REPORT

ON AN ENVIRONMENTAL

SITE ASSESSMENT

AT

BUCKLEY & MANN, INC.
NORFOLK, MA

PREPARED BY

CAMP DRESSER & MCKEE INC.
BOSTON, MA

JULY, 1986

CDM

environmental engineers, scientists, planners, & management consultants

CAMP DRESSER & McKEE INC.

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July 11, 1986

Mr. Richard Mann
Buckley & Mann Inc.
P. O. Box 409
Franklin, MA 02038

Dear Dick:

Enclosed for your review is a draft-final report which responds to the DEQE's March 25, 1986 letter requesting an assessment of the Buckley & Mann site. The DEQE's buried tank removal and/or testing request must still be addressed, presumably as part of the "Final Judgement" in a manner similar to that proposed in CDM's May 29, 1986 letter to you.

I would be pleased to discuss the report with you at your earliest convenience. Please do not hesitate to call if you have any questions.

Very truly yours,

CAMP DRESSER & McKEE INC.

Robert A. Dangel

Approved by:

James T. O'Rourke, Ph.D., P.E.
Senior Vice President

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INTRODUCTION

Buckley & Mann, Inc. (B&M) has manufactured textile products at its facility in Norfolk, MA northwest of the junction of Park and Lawrence Streets for over 100 years. Until recently, the company operated a small dyehouse which discharged wastewater to two lagoons for settling and facultative biological treatment, the outflow from the lagoons is by percolation to the ground. The Massachusetts Department of Environmental Quality Engineering (DEQE) asked B&M to conduct a study of the impact of the lagoons and some nearby, old solid waste disposal areas on the groundwater. Camp Dresser & McKee (CDM) was retained by B&M to develop a plan of investigation and execute the plan. The report describes CDM's work and conclusions about the groundwater and soils on the site.

RECENT HISTORY OF THE SITE

B&M has operated both a carbonizer and a dyehouse, as wastewater generating processes, in addition to its dry textile manufacturing operations. Until it was discontinued and demolished in about 1965, the carbonizer was part of a process to reclaim wool from old garments by passing the stock through acidic steam. This charred the cotton threads on the seams, zippers, buttons, etc. and facilitated their separation from the wool. The wool was then neutralized and rinsed, and the solid residues were discarded, mostly on-site. The wastewater from the neutralization and rinsing was discharged via a shallow ditch to the Carbonizer lagoon for settling and facultative biological treatment.

The dyehouse operations were fully discontinued in June, 1986, although little fiber was dyed after March, 1986. Over the previous 10 years, about 90% of the work was polyester fiber processed with disperse dyes. Of the

remainder, basic dyes accounted for about 8% and acid dyes for the other 2%. In earlier years, chrome dyes were applied to wool. The total wastewater flow was estimated by B&M at 30,000 to 40,000 gallons per week. The wastewater was discharged via a ditch to Lagoon #1 for settling and facultative biological treatment.

In 1978, B&M constructed two new lagoons to supplement Lagoon #1. Lagoon #2 received the overflow from Lagoon #1. The wall of Lagoon #3 was breached in 1978 to drain a groundwater spring which upwelled into the lagoon. Lagoon #3 remains as a large diversion ditch and has never received wastewater.

The industrial activities at B&M have been conducted in a cluster of buildings near Lawrence Street. The area north of the buildings, between Lagoon #1 and the Carbonizer lagoon, is covered with varying amounts of fiber wastes, carbonizer residue (including buttons), and building and machinery debris. The dike separating the Carbonizer lagoon from the Mill River is made of soil mixed with fiber residue from dredging the lagoon, probably prior to 1940. The areas outside the immediate vicinity of the manufacturing buildings support a hardwood forest.

The site and the neighboring properties are shown in Figure 1. Adjacent uses are residential, proposed residential and undeveloped and are all well separated from B&M's activities by virtue of B&M's boundaries.

GEOLOGY AND HYDROGEOLOGY

Regional Conditions

The geology and hydrogeology of the area was described in a December, 1985 untitled draft report by Goldberg-Zoino and Associates (GZA). The GZA study area was to the south side of Lawrence Street, across from B&M. CDM reviewed the topography of the area from the USGS Wrentham map and a field visit. CDM also reviewed the hydrogeology from the USGS Massachusetts Hydrologic - Data Report No. 19 for the Charles River Basin to develop a

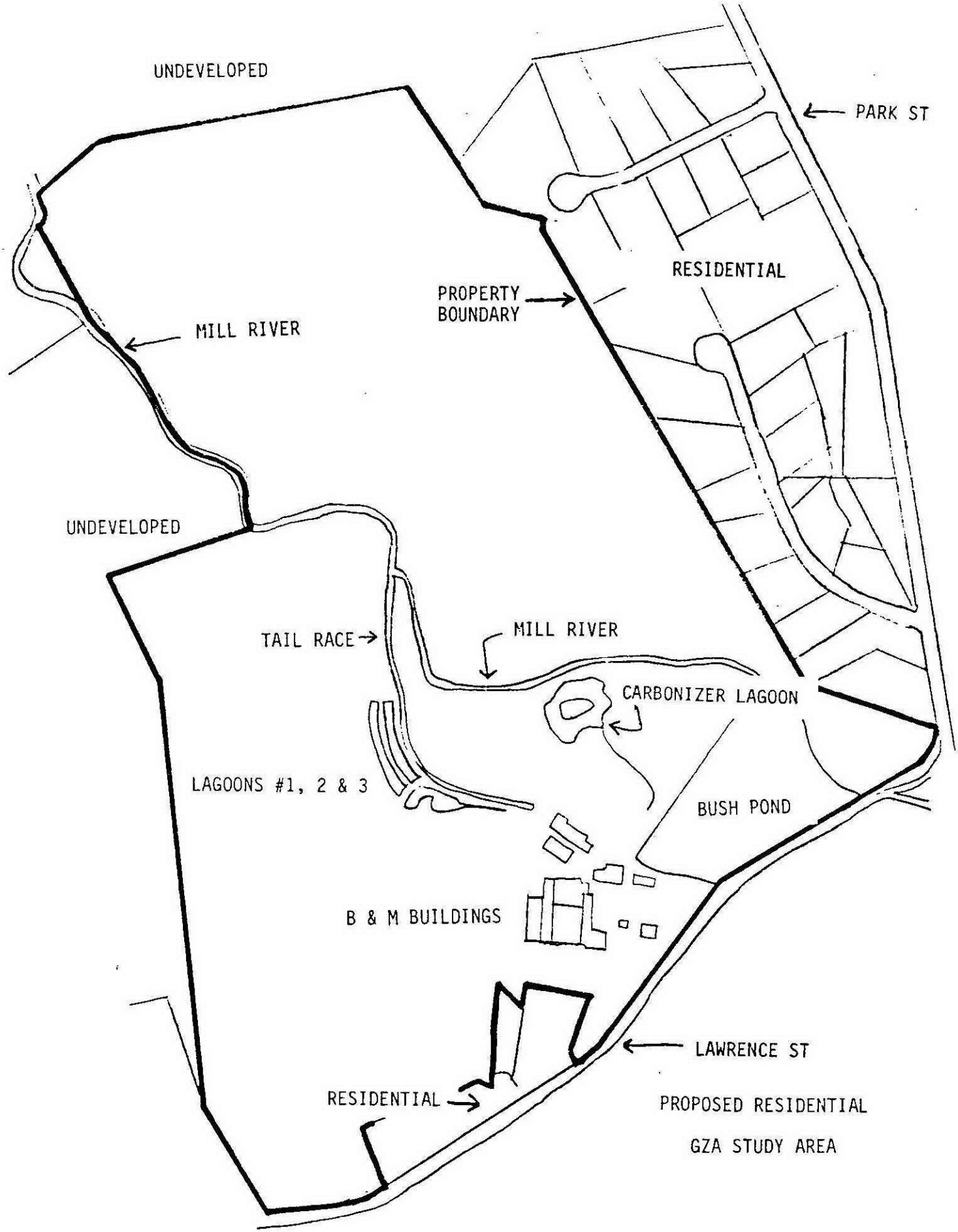

FIGURE 1
BUCKLEY & MANN PROPERTY BOUNDARY
AND ADJACENT LAND USE

Scale 1" is about 430'

