand and has a petroleum hydrocarbon odor. The silty clay becomes gravelly in areas. PID readings ranged from 0 to 60 ppm (PID units) in the excavated soil. Within this soil are small lenses of a white sand-like material and small lenses of oil-saturated silt and clay containing white nodules. Approximately 23,000 cubic yards of this type of soil is present in Area B.

  The second type of soil exists in the southern quarter of the mound and is also found as a thin veneer covering the northern three-quarters of the mound. This soil was also the predominant type noted in Test Pit 3. It consists of a brown silty clay with little to some fine to medium sand, and trace to little fine gravel, and has a petroleum hydrocarbon odor in isolated areas. PID readings ranged from 0 to 10 ppm (PID units). Approximately 9,000 cubic yards of this type of soil exists. A line delineating the two soil types is shown on Figure 2. A cross section depicting the soil types and other observations noted during the field investigation is presented on Figure 3.

which was collected below the concrete from an asphalt-like material believed to be the bed of the old railroad yard, was analyzed for PCBs, the Modified Skinner List parameters, and EP Tox organics and inorganics.

Table 2 is a summary of the analytical laboratory data. Appendix B contains the laboratory reports and Quality Control (QC) summaries. Note that many of the samples had to be diluted for various analyses due to matrix interference. The dilutions subsequently resulted in elevated detection limits. A summary of the samples that were diluted is presented in the Report Narrative in Appendix B. The resultant increased detection limits for the parameters analyzed are included in the laboratory reports in Appendix B.

The results of the analyses indicate that significant levels of total base/neutral (B/N) extractable organics (greatest concentration of 668.6 parts per million [ppm] for sample B7), VOCs (greatest concentration of 492 ppm for sample B2) and TPH (greatest concentration of 32,000 ppm for sample B7) are present in Area B soils.

The results of the analyses also indicate that certain metals are present at elevated concentrations in the Area B soils. These metals, plus the greatest detected concentration for each metal and the respective sample location are: chromium, 3,710 ppm - B2; vanadium, 243 ppm - B7; arsenic, 99.5 ppm - B1; and lead, 559 ppm - B12. Sample B18-RRB contained a greater lead concentration (637 ppm) than sample B12; however, sample B18-RRB was collected from an asphalt-like layer below the Area B soils.

Total cyanide is present in Area B soils at concentrations no greater than 3.7 ppm (sample B2). PCBs are also present in Area B soils. A concentration of 51 ppm of PCBs was detected in sample B1.

The results of the EP Tox analysis on composite sample B18-RRB indicate that barium and chromium are present, but at concentrations below the maximum allowable level (MAL) according to 40 CFR Part 261. The MALs for barium and chromium are 100 and 5 mg/l, respectively. The sample point, and its respective concentrations in mg/l of barium and chromium as detected by the laboratory are: B5 comp - 0.465 and 0.010, B11 comp - 0.415 and <0.010, B15 comp - 0.195 and <0.010, and B18-RRB - 0.164 and 0.010.

5.0 CONCLUSIONS

Based on the data gathered and analyzed during this investigation, our conclusions are:

- The mound of Area B soils can be divided into two areas: the northern three-quarters, which appears to be contaminated, and the southern quarter, which appears to be free of contamination (see Figure 2 for delineation of these two areas).

- In comparison to cleanup guidelines or concentrations of concern typically used by state officials, the concentrations of B/Ns, VOCs, TPH, and metals are significant for those soils in the northern three-quarters of Area B. Typical cleanup guidelines used by the Pennsylvania Department of Environmental Rsources (PADER) for the various parameters detected in the Area B soils are presented on Table 3. Note that the levels presented on Table 3 are subject to change based on the area of contamination and the potential for impact to the enviornment.

- The southern quarter of Area B contains insignificant concentrations of B/Ns, VOCs, TPH, and metals.

- The concentrations of B/Ns, VOCs, and TPH were not as elevated in Test Pits B3 and B6 as they were in other pits in the northern three-quarters of Area B.

- The concentrations of PCBs throughout Area B are insignificant, except for an isolated area surrounding Test Pit B1.

- Based on our experience, the total cyanide concentrations are insignificant throughout the mound of Area B soils.

- Based on the RCRA characterization analysis (see Appendix B), the soil appears to be non-hazardous.

- Sample B18-RRB, which was collected below the Area B soils from an asphlt-like material believed to be an old railroad bed, contained a significant concentration of lead (637 ppm). No other parameters tested were detected in significant concentrations in this sample.

6.0 RECOMMENDATIONS

Dames & Moore recommends that a feasibility study be performed to evaluate the most cost-effective and environmentally sound remedial alternative for the contaminants found in the Area B soils.

Remedial alternatives that should be investigated during the feasibility study include, but should not be limited to off-site disposal, on-site treatment such as bioremediation (landfarming), incineration by the rotary kiln method, and stabilization.

Dames & Moore appreciated the opportunity to prepare this report for Chevron and we look forward to working with you in the future.

DAMES & MOORE
A Professional Limited Partnership

Frank J. Vernese

Frank J. Vernese
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Project Manager

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FJV/RTG/DJW:lb

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TABLE 1

GENERAL SOIL SAMPLING DATA
BALLFIELDS - AREA B
CHEVRON REFINERY
PHILADELPHIA, PENNSYLVANIA
MARCH 23, 1988

Sample Point I.D.	Approximate Depth (ft)	PID Headspace Readings - ppm (PID Units)
B1	3	40
	6	50
	9	25
B2	3	50
	6	30
B3	3	70
	6	115
B4	3	10
	6	15
B5	2.5	20
	3-5	30
	6	40
B6	2.5	0
	5	1
B7	3	35
	6	70
B8	3	15
	6	100
B9	3	50
	6	15
B10	3	95
	6	60
B11	3	0
	6	50
	9	70
B12	3	1
	6	70
	9	70
B13	3	0
	6	0
B14	2	150
	5	110
B15	3	0
	6	0
B16	3	0
	6	0
B18	3	0
	6	0

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TABLE 2

SUMMARY OF ANALYTICAL LABORATORY DATA
BALLFIELDS - AREA B
CHEVRON REFINERY
PHILADELPHIA, PENNSYLVANIA
MARCH 23, 1988

Composite Sample I.D.	B1	B2	B3	B4	B5	B6	B7	B9	B10	B11	B12	B13	B14	B15	B16	B18	B18-RRB
Parameters																	
Base/Neutral Extractable Organics (ug/kg)																	
Flourene	970	58000	710	26000	34000	J	360000	U	14000	30000	J	U	16000	U	U	U	U
Flouranthene	390	U	110	77000	U	J	8600	5200	U	U	U	95	520	U	U	U	U
Pyrene	1600	38000	1300	160000	10000	590	32000	12000	U	60000	J	100	2000	U	180	130	U
Chrysene	1200	16000	400	38000	8700	J	18000	J	U	U	U	U	1300	U	U	U	U
Phenanthrene	2800	62000	770	62000	24000	J	160000	J	J	58000	J	U	10000	U	U	U	93
Naphthalene	420	46000	U	U	U	U	90000	U	U	U	U	U	2200	U	U	U	U
Benzo(a)Anthracene	J	U	J	41000	3600	U	U	U	U	U	U	J	U	U	U	U	U
Benzo(a)Pyrene	740	U	320	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Anthracene	U	J	U	23000	U	U	U	U	U	U	U	U	U	U	U	U	U
Di-N-Butylphthalate	U	U	180	U	U	U	U	U	U	U	U	U	U	U	130	U	J,B
Bis(2-Ethylhexyl) Phthalate	U	U	470	U	U	U	U	U	U	U	U	J,B	U	J	U	U	U
Benzo(b)Flouranthene	U	U	U	32000	U	U	U	U	U	U	U	U	U	U	U	U	U
Indeno (1,2,3-cd)Pyrene	U	U	U	27000	U	U	U	U	U	U	U	U	U	U	U	U	U
Benzo(g,h,i) Perylene	U	U	U	8100	U	U	U	U	U	U	U	U	U	U	U	U	U
TOTAL*	8120	220000	4260	494100	80300	590	668600	17200	14000	148000	-	195	32020	-	310	130	93
Volatile Organics (ug/kg)																	
Benzene	140	60000	U	U	9000	U	2800	U	66000	J	J	U	U	NS	U	NS	U
Toluene	5	55000	J	J	U	U	J	U	U	U	U	U	U	NS	U	NS	U
Xylenes	88	330000	6	U	U	U	37000	U	110000	18000	7900	U	U	NS	U	NS	U
Ethylbenzene	62	47000	U	U	U	U	52000	U	30000	5200	2500	U	U	NS	U	NS	U
TOTAL*	295	492000	6	-	9000	-	91800	-	206000	23200	10400	-	-	NS	-	NS	-

TABLE 2 (Continued)

SUMMARY OF ANALYTICAL LABORATORY DATA
BALLFIELDS - AREA B
CHEVRON REFINERY
PHILADELPHIA, PENNSYLVANIA
MARCH 23, 1988

Composite Sample I.D.	B1	B2	B3	B4	B5	B6	B7	B9	B10	B11	B12	B13	B14	B15	B16	B18	B18-RRB
Parameters																	
Metals (mg/kg)																	
Antimony	3.24	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	21.2
Barium	101	383	9.40	143	86.0	112	225	141	178	210	182	51.9	89.2	40.7	58.1	34.8	41.5
Beryllium	U	U	U	U	1.36	U	1.61	U	1.29	2.51	U	U	U	U	U	U	U
Cadmium	U	3.00	U	1.93	3.00	2.64	3.50	1.62	2.33	2.41	2.70	1.42	2.18	1.33	1.67	1.44	U
Chromium	55.9	3710	99.2	165	103	73.7	1190	125	425	668	421	19.7	340	19.4	18.3	16.1	5.35
Cobalt	10.6	66.0	17.2	17.6	16.1	14.2	62.4	10.1	19.4	28.2	24.7	U	U	U	U	U	U
Mercury	0.507	2.64	0.751	1.77	1.78	0.867	3.08	1.31	2.48	2.52	1.35	0.269	0.218	0.217	0.333	U	U
Nickel	20.3	83.1	40.6	122	84.6	88.1	258	26.8	54.1	66.6	38.0	11.4	48.4	11.70	11.9	11.1	13.8
Vanadium	37.9	71.4	35.0	69.1	186	201	243	54.8	105	95.8	80.9	26.3	70.4	25.3	23.6	24.2	U
Arsenic	99.5	16.5	7.74	36.7	2.18	3.47	22.9	9.41	10.1	7.76	10.3	6.87	6.80	3.98	5.48	4.49	3.98
Lead	280	263	216	472	183	237	479	191	264	242	559	110	151	46.3	179	30.3	637
Selenium	0.926	1.01	U	0.942	2.46	U	5.38	1.88	3.62	3.10	2.94	1.89	3.81	2.11	2.82	2.37	2.68
Miscellaneous (mg/kg)																	
Total Cyanide	0.3	3.7	0.5	U	0.72	U	1.4	0.4	2.7	U	1.7	U	3.2	U	0.2	U	NS
Total Petroleum Hydrocarbons	5800	18000	580	5400	2200	1200	32000	13000	9800	82	13000	150	3500	82	740	170	NS
PCBs																	
Aroclor 1248	51	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
Aroclor 1254	U	U	1.4	0.4	U	U	U	U	U	U	U	0.3	U	U	0.53	U	U

Key:
U - Indicates compound was analyzed for but not detected, based on necessary concentration/dilution
B - This flag is used when the analyte is found in the blank as well as the sample. It indicates possible/probable contamination and warns the data user to take appropriate action.
J - Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicates the presence of a compound at levels below the specified detection limit.
NS - Not Sampled.
* - Total Excluding B & J

Sample B18-RRB was taken below the concrete from the bed of the old railroad yard.

TABLE 3

TYPICAL PADER CLEANUP GUIDELINES
BALLFIELDS - AREA B
CHEVRON REFINERY
PHILADELPHIA, PENNSYLVANIA

Parameter	Action Level	
	Soil	Water
Total Petroleum Hydrocarbons	100 ppm	1 ppm
Total Volatile Organics	1 ppm	10 ppb
Total Base/Neutral Extractables + Library Search	No Level Exists	50 ppb
Total Acid Extractables + Library Search	No Level Exists	50 ppb
PCBs	1 to 5 ppm	No Level Exists
Metals	EPA EP Tox Levels	EPA Primary Drinking Water Standards
Pesticides/Herbicides	EPA Standards	EPA Primary Drinking Water Standards
Cyanide	10 to 15 ppm	<0.2 ppm
Total Phenols	No Level Exists	4 ppm

Note:

These levels were provided to us by Jim Dolan of PADER's Norristown office. These levels are not official or even published guidelines. All levels are actually determined on a case-by-case basis.

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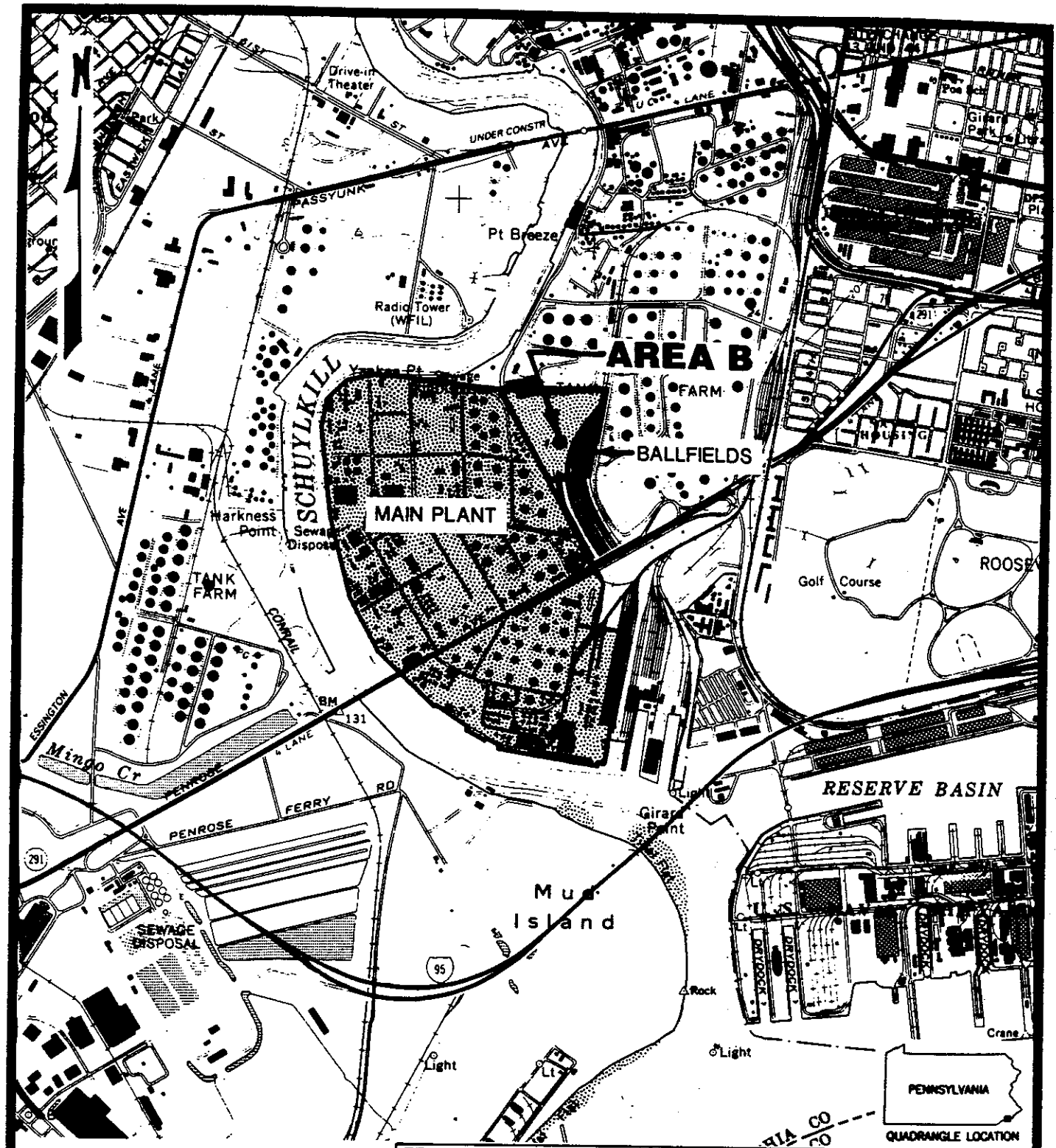
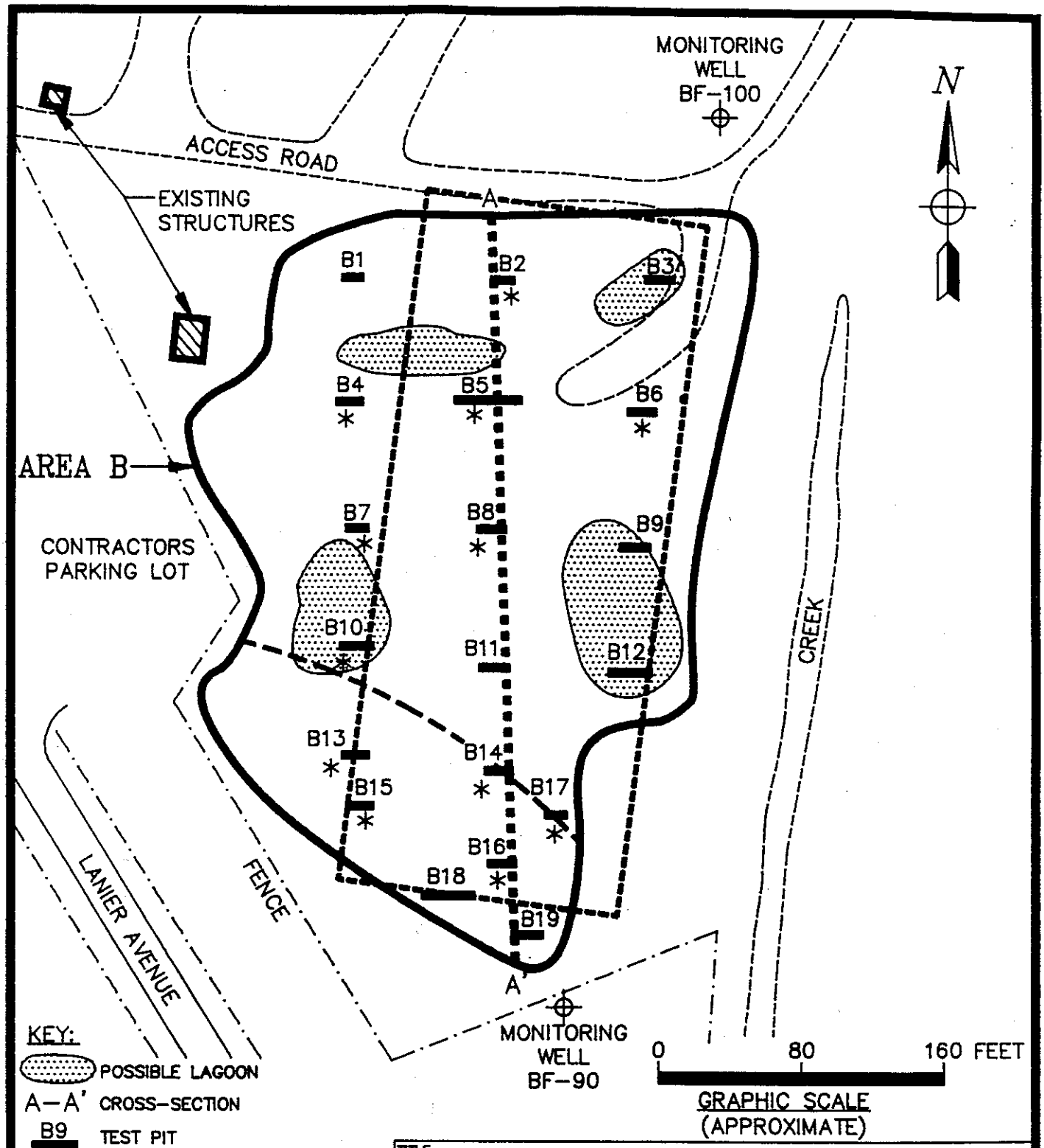