conceptual understanding of the regional groundwater hydrology. From the USGS data and Norfolk town records, CDM established that local residences obtain water from individual bedrock wells and there are no public water supply wells or other major groundwater withdrawals within one mile of B&M. Based on the above information, CDM concluded that the Mill River acts as the drainage for runoff from the surrounding low hills, which consists of rhyolite and shale bedrock overlain by glacial till and stratified drift. Precipitation which does not runoff or evapotranspirate percolates into and through the unconsolidated soils and joints and fractures in the bedrock to recharge groundwater. The groundwater then flows to the Mill River, which act as a discharge point for the region.

Site Conditions

In 1977 and 1978, R.E. Chapman installed five monitoring wells near the lagoons. Two wells were removed during or after construction of Lagoons #1 and #2. The remaining 3 wells were installed in sand and gravel over bedrock encountered at between 18 and 27 feet below grade, according to Chapman's boring logs. The screens extended to near the bedrock. EW-1 and EW-3 were filled with silt or obstructed at less than 5 feet below grade during the May, 1986 sampling program.

On April 21 through 23, 1986, CDM observed the installation by Guild Drilling Co., Inc. of five water table wells in unconsolidated soils and one bedrock well at B&M. The locations are shown on the drawing attached with this report and the boring logs are included in Appendix A. The well boreholes encountered statified drift ranging from gravel to sand with some silt. No glacial till was encountered in any of the boreholes. The bedrock well was constructed in rhyolite, which showed little surface weathering and had tightly closed joints filled with silt. The wells were developed with air and water purging immediately after completion. Subsequently, water in the wells was pumped to waste with a peristaltic pump about one week before samples were collected.

Water elevations relative to the top of the well casings were measured on May 7, 1986, before sample collection. On June 10-11, 1986, the elevations of top of the well casings were determined, along with several surface water elevations, in a survey by Stavinski Engineering Associates, Inc. The elevations of the well casings, groundwaters and surface waters are shown on the Drawing.

Based on the survey data, the lowest water elevation line in the study area is along the Tailrace. Ground and surface water elevations to the west of the Tailrace, including Lagoons 1, 2 and 3 and wells MW-3, EW-1, EW-2 and EW-3 were higher than observed in the Tailrace, generally as would be expected from the ground surface contours. The bedrock well, MW-3A, near the Tailrace had a 1.5 foot higher water level than the adjacent well MW-3 constructed in the unconsolidated overburden soils. Water elevations in monitoring wells MW-4, MW-5 and MW-6 and the Carbonizer lagoon indicate the presence of a groundwater mound between the Mill River and the Tailrace. General groundwater flow directions are shown by the arrows on the Drawing.

The site data confirms that the general description of the regional geo-hydrology in the Mill River valley, prepared by GZA is accurate, except that the Tailrace as well as the Mill River are groundwater discharge locations in the B&M study area. The bedrock well (MW-3A) water elevation indicates that there is a vertical flow up from the bedrock to the unconsolidated overburden in the vicinity of the Tailrace, as would be expected at a discharge location.

SAMPLING AND ANALYSIS

The sampling and analysis plan shown in Table 1 was prepared after several discussions between CDM and the DEQE. CDM was able to collect and analyze all of the samples described in the plan, with the exception of four soils and sludges from the lagoons, as explained below.

Twelve-inch soil cores from Lagoon #1 showed about a 6" layer of organic sludge including some leaves and fiber, underlain by a mixture of sand and

TABLE 1
BUCKLEY & MANN SITE
SAMPLING AND ANALYSIS PLAN
(X - Sample collected and analyzed. O - Sample omitted)

Sample Code	Sample Name	VOA	Metals	B/N	pH, SC, Alk, T	Anions	COD	Comment
SW-1	Tailrace at culvert exit downstream of Dyehouse	X	X	X	X	X		Test for Hg
SW-2	Boiler Blowdown				X	X		Test for Fe, Na
SW-3	Lagoon #2	X	X	X	X	X	X	
SW-4	Lagoon #1	X	X		X		X	
SW-5	Mill River 100 Ft below confluence with Tailrace	X	X		X	X		
SW-6	Bush Pond	X	X		X	X		
SW-7	Cooling Waters				X			
MW-2	Upgradient Watertable Well	X	X	X	X	X	X	
MW-3	Watertable Well N. of Lagoon #2	X	X	X	X	X	X	
MW-3A	Bedrock Well N. of Lagoon #2	X	X	X	X	X	X	
MW-4	Watertable Well near drums in Old Disposal Area	X	X		X		X	
MW-5	Watertable Well between Tailrace and Mill River (WP-1)	X	X	X	X		X	
MW-6	Watertable Well NW of Carbonizer Lagoon	X	X		X	X	X	
GW-1	Bedrock Well at 25 Lawrence St.	X	X	X	X		X	
GW-2	Bedrock Well at B&M	X	X	X	X		X	
GW-3	Dug Well at B&M	X	X	X	X		X	

TABLE 1 (Cont'd)
BUCKLEY & MANN SITE
SAMPLING AND ANALYSIS PLAN (Cont'd)

Sample Code	Sample Name	VOA	Metals	B/N	pH, SC, Alk, T	Anions	COD	Comment
SS-1	Soils near drums at Old Disposal Area	X	X					
SS-2	Soils at Sludge Pile W. of Lagoon #1		X					
SS-3	Soil Core Lagoon #2: Sludge	0	X					
	: Subsoil	0	0					
SS-4	Soil Core Lagoon #1: Sludge	0	X	X				
SS-4A	: Subsoil	X	X	X				
SS-5	Soil Core Carbonizer Lagoon: Sludge	X	X					
SS-5A	: Subsoil	X	X					
ST-1,2,3	Cesspools & Septic Tanks Tanks	XXX		X				Composite B/N
EW-1,2,3	Existing Monitoring Wells*						XXX	
	Water	17	14	10	16	12	11	Hg,Fe,Na-1
	Solid/Sludge	4	7	2	--		--	
	Total	21	21	12	16	12	11	

VOA = Volatile organic by EPA Method 624
Metals = As, Cd, Cr, Pb, Se, Ag, Fe, Na, Al, Zn
B/N = Base/Neutral extractable organics by EPA method 8270 or 625, with library search for other peak identification of non-priority pollutants.
pH, SC, Alk, T = pH, specific conductivity, alkalinity and temperature.
Anions = Anions by the ion chromatograph method.
COD = Chemical oxygen demand.

*The designations EW-2 and EW-3 are different from the previous numbering for these wells.

sludge. It was not possible to obtain a longer core due to the water level in the lagoon and the loose sand encountered. No volatile organics (VOA) sample was collected from the top sludge layer because CDM judged that the result would be the same as the lagoon water.

Lagoon #2 had less than 1/2" of sludge in the area accessible from the banks. The underlying soils were coarse sand mixed with gravel and appeared clean. Consequently, a sample of sludge, but not subsoil, was collected for metals analysis. No samples were collected for VOA from the sludge or soils in Lagoon #2, because CDM judged that the results would be the same as the lagoon water.

The Carbonizer lagoon was found to have a soft bottom. CDM collected 12" soil cores and submitted separate composites of the top and bottom layers to the laboratory.

Groundwater was collected from the wells by a peristaltic pump. Nevertheless, there was considerable silt in the waters. CDM filtered all groundwater samples prior to preservation with nitric acid for metals analysis.

The analytical methodologies are described fully in the Appendix B to this report, along with the complete analytical results. Library searches were conducted on the volatile organic chemical analysis (VOA, EPA Method 624) and base/neutral extractable organic chemical analysis (EPA Method 625 or 8270) spectra to identify non-priority pollutant compounds.

The analytical results are summarized in Tables 2 through 5 and are discussed below.

SURFACE AND GROUNDWATERS

All samples had similar results within the ranges expected for pH, alkalinity, temperature, conductivity, anions and COD in uncontaminated waters of southeastern Massachusetts, based on comparison with data from other sites.

TABLE 2

CONVENTIONAL PARAMETERS

	Bush Pond SW-6	Trailrace Head SW-1	Cooling Water SW-7	Mill River SW-5	Upgradient Well MW-2	Bedrock Well 25 Law. St. GW-1	Bedrock Well B & M GW-2	Dug Well B & M GW-3
pH	6.59	6.04	6.68	7.02	6.43	6.94	6.39	6.71
Temp., ^{o}C	15.2	13.0	26.0	14.8	8.1	13.3	-	12.4
Conductivity, umho	158	160	153	152	74	168	221	208
Alkalinity, mg/l as $CaCO_3$	18	35	19	28	17	110	68	13
Chloride, mg/l	27	36	44	30	7.4	<0.5	21	68
Nitrate, mg/l	<0.5	<0.5	<0.5	<0.5	0.9	<0.5	2.3	7.2
Sulfate, mg/l	12	8.3	12	11	10	5.0	14	10
COD, mg/l	-	-	-	-	50	-	-	-

Fluoride, nitrite and bromide were <0.5 mg/l in all samples.

Orthophosphate was <1.0 mg/l in all samples.

TABLE 2 (Cont'd)

CONVENTIONAL PARAMETERS

	MW-3	Bedrock Well MW-3A	MW-4	MW-5	MW-6	EW. 1,2,3	Lagoon #1 SW-4	Lagoon #2 SW-3	Boiler Blowdown SW-2
pH	6.23	6.89	6.42	6.20	6.45	-	7.18	6.70	9.2
Temp., ^{o}C	-	9.5	9.0	8.0	7.8	-,8.9, -	-	-	85
Conductivity, umho	86	102	92	100	153	-	730	352	1330
Alkalinity, mg/l as $CaCO_3$	18	32	17	24	25	-	270	130	320
Chloride, mg/l	14	12	7.8	14	24	-	22	14	75
Nitrate, mg/l	0.8	8.2	1.6	0.7	<0.5	-	<0.5	<0.5	0.6
Sulfate, mg/l	9.8	10	11	9.4	9.7	-	170	74	240
COD, mg/l	<10	<10	<10	<10	40	<10,<10,140	440	360	-

Fluoride, nitrite and bromide were <0.5 mg/l in all samples

Orthophosphate was 2.8 mg/l in SW-4, 2.4 mg/l in SW-3, 3.6 mg/l in SW-2 and <1.0 mg/l in all other samples.

TABLE 3

METALS

(All Concentrations in mg/l)

	Bush Pd. SW-6	Trailrace Head SW-1	Mill River SW-5	Upgradient Well MW-2	Bedrock Well 25 Law. St. GW-1	Bedrock Well B & M GW-2	Dug Well B & M GW-3
Ag	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Al	0.13	0.29	<0.1	0.21	<0.1	0.22	0.11
As	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
Cd	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cr	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025
Fe	0.13	2.8	0.16	<0.025	0.44	<0.025	0.13
Na	20	20	21	8.1	14	21	31
Pb	<0.003	0.004	<0.003	<0.003	0.004	0.006	0.005
Se	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zn	<0.02	<0.02	<0.02	<0.02	0.02	0.02	<0.02
Hg		<0.0004					

SW-2 Boiler Blowdown Fe 4.5, Na 260

TABLE 3 (Cont'd)

METALS

(All concentrations in mg/l)

	MW-3	Bedrock Well MW-3A	MW-4	MW-5	MW-6	Lagoon #1 SW-4	Lagoon #2 SW-3
Ag	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Al	0.15	<0.1	0.12	0.31	0.32	0.61	0.27
As	<0.16	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
Cd	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cr	<0.025	<0.025	<0.025	<0.025	<0.025	0.72	0.09
Fe	<0.025	<0.025	0.11	0.96	1.9	0.76	2.1
Na	9.5	8.3	6.1	9.1	18	180	73
Pb	<0.003	<0.003	0.007	<0.003	0.003	0.03	0.009
Se	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Zn	0.03	<0.02	<0.02	<0.02	<0.02	0.23	0.10

TABLE 3 (Cont'd)

METALS

(All concentrations in mg/kg)

	Soils SS-1	Soils SS-2	Lagoon #1 Sludge SS-4	Lagoon #1 Sludge SS-4A	Lagoon #2 Sludge SS-3	Carbonizer Lag. Sludge SS-5	Carbonizer Lag. Sludge SS-5A
Ag	16	<1.0	<1.0	<1.0	<1.0	5.7	<1.0
Al	27,000	11,000	7600	5900	5900	6700	13,000
As	21	12	2.1	2.9	1.3	4.7	2.7
Cd	28	<2.5	<2.5	<3.8	<2.8	18	2.9
Cr	1000	2100	270	1300	430	450	62
Fe	110,000	13,000	10,000	8400	7700	7600	5800
Na	1300	97	250	850	311	200	96
Pb	1200	38	12	19	12	670	88
Se	0.35	0.50	<0.19	0.57	<0.21	0.97	0.44
Zn	8200	110	930	4600	230	920	260

TABLE 4
VOLATILE ORGANIC COMPOUNDS
(All concentrations in ug/l for water and ug/kg/ for soil and sludge)

	Bush Pd. SW-6	Tailrace Head SW-1	Mill River SW-5	MW-2	Bedrock Well 25 Law. St. GW-1	Bedrock Well B & M GW-2	Dug Well B & M GW-3
Detection Limit	10	10	10	10	10	10	10
None	*	*	*	*	*	*	*

	MW-3	Bedrock Well MW-3A	MW-4	MW-5	MW-6	Lagoon #1 SW-4	Lagoon #2 SW-3
Detection Limit	10	10	10	10	10	10	10
None	*	*	*	*	*	*	*
1,1,1-Trichloroethane						P	
Toluene						P	
Xylenes						45	

	Soils SS-1	Lagoon #1 Sludge SS-4A	Carbonizer Lag. Sludge SS-5	Carbonizer Lag. Sludge SS-5A	Septic Tank ST-1	Septic Tank ST-2	Septic Tank ST-3
Detection Limit	25	45	25	25	10	10	10
None	*		*	*	*	*	*
Trichloroethene		45					
Benzene		P					
1,1,2,2-Tetrachloroethene		P					
Toluene		150				91	
Chlorobenzene		1100					
Ethyl benzene		860					
Xylenes		2100				20	

* None - No priority pollutants and no other compounds detected.
P = Present, but at a concentration below the detection limit.