REFERENCE:
A PORTION OF USGS 7.5 MINUTE TOPOGRAPHIC MAP; PHILADELPHIA QUADRANGLE, PENNSYLVANIA, 1967, PHOTOREVISED 1985.

TITLE: SITE VICINITY MAP		
PROJECT: CHEVRON REFINERY PHILADELPHIA, PENNSYLVANIA		
Dames & Moore, TREVOSE, PENNSYLVANIA		
SCALE: AS NOTED	DWN. BY: R.G.B.	JOB NO.: 16000-034
DATE: 5-9-88	APPR. BY: D.J.W.	FIG. NO.: 1

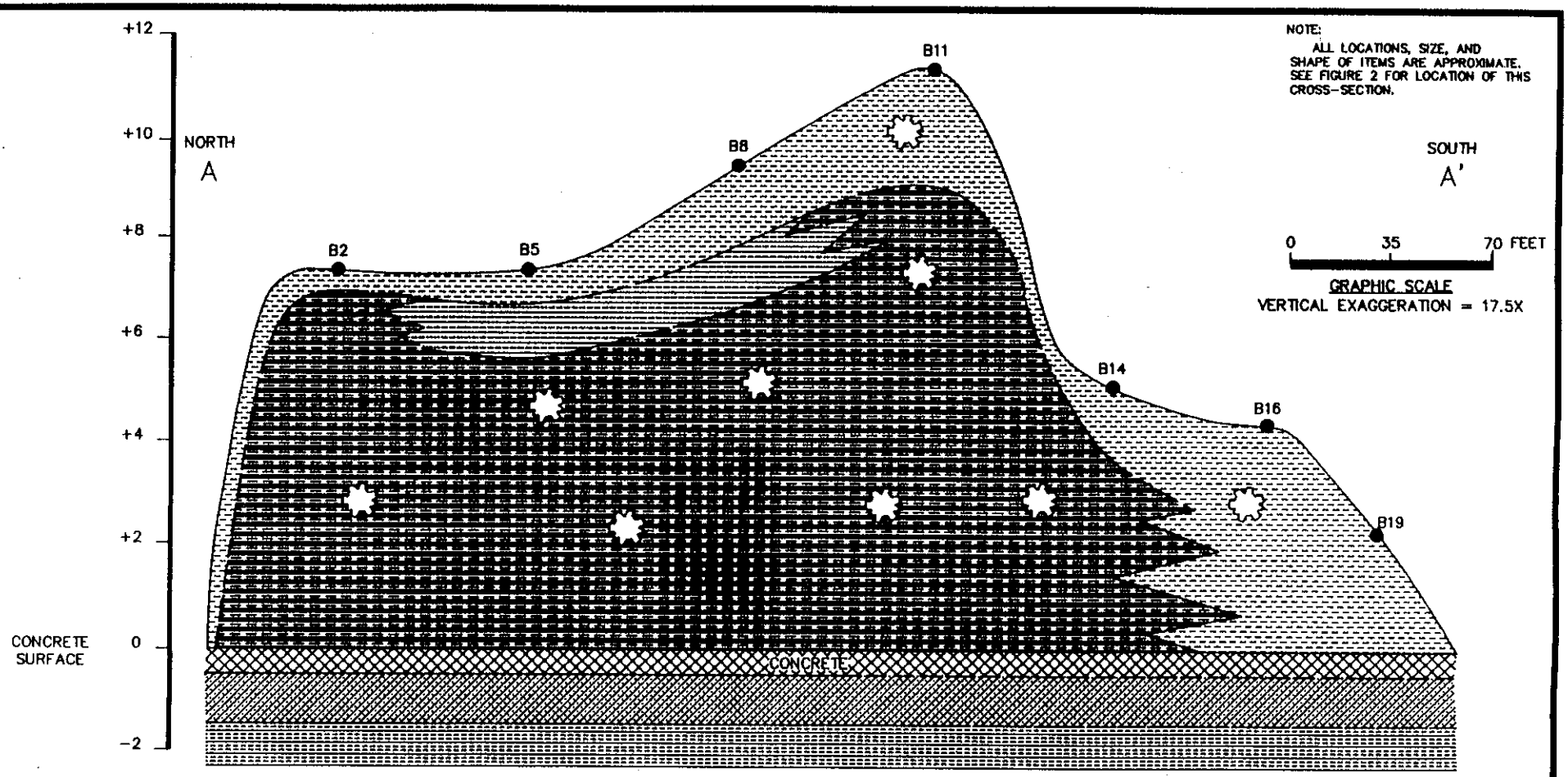


TITLE: PLOT PLAN SHOWING TEST PIT LOCATIONS
BALLFIELDS - AREA B

PROJECT: CHEVRON REFINERY
PHILADELPHIA, PENNSYLVANIA

Dames & Moore
TREVOSE, PENNSYLVANIA

SCALE	DWN. BY	JOB NO.
AS NOTED	R.G.B.	16000-034
DATE	APPR. BY	FIG. NO.
5-31-88	D.J.W.	2



KEY:

DEBRIS: METAL, BARS, PIPES, TIRES, CONCRETE, MACADAM, WOOD, ETC.

BLACK OIL SATURATED SILTY CLAY WITH TRACE SAND, BECOMES GRAVELLY IN AREAS, PETROLEUM HYDROCARBON ODOR, PID READINGS RANGE FROM 0 TO 60 ppm (PID UNITS), CONTAINS SMALL LENSES OF WHITE SAND AND SMALL LENSES OF OIL SATURATED SILT AND CLAY WITH WHITE NODULES.

BROWN SILTY CLAY WITH LITTLE TO SOME FINE TO MEDIUM SAND, TRACE TO LITTLE FINE GRAVEL, MOIST, PETROLEUM HYDROCARBON ODOR IN AREAS, PID READINGS RANGE FROM 0 TO 10 ppm (PID UNITS).

LIGHT BROWN SAND WITH LITTLE SILT AND CLAY, DRY, PETROLEUM HYDROCARBON ODOR IN AREAS, PID READINGS RANGE FROM 0 TO 20 ppm (PID UNITS)

BLACK SILTY SAND WITH GRAVEL, TAR, SLAG, WOOD, PIPE, ETC., PETROLEUM HYDROCARBON ODOR (BED OF OLD RAILROAD YARD)

SILTY SAND WITH TRACE GRAVEL AND TRACE TO LITTLE CLAY

- - - - LITHOLOGIC BOUNDARIES, DASHED WHERE ESTIMATED

B11 ● TEST PIT LOCATION (SEE FIGURE 2)

TITLE	CROSS-SECTION A-A' (EAST WALL) BALLFIELDS - AREA B
PROJECT	CHEVRON REFINERY PHILADELPHIA, PENNSYLVANIA
	Dames & Moore, TREVOSE, PENNSYLVANIA
SCALE: AS SHOWN	DSN. BY: G.E.B.
DATE: 5-31-88	APPR. BY: D.J.W.
JOB NO. 16000-034	FIG. NO. 3

APPENDIX A

APPENDIX A

Modified Skinner List for Petroleum Refinery Wastes

SUBJECT: **PETROLEUM REFINERY WASTE-PRV**
MODIFIED SKINNER LIST - JULY 198

I. VOLATILE PARAMETERS

NPDES Number	CAS Number	Compound
3V	71-43-2	Benzene
-	75-15-0	Carbon Disulfide
7V	108-90-7	Chlorobenzene
11V	67-66-3	Chloroform
15V	107-06-2	1,2 - Dichloroethane
-	123-91-1	1,4 - Dioxane
19V	100-41-4	Ethyl benzene
-	106-93-4	Ethylene dibromide
-	78-93-3	Methyl ethyl ketone
-	100-42-5	Styrene
25V	108-88-2	Toluene
-	95-47-6	Xylene (O,M & P)

II. ACID PARAMETERS

NPDES Number	CAS Number	Compound
-	108-98-5	Benzenethiol
-	95-48-7	Cresols (O, M & P)
3A	105-67-9	2,4 - Dimethylphenol
5A	51-28-5	2,4 - Dinitrophenol
7A	100-02-7	4-Nitrophenol
10A	108-95-2	Phenol

III. BASE NEUTRAL PARAMETERS

NPDES Number	CAS Number	Compound
3B	120-12-7	Anthracene
5B	56-55-3	Benzo(a)anthracene
7B	205-99-2	Benzo(b)Fluoranthene
9B	207-08-9	Benzo(k)Fluoranthene
6B	50-32-8	Benzo(a)pyrene
13B	117-81-7	Bis(2-ethylhexyl)phthalate
15B	85-68-7	Butyl benzyl phthalate
18B	218-01-9	Chrysene
-	224-42-0	Dibenz(a,h)acridine
19B	53-70-3	Dibenz(a,h)anthracene
20-22B	95-50-1	Dichlorobenzenes (1,2 1,3 & 1,4)
24B	84-66-2	Diethylphthalate

SUBJECT: **PETROLEUM REFINERY WASTE - PRW**
MODIFIED SKINNER LIST - JULY 198

III. BASE NEUTRAL PARAMETERS

NPDES Number	CAS Number	Compound
-	57-97-6	7,12-Dimethylbenz(a)anthracene
25B	131-11-3	Dimethylphthalate
26B	84-74-2	Di(n)butyl phthalate
29B	117-84-0	Di(n)octyl phthalate
31B	206-44-0	Fluoranthene
-	95-13-6	Indene
-	3351-28-8	Methyl Chrysene
-	90-12-0	1 - Methyl napthalene
39B	91-20-3	Napthalene
44B	85-01-8	Phenanthrene
45B	129-00-0	Pyrene
-	110-86-1	Pyridine
-	91-22-5	Quinoline

IV. METAL PARAMETERS

NPDES Number	CAS Number	Compound
1M	7440-36-0	Antimony
2M	7440-38-2	Arsenic
-	7440-39-3	Barium
3M	7440-41-7	Beryllium
4M	7440-43-9	Cadmium
5M	7440-47-3	Chromium
-	7440-48-4	Cobalt
7M	7439-92-1	Lead
8M	7439-97-6	Mercury
9M	7440-02-0	Nickel
10M	7782-49-2	Selenium
-	7440-62-2	Vanadium

APPENDIX B

APPENDIX B

Laboratory Reports
and Quality Control Summaries

CENTURY
LABORATORIES, INC.

1501 Grandview Ave., Thorofare, NJ 08086 609/848-3939

REPORT #: 88-0629
DATE: 04/21/88

CLIENT DAMES & MOORE
4620 Street Road
Trevose, Pa. 19047

SUBJECT Seventeen (17) samples submitted by the client on 03/23/88, and identified as: Project: Chevron - Ballfields Area B.

AUTHORIZATION David Wagner

PURPOSE Chemical Analysis

PROCEDURE Samples were analyzed in accordance with procedures presented in the following:

1. "Test Methods for Evaluating Solid Waste - Physical/Chemical Methods", 2nd Ed., 1984 U.S. Environmental Protection Agency (SW-846)

2. "Methods for the Chemical Analysis of Water and Wastes", March, 1979, U.S. Environmental Protection Agency (EPA-600/4-79-020)

CENTURY LABORATORIES, INC.

Rodney T. Miller

Rodney T. Miller

1h
NJ DEP CERTIFICATION NO: 08153

NATIONAL ENVIRONMENTAL TESTING INC NET Laboratory Group

REPORT NARRATIVE

Samples B7 Comp, B2 Comp, B10 Comp, B9 Comp, B12 Comp, B14 Comp, and B11 Comp were prepped as medium level samples in the PAT-VOA analysis because of matrix problems indicated by the prescreen or the appearance of the sample. The minimum detection limit is elevated when a sample is prepped as a medium level sample.

Samples B18 RRB and B6 Comp in the PAT-VOA analysis were rerun because a surrogate was out of control limits. The surrogate was out again in both samples indicating matrix problems.

The following samples analyzed for PCB's have been diluted due to matrix interference. This accounts for elevated detection limits.

880629 -	B7 Comp	B7 Comp	B5 Comp
	B2 Comp	B9 Comp	B11 Comp
	B4 Comp	B10 Comp	B18 RRB
	B6 Comp	B12 Comp	

The following Dames & Moore samples analyzed for extractables method 8270, were diluted prior to analysis based on matrix interference. This accounts for elevated detection limits.

88-0629 -	B7 Comp	6 fold
	B4 Comp	9 fold
	B6 Comp	3 fold
	B14 Comp	6 fold

The following samples were prepared at a medium level due to high levels of matrix interference. This accounts for elevated detection limits.

88-0629 -	B2 Comp
	B7 Comp
	B9 Comp
	B10 Comp
	B12 Comp
	B5 Comp

Sample number B-3 Comp was reanalyzed due to poor surrogate recoveries. The initial run was reported since the reanalysis displayed matrix interference.

CENTURY LABORATORIES, INC.

REPORT OF ANALYSIS

Client: DAMES & MOORE

Date: 04-22-88
Job No: 880629

Date Received: 03-23-88 1240

Sample ID: B3 COMP
Date/Time Collected: 03-21-88

Parameter	Results	Units
Cyanide	0.5	mg/l
Petroleum Hydrocarbons	580	mg/kg*
Antimony	<1.17	mg/kg
Barium	94.0	mg/kg
Beryllium	<1.18	mg/kg
Cadmium	<1.18	mg/kg
Chromium	99.2	mg/kg
Cobalt	17.2	mg/kg
Mercury	0.751	mg/kg
Nickel	40.6	mg/kg
Vanadium	35.0	mg/kg
Arsenic	7.74	mg/kg
Lead	216	mg/kg
Selenium	<0.704	mg/kg

* Wet Weight
< = Less than.
Parameter not detected at or above value shown.

CENTURY LABORATORIES, INC.