TABLE 5
BASE/NEUTRAL EXTRACTABLE COMPOUNDS
(All concentrations in ug/l)

	Tailrace Head SW-1	MW-2	Bedrock Well 25. Law. St. GW-1	Bedrock Well B & M GW-2	Dug Well B & M GW-3	MW-3	Bedrock Well MW-3A	MW-5
Detection Limit	10	10	10	10	10	10	10	
None	*		*	*	*			
Benzamide N-(1,1-dimethylethyl) -4-Methyl-		6						27
Benzenesulfonamide, N-Butyl						32	11	

*None - No priority pollutants and no other compounds detected.

TABLE 5 (Cont'd)
BASE/NEUTRAL EXTRACTABLE COMPOUNDS

	Lagoon #2 Water SW-3 ug/l	Lagoon #1 Sludge SS-4 ug/kg	Lagoon #1 Sludge SS-4A ug/kg	Septic Tanks ST-C ug/l
Detection Limit	10	3300	1700	10
Priority Pollutants				
1,3-Dichlorobenzene			3200	
1,4-Dichlorobenzene			9100	34
1,2-Dichlorobenzene			5700	
Hexachloroethane	22			
1,2,4-Trichlorobenzene		1600	61,000	
Napthalene	50	10,000	8700	
Acenaphthene	73	8600	5300	
Fluorene	47	3400		
Phenanthrene	33			
Other Compounds				(See Appendix B)
Benzamine	53			
Benzene, 2-ethyl-1,4Dimethyl-	95	7700	3800	
Napthalene, 2-Methyl-	250	11,500	13,000	
1,1-Biphenyl	340	23,000	29,000	
Heptadecane	150	7000	6500	
Dibenzofuran	50	4700		
Isoquinoline		1400		
Naphthalene,2,3-Dimethyl		1300		
Naphthalene,1,2-Dimethyl		2100		
Phenol, 4-Nonyl		10,000	11,000	
Benzene,1,2,3-Trichloro-			4700	
Benzene, 1,2,3,5-Tetramethyl			5400	
Phenol, 4-(2,2,3,3-Tetramethylbutyl)-			6300	

No metals were found above trace levels, except for iron, aluminum and sodium, which were present at concentrations typical for the area. No volatile organic compounds were found. No base/neutral priority pollutants were found, although traces of surfactants were found in four wells.

The COD was less than 10 mg/l in MW-3, 3A, 4 and 5 and EW 1 and 2. The COD was 50 mg/l in the upgradient well MW-2, 40 mg/l in MW-6 and 140 mg/l in EW-3. There is no pattern in the higher COD samples, in terms of proximity to the lagoons or groundwater elevation. EW-3 and MW-6 are near swampy areas, which may account for the presence of oxygen demanding substances.

LAGOONS #1 AND #2 - WATER

Wastewater samples from Lagoons #1 and #2 had higher alkalinity, conductivity, sulfate, COD and sodium than the uncontaminated surface and groundwaters, but were similar in the other conventional parameters. Lagoon #1 had 0.72 mg/l of chromium, and both lagoons had zinc concentrations slightly above background levels. The other metals were present at concentrations below the detection limits or comparable with non-contaminated samples. Lagoon #1 contained 45 ug/l of xylene and less than 10 ug/l of toluene and 1,1,1-trichloroethane. Lagoon #2 contained no volatile organic compounds, but the base/neutral extract contained a variety of naphthelene derivates and related compounds, typical of dyecarriers, at concentrations up to 340 ug/l.

MISCELLANEOUS WATERS

The non-contact cooling water was almost identical to Bush Pond water, other than temperature. The boiler blowdown had conductivity, alkalinity and dissolved salts typical of blowdown.

SOILS AND SLUDGES

The soil and sludge samples were subjected to a rigorous hot acid/hydrogen peroxide digestion prior to metals analysis. Hence, metal ions normally

present in the soil were dissolved in the sample preparation procedure. Likewise, metal ions incorporated in textile fiber mixed with the soil and sludge were dissolved.

Aluminum and iron were the principal metals in all soil and sludge samples. Traces of silver, arsenic, cadmium and selenium were found in some samples at concentrations which could be expected for uncontaminated soils. Chromium was found in the range of 62 to 1000 mg/kg and most likely originates from chrome-dyed textile fiber. Lead was above the anticipated background level in soil sample SS-1 and Carbonizer lagoon sludge sample SS-5. Zinc concentrations ranged from 110 to 8200 mg/kg. Zinc may derive from the basic dye family or from brass buttons, zippers, etc.

The metal contentrations (except for iron and aluminum) in the Carbonizer lagoon were two to ten times greater in the surface sludge as compared to the samples taken about 6 to 12 inches into the sediments. In contrast, the lower sample layer had slightly higher metal concentrations in Lagoon #1.

Of the four soils and sludges tested for volatile organics, detectable concentrations were found only in SS-4A, the lower sludge layer from Lagoon #1. Toluene, ethylbenzene, xylenes and chlorobenzene were the principal compounds detected. These are all related to dyeing operations.

The base/neutral extractable analyses of the upper and lower sludge/soil layers in Lagoon #1 contained a variety of naphthalene and benzene derivatives at concentrations up to 61,000 ug/kg (61 mg/kg). The compounds are all related to dyeing operations, mostly as dye carriers or impurities in dye carriers.

SEPTIC TANKS

Of the three septic tanks tested for volatile organics, only ST-2 contained any compounds above the detection limit. ST-2 had traces of toluene and xylene. The base/neutral extractable organic analysis of the composite of

the three septic tanks contained a variety of aliphatic and several proteinaceous compounds. A listing of the compounds is included with the complete analytical data in Appendix B. The compounds are typical of what would be expected from human wastes, with the addition of a small amount of paint thinner.

CONCLUSIONS AND RECOMMENDATIONS

In this section, CDM presents its conclusions and recommendations for cleanup of the Buckley & Mann site, based on the laboratory data, visual observations and the history of the site.

Surface and Groundwaters

There was no analytical evidence that the wastewater lagoons or solid wastes on the site have caused any contamination of the Mill River or the Tailrace. CDM found above background COD levels in monitoring well EW-1 adjacent to the Lagoon #1 in previous sampling in 1979 and 1980, so it is likely that the groundwater between Lagoons #1 and #2 and the Tailrace continues to be contaminated with partially treated leachate from the Lagoons. Traces of surfactant found in four wells, including the up-gradient well, in CDM's May 1986 sampling program are not considered significant. Otherwise, there is no evidence that the lagoons or the solid wastes on the site have had any impact on the groundwater.