REPORT OF ANALYSIS

Client: DAMES & MOORE

Date: 04-22-88
Job No: 880629

Date Received: 03-23-88 1240

Sample ID: B5 COMP
Date/Time Collected: 03-21-88

Parameter	Results	Units
Cyanide	0.72	mg/kg
Petroleum Hydrocarbons	2200	mg/kg
Antimony	<1.36	mg/kg
Barium	86.0	mg/kg
Beryllium	1.36	mg/kg
Cadmium	3.00	mg/kg
Chromium	103	mg/kg
Cobalt	16.1	mg/kg
Mercury	1.78	mg/kg
Nickel	84.6	mg/kg
Vanadium	186	mg/kg
Arsenic	2.18	mg/kg
Lead	183	mg/kg
Selenium	2.46	mg/kg

< = Less than.
Parameter not detected at or above value shown.

CENTURY LABORATORIES, INC.

REPORT OF ANALYSIS

Client: DAMES & MOORE

Date: 04-22-88
Job No: 880629

Date Received: 03-23-88 1240

Sample ID: B9 COMP
Date/Time Collected: 03-21-88

Parameter	Results	Units
Cyanide	0.4	mg/l
Petroleum Hydrocarbons	13000	mg/kg
Antimony	<1.18	mg/kg
Barium	141	mg/kg
Beryllium	<1.18	mg/kg
Cadmium	1.62	mg/kg
Chromium	125	mg/kg
Cobalt	10.1	mg/kg
Mercury	1.31	mg/kg
Nickel	26.8	mg/kg
Vanadium	54.8	mg/kg
Arsenic	9.41	mg/kg
Lead	191	mg/kg
Selenium	1.88	mg/kg

< = Less than.
Parameter not detected at or above value shown.

CENTURY LABORATORIES, INC.

REPORT OF ANALYSIS

Client: DAMES & MOORE

Date: 04-22-88
Job No: 880629

Date Received: 03-23-88 1240

Sample ID: B10 COMP
Date/Time Collected: 03-21-88

Parameter	Results	Units
Cyanide	2.7	mg/kg
Petroleum Hydrocarbons	9800	mg/kg
Antimony	<1.29	mg/kg
Barium	178	mg/kg
Beryllium	1.29	mg/kg
Cadmium	2.33	mg/kg
Chromium	425	mg/kg
Cobalt	19.4	mg/kg
Mercury	2.48	mg/kg
Nickel	54.1	mg/kg
Vanadium	105	mg/kg
Arsenic	10.1	mg/kg
Lead	264	mg/kg
Selenium	3.62	mg/kg

< = Less than.
Parameter not detected at or above value shown.

CENTURY LABORATORIES, INC.

REPORT OF ANALYSIS

Client: DAMES & MOORE

Date: 04-22-88
Job No: 880629

Date Received: 03-23-88 1240

Sample ID: B12 COMP
Date/Time Collected: 03-21-88

Parameter	Results	Units
Cyanide	1.7	mg/kg
Petroleum Hydrocarbons	13000	mg/kg
Antimony	<1.22	mg/kg
Barium	182	mg/kg
Beryllium	<1.22	mg/kg
Cadmium	2.70	mg/kg
Chromium	421	mg/kg
Cobalt	24.7	mg/kg
Mercury	1.35	mg/kg
Nickel	38.0	mg/kg
Vanadium	80.9	mg/kg
Arsenic	10.3	mg/kg
Lead	559	mg/kg
Selenium	2.94	mg/kg

< = Less than.
Parameter not detected at or above value shown.

CENTURY LABORATORIES, INC.

REPORT OF ANALYSIS

Client: DAMES & MOORE

Date: 04-22-88
Job No: 880629

Date Received: 03-23-88 1240

Sample ID: B13 COMP
Date/Time Collected: 03-22-88

Parameter	Results	Units
Cyanide	<0.1	
Petroleum Hydrocarbons	150	mg/kg
Antimony	<1.18	mg/kg
Barium	51.9	mg/kg
Beryllium	<1.18	mg/kg
Cadmium	1.42	mg/kg
Chromium	19.7	mg/kg
Cobalt	<11.8	mg/kg
Mercury	0.269	mg/kg
Nickel	11.4	mg/kg
Vanadium	26.3	mg/kg
Arsenic	6.87	mg/kg
Lead	110	mg/kg
Selenium	1.89	mg/kg

< = Less than.
Parameter not detected at or above value shown.

CENTURY LABORATORIES, INC.

REPORT OF ANALYSIS

Client: DAMES & MOORE

Date: 04-22-88
Job No: 880629

Date Received: 03-23-88 1240

Sample ID: B14 COMP
Date/Time Collected: 03-22-88

Parameter	Results	Units
Cyanide	3.2	mg/l
Petroleum Hydrocarbons	3500	mg/kg
Antimony	<1.36	mg/kg
Barium	89.2	mg/kg
Beryllium	<1.36	mg/kg
Cadmium	2.18	mg/kg
Chromium	340	mg/kg
Cobalt	<13.6	mg/kg
Mercury	0.218	mg/kg
Nickel	48.4	mg/kg
Vanadium	70.4	mg/kg
Arsenic	6.80	mg/kg
Lead	151	mg/kg
Selenium	3.81	mg/kg

< = Less than.
Parameter not detected at or above value shown.

CENTURY LABORATORIES, INC.

REPORT OF ANALYSIS

Client: DAMES & MOORE

Date: 04-22-88
Job No: 880629

Date Received: 03-23-88 1240

Sample ID: B15 COMP
Date/Time Collected: 03-22-88

Parameter	Results	Units
Cyanide	<0.1	mg/kg
Petroleum Hydrocarbons	82	mg/kg
Antimony	<1.17	mg/kg
Barium	40.7	mg/kg
Beryllium	<1.17	mg/kg
Cadmium	1.33	mg/kg
Chromium	19.4	mg/kg
Cobalt	<11.7	mg/kg
Mercury	0.217	mg/kg
Nickel	11.7	mg/kg
Vanadium	25.3	mg/kg
Arsenic	3.98	mg/kg
Lead	46.3	mg/kg
Selenium	2.11	mg/kg

< = Less than.
Parameter not detected at or above value shown.

CENTURY LABORATORIES, INC.

REPORT OF ANALYSIS

Client: DAMES & MOORE

Date: 04-22-88
Job No: 880629

Date Received: 03-23-88 1240

Sample ID: B16 COMP
Date/Time Collected: 03-22-88

Parameter	Results	Units
Cyanide	0.2	mg/kg
Petroleum Hydrocarbons	740	mg/kg
Antimony	<1.19	mg/kg
Barium	58.1	mg/kg
Beryllium	<1.19	mg/kg
Cadmium	1.67	mg/kg
Chromium	18.3	mg/kg
Cobalt	<11.9	mg/kg
Mercury	0.333	mg/kg
Nickel	11.9	mg/kg
Vanadium	23.6	mg/kg
Arsenic	5.48	mg/kg
Lead	179	mg/kg
Selenium	2.86	mg/kg

< = Less than.
Parameter not detected at or above value shown.

CENTURY LABORATORIES, INC.

REPORT OF ANALYSIS

Client: DAMES & MOORE

Date: 04-22-88
Job No: 880629

Date Received: 03-23-88 1240

Sample ID: B18 COMP
Date/Time Collected: 03-22-88

Parameter	Results	Units
Cyanide	<0.1	mg/kg
Petroleum Hydrocarbons	170	mg/kg
Antimony	<1.18	mg/kg
Barium	34.8	mg/kg
Beryllium	<1.18	mg/kg
Cadmium	1.44	mg/kg
Chromium	16.1	mg/kg
Cobalt	<11.8	mg/kg
Mercury	<0.118	mg/kg
Nickel	11.1	mg/kg
Vanadium	24.2	mg/kg
Arsenic	4.49	mg/kg
Lead	30.3	mg/kg
Selenium	2.37	mg/kg

< = Less than.
Parameter not detected at or above value shown.

CENTURY LABORATORIES, INC.

REPORT OF ANALYSIS

Client: DAMES & MOORE

Date: 04-22-88
Job No: 880629

Date Received: 03-23-88 1240

Sample ID: B18 RRB
Date/Time Collected: 03-22-88

Parameter	Results	Units
Antimony	21.2	mg/kg
Barium	41.5	mg/kg
Beryllium	<1.21	mg/kg
Cadmium	<1.21	mg/kg
Chromium	5.35	mg/kg
Cobalt	<12.1	mg/kg
Mercury	<0.122	mg/kg
Nickel	13.8	mg/kg
Vanadium	<12.1	mg/kg
Arsenic	3.89	mg/kg
Lead	637	mg/kg
Selenium	2.68	mg/kg

< = Less than.
Parameter not detected at or above value shown.

CENTURY LABORATORIES, INC.

Report #: 88-0629

CLIENT: Dames & Moore
CLIENT ID: Chevron - Ballfields Area B
DATE COLLECTED: 03/21/88

April 21, 1988

LABORATORY ANALYSIS - PCB's (AROCLORS)

Results (ug/kg)

Parameter	B1 COMP	B2 COMP	B3 COMP	B4 COMP
Aroclor 1016	3500 U	19000 U	180 U	1800 U
Aroclor 1221	3500 U	19000 U	180 U	1800 U
Aroclor 1232	3500 U	19000 U	180 U	1800 U
Aroclor 1242	3500 U	19000 U	180 U	1800 U
Aroclor 1248	51000	19000 U	180 U	1800 U
Aroclor 1254	3500 U	2300 U	1400	400
Aroclor 1260	3500 U	2300 U	180 U	350 U

DEFINITIONS:

Value	If the result is a value greater than or equal to the detection limit, report the value.
U	Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

CENTURY LABORATORIES, INC.

Report #: 88-0629

CLIENT: Dames & Moore
CLIENT ID: Chevron - Ballfields Area B
DATE COLLECTED: 03/21/88

April 21, 1988

LABORATORY ANALYSIS - PCB's (AROCLORS)

Results (ug/kg)

Parameter	B6 COMP	B7 COMP	B9 COMP	B10 COMP
Aroclor 1016	2000 U	6100 U	880 U	1300 U
Aroclor 1221	2000 U	6100 U	880 U	3900 U
Aroclor 1232	2000 U	6100 U	880 U	1300 U
Aroclor 1242	2000 U	6100 U	350 U	390 U
Aroclor 1248	2000 U	6100 U	350 U	390 U
Aroclor 1254	400 U	2000 U	350 U	390 U
Aroclor 1260	400 U	2000 U	350 U	390 U

DEFINITIONS:

Value	If the result is a value greater than or equal to the detection limit, report the value.
U	Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

CENTURY LABORATORIES, INC.

Report #: 88-0629

CLIENT: Dames & Moore
CLIENT ID: Chevron - Ballfields Area B
DATE COLLECTED: 03/21/88

April 21, 1988

LABORATORY ANALYSIS - PCB's (AROCLORS)

Results (ug/kg)

Parameter	B12 COMP	B13 COMP	B14 COMP	B16 COMP
Aroclor 1016	1800 U	180 U	2000 U	180 U
Aroclor 1221	1800 U	180 U	2000 U	180 U
Aroclor 1232	1800 U	180 U	2000 U	180 U
Aroclor 1242	1800 U	180 U	2000 U	180 U
Aroclor 1248	1800 U	180 U	2000 U	180 U
Aroclor 1254	1800 U	300	270 J	530
Aroclor 1260	1800 U	180 U	410 U	180 U

DEFINITIONS:

Value	If the result is a value greater than or equal to the detection limit, report the value.
U	Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.
J	Indicates the presence of the compounds at levels less than the specified detection limits. Value presented is an estimated value.

CENTURY LABORATORIES, INC.

Report #: 88-0629

CLIENT: Dames & Moore
CLIENT ID: Chevron - Ballfields Area B
DATE COLLECTED: 03/21/88

April 21, 1988

LABORATORY ANALYSIS - PCB's (AROCLORS)

Results (ug/kg)

Parameter	B5 COMP	B11 COMP	B15 COMP
Aroclor 1016	1200 U	5800 U	350 U
Aroclor 1221	1200 U	5800 U	350 U
Aroclor 1232	1200 U	5800 U	350 U
Aroclor 1242	410 U	5800 U	350 U
Aroclor 1248	410 U	1900 U	350 U
Aroclor 1254	410 U	1900 U	350 U
Aroclor 1260	410 U	1900 U	350 U

DEFINITIONS:

Value	If the result is a value greater than or equal to the detection limit, report the value.
U	Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

CENTURY LABORATORIES, INC.

Report #: 88-0629

CLIENT: Dames & Moore
CLIENT ID: Chevron - Ballfields Area B
DATE COLLECTED: 03/22/88

April 21, 1988

LABORATORY ANALYSIS - PCB's (AROCLORS)

Results (ug/kg)

Parameter	B18 COMP
Aroclor 1016	350 U
Aroclor 1221	350 U
Aroclor 1232	350 U
Aroclor 1242	350 U
Aroclor 1248	350 U
Aroclor 1254	350 U
Aroclor 1260	350 U

DEFINITIONS:

Value	If the result is a value greater than or equal to the detection limit, report the value.
U	Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

CENTURY LABORATORIES, INC.

Report #: 88-0629

CLIENT: Dames & Moore
CLIENT ID: Chevron - Ballfields Area B
DATE COLLECTED: 03/22/88

April 21, 1988

LABORATORY ANALYSIS - PCB's (AROCLORS)

Results (ug/kg)

Parameter	B18 RRB
Aroclor 1016	1800 U
Aroclor 1221	1800 U
Aroclor 1232	1800 U
Aroclor 1242	1800 U
Aroclor 1248	1800 U
Aroclor 1254	1800 U
Aroclor 1260	1800 U

DEFINITIONS:

Value	If the result is a value greater than or equal to the detection limit, report the value.
U	Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

CENTURY LABORATORIES, INC.
Report of Results

VOLATILE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B1 Comp
% Moisture: 13.50

Report #: 880629
Century ID: 4882

	ug/kg			ug/kg	
1,4-Dioxane	120	U	Chloromethane	12	U
1,2-Dichloropropane	7	U	Bromomethane	12	U
trans-1,3-Dichloropropene	6	U	Vinyl chloride	12	U
Trichloroethene	2	U	Chloroethane	12	U
Chlorodibromomethane	4	U	Methylene chloride	3	U
1,1,2-Trichloroethane	6	U	Acetone	34	B (B=5)
Benzene	140		Carbon disulfide	6	U
cis-1,3-Dichloropropene	6	U	1,1-Dichloroethene	3	U
2-Chloroethyl vinyl ether	12	U	1,1-Dichloroethane	5	U
Bromoform	5	U	trans-1,2-Dichloroethene	2	U
4-Methyl-2-pentanone	12	U	Chloroform	2	U
2-Hexanone	12	U	1,2-Dichloroethane	3	U
Tetrachloroethene	5	U	2-Butanone	12	U
1,1,2,2-Tetrachloroethane	8	U	1,1,1-Trichloroethane	4	U
Toluene	5		Carbon tetrachloride	3	U
Chlorobenzene	7	U	Vinyl acetate	12	U
Ethylbenzene	62		Bromodichloromethane	3	U
Styrene	6	U	Xylenes	88	
1,2-&1,4-Dichlorobenzenes	2	U	1,3-Dichlorobenzene	6	U
Trichlorofluoromethane	2	U			

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

CENTURY LABORATORIES, INC.
Report of Results

VOLATILE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B2 Comp
% Moisture: 21.14

Report #: 880629
Century ID: 4883

	ug/kg			ug/kg	
1,4-Dioxane	160000	U	Chloromethane	16000	U
1,2-Dichloropropane	9500	U	Bromomethane	16000	U
trans-1,3-Dichloropropene	7900	U	Vinyl chloride	16000	U
Trichloroethene	3000	U	Chloroethane	16000	U
Chlorodibromomethane	4900	U	Methylene chloride	4400	U
1,1,2-Trichloroethane	7900	U	Acetone	16000	U
Benzene	60000		Carbon disulfide	7900	U
cis-1,3-Dichloropropene	7900	U	1,1-Dichloroethene	4400	U
2-Chloroethyl vinyl ether	16000	U	1,1-Dichloroethane	7400	U
Bromoform	7400	U	trans-1,2-Dichloroethene	2500	U
4-Methyl-2-pentanone	16000	U	Chloroform	2500	U
2-Hexanone	16000	U	1,2-Dichloroethane	4400	U
Tetrachloroethene	6500	U	2-Butanone	16000	U
1,1,2,2-Tetrachloroethane	11000	U	1,1,1-Trichloroethane	6000	U
Toluene	55000		Carbon tetrachloride	4400	U
Chlorobenzene	9500	U	Vinyl acetate	16000	U
Ethylbenzene	47000		Bromodichloromethane	3500	U
Styrene	7900	U	Xylenes	330000	
1,2-&1,4-Dichlorobenzenes	3200	U	1,3-Dichlorobenzene	7900	U
Trichlorofluoromethane	3200	U			

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

CENTURY LABORATORIES, INC.
Report of Results

VOLATILE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B3 Comp
% Moisture: 14.77

Report #: 880629
Century ID: 4884

	ug/kg			ug/kg	
1,4-Dioxane	120	U	Chloromethane	12	U
1,2-Dichloropropane	7	U	Bromomethane	12	U
trans-1,3-Dichloropropene	6	U	Vinyl chloride	12	U
Trichloroethene	2	U	Chloroethane	12	U
Chlorodibromomethane	4	U	Methylene chloride	3	U
1,1,2-Trichloroethane	6	U	Acetone	3	J
Benzene	5	U	Carbon disulfide	6	U
cis-1,3-Dichloropropene	6	U	1,1-Dichloroethene	3	U
2-Chloroethyl vinyl ether	12	U	1,1-Dichloroethane	6	U
Bromoform	6	U	trans-1,2-Dichloroethene	2	U
4-Methyl-2-pentanone	12	U	Chloroform	2	U
2-Hexanone	12	U	1,2-Dichloroethane	3	U
Tetrachloroethene	5	U	2-Butanone	12	U
1,1,2,2-Tetrachloroethane	8	U	1,1,1-Trichloroethane	4	U
Toluene	3	J	Carbon tetrachloride	3	U
Chlorobenzene	7	U	Vinyl acetate	12	U
Ethylbenzene	8	U	Bromodichloromethane	3	U
Styrene	6	U	Xylenes	6	
1,2-&1,4-Dichlorobenzenes	2	U	1,3-Dichlorobenzene	6	U
Trichlorofluoromethane	2	U			

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

CENTURY LABORATORIES, INC.
Report of Results

VOLATILE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B4 Comp
% Moisture: 15.00

Report #: 880629
Century ID: 4885

	ug/kg			ug/kg	
1,4-Dioxane	120	U	Chloromethane	12	U
1,2-Dichloropropane	7	U	Bromomethane	12	U
trans-1,3-Dichloropropene	6	U	Vinyl chloride	12	U
Trichloroethene	2	U	Chloroethane	12	U
Chlorodibromomethane	4	U	Methylene chloride	13	
1,1,2-Trichloroethane	6	U	Acetone	40	B (B=8)
Benzene	5	U	Carbon disulfide	6	U
cis-1,3-Dichloropropene	6	U	1,1-Dichloroethene	3	U
2-Chloroethyl vinyl ether	12	U	1,1-Dichloroethane	6	U
Bromoform	6	U	trans-1,2-Dichloroethene	2	U
4-Methyl-2-pentanone	12	U	Chloroform	2	U
2-Hexanone	12	U	1,2-Dichloroethane	3	U
Tetrachloroethene	5	U	2-Butanone	7	J
1,1,2,2-Tetrachloroethane	8	U	1,1,1-Trichloroethane	4	U
Toluene	3	J	Carbon tetrachloride	3	U
Chlorobenzene	7	U	Vinyl acetate	12	U
Ethylbenzene	8	U	Bromodichloromethane	3	U
Styrene	6	U	Xylenes	6	U
1,2-&1,4-Dichlorobenzenes	2	U	1,3-Dichlorobenzene	6	U
Trichlorofluoromethane	2	U			

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

CENTURY LABORATORIES, INC.
Report of Results

VOLATILE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B5 Comp
% Moisture: 26.78

Report #: 880629
Century ID: 4894

	ug/kg			ug/kg	
1,4-Dioxane	17000	U	Chloromethane	1700	U
1,2-Dichloropropane	1000	U	Bromomethane	1700	U
trans-1,3-Dichloropropene	850	U	Vinyl chloride	1700	U
Trichloroethene	320	U	Chloroethane	1700	U
Chlorodibromomethane	530	U	Methylene chloride	480	U
1,1,2-Trichloroethane	850	U	Acetone	1700	U
Benzene	9000		Carbon disulfide	850	U
cis-1,3-Dichloropropene	850	U	1,1-Dichloroethene	480	U
2-Chloroethyl vinyl ether	1700	U	1,1-Dichloroethane	800	U
Bromoform	800	U	trans-1,2-Dichloroethene	270	U
4-Methyl-2-pentanone	1700	U	Chloroform	270	U
2-Hexanone	1700	U	1,2-Dichloroethane	480	U
Tetrachloroethene	700	U	2-Butanone	2600	B (B=290C
1,1,2,2-Tetrachloroethane	1200	U	1,1,1-Trichloroethane	650	U
Toluene	1000	U	Carbon tetrachloride	480	U
Chlorobenzene	1000	U	Vinyl acetate	1700	U
Ethylbenzene	1200	U	Bromodichloromethane	380	U
Styrene	850	U	Xylenes	850	U
1,2-&1,4-Dichlorobenzenes	340	U	1,3-Dichlorobenzene	850	U
Trichlorofluoromethane	340	U			

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

CENTURY LABORATORIES, INC.
Report of Results

VOLATILE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B6 Comp
% Moisture: 21.03

Report #: 880629
Century ID: 4886

	ug/kg		ug/kg
1,4-Dioxane	130 U	Chloromethane	13 U
1,2-Dichloropropane	8 U	Bromomethane	13 U
trans-1,3-Dichloropropene	6 U	Vinyl chloride	13 U
Trichloroethene	2 U	Chloroethane	13 U
Chlorodibromomethane	4 U	Methylene chloride	4 U
1,1,2-Trichloroethane	6 U	Acetone	7 J
Benzene	6 U	Carbon disulfide	6 U
cis-1,3-Dichloropropene	6 U	1,1-Dichloroethene	4 U
2-Chloroethyl vinyl ether	13 U	1,1-Dichloroethane	6 U
Bromoform	6 U	trans-1,2-Dichloroethene	2 U
4-Methyl-2-pentanone	13 U	Chloroform	2 U
2-Hexanone	13 U	1,2-Dichloroethane	4 U
Tetrachloroethene	5 U	2-Butanone	13 U
1,1,2,2-Tetrachloroethane	9 U	1,1,1-Trichloroethane	5 U
Toluene	8 U	Carbon tetrachloride	4 U
Chlorobenzene	8 U	Vinyl acetate	13 U
Ethylbenzene	9 U	Bromodichloromethane	3 U
Styrene	6 U	Xylenes	6 U
1,2-&1,4-Dichlorobenzenes	3 U	1,3-Dichlorobenzene	6 U
Trichlorofluoromethane	3 U		

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

CENTURY LABORATORIES, INC.
Report of Results

VOLATILE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B7 Comp
% Moisture: 25.72

Report #: 880629
Century ID: 4887

	ug/kg			ug/kg	
1,4-Dioxane	170000	U	Chloromethane	17000	U
1,2-Dichloropropane	10000	U	Bromomethane	17000	U
trans-1,3-Dichloropropene	8400	U	Vinyl chloride	17000	U
Trichloroethene	3200	U	Chloroethane	17000	U
Chlorodibromomethane	5200	U	Methylene chloride	4700	U
1,1,2-Trichloroethane	8400	U	Acetone	17000	U
Benzene	28000		Carbon disulfide	8400	U
cis-1,3-Dichloropropene	8400	U	1,1-Dichloroethene	4700	U
2-Chloroethyl vinyl ether	17000	U	1,1-Dichloroethane	7900	U
Bromoform	7900	U	trans-1,2-Dichloroethene	2700	U
4-Methyl-2-pentanone	17000	U	Chloroform	2700	U
2-Hexanone	17000	U	1,2-Dichloroethane	4700	U
Tetrachloroethene	6900	U	2-Butanone	17000	U
1,1,2,2-Tetrachloroethane	12000	U	1,1,1-Trichloroethane	6400	U
Toluene	5900	J	Carbon tetrachloride	4700	U
Chlorobenzene	10000	U	Vinyl acetate	17000	U
Ethylbenzene	52000		Bromodichloromethane	3700	U
Styrene	8400	U	Xylenes	37000	
1,2-&1,4-Dichlorobenzenes	3400	U	1,3-Dichlorobenzene	8400	U
Trichlorofluoromethane	3400	U			

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

CENTURY LABORATORIES, INC.
Report of Results

VOLATILE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B10 Comp
% Moisture: 77.29

Report #: 880629
Century ID: 4889

	ug/kg			ug/kg	
1,4-Dioxane	13000	U			
Chloromethane	22000	U	1,2-Dichloropropane	13000	U
Bromomethane	22000	U	trans-1,3-Dichloropropene	11000	U
Vinyl chloride	22000	U	Trichloroethene	4200	U
Chloroethane	22000	U	Chlorodibromomethane	6800	U
Methylene chloride	6200	U	1,1,2-Trichloroethane	11000	U
Acetone	22000	U	Benzene	66000	
Carbon disulfide	11000	U	cis-1,3-Dichloropropene	11000	U
1,1-Dichloroethene	6200	U	2-Chloroethyl vinyl ether	22000	U
1,1-Dichloroethane	10000	U	Bromoform	10000	U
trans-1,2-Dichloroethene	3500	U	4-Methyl-2-pentanone	22000	U
Chloroform	3500	U	2-Hexanone	22000	U
1,2-Dichloroethane	6200	U	Tetrachloroethene	9000	U
2-Butanone	22000	U	1,1,2,2-Tetrachloroethane	15000	U
1,1,1-Trichloroethane	8400	U	Toluene	13000	U
Carbon tetrachloride	6200	U	Chlorobenzene	13000	U
Vinyl acetate	22000	U	Ethylbenzene	30000	
Bromodichloromethane	4800	U	Styrene	11000	U
Xylenes	110000		1,2-&1,4-Dichlorobenzenes	4400	U
1,3-Dichlorobenzene	11000	U	Trichlorofluoromethane	4400	U

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

CENTURY LABORATORIES, INC.
Report of Results

VOLATILE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B9 Comp
% Moisture: 15.00

Report #: 880629
Century ID: 4888

	ug/kg			ug/kg	
1,4-Dioxane	15000	U	Chloromethane	1500	U
1,2-Dichloropropane	880	U	Bromomethane	1500	U
trans-1,3-Dichloropropene	740	U	Vinyl chloride	1500	U
Trichloroethene	280	U	Chloroethane	1500	U
Chlorodibromomethane	460	U	Methylene chloride	410	U
1,1,2-Trichloroethane	740	U	Acetone	2900	B(B=1400)
Benzene	650	U	Carbon disulfide	740	U
cis-1,3-Dichloropropene	740	U	1,1-Dichloroethene	410	U
2-Chloroethyl vinyl ether	1500	U	1,1-Dichloroethane	690	U
Bromoform	690	U	trans-1,2-Dichloroethene	240	U
4-Methyl-2-pentanone	1500	U	Chloroform	240	U
2-Hexanone	1500	U	1,2-Dichloroethane	410	U
Tetrachloroethene	600	U	2-Butanone	3700	B(B=2500)
1,1,2,2-Tetrachloroethane	1000	U	1,1,1-Trichloroethane	560	U
Toluene	880	U	Carbon tetrachloride	410	U
Chlorobenzene	880	U	Vinyl acetate	1500	U
Ethylbenzene	1100	U	Bromodichloromethane	320	U
Styrene	740	U	Xylenes	740	U
1,2-&1,4-Dichlorobenzenes	290	U	1,3-Dichlorobenzene	740	U
Trichlorofluoromethane	290	U			

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

CENTURY LABORATORIES, INC.
Report of Results

VOLATILE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B11 Comp
% Moisture: 22.73

Report #: 880629
Century ID: 4895

	ug/kg			ug/kg	
1,4-Dioxane	65000	U	Chloromethane	6500	U
1,2-Dichloropropane	3900	U	Bromomethane	6500	U
trans-1,3-Dichloropropene	3200	U	Vinyl chloride	6500	U
Trichloroethene	1200	U	Chloroethane	6500	U
Chlorodibromomethane	2000	U	Methylene chloride	1800	U
1,1,2-Trichloroethane	3200	U	Acetone	6500	U
Benzene	2100	J	Carbon disulfide	3200	U
cis-1,3-Dichloropropene	3200	U	1,1-Dichloroethene	1800	U
2-Chloroethyl vinyl ether	6500	U	1,1-Dichloroethane	3000	U
Bromoform	3000	U	trans-1,2-Dichloroethene	1000	U
4-Methyl-2-pentanone	6500	U	Chloroform	1000	U
2-Hexanone	6500	U	1,2-Dichloroethane	1800	U
Tetrachloroethene	2700	U	2-Butanone	6500	U
1,1,2,2-Tetrachloroethane	4500	U	1,1,1-Trichloroethane	2500	U
Toluene	3900	U	Carbon tetrachloride	1800	U
Chlorobenzene	3900	U	Vinyl acetate	6500	U
Ethylbenzene	5200		Bromodichloromethane	1400	U
Styrene	3200	U	Xylenes	18000	
1,2-&1,4-Dichlorobenzenes	1300	U	1,3-Dichlorobenzene	3200	U
Trichlorofluoromethane	1300	U			

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

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J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

CENTURY LABORATORIES, INC.
Report of Results

VOLATILE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B12 Comp
% Moisture: 18.36

Report #: 880629
Century ID: 4890

	ug/kg			ug/kg	
1,4-Dioxane	15000	U	Chloromethane	1500	U
1,2-Dichloropropane	920	U	Bromomethane	1500	U
trans-1,3-Dichloropropene	770	U	Vinyl chloride	1500	U
Trichloroethene	290	U	Chloroethane	1500	U
Chlorodibromomethane	470	U	Methylene chloride	430	U
1,1,2-Trichloroethane	770	U	Acetone	1500	B(B=1400)
Benzene	690	J	Carbon disulfide	770	U
cis-1,3-Dichloropropene	770	U	1,1-Dichloroethene	430	U
2-Chloroethyl vinyl ether	1500	U	1,1-Dichloroethane	720	U
Bromoform	720	U	trans-1,2-Dichloroethene	240	U
4-Methyl-2-pentanone	1500	U	Chloroform	240	U
2-Hexanone	1500	U	1,2-Dichloroethane	430	U
Tetrachloroethene	630	U	2-Butanone	2800	B(B=2500)
1,1,2,2-Tetrachloroethane	1100	U	1,1,1-Trichloroethane	580	U
Toluene	920	U	Carbon tetrachloride	430	U
Chlorobenzene	920	U	Vinyl acetate	1500	U
Ethylbenzene	2500		Bromodichloromethane	340	U
Styrene	770	U	Xylenes	7900	
1,2-&1,4-Dichlorobenzenes	310	U	1,3-Dichlorobenzene	770	U
Trichlorofluoromethane	310	U			

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

CENTURY LABORATORIES, INC.
Report of Results

VOLATILE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B13 Comp
% Moisture: 15.61

Report #: 880629
Century ID: 4891

	ug/kg		ug/kg
1,4-Dioxane	120 U	Chloromethane	12 U
1,2-Dichloropropane	7 U	Bromomethane	12 U
trans-1,3-Dichloropropene	6 U	Vinyl chloride	12 U
Trichloroethene	2 U	Chloroethane	12 U
Chlorodibromomethane	4 U	Methylene chloride	3 U
1,1,2-Trichloroethane	6 U	Acetone	12 B (B=5)
Benzene	5 U	Carbon disulfide	6 U
cis-1,3-Dichloropropene	6 U	1,1-Dichloroethene	3 U
2-Chloroethyl vinyl ether	12 U	1,1-Dichloroethane	6 U
Bromoform	6 U	trans-1,2-Dichloroethene	2 U
4-Methyl-2-pentanone	12 U	Chloroform	2 U
2-Hexanone	12 U	1,2-Dichloroethane	3 U
Tetrachloroethene	5 U	2-Butanone	12 U
1,1,2,2-Tetrachloroethane	8 U	1,1,1-Trichloroethane	5 U
Toluene	7 U	Carbon tetrachloride	3 U
Chlorobenzene	7 U	Vinyl acetate	12 U
Ethylbenzene	9 U	Bromodichloromethane	3 U
Styrene	6 U	Xylenes	6 U
1,2-&1,4-Dichlorobenzenes	2 U	1,3-Dichlorobenzene	6 U
Trichlorofluoromethane	2 U		

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

CENTURY LABORATORIES, INC.
Report of Results

VOLATILE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B14 Comp
% Moisture: 26.52

Report #: 880629
Century ID: 4892

	ug/kg		ug/kg
1,4-Dioxane	68000 U	Chloromethane	6800 U
1,2-Dichloropropane	4100 U	Bromomethane	6800 U
trans-1,3-Dichloropropene	3400 U	Vinyl chloride	6800 U
Trichloroethene	1300 U	Chloroethane	6800 U
Chlorodibromomethane	2100 U	Methylene chloride	1900 U
1,1,2-Trichloroethane	3400 U	Acetone	6800 U
Benzene	3000 U	Carbon disulfide	3400 U
cis-1,3-Dichloropropene	3400 U	1,1-Dichloroethene	1900 U
2-Chloroethyl vinyl ether	6800 U	1,1-Dichloroethane	3200 U
Bromoform	3200 U	trans-1,2-Dichloroethene	1100 U
4-Methyl-2-pentanone	6800 U	Chloroform	1100 U
2-Hexanone	6800 U	1,2-Dichloroethane	1900 U
Tetrachloroethene	2800 U	2-Butanone	6800 U
1,1,2,2-Tetrachloroethane	4700 U	1,1,1-Trichloroethane	2600 U
Toluene	4100 U	Carbon tetrachloride	1900 U
Chlorobenzene	4100 U	Vinyl acetate	6800 U
Ethylbenzene	4900 U	Bromodichloromethane	1500 U
Styrene	3400 U	Xylenes	3400 U
1,2-&1,4-Dichlorobenzenes	1400 U	1,3-Dichlorobenzene	3400 U
Trichlorofluoromethane	1400 U		