As there is no longer any wastewater discharged to the lagoons, CDM anticipates that the contaminated groundwaters immediately adjacent to Lagoons #1 and #2 will be further treated by soil microorganisms and diluted by groundwater. Consequently, CDM recommends that B&M take no action in regard to groundwater on the site.

Lagoons #1 and #2 Water

The wastewater in Lagoons #1 and #2 contain dyehouse wastewater that has undergone facultative biological treatment and dilution from rain since the

dyehouse was shutdown. CDM anticipates that further purification and dilution will occur during the summer. The water levels in the lagoons should drop during the summer of 1986, and by fall Lagoon #2 should be dry and Lagoon #1 nearly dry, assuming normal precipitation. Consequently, CDM recommends that B&M take no action with regard to the water in Lagoon #1 and #2.

Lagoon #1 and #2 Sludge

The sludge in Lagoons #1 and #2 contain both metals and dyecarriers including naphthalene and benzene derivatives. CDM analyzed samples of the sludges from the lagoons in 1980 by the RCRA Extraction Procedure method and found less than 0.1 mg/l of lead and 0.1 mg/l chromium in the extracts. Consequently, the sludges are not hazardous wastes.

The dyecarrier compounds are amenable to aerobic biological decomposition, according to literature reports. This is supported by observation of the sludge which was dredged from Lagoon #1 prior to 1975 and deposited nearby. The sludge appears to be stabilized and looks like fine grained soil with fabric/fiber scraps mixed in, has no black color or odor, and supports vegetation. CDM proposes that the sludge from Lagoons #1 and #2 be stabilized in a similar, but faster aerobic process: composting. Sludge would be mixed with wood chips and leaves and aerated with a blower through perforated pipe in a windrow arrangement. The composting would be performed adjacent to Lagoon #1. A pilot project would be conducted on the process in the fall of 1986. If successful, full scale operation would commence in the warm months of 1987. The estimated quantities of sludge are 600 and 50 cubic yards for Lagoons #1 and #2, respectively.

After removal and treatment of the sludge, the lagoons would be filled and regraded with clean fill available nearby on the site. The stabilized sludge, which would be primarily sand and composted leaves/wood chips, would remain on-site to decay further, or could be trucked to a licensed landfill.

Carbonizer Lagoon

The Carbonizer Lagoon sediments contain metals, which were greater in the upper 6-inches than the next lower 6-inches. There is no evidence from MW-6 that any of the metals are leaching into the groundwater. The lagoon was well-established wetland vegetation on the non-flooded areas, and a soft bottom, indicating that it was probably swampland prior to construction of the containment dikes. Consequently, any filling or dredging would require special permits under Massachusetts wetland regulations. As the lagoon sediments do not appear to have any impact on the groundwater, CDM recommends that B&M take no action with regard to the Carbonizer Lagoon.

Residues and Debris

The machinery, building materials, carbonizer process residues (including buttons and zippers) and sludge dredged from Lagoon #1 discarded on the site have had no impact on the ground or surface waters, based on the laboratory results. Consequently, there is no need to remove these materials from the site. Nevertheless, CDM recommends that B&M initiate a program for aesthetic reasons to excavate and dispose of the soils and debris at a local, licensed landfill. Removal of the material would enhance the value of B&M's land. CDM recommends that such a program be conducted as expeditiously as possible within B&M's financial capability, with completion within 3 to 5 years.

Septic Tanks

Septic Tank #2 contained traces of toluene and xylene, and is the most likely source of the aliphatic compounds observed in the base/neutral extract composite. As the compounds were present at low concentrations (most at less than 100 ug/l), CDM recommends that B&M take no action, other than ensuring that the septic systems be used in the future for disposal of sanitary wastes only.

APPENDIX A

BORING LOGS

Camp, Dresser & McKee, Inc. One Center Plaza, Boston, Massachusetts 02108

Soil Boring Log

Well Installation and Completion Data

Client Buckley & Mann Inc. Site Norfolk, MA Job No. 1121-5-RT Surveyed Elevation: Ground _____

Date Drilled 4/21/86 Well No. MW-2 Boring Co. Guild Drilling Co. Top of Casing 175.31 Screen Length 10.0'

Total Depth 16.0' Boring Method Used Hollow Stem Auger Piezometer Casing Size & Type 1.5" Schedule 40 PVC

Field Geologist M. D. Johnson Organic Vapor Instruments Used HN_U Water Table Depth 9.0'

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. - PPM	Sample Description	Strata. Change	Equipment Installed
						0-0.5' Topsoil Loam		Cement
						Brown fine-course sand and gravel subangular-subrounded		Bentonite Pellets
						4.0'		
5	1	13-25-43	4.0-5.5'	18"/18"	Oppm	Tan fine sand some silt, trace gravel	sand and gravel	
						5.0'		#2 Morry Sand
						9.0'-9.5' Tan fine-medium sand and gravel, trace silt		
10	2	10-8-11	9.0-10.5'	18"/18"	Oppm	9.5'-10.5' Tan fine silty sand	9.5' silty sand	10.0' Sch 40 PVC Screen
						14.0'-15.0' Tan course angular sand, trace gravel	14.0' sand	
15	3	17-14-27	14.0-15.5'	18"/18"	Oppm	15.0'-15.5' Tan fine silt, trace fine sand	15.0' silt	@ 16.0'

Remarks:

amp, Dresser & McKee, Inc. One Center Plaza, Boston, Massachusetts 02108

Soil Boring Log

Well Installation and Completion Data

Client Buckley & Mann Inc. Site Norfolk, MA Job No. 1121-5-RT Surveyed Elevation: Ground _____

te Drilled 5/22/86 Well No. MW-3 Boring Co. Guild Drilling Co. Top of Casing 164.81 Screen Length 7.5'

Total Depth 10.5' Boring Method Used Hollow Stem Auger Piezometer Casing Size & Type 1.5" Schedule 40 PVC

Field Geologist M. D. Johnson Organic Vapor Instruments Used HNu Water Table Depth 4.0'

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. - PPM	Sample Description	Strata. Change	Equipment Installed
						0-0.5' Topsoil (Loam)		Cement
						Brown fine-course sand and gravel subangular-rounded, little cobbles	sand and gravel	Bentonite Pellets
						4.0'		
		25-33-46	4.0-5.5'	18"/18"	1 ppm	Brownish green fine-course sand and fine-medium gravel, angular-subangular, trace silt		#2 Morry Sand
5						5.5'		
								7.5' Sch 40 PVC Screen
		27-50/3"	9.0-10.5'	9"/9"	Oppm	9.0' Brown-tan fine-course sand, angular-subangular and fine-medium gravel (angular)		@ 10.5'
10						10.5'		

Remarks:

Camp, Dresser & McKee, Inc. One Center Plaza, Boston, Massachusetts 02108

Soil Boring Log

Well Installation and Completion Data

Client Buckley & Mann Inc. Site Norfolk, MA Job No. 1121-5-RT Surveyed Elevation: Ground _____

Date Drilled 5/22-23/86 Well No. MW-3A Boring Co. Guild Drilling Co Top of Casing 165.32 Screen Length 10.0'

Total Depth 25'3" Boring Method Used Hollow Stem Auger Piezometer Casing Size & Type 1.5" Schedule 40 PVC

Field Geologist M. D. Johnson Organic Vapor Instruments Used HNu Water Table Depth 4.0"

Depth (feet)	Samp. No.	NX-Core min./ft.	Sample Interval	Adv./ Recov.	Org. Vap. - PPM	Sample Description	Strata. Change	Equipment Installed
						No samples taken See MW-3 Logsheet for unconsolidated statigraphy		
								Cement
5							sand and gravel	
10		5 min/ft	12'3"-17'3"	60"/60"		12'3"	12'3"	Bentonite Pellets
		5 min/ft 5 min/ft 5 min/ft				Rhyolite-Quartz, Alkali Feldspar minerals, some plagioclase and mafic minerals 14'7" Tightly closed fracture 45° Dip South	Rhyolite	
15		5½ min/ft 5½ min/ft	17'3"-23'3"	60"/60"		Same as above 18'4" Fracture 45° Dip East filled with silt 1/8 inch spacing		#2 Morry Sand
		5 min/ft 4½ min/ft 5 min/ft						
20		4 min/ft 5 min/ft	23'3"-25'3"	36"/36"		21.0' Fracture irregular 40-50° Dip Southeast closed spacing Same as above		10.0' Sch. 40 PVC Screen
		5½ min/ft 4 min/ft				23'3" Fracture 90° closed spacing		
25						25'3"	25'3"	@ 25'3"

Remarks:

Camp, Dresser & McKee, Inc. One Center Plaza, Boston, Massachusetts 02108

Soil Boring Log — Well Installation and Completion Data

Client Buckley & Mann Inc. Site Norfolk, Inc. Job No. 121-5-RT Surveyed Elevation: Ground _____

Date Drilled 4/21/86 Well No. MW-4 Boring Co. Guild Drilling Co. Top of Casing 166.55 Screen Length 7.5'

Total Depth 10.5' Boring Method Used Hollow Stem Auger Piezometer Casing Size & Type 1.5" Schedule 40 PVC

Field Geologist M. D. Johnson Organic Vapor Instruments Used HNu Water Table Depth 3.0'

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. - PPM	Sample Description	Strata. Change	Equipment Installed
						0-0.5' Topsoil (Loam)		Cement Bentonite Pellets
						Brown medium-course sand and gravel, trace cobbles	sand and gravel	
						4.0'	4.0'	#2 Morry Sand
5	1	10-12-11	4.0'-5.5'	18"/18"	0ppm	Tan fine silt, trace-little sand 5.0'	silt 5.0'	
						Tan fine-medium rounded sand 5.5'	sand	
						2" fine silt		
						9.0'		7.5' Sch 40 PVC Screen @ 10.5'
10	2	2-5	9.0-10.0'	12"/12"	0ppm	Tan-gray fine silty sand 10.0'	9.0' silty sand	

Remarks:

Camp, Dresser & McKee, Inc. One Center Plaza, Boston, Massachusetts 02108

Soil Boring Log

Well Installation and Completion Data

Client Buckley & Mann Inc. Site Norfolk, MA Job No. 1121-5-RT Surveyed Elevation: Ground _____

Date Drilled 4/21/86 Well No. MW-5 Boring Co. Guild Drilling Co. Top of Casing 164.57 Screen Length 7.5'

Total Depth 10.0' Boring Method Used Hollow Stem Auger Piezometer Casing Size & Type 1.5" Schedule 40 PVC

Field Geologist M. D. Johnson Organic Vapor Instruments Used HNu Water Table Depth 3.5'

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. - PPM	Sample Description	Strata. Change	Equipment Installed
						0-0.5' Topsoil (Loam)		Cement Bentonite Pellets
						Tan-brown medium-coarse gravel, some sand, little cobbles	Sand and Gravel	
						4.0'	4.0'	
5	1	9-7-6	4.0-5.5'	18"/4"	Oppm	Brown medium-coarse angular sand, little silt	sand	#2 Morry Sand
						5.5'		
								7.5' Sch 40 PVC Screen
10	2	10-14-14	9.0-10.5'	18"/18"	Oppm	9.0'-9.5' Light brown medium-coarse angular sub-angular sand		@ 10.0'
						9.5-10.5' Fine light brown silt	9.5' silt	
15								

Remarks:

Camp, Dresser & McKee, Inc. One Center Plaza, Boston, Massachusetts 02108

Soil Boring Log — Well Installation and Completion Data

Client Buckley & Mann Inc. Site Norfolk, MA Job No. 1121-5-RT Surveyed Elevation: Ground _____

Date Drilled 4/22/86 Well No. MW-6 Boring Co. Guild Drilling Co. Top of Casing 168.06 Screen Length 7.5'

Total Depth 10.5' Boring Method Used Hollow Stem Auger Piezometer Casing Size & Type 1.5" Schedule 40 PVC

Field Geologist M. D. Johnson Organic Vapor Instruments Used HNu Water Table Depth 3.5'

Depth (feet)	Samp. No.	Blows per 6" 140 lbs.	Sample Interval	Adv./ Recov.	Org. Vap. - PPM	Sample Description	Strata. Change	Equipment Installed
						0.-0.5' Topsoil (Loam)		Cement Bentonite Pellets
						Brown fine silty sand, trace clay	silty sand	
						4.0'	4.0'	
5	1	20-42-54	4.0-5.5'	18"/12"	0.5 ppm	Brown fine-coarse sand and gravel subrounded, trace silt	sand and gravel	#2 Morry Sand
						5.5'		
								7.5' Sch 40 PVC Screen @ 10.5'
						9.0'	9.0'	
10	2	6-8-14	9.0-10.5	18"/18"	0ppm	Green-gray fine silt, some fine sand rounded	sandy silt	
						10.5'		

Remarks:

APPENDIX B

COMPLETE ANALYTICAL

RESULTS

CAMP DRESSER & McKEE CLIENT _____ JOB NO. _____ COMPUTED BY _____
PROJECT _____ DATE CHECKED _____ DATE _____
DETAIL _____ CHECKED BY _____ PAGE NO. _____

KEY TO SAMPLE IDENTIFICATION

SAMPLE LOCATION	SAMPLE ID #	CDM LAB. #186__	CAA LAB. #	Compositor Lab. # 849__
BUSH POND	SW-6	13	06	
TAILRACE HEAD	SW-1	15	15	17
COOLING WATER	SW-7	16		
MILL RIVER BELOW JUNCTION	SW-5	08	02	
LAGOON #1	SW-4	09	03	
LAGOON #2	SW-3	22	13	21
UPGRADIENT WATER TABLE WELL	MW-2	21	12	20
BEDROCK WELL AT 25 LAWRENCE ST.	GW-1	12	05	15
BED ROCK WELL AT B+M	GW-2	17	08	18
DUG WELL AT B+M	GW-3	07	01	11
WATER TABLE WELL N. OF LAGOON #2	MW-3	14	07	16
BEDROCK WELL N. OF " #2	MW-3A	11	04	14
EXPLORATORY WELL E. OF " #1	EW-1	31		
" " NE OF " #2	EW-2	32		
" " " #3	EW-3	33		
WATER TABLE WELL NEAR OLD DISPOSAL AREA	MW-4	18	09	
" " " BETWEEN RIVER & FACE	MW-5	19	10	19
" " " NEAR CARBONIZER BLDG.	MW-6	20	11	
SOIL NEAR OLD DISPOSAL AREA	SS-1	24	19	
SOIL LAGOON #1 SLUDGE PILE	SS-2		22	
SLUDGE CORE LAGOON #1 TOP	SS-4	27	20	10
" " " BOTTOM	SS-4A	23	16	07
" " #2 TOP	SS-3		21	
" " CARBONIZER LAGOON TOP	SS-5	25	17	
" " " BOTTOM	SS-5A	26	18	
SEPTIC TANK #1	ST-1	28		
" #2	ST-2	29		
" #3	ST-3	30		
" COMPOSITE	ST-C	30A		22
BOILER BLOWDOWN	SW-8	10610	14	