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

CENTURY LABORATORIES, INC.
Report of Results

VOLATILE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B16 Comp
% Moisture: 16.02

Report #: 880629
Century ID: 4893

	ug/kg			ug/kg	
1,4-Dioxane	120	U	Chloromethane	12	U
1,2-Dichloropropane	7	U	Bromomethane	12	U
trans-1,3-Dichloropropene	6	U	Vinyl chloride	12	U
Trichloroethene	2	U	Chloroethane	12	U
Chlorodibromomethane	4	U	Methylene chloride	3	U
1,1,2-Trichloroethane	6	U	Acetone	28	B (B=5)
Benzene	5	U	Carbon disulfide	6	U
cis-1,3-Dichloropropene	6	U	1,1-Dichloroethene	3	U
2-Chloroethyl vinyl ether	12	U	1,1-Dichloroethane	6	U
Bromoform	6	U	trans-1,2-Dichloroethene	2	U
4-Methyl-2-pentanone	12	U	Chloroform	2	U
2-Hexanone	12	U	1,2-Dichloroethane	3	U
Tetrachloroethene	5	U	2-Butanone	5	J,B (B=1)
1,1,2,2-Tetrachloroethane	8	U	1,1,1-Trichloroethane	5	U
Toluene	7	U	Carbon tetrachloride	3	U
Chlorobenzene	7	U	Vinyl acetate	12	U
Ethylbenzene	9	U	Bromodichloromethane	3	U
Styrene	6	U	Xylenes	6	U
1,2-&1,4-Dichlorobenzenes	2	U	1,3-Dichlorobenzene	6	U
Trichlorofluoromethane	2	U			

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

CENTURY LABORATORIES, INC.
Report of Results

VOLATILE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B18 RRB
% Moisture: 17.84

Report #: 880629
Century ID: 4897

	ug/kg			ug/kg	
1,4-Dioxane	120	U	Chloromethane	12	U
1,2-Dichloropropane	7	U	Bromomethane	12	U
trans-1,3-Dichloropropene	6	U	Vinyl chloride	12	U
Trichloroethene	2	U	Chloroethane	12	U
Chlorodibromomethane	4	U	Methylene chloride	3	U
1,1,2-Trichloroethane	6	U	Acetone	43	B (B=5)
Benzene	5	U	Carbon disulfide	6	U
cis-1,3-Dichloropropene	6	U	1,1-Dichloroethene	3	U
2-Chloroethyl vinyl ether	12	U	1,1-Dichloroethane	6	U
Bromoform	6	U	trans-1,2-Dichloroethene	2	U
4-Methyl-2-pentanone	12	U	Chloroform	2	U
2-Hexanone	12	U	1,2-Dichloroethane	3	U
Tetrachloroethene	5	U	2-Butanone	8	B (B=1)
1,1,2,2-Tetrachloroethane	8	U	1,1,1-Trichloroethane	5	U
Toluene	7	U	Carbon tetrachloride	3	U
Chlorobenzene	7	U	Vinyl acetate	12	U
Ethylbenzene	9	U	Bromodichloromethane	3	U
Styrene	6	U	Xylenes	6	U
1,2-&1,4-Dichlorobenzenes	2	U	1,3-Dichlorobenzene	6	U
Trichlorofluoromethane	2	U			

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

CENTURY LABORATORIES, INC.
Report of Results

EXTRACTABLE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B1 Comp
% Moisture: 13.58

Report #: 880629
Century ID: 4882

	ug/kg			ug/kg	
Phenol	350	U	Acenaphthene	440	U
bis(2-Chloroethyl)Ether	1300	U	2,4-Dinitrophenol	9700	U
2-Chlorophenol	760	U	4-Nitrophenol	560	U
1,3-Dichlorobenzene	440	U	1,4-Dichlorobenzene	1000	U
2,4-Dinitrotoluene	1300	U	2,6-Dinitrotoluene	440	U
1,2-Dichlorobenzene	440	U	Diethylphthalate	440	U
4-Chlorophenyl-phenylether	970	U	bis(2-chloroisopropyl)Ether	1300	U
Fluorene	970		N-Nitroso-Di-n-Propylamine	2300	U
4,6-Dinitro-2-Methylphenol	5600	U	Hexachloroethane	370	U
N-Nitrosodiphenylamine (1)	440	U	Nitrobenzene	440	U
4-Bromophenyl-phenylether	440	U	Isophorone	510	U
Hexachlorobenzene	440	U	Pentachlorophenol	830	U
2,4-Dimethylphenol	620	U	Phenanthrene	2800	
Anthracene	440	U	bis(2-Chloroethoxy)Methane	1200	U
Di-n-Butylphthalate	580	U	2,4-Dichlorophenol	620	U
Fluoranthene	390		1,2,4-Trichlorobenzene	440	U
Pyrene	1600		Naphthalene	420	
Butylbenzylphthalate	580	U	3,3'-Dichlorobenzidine	3800	U
Hexachlorobutadiene	210	U	Benzo(a)Anthracene	740	J
4-Chloro-3-Methylphenol	690	U	bis(2-ethylhexyl)phthalate	580	U
Chrysene	1200		Hexachlorocyclopentadiene	2300	U
Di-n-Octyl Phthalate	580	U	2,4,6-Trichlorophenol	620	U
Benzo(b)Fluoranthene	1100	U	Benzo(k)Fluoranthene	580	U
2-Chloronaphthalene	440	U	Benzo(a)Pyrene	740	
Indeno(1,2,3-cd)Pyrene	860	U	Dimethyl Phthalate	370	U
Dibenz(a,h)Anthracene	580	U	Acenaphthylene	810	U
Benzo(g,h,i)Perylene	950	U	2-Nitrophenol	830	U

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

(1) Cannot be separated from diphenylamine

CENTURY LABORATORIES, INC.
Report of Results

EXTRACTABLE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B2 Comp
% Moisture: 21.14

Report #: 880629
Century ID: 4883

	ug/kg			ug/kg	
Phenol	3800	U	Acenaphthene	4800	U
bis(2-Chloroethyl)Ether	14000	U	2,4-Dinitrophenol	110000	U
2-Chlorophenol	8400	U	4-Nitrophenol	6100	U
1,3-Dichlorobenzene	4800	U	1,4-Dichlorobenzene	11000	U
2,4-Dinitrotoluene	14000	U	2,6-Dinitrotoluene	4800	U
1,2-Dichlorobenzene	4800	U	Diethylphthalate	4800	U
4-Chlorophenyl-phenylether	11000	U	bis(2-chloroisopropyl)Ether	14000	U
Fluorene	58000		N-Nitroso-Di-n-Propylamine	25000	U
4,6-Dinitro-2-Methylphenol	61000	U	Hexachloroethane	4100	U
N-Nitrosodiphenylamine (1)	4800	U	Nitrobenzene	4800	U
4-Bromophenyl-phenylether	4800	U	Isophorone	5600	U
Hexachlorobenzene	4800	U	Pentachlorophenol	9100	U
2,4-Dimethylphenol	6800	U	Phenanthrene	62000	
Anthracene	3600	J	bis(2-Chloroethoxy)Methane	13000	U
Di-n-Butylphthalate	6300	U	2,4-Dichlorophenol	6800	U
Fluoranthene	5600	U	1,2,4-Trichlorobenzene	4800	U
Pyrene	38000		Naphthalene	46000	
Butylbenzylphthalate	6300	U	3,3'-Dichlorobenzidine	42000	U
Hexachlorobutadiene	2300	U	Benzo(a)Anthracene	20000	U
4-Chloro-3-Methylphenol	7600	U	bis(2-ethylhexyl)phthalate	6300	U
Chrysene	16000		Hexachlorocyclopentadiene	25000	U
Di-n-Octyl Phthalate	6300	U	2,4,6-Trichlorophenol	6800	U
Benzo(b)Fluoranthene	12000	U	Benzo(k)Fluoranthene	6300	U
2-Chloronaphthalene	4800	U	Benzo(a)Pyrene	6300	U
Indeno(1,2,3-cd)Pyrene	9400	U	Dimethyl Phthalate	4100	U
Dibenz(a,h)Anthracene	6300	U	Acenaphthylene	8900	U
Benzo(g,h,i)Perylene	10000	U	2-Nitrophenol	9100	U

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B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

(1) Cannot be separated from diphenylamine

CENTURY LABORATORIES, INC.
Report of Results

EXTRACTABLE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B3 Comp
% Moisture: 14.77

Report #: 880629
Century ID: 4884

	ug/kg			ug/kg	
Phenol	59	U	Acenaphthene	74	U
bis(2-Chloroethyl)Ether	220	U	2,4-Dinitrophenol	1600	U
2-Chlorophenol	130	U	4-Nitrophenol	94	U
1,3-Dichlorobenzene	74	U	1,4-Dichlorobenzene	170	U
2,4-Dinitrotoluene	220	U	2,6-Dinitrotoluene	74	U
1,2-Dichlorobenzene	74	U	Diethylphthalate	74	U
4-Chlorophenyl-phenylether	160	U	bis(2-chloroisopropyl)Ether	220	U
Fluorene	710		N-Nitroso-Di-n-Propylamine	390	U
4,6-Dinitro-2-Methylphenol	940	U	Hexachloroethane	63	U
N-Nitrosodiphenylamine (1)	74	U	Nitrobenzene	74	U
4-Bromophenyl-phenylether	74	U	Isophorone	86	U
Hexachlorobenzene	74	U	Pentachlorophenol	140	U
2,4-Dimethylphenol	110	U	Phenanthrene	770	
Anthracene	74	U	bis(2-Chloroethoxy)Methane	210	U
Di-n-Butylphthalate	180		2,4-Dichlorophenol	110	U
Fluoranthene	110		1,2,4-Trichlorobenzene	74	U
Pyrene	1300		Naphthalene	63	U
Butylbenzylphthalate	98	U	3,3'-Dichlorobenzidine	650	U
Hexachlorobutadiene	35	U	Benzo(a)Anthracene	210	J
4-Chloro-3-Methylphenol	120	U	bis(2-ethylhexyl)phthalate	470	
Chrysene	400		Hexachlorocyclopentadiene	390	U
Di-n-Octyl Phthalate	98	U	2,4,6-Trichlorophenol	110	U
Benzo(b)Fluoranthene	190	U	Benzo(k)Fluoranthene	98	U
2-Chloronaphthalene	74	U	Benzo(a)Pyrene	320	
Indeno(1,2,3-cd)Pyrene	140	U	Dimethyl Phthalate	63	U
Dibenz(a,h)Anthracene	98	U	Acenaphthylene	140	U
Benzo(g,h,i)Perylene	160	U	2-Nitrophenol	140	U

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

CENTURY LABORATORIES, INC.
Report of Results

EXTRACTABLE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B4 Comp
% Moisture: 15.06

Report #: 880629
Century ID: 4885

	ug/kg			ug/kg	
Phenol	530	U	Acenaphthene	670	U
bis(2-Chloroethyl)Ether	2000	U	2,4-Dinitrophenol	15000	U
2-Chlorophenol	1200	U	4-Nitrophenol	850	U
1,3-Dichlorobenzene	670	U	1,4-Dichlorobenzene	1600	U
2,4-Dinitrotoluene	2000	U	2,6-Dinitrotoluene	670	U
1,2-Dichlorobenzene	670	U	Diethylphthalate	670	U
4-Chlorophenyl-phenylether	1500	U	bis(2-chloroisopropyl)Ether	2000	U
Fluorene	26000		N-Nitroso-Di-n-Propylamine	3500	U
4,6-Dinitro-2-Methylphenol	8500	U	Hexachloroethane	570	U
N-Nitrosodiphenylamine (1)	670	U	Nitrobenzene	670	U
4-Bromophenyl-phenylether	670	U	Isophorone	780	U
Hexachlorobenzene	670	U	Pentachlorophenol	1300	U
2,4-Dimethylphenol	950	U	Phenanthrene	62000	
Anthracene	23000		bis(2-Chloroethoxy)Methane	1900	U
Di-n-Butylphthalate	880	U	2,4-Dichlorophenol	950	U
Fluoranthene	77000		1,2,4-Trichlorobenzene	670	U
Pyrene	160000		Naphthalene	570	U
Butylbenzylphthalate	880	U	3,3'-Dichlorobenzidine	5800	U
Hexachlorobutadiene	320	U	Benzo(a)Anthracene	41000	
4-Chloro-3-Methylphenol	1100	U	bis(2-ethylhexyl)phthalate	880	U
Chrysene	38000		Hexachlorocyclopentadiene	3500	U
Di-n-Octyl Phthalate	880	U	2,4,6-Trichlorophenol	950	U
Benzo(b)Fluoranthene	32000		Benzo(k)Fluoranthene	880	U
2-Chloronaphthalene	670	U	Benzo(a)Pyrene	880	U
Indeno(1,2,3-cd)Pyrene	27000		Dimethyl Phthalate	570	U
Dibenz(a,h)Anthracene	880	U	Acenaphthylene	1200	U
Benzo(g,h,i)Perylene	8100		2-Nitrophenol	1300	U

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J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

(1) Cannot be separated from diphenylamine

CENTURY LABORATORIES, INC.
Report of Results

EXTRACTABLE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B5 Comp
% Moisture: 26.78

Report #: 880629
Century ID: 4894

	ug/kg			ug/kg	
Phenol	4100	U	Acenaphthene	5200	U
bis(2-Chloroethyl)Ether	16000	U	2,4-Dinitrophenol	110000	U
2-Chlorophenol	9000	U	4-Nitrophenol	6600	U
1,3-Dichlorobenzene	5200	U	1,4-Dichlorobenzene	12000	U
2,4-Dinitrotoluene	16000	U	2,6-Dinitrotoluene	5200	U
1,2-Dichlorobenzene	5200	U	Diethylphthalate	5200	U
4-Chlorophenyl-phenylether	11000	U	bis(2-chloroisopropyl)Ether	16000	U
Fluorene	34000		N-Nitroso-Di-n-Propylamine	27000	U
4,6-Dinitro-2-Methylphenol	66000	U	Hexachloroethane	4400	U
N-Nitrosodiphenylamine (1)	5200	U	Nitrobenzene	5200	U
4-Bromophenyl-phenylether	5200	U	Isophorone	6000	U
Hexachlorobenzene	5200	U	Pentachlorophenol	9800	U
2,4-Dimethylphenol	7400	U	Phenanthrene	24000	
Anthracene	5200	U	bis(2-Chloroethoxy)Methane	14000	U
Di-n-Butylphthalate	6800	U	2,4-Dichlorophenol	7400	U
Fluoranthene	6000	U	1,2,4-Trichlorobenzene	5200	U
Pyrene	10000		Naphthalene	4100	J
Butylbenzylphthalate	6800	U	3,3'-Dichlorobenzidine	45000	U
Hexachlorobutadiene	2500	U	Benzo(a)Anthracene	3600	
4-Chloro-3-Methylphenol	8200	U	bis(2-ethylhexyl)phthalate	6800	U
Chrysene	8700		Hexachlorocyclopentadiene	27000	U
Di-n-Octyl Phthalate	6800	U	2,4,6-Trichlorophenol	7400	U
Benzo(b)Fluoranthene	13000	U	Benzo(k)Fluoranthene	6800	U
2-Chloronaphthalene	5200	U	Benzo(a)Pyrene	6800	U
Indeno(1,2,3-cd)Pyrene	10000	U	Dimethyl Phthalate	4400	U
Dibenz(a,h)Anthracene	6800	U	Acenaphthylene	9600	U
Benzo(g,h,i)Perylene	11000	U	2-Nitrophenol	9800	U

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J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

(1) Cannot be separated from diphenylamine

CENTURY LABORATORIES, INC.
Report of Results

EXTRACTABLE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B6 Comp
% Moisture: 25.01

Report #: 880629
Century ID: 4886

	ug/kg			ug/kg	
Phenol	200	U	Acenaphthene	250	U
bis(2-Chloroethyl)Ether	760	U	2,4-Dinitrophenol	5600	U
2-Chlorophenol	440	U	4-Nitrophenol	320	U
1,3-Dichlorobenzene	250	U	1,4-Dichlorobenzene	590	U
2,4-Dinitrotoluene	760	U	2,6-Dinitrotoluene	250	U
1,2-Dichlorobenzene	250	U	Diethylphthalate	250	U
4-Chlorophenyl-phenylether	560	U	bis(2-chloroisopropyl)Ether	760	U
Fluorene	170	J	N-Nitroso-Di-n-Propylamine	1300	U
4,6-Dinitro-2-Methylphenol	3200	U	Hexachloroethane	210	U
N-Nitrosodiphenylamine (1)	250	U	Nitrobenzene	250	U
4-Bromophenyl-phenylether	250	U	Isophorone	290	U
Hexachlorobenzene	250	U	Pentachlorophenol	480	U
2,4-Dimethylphenol	360	U	Phenanthrene	310	J
Anthracene	250	U	bis(2-Chloroethoxy)Methane	710	U
Di-n-Butylphthalate	330	U	2,4-Dichlorophenol	360	U
Fluoranthene	120	J	1,2,4-Trichlorobenzene	250	U
Pyrene	590		Naphthalene	210	U
Butylbenzylphthalate	330	U	3,3'-Dichlorobenzidine	2200	U
Hexachlorobutadiene	120	U	Benzo(a)Anthracene	1000	U
4-Chloro-3-Methylphenol	400	U	bis(2-ethylhexyl)phthalate	330	U
Chrysene	330	U	Hexachlorocyclopentadiene	1300	U
Di-n-Octyl Phthalate	330	U	2,4,6-Trichlorophenol	360	U
Benzo(b)Fluoranthene	640	U	Benzo(k)Fluoranthene	330	U
2-Chloronaphthalene	250	U	Benzo(a)Pyrene	330	U
Indeno(1,2,3-cd)Pyrene	490	U	Dimethyl Phthalate	210	U
Dibenz(a,h)Anthracene	330	U	Acenaphthylene	470	U
Benzo(g,h,i)Perylene	550	U	2-Nitrophenol	480	U