CDM
environmental engineers, scientists, planners, & management consultants

CAMP DRESSER & McKEE INC.
One Center Plaza
Boston, Massachusetts 02108
617 742-5151

TASK NO: 86050802
FILE NO: 9956-182
LAB NOS: 18607-33

11 JUNE 1986

CERTIFICATE OF LABORATORY ANALYSIS

PROJECT: BUCKLEY & MANN

REPORT TO: ROBERT A. DANGEL
CDM/BOSTON
RE: 1121-5-RT-GEAD

DATE SAMPLES RECEIVED: 8 MAY 1986

DATE SAMPLES COLLECTED: 7 MAY 1986 BY A.MICHELINI, R.DANGEL/CDM

ANALYTICAL METHODS: METHOD 624, PURGEABLES, METHODS FOR ORGANIC CHEMICAL ANALYSIS OF MUNICIPAL AND INDUSTRIAL WASTEWATER, EPA-600/4-82-057, JULY 1982.

BASE NEUTRALS + LIBRARY SEARCH ANALYSIS CONDUCTED BY COMPUCHEM LABORATORIES, RESEARCH TRIANGLE PARK, NC, IN ACCORDANCE WITH APPROVED EPA METHODOLOGY.

ALL OTHER PARAMETERS - STANDARD METHODS FOR THE EXAMINATION OF WATER & WASTEWATER, 16TH ED., 1985, AND/OR BY THE US EPA MANUAL OF METHODS FOR CHEMICAL ANALYSIS OF WATER & WASTES, MARCH 1983.

ANALYTICAL RESULTS: AS ON ATTACHED TABLES. COMPUCHEM RESULTS AS ON ATTACHED REPORTS.

Peter T Maynard 6/12/86
PETER T. MAYNARD DATE
SENIOR INORGANICS CHEMIST

James F Occhialini 6/12/86
JAMES F. OCCHIALINI DATE
LABORATORY SUPERVISOR

PTM,JFO/EK

ANALYTICAL RESULTS

CDM LAB NO.	SAMPLE DESCRIPTION	ALKALINITY, TOTAL, MG/L AS $CaCO_3$	CHEMICAL OXYGEN DEMAND, MG/L
18607	GW-3	13.	X
18608	SW-5	28.	X
18609	SW-4	270.	440.
18610	SW-2	320.	X
18611	MW-3A	32.	<10.
18612	GW-1	110.	X
18613	SW-6	18.	X
18614	MW-3	18.	<10.
18615	SW-1	35.	X
18616	SW-7	19.	X
18617	GW-2	68.	X
18618	MW-4	17.	<10.
18619	MW-5	24.	<10.
18620	MW-6	25.	40.
18621	MW-2	17.	50.
18622	SW-3	130.	360.
18631	EW-1	X	<10.
18632	EW-2	X	<10.
18633	EW-3	X	140.

X - ANALYSIS NOT REQUESTED

EPA METHOD 300

- ALL CONCENTRATIONS IN MG/L -

SAMPLE DESCRIPTION:	GW-3	SW-5	SW-4	SW-2	MW-3A	GW-1	SW-6	MW-3
CDM LAB NO:	18607	18608	18609	18610	18611	18612	18613	18614
ANION:								
FLUORIDE	<0.5	<0.5	<0.5	0.6	<0.5	<0.5	<0.5	<0.5
CHLORIDE	68.	30.	22.	75.	12.	<0.5	27.	14.
NITRITE-N	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
ORTHO-P	<1.0	<1.0	2.8	3.6	<1.0	<1.0	<1.0	<1.0
BROMIDE	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
NITRATE-N	7.2	<0.5	<0.5	0.6	8.2	<0.5	<0.5	0.8
SULPHATE	10.	11.	170.	240.	10.	5.0	12.	9.8

ANALYTICAL NOTES:

CHROMATOGRAPHIC CONDITIONS:

UNIT: DIONEX 2000i
ANION COLUMN: DIONEX HPIC-AS4A
GUARD COLUMN: DIONEX HPIC-AS8A
DETECTOR: CONDUCTIVITY
ELUENT: 0.75 MM $NaHCO_3$/2.2 MM Na_2CO_3
RANGE: 100 US
PUMP VOLUME: 2.0 ML/MIN.
SAMPLE LOOP: 100 µL (APPROX.)

EPA METHOD 300

- ALL CONCENTRATIONS IN MG/L -

SAMPLE DESCRIPTION:	SW-1	SW-7	GW-2	MW-4	MW-5	MW-6	MW-2	SW-3
CDM LAB NO:	18615	18616	18617	18618	18619	18620	18621	18622
ANION:								
FLUORIDE	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
CHLORIDE	36.	44.	21.	7.8	14.	24.	7.4	14.
NITRITE-N	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
ORTHO-P	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.4
BROMIDE	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
NITRATE-N	<0.5	<0.5	2.3	1.6	0.7	<0.5	0.9	<0.5
SULPHATE	8.3	12.	14.	11.	9.4	9.7	10.	74.

ANALYTICAL NOTES:

CHROMATOGRAPHIC CONDITIONS:

UNIT:	DIONEX 2000i
ANION COLUMN:	DIONEX HPIC-AS4A
GUARD COLUMN:	DIONEX HPIC-ASGA
DETECTOR:	CONDUCTIVITY
ELUENT:	0.75 mM $NaHCO_3$/2.2 mM Na_2CO_3
RANGE:	100 US
PUMP VOLUME:	2.0 ML/MIN.
SAMPLE LOOP:	100 µL (APPROX.)