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

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J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

(1) Cannot be separated from diphenylamine

CENTURY LABORATORIES, INC.
Report of Results

EXTRACTABLE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B7 Comp
% Moisture: 25.72

Report #: 880629
Century ID: 4887

	ug/kg			ug/kg	
Phenol	8100	U	Acenaphthene	10000	U
bis(2-Chloroethyl)Ether	31000	U	2,4-Dinitrophenol	230000	U
2-Chlorophenol	18000	U	4-Nitrophenol	13000	U
1,3-Dichlorobenzene	10000	U	1,4-Dichlorobenzene	24000	U
2,4-Dinitrotoluene	31000	U	2,6-Dinitrotoluene	10000	U
1,2-Dichlorobenzene	10000	U	Diethylphthalate	10000	U
4-Chlorophenyl-phenylether	23000	U	bis(2-chloroisopropyl)Ether	31000	U
Fluorene	360000		N-Nitroso-Di-n-Propylamine	54000	U
4,6-Dinitro-2-Methylphenol	130000	U	Hexachloroethane	8600	U
N-Nitrosodiphenylamine (1)	10000	U	Nitrobenzene	10000	U
4-Bromophenyl-phenylether	10000	U	Isophorone	12000	U
Hexachlorobenzene	10000	U	Pentachlorophenol	19000	U
2,4-Dimethylphenol	15000	U	Phenanthrene	160000	
Anthracene	9200	J	bis(2-Chloroethoxy)Methane	29000	U
Di-n-Butylphthalate	13000	U	2,4-Dichlorophenol	15000	U
Fluoranthene	8600		1,2,4-Trichlorobenzene	10000	U
Pyrene	32000		Naphthalene	90000	
Butylbenzylphthalate	13000	U	3,3'-Dichlorobenzidine	89000	U
Hexachlorobutadiene	4800	U	Benzo(a)Anthracene	42000	U
4-Chloro-3-Methylphenol	16000	U	bis(2-ethylhexyl)phthalate	13000	U
Chrysene	18000		Hexachlorocyclopentadiene	54000	U
Di-n-Octyl Phthalate	13000	U	2,4,6-Trichlorophenol	15000	U
Benzo(b)Fluoranthene	26000	U	Benzo(k)Fluoranthene	13000	U
2-Chloronaphthalene	10000	U	Benzo(a)Pyrene	13000	U
Indeno(1,2,3-cd)Pyrene	20000	U	Dimethyl Phthalate	8600	U
Dibenz(a,h)Anthracene	13000	U	Acenaphthylene	19000	U
Benzo(g,h,i)Perylene	22000	U	2-Nitrophenol	19000	U

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

(1) Cannot be separated from diphenylamine

CENTURY LABORATORIES, INC.
Report of Results

EXTRACTABLE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B11 Comp
% Moisture: 22.73

Report #: 880629
Century ID: 4895

	ug/kg			ug/kg	
Phenol	19000	U	Acenaphthene	25000	U
bis(2-Chloroethyl)Ether	74000	U	2,4-Dinitrophenol	540000	U
2-Chlorophenol	43000	U	4-Nitrophenol	31000	U
1,3-Dichlorobenzene	25000	U	1,4-Dichlorobenzene	57000	U
2,4-Dinitrotoluene	74000	U	2,6-Dinitrotoluene	25000	U
1,2-Dichlorobenzene	25000	U	Diethylphthalate	25000	U
4-Chlorophenyl-phenylether	54000	U	bis(2-chloroisopropyl)Ether	74000	U
Fluorene	30000		N-Nitroso-Di-n-Propylamine	130000	U
4,6-Dinitro-2-Methylphenol	310000	U	Hexachloroethane	21000	U
N-Nitrosodiphenylamine (1)	25000	U	Nitrobenzene	25000	U
4-Bromophenyl-phenylether	25000	U	Isophorone	28000	U
Hexachlorobenzene	25000	U	Pentachlorophenol	47000	U
2,4-Dimethylphenol	35000	U	Phenanthrene	58000	
Anthracene	25000	U	bis(2-Chloroethoxy)Methane	69000	U
Di-n-Butylphthalate	32000	U	2,4-Dichlorophenol	35000	U
Fluoranthene	28000	U	1,2,4-Trichlorobenzene	25000	U
Pyrene	60000		Naphthalene	21000	U
Butylbenzylphthalate	32000	U	3,3'-Dichlorobenzidine	210000	U
Hexachlorobutadiene	12000	U	Benzo(a)Anthracene	100000	U
4-Chloro-3-Methylphenol	39000	U	bis(2-ethylhexyl)phthalate	32000	U
Chrysene	32000	U	Hexachlorocyclopentadiene	130000	U
Di-n-Octyl Phthalate	32000	U	2,4,6-Trichlorophenol	35000	U
Benzo(b)Fluoranthene	62000	U	Benzo(k)Fluoranthene	32000	U
2-Chloronaphthalene	25000	U	Benzo(a)Pyrene	32000	U
Indeno(1,2,3-cd)Pyrene	48000	U	Dimethyl Phthalate	21000	U
Dibenz(a,h)Anthracene	32000	U	Acenaphthylene	45000	U
Benzo(g,h,i)Perylene	53000	U	2-Nitrophenol	47000	U

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

(1) Cannot be separated from diphenylamine

CENTURY LABORATORIES, INC.
Report of Results

EXTRACTABLE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B12 Comp
% Moisture: 18.36

Report #: 880629
Century ID: 4890

	ug/kg			ug/kg	
Phenol	3700	U	Acenaphthene	4700	U
bis(2-Chloroethyl)Ether	14000	U	2,4-Dinitrophenol	100000	U
2-Chlorophenol	8100	U	4-Nitrophenol	5900	U
1,3-Dichlorobenzene	4700	U	1,4-Dichlorobenzene	11000	U
2,4-Dinitrotoluene	14000	U	2,6-Dinitrotoluene	4700	U
1,2-Dichlorobenzene	4700	U	Diethylphthalate	4700	U
4-Chlorophenyl-phenylether	10000	U	bis(2-chloroisopropyl)Ether	14000	U
Fluorene	3200	J	N-Nitroso-Di-n-Propylamine	24000	U
4,6-Dinitro-2-Methylphenol	59000	U	Hexachloroethane	3900	U
N-Nitrosodiphenylamine (1)	4700	U	Nitrobenzene	4700	U
4-Bromophenyl-phenylether	4700	U	Isophorone	5400	U
Hexachlorobenzene	4700	U	Pentachlorophenol	8800	U
2,4-Dimethylphenol	6600	U	Phenanthrene	5100	J
Anthracene	4700	U	bis(2-Chloroethoxy)Methane	13000	U
Di-n-Butylphthalate	6100	U	2,4-Dichlorophenol	6600	U
Fluoranthene	5400	U	1,2,4-Trichlorobenzene	4700	U
Pyrene	3700	J	Naphthalene	3900	U
Butylbenzylphthalate	6100	U	3,3'-Dichlorobenzidine	40000	U
Hexachlorobutadiene	2200	U	Benzo(a)Anthracene	19000	U
4-Chloro-3-Methylphenol	7300	U	bis(2-ethylhexyl)phthalate	6100	U
Chrysene	6100	U	Hexachlorocyclopentadiene	24000	U
Di-n-Octyl Phthalate	6100	U	2,4,6-Trichlorophenol	6600	U
Benzo(b)Fluoranthene	12000	U	Benzo(k)Fluoranthene	6100	U
2-Chloronaphthalene	4700	U	Benzo(a)Pyrene	6100	U
Indeno(1,2,3-cd)Pyrene	9100	U	Dimethyl Phthalate	3900	U
Dibenz(a,h)Anthracene	6100	U	Acenaphthylene	8600	U
Benzo(g,h,i)Perylene	10000	U	2-Nitrophenol	8800	U

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

(1) Cannot be separated from diphenylamine

CENTURY LABORATORIES, INC.
Report of Results

EXTRACTABLE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B13 Comp
% Moisture: 15.61

Report #: 880629
Century ID: 4891

	ug/kg			ug/kg	
Phenol	59	U	Acenaphthene	75	U
bis(2-Chloroethyl)Ether	230	U	2,4-Dinitrophenol	1700	U
2-Chlorophenol	130	U	4-Nitrophenol	95	U
1,3-Dichlorobenzene	75	U	1,4-Dichlorobenzene	170	U
2,4-Dinitrotoluene	230	U	2,6-Dinitrotoluene	75	U
1,2-Dichlorobenzene	75	U	Diethylphthalate	75	U
4-Chlorophenyl-phenylether	170	U	bis(2-chloroisopropyl)Ether	230	U
Fluorene	75	U	N-Nitroso-Di-n-Propylamine	390	U
4,6-Dinitro-2-Methylphenol	950	U	Hexachloroethane	63	U
N-Nitrosodiphenylamine (1)	75	U	Nitrobenzene	75	U
4-Bromophenyl-phenylether	75	U	Isophorone	87	U
Hexachlorobenzene	75	U	Pentachlorophenol	140	U
2,4-Dimethylphenol	110	U	Phenanthrene	210	U
Anthracene	75	U	bis(2-Chloroethoxy)Methane	210	U
Di-n-Butylphthalate	79	J,B (B=32)	2,4-Dichlorophenol	110	U
Fluoranthene	95		1,2,4-Trichlorobenzene	75	U
Pyrene	100		Naphthalene	63	U
Butylbenzylphthalate	99	U	3,3'-Dichlorobenzidine	650	U
Hexachlorobutadiene	36	U	Benzo(a)Anthracene	110	J
4-Chloro-3-Methylphenol	120	U	bis(2-ethylhexyl)phthalate	99	U
Chrysene	99	U	Hexachlorocyclopentadiene	390	U
Di-n-Octyl Phthalate	99	U	2,4,6-Trichlorophenol	110	U
Benzo(b)Fluoranthene	190	U	Benzo(k)Fluoranthene	99	U
2-Chloronaphthalene	75	U	Benzo(a)Pyrene	99	U
Indeno(1,2,3-cd)Pyrene	150	U	Dimethyl Phthalate	63	U
Dibenz(a,h)Anthracene	99	U	Acenaphthylene	140	U
Benzo(g,h,i)Perylene	160	U	2-Nitrophenol	140	U

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

CENTURY LABORATORIES, INC.
Report of Results

EXTRACTABLE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B14 Comp
% Moisture: 26.52

Report #: 880629
Century ID: 4892

	ug/kg			ug/kg	
Phenol	410	U	Acenaphthene	520	U
bis(2-Chloroethyl)Ether	1600	U	2,4-Dinitrophenol	11000	U
2-Chlorophenol	900	U	4-Nitrophenol	650	U
1,3-Dichlorobenzene	520	U	1,4-Dichlorobenzene	1200	U
2,4-Dinitrotoluene	1600	U	2,6-Dinitrotoluene	520	U
1,2-Dichlorobenzene	520	U	Diethylphthalate	520	U
4-Chlorophenyl-phenylether	1100	U	bis(2-chloroisopropyl)Ether	1600	U
Fluorene	16000		N-Nitroso-Di-n-Propylamine	2700	U
4,6-Dinitro-2-Methylphenol	6500	U	Hexachloroethane	440	U
N-Nitrosodiphenylamine (1)	520	U	Nitrobenzene	520	U
4-Bromophenyl-phenylether	520	U	Isophorone	600	U
Hexachlorobenzene	520	U	Pentachlorophenol	980	U
2,4-Dimethylphenol	730	U	Phenanthrene	10000	
Anthracene	520	U	bis(2-Chloroethoxy)Methane	1400	U
Di-n-Butylphthalate	680	U	2,4-Dichlorophenol	730	U
Fluoranthene	520		1,2,4-Trichlorobenzene	520	U
Pyrene	2000		Naphthalene	2200	
Butylbenzylphthalate	680	U	3,3'-Dichlorobenzidine	4500	U
Hexachlorobutadiene	240	U	Benzo(a)Anthracene	2100	U
4-Chloro-3-Methylphenol	820	U	bis(2-ethylhexyl)phthalate	680	U
Chrysene	1300		Hexachlorocyclopentadiene	2700	U
Di-n-Octyl Phthalate	680	U	2,4,6-Trichlorophenol	730	U
Benzo(b)Fluoranthene	1300	U	Benzo(k)Fluoranthene	680	U
2-Chloronaphthalene	520	U	Benzo(a)Pyrene	680	U
Indeno(1,2,3-cd)Pyrene	1000	U	Dimethyl Phthalate	440	U
Dibenz(a,h)Anthracene	680	U	Acenaphthylene	950	U
Benzo(g,h,i)Perylene	1100	U	2-Nitrophenol	980	U

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

(1) Cannot be separated from diphenylamine

CENTURY LABORATORIES, INC.
Report of Results

EXTRACTABLE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B16 Comp
% Moisture: 16.02

Report #: 880629
Century ID: 4893

	ug/kg			ug/kg	
Phenol	60	U	Acenaphthene	75	U
bis(2-Chloroethyl)Ether	230	U	2,4-Dinitrophenol	1700	U
2-Chlorophenol	130	U	4-Nitrophenol	95	U
1,3-Dichlorobenzene	75	U	1,4-Dichlorobenzene	170	U
2,4-Dinitrotoluene	230	U	2,6-Dinitrotoluene	75	U
1,2-Dichlorobenzene	75	U	Diethylphthalate	75	U
4-Chlorophenyl-phenylether	170	U	bis(2-chloroisopropyl)Ether	230	U
Fluorene	75	U	N-Nitroso-Di-n-Propylamine	400	U
4,6-Dinitro-2-Methylphenol	950	U	Hexachloroethane	64	U
N-Nitrosodiphenylamine (1)	75	U	Nitrobenzene	75	U
4-Bromophenyl-phenylether	75	U	Isophorone	87	U
Hexachlorobenzene	75	U	Pentachlorophenol	140	U
2,4-Dimethylphenol	110	U	Phenanthrene	210	U
Anthracene	75	U	bis(2-Chloroethoxy)Methane	210	U
Di-n-Butylphthalate	130		2,4-Dichlorophenol	110	U
Fluoranthene	87	U	1,2,4-Trichlorobenzene	75	U
Pyrene	180		Naphthalene	64	U
Butylbenzylphthalate	99	U	3,3'-Dichlorobenzidine	650	U
Hexachlorobutadiene	36	U	Benzo(a)Anthracene	310	U
4-Chloro-3-Methylphenol	120	U	bis(2-ethylhexyl)phthalate	99	U
Chrysene	99	U	Hexachlorocyclopentadiene	400	U
Di-n-Octyl Phthalate	99	U	2,4,6-Trichlorophenol	110	U
Benzo(b)Fluoranthene	190	U	Benzo(k)Fluoranthene	99	U
2-Chloronaphthalene	75	U	Benzo(a)Pyrene	99	U
Indeno(1,2,3-cd)Pyrene	150	U	Dimethyl Phthalate	64	U
Dibenz(a,h)Anthracene	99	U	Acenaphthylene	140	U
Benzo(g,h,i)Perylene	160	U	2-Nitrophenol	140	U

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

CENTURY LABORATORIES, INC.
Report of Results

EXTRACTABLE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B18 Comp
% Moisture: 15.46

Report #: 880629
Century ID: 4898

	ug/kg		ug/kg
Phenol	59 U	Acenaphthene	75 U
bis(2-Chloroethyl)Ether	220 U	2,4-Dinitrophenol	1700 U
2-Chlorophenol	130 U	4-Nitrophenol	95 U
1,3-Dichlorobenzene	75 U	1,4-Dichlorobenzene	170 U
2,4-Dinitrotoluene	220 U	2,6-Dinitrotoluene	75 U
1,2-Dichlorobenzene	75 U	Diethylphthalate	75 U
4-Chlorophenyl-phenylether	170 U	bis(2-chloroisopropyl)Ether	220 U
Fluorene	75 U	N-Nitroso-Di-n-Propylamine	390 U
4,6-Dinitro-2-Methylphenol	950 U	Hexachloroethane	63 U
N-Nitrosodiphenylamine (1)	75 U	Nitrobenzene	75 U
4-Bromophenyl-phenylether	75 U	Isophorone	87 U
Hexachlorobenzene	75 U	Pentachlorophenol	140 U
2,4-Dimethylphenol	110 U	Phenanthrene	210 U
Anthracene	75 U	bis(2-Chloroethoxy)Methane	210 U
Di-n-Butylphthalate	99 U	2,4-Dichlorophenol	110 U
Fluoranthene	87 U	1,2,4-Trichlorobenzene	75 U
Pyrene	130	Naphthalene	63 U
Butylbenzylphthalate	99 U	3,3'-Dichlorobenzidine	650 U
Hexachlorobutadiene	35 U	Benzo(a)Anthracene	310 U
4-Chloro-3-Methylphenol	120 U	bis(2-ethylhexyl)phthalate	99 U
Chrysene	99 U	Hexachlorocyclopentadiene	390 U
Di-n-Octyl Phthalate	99 U	2,4,6-Trichlorophenol	110 U
Benzo(b)Fluoranthene	190 U	Benzo(k)Fluoranthene	99 U
2-Chloronaphthalene	75 U	Benzo(a)Pyrene	99 U
Indeno(1,2,3-cd)Pyrene	150 U	Dimethyl Phthalate	63 U
Dibenz(a,h)Anthracene	99 U	Acenaphthylene	140 U
Benzo(g,h,i)Perylene	160 U	2-Nitrophenol	140 U

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

(1) Cannot be separated from diphenylamine

CENTURY LABORATORIES, INC.
Report of Results

EXTRACTABLE ORGANICS ANALYSIS

Client: Dames & Moore
Sample ID: B18 RRB
% Moisture: 17.84

Report #: 880629
Century ID: 4897

	ug/kg			ug/kg	
Phenol	61	U	Acenaphthene	77	U
bis(2-Chloroethyl)Ether	230	U	2,4-Dinitrophenol	1700	U
2-Chlorophenol	130	U	4-Nitrophenol	97	U
1,3-Dichlorobenzene	77	U	1,4-Dichlorobenzene	180	U
2,4-Dinitrotoluene	230	U	2,6-Dinitrotoluene	77	U
1,2-Dichlorobenzene	77	U	Diethylphthalate	41	J
4-Chlorophenyl-phenylether	170	U	bis(2-chloroisopropyl)Ether	230	U
Fluorene	77	U	N-Nitroso-Di-n-Propylamine	410	U
4,6-Dinitro-2-Methylphenol	970	U	Hexachloroethane	65	U
N-Nitrosodiphenylamine (1)	77	U	Nitrobenzene	77	U
4-Bromophenyl-phenylether	77	U	Isophorone	89	U
Hexachlorobenzene	77	U	Pentachlorophenol	150	U
2,4-Dimethylphenol	110	U	Phenanthrene	93	
Anthracene	77	U	bis(2-Chloroethoxy)Methane	220	U
Di-n-Butylphthalate	57	J,B (B=32)	2,4-Dichlorophenol	110	U
Fluoranthene	89	U	1,2,4-Trichlorobenzene	77	U
Pyrene	77	U	Naphthalene	65	U
Butylbenzylphthalate	100	U	3,3'-Dichlorobenzidine	670	U
Hexachlorobutadiene	37	U	Benzo(a)Anthracene	320	U
4-Chloro-3-Methylphenol	120	U	bis(2-ethylhexyl)phthalate	100	U
Chrysene	100	U	Hexachlorocyclopentadiene	410	U
Di-n-Octyl Phthalate	100	U	2,4,6-Trichlorophenol	110	U
Benzo(b)Fluoranthene	190	U	Benzo(k)Fluoranthene	100	U
2-Chloronaphthalene	77	U	Benzo(a)Pyrene	100	U
Indeno(1,2,3-cd)Pyrene	150	U	Dimethyl Phthalate	65	U
Dibenz(a,h)Anthracene	100	U	Acenaphthylene	140	U
Benzo(g,h,i)Perylene	170	U	2-Nitrophenol	150	U

U Indicates compound was analyzed for but not detected (eg. 10U), based on necessary concentration/dilution. The number is the minimum attainable detection limit for the sample.

B This flag is used when the analyte is found in the blank as well as a sample. It indicates possible/probable contamination and warns the data user to take appropriate action.

J Indicates an estimated value, based on assumption of a 1:1 response for tentatively identified compounds, or when mass spectral data indicate the presence of a compound at levels below the specified detection limit.

(1: Cannot be separated from diphenylamine

CENTURY LABORATORIES, INC.

DATE: 04/21/88

CLIENT: Dames & Moore
REPORT #: 88-0629
CLIENT ID: Chevron - Ballfields Area B
DATE COLLECTED: 03/21/88

CERTIFICATE OF ANALYSIS
RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)

	*MAL	B5 COMP	B11 COMP	B15 COMP
LEACHATE ANALYSIS (mg/l):				
Arsenic	5.0	<0.007	<0.007	<0.007
Barium	100.0	0.465	0.415	0.195
Cadmium	1.0	<0.005	<0.005	<0.005
Chromium	5.0	0.010	<0.010	<0.010
Lead	5.0	<0.100	<0.100	<0.100
Mercury	0.2	<0.0002	<0.0002	<0.0002
Selenium	1.0	<0.003	<0.003	<0.003
Silver	5.0	<0.010	<0.010	<0.010
Endrin	0.02	0.002 U	0.002 U	0.002 U
Lindane	0.4	0.04 U	0.04 U	0.04 U
Methoxychlor	10.0	1.0 U	1.0 U	1.0 U
Toxaphene	0.5	0.05 U	0.05 U	0.05 U
2,4-D	10.0	0.01 U	0.01 U	0.01 U
2,4,5-TP (Silvex)	1.0	0.003 U	0.003 U	0.003 U

*MAL = Maximum allowable level, as per 40 CFR 261
< = Less than. Parameter not detected at or above value shown.

DEFINITIONS:

Value	If the result is a value greater than or equal to the detection limit, report the value.
U	Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

CENTURY LABORATORIES, INC.

DATE: 04/21/88

CLIENT: Dames & Moore
REPORT #: 88-0629
CLIENT ID: Chevron - Ballfields Area B
DATE COLLECTED: 03/22/88

CERTIFICATE OF ANALYSIS
RESOURCE CONSERVATION AND RECOVERY ACT (RCRA)

LEACHATE ANALYSIS (mg/l):	*MAL	B18 RRB
Arsenic	5.0	<0.007
Barium	100.0	0.164
Cadmium	1.0	<0.005
Chromium	5.0	<0.010
Lead	5.0	<0.100
Mercury	0.2	<0.0002
Selenium	1.0	<0.003
Silver	5.0	<0.010
Endrin	0.02	0.002 U
Lindane	0.4	0.04 U
Methoxychlor	10.0	1.0 U
Toxaphene	0.5	0.05 U
2,4-D	10.0	0.01 U
2,4,5-TP (Silvex)	1.0	0.003 U

*MAL = Maximum allowable level, as per 40 CFR 261
< = Less than. Parameter not detected at or above value shown.

DEFINITIONS:

Value	If the result is a value greater than or equal to the detection limit, report the value.
U	Compound was analyzed for but not detected. The number is the minimum attainable detection limit for the sample.

DAMES & MOORE CHAIN-OF-CUSTODY RECORD

Sample Source & Client: AREA B CHEVRON

Project Title: BALLFIELDS - AREA B

Job No. 16000-034

Field Personnel (Signature): David Hay

Date	Time	Sample I.D. No.	Sample Type	No. of Containers	Sampling Site	Remarks
3/21/88		B1 Comp	SOIL	4 (INCLUDES VOA)		ANALYZE FOR:
		B2 Comp				MODIFIED SKINNER'S LIST,
		B3 Comp				PCBs, TOTAL CYANIDE,
		B4 Comp				TOTAL PETROLEUM HYDROCARBONS
	↓	B5 Comp				ALSO ANALYZE B5, B11 &
↓		B6 Comp	↓	↓		B15 FOR EP TOX -
		B7 Comp				METALS & ORGANICS.
		B9 Comp				
		B10 Comp				(NORMAL TURNAROUND)
	↓	B11 Comp				
↓		B12 Comp	↓	↓		SAMPLES HAVE STRONG
3/22/88		B13 Comp		2 (INCLUDES VOA)		TPH ODOR
		B14 Comp		4 (INCLUDES VOA)		
	↓	B15 Comp		2 (NO VOA)		
↓		B16 Comp		4 (INCLUDES VOA)		

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time	Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
David Hay	3/23/88	10 AM	Tracy L. Funk	3-23-88	10:10 AM	Tracy L. Funk	3-23-88	13:40		3/23/88	12:45
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time	Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time	Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time

DAMES & MOORE CHAIN-OF-CUSTODY RECORD

Sample Source & Client: AREA B - CHEVRON

Project Title: BALLFIELDS - AREA B

Job No. 16000-034

Field Personnel (Signature): [signature]

Date	Time	Sample I.D. No.	Sample Type	No. of Containers	Sampling Site	Remarks
3/22/88		B18-RRB	SOIL	3 (INCLUDES VOA)	→	MODIFIED SKINNER LIST EP TOX AND PCB's
3/22/88		B18Comp	SOIL	2 (NO VOA)	→ NORMAL TURNAROUND	ANALYZE FOR: MODIFIED SKINNERS LIST, PCBs, TOTAL CYANIDE + TOTAL PET HYDROCARBONS
						SAMPLE HAVE STRONG TOTAL PET HYD. ODOR

Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time	Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
[signature]	3/23/88	10:10 AM	[signature]	3-23-88	[illegible]	[signature]	3-29-88	[illegible]	[signature]	3/29/88	[illegible]
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time	Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time
Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time	Relinquished by: (Signature)	Date	Time	Received by: (Signature)	Date	Time

NET NATIONAL ENVIRONMENTAL TESTING, INC.

NET Mid-Atlantic, Inc.
1501 Grandview Avenue
P.O. Box 248
Thorofare, NJ 08086
Tel: (609) 848-3939
Fax: (609) 848-9195

August 23, 1988

Dames & Moore
2360 Maryland Road
Willow Grove, PA 19090

Dear Mr. Wagner:

Please find enclosed the QC Summaries that were requested for NET Mid-Atlantic, Inc. job number 880629.

The QC Summary report includes the Sample Surrogate Recoveries for ABN, VOA, and Pest/PCB. Also, included are the Matrix Spike and Matrix Spike Duplicate associated with this job.

Sincerely,

NET Mid-Atlantic, Inc.

Ken Bond

Ken Bond

ljs
Enclosures

NET Mid- Atlantic, Inc.

SOIL SURROGATE PERCENT RECOVERY SUMMARY

Client: DAMES + MOORE
Report #: PF0629

		Volatiles			Extractables						Pesticides
Client ID	NET ID	Toluene-d8 (81-117)	BFB (74-121)	1,2-Dichloroethane-d4 (70-121)	Nitrobenzene-d5 (23-121)	2-Fluorobiphenyl (30-115)	p-terphenyl-d14 (18-137)	Phenol-d6 (24-113)	2-Fluorophenol (25-121)	2,4,6-Tribromophenol (19-122)	Dibutyl Chlorendate (20-150)**
S1 COMP	4FF2	101	106	91	41	67	77	47	53	57	NR
B2 COMP	4FF3	96	102	87	63	73	147 *	66	64	73	NR
B3 COMP	4FF4	103	97	81	107	120 *	353 *	112	102	6 *	185
B4 COMP	4FF5	109	110	93	32	83	234 *	51	54	111	151
B6 COMP	4FF6	120 *	91	84	35	64	174 *	48	44	80	171
B7 COMP	4FF7	99	109	92	38	44	127	47	43	72	D
B9 COMP	4FF8	97	100	86	38	44	127	47	43	72	NR
B10 COMP	4FF9	96	103	81	43	53	122	52	57	70	192
B12 COMP	4FF90	97	111	85	72	80	154 *	79	77	91	NR
B13 COMP	4FF91	100	97	90	64	67	100	65	61	67	FF
B14 COMP	4FF92	97	106	86	55	92	150 *	65	60	79	166
B15 COMP	4FF93	100	101	92	49	54	145 *	61	51	95	NR
B5 COMP	4FF94	95	105	85	59	72	95	66	77	69	
B11 COMP	4FF95	97	105	84	42	57	205 *	54	47	62	D
	4FF96				57	62	83	61	55	64	NR
B1F COMP	4FF97	131 *	79	96	42	48	112	45	41	94	166
	4FF9F				58	51	160 *	61	54	83	114
B6 COMP	4FF6	126 *	87	85							
B1F COMP	4FF97	132 *	77	99							
B3 COMP	4FF8R				18 *	73	204 *	55	56	96	

**Advisory limit only

Comments: SAMPLES B6 COMP + B1F COMP WERE REANALYZED TO SHOW REPRODUCIBILITY OF POOR SURROGATE RECOVERY
R DESIGNATES A RE-EXTRACTION
NR = NO RECOVERY DUE TO MATRIX INTERFERENCE
D = DBC SURROGATE DILUTED OUT

NET Mid- Atlantic, Inc.

SOIL SURROGATE PERCENT RECOVERY SUMMARY

Client: DAMES & MOORE
Report #: FF-0629

		Volatiles			Extractables						Pesticides
Client ID	NET ID	Toluene-d8 (81-117)	BFB (74-121)	1,2-Dichloroethane-d4 (70-121)	Nitrobenzene-d5 (23-121)	2-Fluorobiphenyl (30-115)	p-terphenyl-d14 (18-137)	Phenol-d6 (24-113)	2-Fluorophenol (25-121)	2,4,6-Tribromophenol (19-122)	Dibutyl Chlorendate (20-130)**
A221N	3761 MS				22*	36	60	29	33	27	
A221N	3761 MSD				10*	36	40	27	29	25	
A235N	4F76 MS				67	73	90	71	66	71	
A235N	4F76 MSD				64	72	89	74	64	77	
A237N	4F95 MS				25	65	78	36	43	0*	
A237N	4595 MSD				21*	54	72	39	40	0*	
A243N	5226 MS				46	53	89	52	52	74	
A243N	5226 MSD				54	56	85	57	57	79	
NA-7	5514 MS	100	114	87							
NA-7	5514 MSD	98	109	83							
50-45	4F91 MS	101	106	95							
50-45	4F91 MSD	100	99	96							

**Advisory limit only

Comments:

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

QC SAMPLE NO: 0352-3761

QC BATCH NO: A221N

COMPOUND NAME	SPIKE ADDED	SAMPLE RESULT	CONC. MS *	% RECOVERY	CONC. MSD **	% RECOVERY	RPD***
2-Chlorophenol	100 UG	N.D.	37 UG	37	36 UG	36	3 %
Phenol	100 UG	N.D.	23 UG	23	26 UG	26	12 %
p-chloro-m-cresol	100 UG	N.D.	24 UG	24	31 UG	31	25 %
4-Nitrophenol	100 UG	N.D.	14 UG	14	11 UG	11	24 %
Pentachlorophenol	100 UG	N.D.	41 UG	41	31 UG	31	28 %
1,4-Dichlorobenzene	50 UG	N.D.	19 UG	39	18 UG	36	5 %
N-Nitroso-di-n-propylamine	50 UG	N.D.	14 UG	28	13 UG	26	7 %
1,2,4-Trichlorobenzene	50 UG	N.D.	17 UG	34	15 UG	30	13 %
Acenaphthene	50 UG	N.D.	28 UG	56	27 UG	54	4 %
2,4-Dinitrotoluene	50 UG	N.D.	NR	0	NR UG	0	NC %
Pyrene	50 UG	N.D.	34 UG	68	39 UG	78	14 %
1,3 - Dichlorobenzene	50 UG	N.D.	18 UG	36	18 UG	36	0 %
1,2 - Dichlorobenzene	50 UG	N.D.	19 UG	38	17 UG	34	11 %

* Matrix Spike
** Matrix Spike Duplicate
*** Relative Percent Difference
NC = Not Calculatable
NR = No Recovery

Century Sample Numbers: 0352-3761 0352-3762 0352-3763 0352-3764 0335-3652R
0347-3708R 0347-3711R 0522-4555 0522-4556 0522-4570
0546-4622 0548-4649 0522-4557R 0548-4652R 0647-4994
0647-4996 0647-4997 0647-4998 0647-5000 0629-4883

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

QC SAMPLE NO: 88-0628-4876

QC BATCH NO: A235N

COMPOUND NAME	SPIKE ADDED	SAMPLE RESULT	CONC. MS *	% RECOVERY	CONC. MSD **	% RECOVERY	RPD***
2-Chlorophenol	100 UG	N.D.	64 UG	64	66 UG	66	3 %
Phenol	100 UG	N.D.	71 UG	71	76 UG	76	7 %
p-chloro-m-cresol	100 UG	N.D.	65 UG	65	71 UG	71	9 %
4-Nitrophenol	100 UG	N.D.	68 UG	68	83 UG	83	20 %
Pentachlorophenol	100 UG	N.D.	84 UG	84	88 UG	88	5 %
1,4-Dichlorobenzene	50 UG	N.D.	16 UG	32	19 UG	38	17 %
N-Nitroso-di-n-propylamine	50 UG	N.D.	32 UG	64	34 UG	68	6 %
1,2,4-Trichlorobenzene	50 UG	N.D.	23 UG	46	25 UG	50	8 %
Acenaphthene	50 UG	N.D.	34 UG	68	35 UG	70	3 %
2,4-Dinitrotoluene	50 UG	N.D.	39 UG	78	41 UG	82	5 %
Pyrene	50 UG	N.D.	52 UG	104	49 UG	98	6 %
1,3 - Dichlorobenzene	50 UG	N.D.	16 UG	32	19 UG	38	17 %
1,2 - Dichlorobenzene	50 UG	N.D.	18 UG	36	21 UG	42	15

* Matrix Spike

** Matrix Spike Duplicate

*** Relative Percent Difference

Century Sample Numbers:

88-0628-4876 88-0628-4877 88-0628-4878 88-0628-4879
88-0628-4880 88-0628-4881 88-0629-4882 88-0629-4884
88-0629-4885 88-0629-4886 88-0629-4891 88-0629-4892
88-0629-4893 88-0629-4896 88-0629-4897 88-0629-4898
88-0647-4993 88-0647-4994 88-0647-4995 88-0647-4999

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

QC SAMPLE NO: 88-0629-4895

QC BATCH NO: A237N

COMPOUND NAME	SPIKE ADDED	SAMPLE RESULT	CONC. MS *	% RECOVERY	CONC. MSD **	% RECOVERY	RPD***	
2-Chlorophenol	100 UG	N.D.	42 UG	42	42 UG	42	0 %	
Phenol	100 UG	N.D.	38 UG	28	37 UG	37	3 %	
p-chloro-m-cresol	100 UG	N.D.	32 UG	32	41 UG	41	25 %	
4-Nitrophenol	100 UG	N.D.	---UG	---	---UG	---	--- %	+
Pentachlorophenol	100 UG	N.D.	31 UG	31	31 UG	31	0 %	
1,4-Dichlorobenzene	50 UG	N.D.	25 UG	50	25 UG	50	0 %	
N-Nitroso-di-n-propylamine	50 UG	N.D.	18 UG	36	18 UG	36	0 %	
1,2,4-Trichlorobenzene	50 UG	N.D.	26 UG	52	26 UG	52	0 %	
Acenaphthene	50 UG	N.D.	32 UG	64	33 UG	66	3 %	
2,4-Dinitrotoluene	50 UG	N.D.	---UG	---	---UG	---	--- %	+
Pyrene	50 UG	4.6	21 UG	42	20 UG	40	5 %	
1,3 - Dichlorobenzene	50 UG	N.D.	24 UG	48	25 UG	50	4 %	
1,2 - Dichlorobenzene	50 UG	N.D.	22 UG	44	22 UG	44	0 %	

\+ Not able to find these two compounds
* Matrix Spike
** Matrix Spike Duplicate
*** Relative Percent Difference

NET Mid-Atlantic Sample Numbers: 0629-4895 0629-4885 0629-4886 0629-4887
0629-4888 0629-4889 0629-4890 0548-4643
0548-4650 0628-4877 0628-4880 0629-4894
0675-5121 0686-5194 0686-5207 0702-5346R
0702-5347R 0703-5352R 0831-6117R 0831-6118R

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

QC SAMPLE NO: 880686-5226

QC BATCH NO: A243N

COMPOUND NAME	SPIKE ADDED	SAMPLE RESULT	CONC. MS *	% RECOVERY	CONC. MSD **	% RECOVERY	RPD***
2-Chlorophenol	100 UG	N.D.	48 UG	48	52 UG	52	8%
Phenol	100 UG	N.D.	47 UG	47	50 UG	50	6%
p-chloro-m-cresol	100 UG	N.D.	51 UG	51	46 UG	46	10%
4-Nitrophenol	100 UG	N.D.	57 UG	57	59 UG	59	3%
Pentachlorophenol	100 UG	N.D.	54 UG	54	58 UG	58	7%
1,4-Dichlorobenzene	50 UG	N.D.	25 UG	50	26 UG	52	4%
N-Nitroso-di-n-propylamine	50 UG	N.D.	23 UG	46	25 UG	50	8%
1,2,4-Trichlorobenzene	50 UG	N.D.	23 UG	46	24 UG	48	4%
Acenaphthene	50 UG	N.D.	27 UG	54	29 UG	58	7%
2,4-Dinitrotoluene	50 UG	N.D.	36 UG	72	39 UG	78	8%
Pyrene	50 UG	N.D.	42 UG	84	38 UG	76	10%
1,3 - Dichlorobenzene	50 UG	N.D.	24 UG	48	26 UG	52	8%
1,2 - Dichlorobenzene	50 UG	N.D.	23 UG	46	25 UG	50	8%

* Matrix Spike
** Matrix Spike Duplicate
*** Relative Percent Difference

Century Sample Numbers: 0686-5226 0693-5262 0693-5263 0693-5264 0693-5265
0693-5266 0693-5267 0693-5268 0693-5269 0693-5270
0693-5271 0629-4884R 0629-4888R 0629-4889R 0647-4996R
0675-5121R 0686-5194R 0686-5207R 0759-5726 0759-5727

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

QC SAMPLE NO: 880629-4891

QC BATCH NO: SO-45

NET Mid-Atlantic Sample Numbers: 880629-4891 880629-4882 880646-4992 880646-4988
880629-4886 880629-4884 880629-4885 880687-5229
880687-5230 880687-5231 880687-5233 880675-5122
880675-5128 880675-5129 880675-5130 880675-5134
880675-5133 880675-5121 880675-5131 880675-5135

COMPOUND NAME	SPIKE ADDED	SAMPLE RESULT	CONC. MS	% RECOVERY	CONC. MSD	% RECOVERY	RPD
	ug/kg		ug/kg		ug/kg		
Benzene	50	ND	51	101	52	104	3
Bromodichloromethane	50	ND	52	102	52	104	2
Bromoform	50	ND	50	100	53	106	6
Bromomethane	50	ND	56	112	54	108	4
Carbon Tetrachloride	50	ND	55	110	55	110	0
Chlorobenzene	50	ND	52	104	53	106	2
Chlorodibromomethane	50	ND	52	104	52	104	0
Chloroethane	50	ND	47	94	47	94	0
Chloroform	50	ND	54	108	55	110	2
Chloromethane	50	ND	38	76	38	76	0
1,1-Dichloroethane	50	ND	52	104	52	104	0
1,2-Dichloroethane	50	ND	51	102	53	106	4
1,1-Dichloroethene	50	ND	52	104	52	104	0
Total 1,2-Dichloroethene	50	ND	52	104	52	104	0
1,2-Dichloropropane	50	ND	50	100	50	100	0
cis-1,3-Dichloropropene	61	ND	62	102	62	102	0
Trans-1,3-Dichloropropene	39	ND	39	100	40	103	3
Ethylbenzene	50	ND	54	108	54	108	0
Fluorotrichloromethane	50	ND	53	--	--	--	--
Methylene chloride	50	ND	50	100	50	100	0
1,1,2,2, Tetrachloroethane	50	ND	48	96	49	98	2
Tetrachloroethene	50	ND	54	108	55	110	2
Toluene	50	ND	54	108	54	108	0
1,1,1-Trichloroethane	50	ND	55	110	55	110	0
1,1,2-Trichloroethane	50	ND	51	102	51	102	0
Trichloroethene	50	ND	53	106	55	110	4
Vinyl Chloride	50	ND	49	98	49	98	0
1,2-Dichlorobenzene	50	ND	53	106	56	112	6
1,3-Dichlorobenzene	50	ND	49	98	50	100	2
1,4-Dichlorobenzene	50	ND	49	98	44	88	11
1,2-Dichloroethane-d-4(ss)	50	ND	48	96	48	96	0
Toluene-d-8 (ss)	50	ND	51	102	50	100	2
Bromofluorobenzene (ss)	50	ND	50	100	49	98	0
2-Chloroethyl Vinyl ether	50	ND	47	94	47	94	2
Total Xylenes	150	ND	151	101	148	99	2

MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

QC SAMPLE NO: 88-0629-4894

QC BATCH NO: NA - 7

CENTURY SAMPLES NUMBERS: 88-0629-4894 88-0629-4883 88-0629-4889 88-0629-4888
88-0629-4890 88-0629-4887 88-0629-4895 88-0629-4892
88-0686-5208 88-0686-5206 88-0686-5207 88-0686-5209
88-0702-5346 88-0686-5197

COMPOUND NAME	SPIKE ADDED	SAMPLE RESULT	CONC. MS	% RECOVERY	CONC. MSD	% RECOVERY	RPD
	NG		NG		NG		
Benzene	50	53	121	136	128	150	10
Bromodichloromethane	50	ND	150	100	149	98	2
Bromoform	50	ND	149	98	149	98	0
Bromomethane	50	ND	146	92	147	94	2
Carbon Tetrachloride	50	ND	152	104	153	106	2
Chlorobenzene	50	ND	159	116	157	114	2
Chlorodibromomethane	50	ND	151	102	151	102	0
Chloroethane	50	ND	148	46	150	100	4
Chloroform	50	ND	149	98	150	100	2
Chloromethane	50	ND	146	92	147	94	2
Dichlorodifluoromethane	50	ND					
1,1-Dichloroethane	50	ND	145	90	146	92	2
1,2-Dichloroethane	50	ND	148	96	149	98	2
1,1-Dichloroethene	50	ND	149	98	151	102	4
Trans 1,2-Dichloroethene	50	ND	149	98	150	100	2
1,2-Dichloropropane	50	ND	144	88	145	90	2
cis-1,3-Dichloropropene	61	ND	157	93	157	98	0
Trans-1,3-Dichloropropene	39	ND	138	97	139	100	3
Ethylbenzene	50	ND	152	104	152	104	0
Fluorotrichloromethane	50	ND					
Methylene chloride	50	ND	150	100	150	100	0
1,1,2,2, Tetrachloroethane	50	ND	142	84	141	82	2
Tetrachloroethene	50	ND	156	112	156	112	0
Toluene	50	ND	150	100	149	98	2
1,1,1-Trichloroethane	50	ND	151	102	152	104	2
1,1,2-Trichloroethane	50	ND	148	96	148	96	0
Trichloroethene	50	ND	152	104	153	106	2
Vinyl Chloride	50	ND	148	96	148	96	0
1,2-Dichlorobenzene	50	ND	156	112	151	102	9
1,3-Dichlorobenzene	50	ND	156	112	155	110	2
1,4-Dichlorobenzene	50	ND	152	104	154	108	4
1,2-Dichloroethane-d-4(ss)	50	ND	143	86	144	88	2
Toluene-d-8 (ss)	50	ND	149	98	147	94	4
Bromofluorobenzene (ss)	50	ND					
2-Chloroethyl Vinyl ester	50	ND	142	84	142	84	0
Bromofluorobenzene (ss)	50	ND	153	106	151	102	4
Total Xylenes	150	ND	1155	103	1152	101	2
o+p-Xylenes	50	ND					

QC MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

QC SAMPLE NO: 0548-4659

QC BATCH NO: P230N

COMPOUND NAME	SPIKE ADDED	SAMPLE RESULT	CONC. MS *	% RECOVERY	CONC. MSD **	% RECOVERY	RPD***
Aroclor 1232	1250 PG	1421	--	114	--	--	--

* Matrix Spike

** Martix Spike Duplicate

*** Relative Percent Difference

CENTURY SAMPLE NUMBER: 0548-4659 0548-4661 0548-4662 0548-4663 0548-4664
0543-4611 0573-4733 0629-4882 0629-4883 0629-4884
0629-4885 0629-4886 0629-4887 0629-4888 0629-4889
0629-4890 0629-4891 0629-4892 0629-4893 0629-4894

Chevron U.S.A. Inc.
P.O. Box 7408, Philadelphia, PA 19101

Philadelphia Refinery

July 14, 1988

Dames & Moore
4620 Street Road
Trevose, Pennsylvania 19047

Attention: Mr. Ralph Golia

Dear Mr. Golia:

A review of the draft report titled, "Investigation of Pile B Ballfields Chevron Refinery Philadelphia, Pennsylvania" has been completed. We offer the following comments to be included in your final report.

1. The white sand-like material and nodules found in the pile should be analyzed and identified if a sample of the material is available.

2. Page 5, the phrase "high levels of concentrations" is subjective and should read "significant levels."

3. On page 5 is an error regarding maximum detected lead concentration, 637 ppm were detected in sample B-18 RRB.

4. Page 5 the "typical concentrations of concern or action levels" should be stated. At least a range should be given. The subjective statements "i.e., high levels" should be removed. "Action Levels" for PCB compounds that were detected should also be given.

5. The summary should include something comparing the old railroad yard samples to the pile B samples. (i.e., highest lead concentrations.)

6. The results of the E.P. Toxicity and RCRA characterization analyses contained in the Conclusions section should be summarized.

7. Remove the recommendation regarding state and federal reporting requirements.

8. Some of the more highly contaminated samples were diluted prior to analysis, therefore raising the detection limits. A detection limit should be given for each analysis that was done. Both the method and dilution factor should be given.

9. Include QA/QC data, (i.e., duplicate analysis or percent recovery figures), for soil analysis if available.

Please incorporate these comments into your final report.

Also the report issued by your office on May 13, 1988 titled "Draft Report Subsurface Investigation Chevron Hog Island Facility Delaware County, Pennsylvania" can be considered complete and final as we have no further comments. Please submit a final bill regarding the Hog Island investigation.

Should you have any questions regarding this subject, contact Frank Hannigan at 339-7466 or Nick Salladino at 339-7477.

Very truly yours

ORIGINAL SIGNED BY FLH
E.V. SCHNEIDER
for Eric V. Schneider

FLH/eas
bcc: JPE NLS

FLH
Please review this letter & draft a reply letter to D&M with our comments on Zhai report.
LVS

Memorandum

San Francisco, CA
June 9, 1988

REC'D PROCESS ENGINEERING JUN 14 1988 * HANDLE	PROCESS	ENVIRON.
	SUPV.	SUPV. LVS
	TML	FLH
	GDE	LPH
	HLH	VSH
COPY	MAO	VPD
	RMR	
	MJS	
	NTS	
	EGJ	
	OA	
RETURN TO	CO-OP CO-OP	FILE #

Comments issued to D&M 7/14/88

PHILADELPHIA REFINERY
AREA "B" BALLFIELDS ASSESSMENT

MR. E. V. SCHNEIDER:

As discussed with Mr. F. L. Hannigan of your staff, I have reviewed the Dames and Moore contractors report titled, "Investigation of Area B Ballfields Chevron Refinery, Philadelphia, Pennsylvania." Area B is a large mound of oily dirt disposed in the ballfields area of the refinery. The ballfields are separated from the main plant and have a long history of varied used by Gulf and others. The Area B assessment follows an earlier assessment of Area A within the ballfields. The two localized assessments will be combined with an area-wide survey of the ballfields to be completed this summer. Results will indicate options that may be appropriate to mitigate soil contamination in specific portions of the property.

Generally, the subject report is complete and well done. Numerous analysis were run on soil samples taken from test pits and trenches in Area B. Samples were analyzed for:

1. Modified Skinner List for Refinery Waste
2. Polychlorinated biphenyls (PCBs)
3. Total Petroleum Hydrocarbons
4. Total Cyanide
5. Extraction Procedure Toxicity (EP-TOX).

Significant levels of organics and some metals were found in some samples. Total petroleum hydrocarbons ranged to 32,000 ppm. Lead ranged to 637 ppm, total chromium to 3,710 ppm, and vanadium to 243 ppm. PCBs were found in two of the samples. Aroclor 1248 was found at 51 ppm in composite sample B1. Based upon results of these analyses, some further analytical work and possibly mitigation might be warranted for Area B. It is recommended that the general ballfields site assessment be completed prior to doing significant additional work on this soil mound.

The following comments on the contents of the report are offered for your consideration in responding to Dames and Moore.

1. The white sand-like material and white nodules found in the pile should be analyzed and identified. They could potentially be precipitates of some kind.

2. On page 5, the phrase "high levels of concentration" is subjective and should be changed to "significant levels."

3. There is an apparent error on page 5 regarding the maximum detected lead concentration. 637 ppm were detected in sample B-18RRB.

4. After the second bullet on page 5, the "typical concentrations of concern or action levels" should be stated. At least a range should be given. the subjective statements "i.e., high levels" should be removed. "Action Levels" for the PCB compounds that were detected should also be given.

5. The summary should say something about how the old railroad yard samples compared to the pile B samples (i.e., highest lead concentrations).

6. In the Conclusions section, the results of the EP-TOX and RCRA characterization analyses should be summarized.

7. The recommendation regarding State and Federal reporting requirements should be removed. This is the refinery's, not the consultant's responsibility.

8. Some of the more highly contaminated samples were diluted prior to analysis, therefore raising the detection limits. A detection limit should be given for each analysis that was done. Both the method and dilution factor should be given.

9. While we recognize that soil analysis data are less quantitative than water data due to normal heterogeneity, some duplicate analyses or percent recovery figures should be available. If they exist, these QA/QC data should be included.

If I can answer any questions regarding this review, please give me a call.

T. FORT

TF:lgm

cc: Mr. D. G. Dale
Mr. J. W. Fraim
Mr. F. L. Hannigan