CODES
ND - NOT DETECTED
P - PRESENT

VOLATILE ORGANICS

- ALL VALUES REPORTED AS µG/L -

SAMPLE DESCRIPTION:	GW-3	SW-5	SW-4	MW-3A	GW-1
CDM LAB NO:	18607	18608	18609	18611	18612
CHLOROMETHANE	ND	ND	ND	ND	ND
BROMOMETHANE					
VINYL CHLORIDE					
CHLOROETHANE					
METHYLENE CHLORIDE					
TRICHLOROFLUOROMETHANE					
1,1-DICHLOROETHYLENE					
1,1-DICHLOROETHANE					
TRANS-1,2-DICHLOROETHYLENE					
CHLOROFORM					
1,2-DICHLOROETHANE					
1,1,1-TRICHLOROETHANE			P		
CARBON TETRACHLORIDE			ND		
BROMODICHLOROMETHANE					
1,2-DICHLOROPROPANE					
TRANS-1,3-DICHLOROPROPENE					
TRICHLOROETHYLENE					
DIBROMOCHLOROMETHANE					
CIS-1,3-DICHLOROPROPENE					
1,1,2-TRICHLOROETHANE					
BENZENE					
2-CHLOROETHYLVINYLETHER					
BROMOFORM					
1,1,2,2-TETRACHLOROETHYLENE					
1,1,2,2-TETRACHLOROETHANE					
TOLUENE			P		
CHLOROBENZENE			ND		
ETHYLBENZENE			P		
XYLENES	ND	ND	45.	ND	ND
ACETONE	ND	ND	ND	ND	ND
% SURROGATE RECOVERY:					
D6 BENZENE	110	100	90	97	97
D8 TOLUENE	120	115	86	100	100

ND - NOT DETECTED @ DETECTION LIMIT OF 10 UG/L

P - PRESENT, BUT BELOW METHOD DETECTION LIMIT

CODES
ND - NOT DETECTED
P - PRESENT

VOLATILE ORGANICS

- ALL VALUES REPORTED AS µG/L -

SAMPLE DESCRIPTION:	SW-6	MW-3	SW-1	GW-2	MW-4
CDM LAB NO:	18613	18614	18615	18617	18618
CHLOROMETHANE	ND	ND	ND	ND	ND
BROMOMETHANE					
VINYL CHLORIDE					
CHLOROETHANE					
METHYLENE CHLORIDE					
TRICHLOROFLUOROMETHANE					
1,1-DICHLOROETHYLENE					
1,1-DICHLOROETHANE					
TRANS-1,2-DICHLOROETHYLENE					
CHLOROFORM					
1,2-DICHLOROETHANE					
1,1,1-TRICHLOROETHANE					
CARBON TETRACHLORIDE					
BROMODICHLOROMETHANE					
1,2-DICHLOROPROPANE					
TRANS-1,3-DICHLOROPROPENE					
TRICHLOROETHYLENE					
DIBROMOCHLOROMETHANE					
CIS-1,3-DICHLOROPROPENE					
1,1,2-TRICHLOROETHANE					
BENZENE					
2-CHLOROETHYLVINYLETHER					
BROMOFORM					
1,1,2,2-TETRACHLOROETHYLENE					
1,1,2,2-TETRACHLOROETHANE					
TOLUENE					
CHLOROBENZENE					
ETHYLBENZENE	↓	↓	↓	↓	↓
XYLENES	ND	ND	ND	ND	ND
ACETONE	ND	ND	ND	ND	ND
% SURROGATE RECOVERY:					
D6 BENZENE	110	100	100	100	100
D8 TOLUENE	110	110	96	100	100

ND - NOT DETECTED @ DETECTION LIMIT OF 10 UG/L

P - PRESENT, BUT BELOW METHOD DETECTION LIMIT

CODES
ND - NOT DETECTED
P - PRESENT

VOLATILE ORGANICS

- ALL VALUES REPORTED AS µG/L -
*UG/KG

SAMPLE DESCRIPTION:	MW-5	MW-6	MW-2	SW-3	SS-4A*
CDM LAB NO:	18619	18620	18621	18622	18623
CHLOROMETHANE	ND	ND	ND	ND	ND
BROMOMETHANE	↓	↓	↓	↓	↓
VINYL CHLORIDE					
CHLOROETHANE					
METHYLENE CHLORIDE					
TRICHLOROFLUOROMETHANE					
1,1-DICHLOROETHYLENE					
1,1-DICHLOROETHANE					
TRANS-1,2-DICHLOROETHYLENE					
CHLOROFORM					
1,2-DICHLOROETHANE					
1,1,1-TRICHLOROETHANE					
CARBON TETRACHLORIDE					
BROMODICHLOROMETHANE					
1,2-DICHLOROPROPANE					
TRANS-1,3-DICHLOROPROPENE					↓
TRICHLOROETHYLENE					45.
DIBROMOCHLOROMETHANE					ND
CIS-1,3-DICHLOROPROPENE					ND
1,1,2-TRICHLOROETHANE					ND
BENZENE					P
2-CHLOROETHYLVINYLETHER					ND
BROMOFORM					ND
1,1,2,2-TETRACHLOROETHYLENE					P
1,1,2,2-TETRACHLOROETHANE					ND
TOLUENE					150.
CHLOROBENZENE					1100.
ETHYLBENZENE	↓	↓	↓	↓	860.
XYLENES	ND	ND	ND	ND	2100.
ACETONE	ND	ND	ND	ND	ND
% SURROGATE RECOVERY:					
D6 BENZENE	96	100	110	93	93
D8 TOLUENE	92	100	93	96	83

ND - NOT DETECTED @ DETECTION LIMIT OF 10 UG/L

P - PRESENT, BUT BELOW METHOD DETECTION LIMIT

*ND - NOT DETECTED @ DETECTION LIMIT OF 45 UG/KG

CODES
ND - NOT DETECTED
P - PRESENT

VOLATILE ORGANICS

- ALL VALUES REPORTED AS µG/L -

*UG/KG

SAMPLE DESCRIPTION:	SS-1*	SS-5*	SS-5A*	ST-1	ST-2	ST-3
CDM LAB NO:	18624	18625	18626	18628	18629	18630
CHLOROMETHANE	ND	ND	ND	ND	ND	ND
BROMOMETHANE	↓	↓	↓	↓	↓	↓
VINYL CHLORIDE						
CHLOROETHANE						
METHYLENE CHLORIDE						
TRICHLOROFLUOROMETHANE						
1,1-DICHLOROETHYLENE						
1,1-DICHLOROETHANE						
TRANS-1,2-DICHLOROETHYLENE						
CHLOROFORM						
1,2-DICHLOROETHANE						
1,1,1-TRICHLOROETHANE						
CARBON TETRACHLORIDE						
BROMODICHLOROMETHANE						
1,2-DICHLOROPROPANE						
TRANS-1,3-DICHLOROPROPENE						
TRICHLOROETHYLENE						
DIBROMOCHLOROMETHANE						
CIS-1,3-DICHLOROPROPENE						
1,1,2-TRICHLOROETHANE						
BENZENE						
2-CHLOROETHYLVINYLETHER						
BROMOFORM						
1,1,2,2-TETRACHLOROETHYLENE						
1,1,2,2-TETRACHLOROETHANE					↓	
TOLUENE					91.	
CHLOROBENZENE					ND	
ETHYLBENZENE	↓	↓	↓	↓	ND	↓
XYLENES	ND	ND	ND	ND	20.	ND
ACETONE	ND	ND	ND	ND	ND	ND
% SURROGATE RECOVERY:						
D6 BENZENE	87	93	90	115	100	93
D8 TOLUENE	85	69	81	82	92	100

ND - NOT DETECTED @ DETECTION LIMIT OF 10 UG/L

P - PRESENT, BUT BELOW METHOD DETECTION LIMIT

*ND - NOT DETECTED @ DETECTION LIMIT OF 25 UG/KG

R E P O R T T O

Camp, Dresser & McKee, Inc.
One Center Plaza
Boston, MA 02108

Attn: Mr. Robert Dangel

Work ID: 1121-5-RT-GEAD (Buckley)
P.O. No.: 36710
Work Order: 86-05-056

Cambridge Analytical Associates
1106 Commonwealth Avenue / Boston, Massachusetts 02215 / (617) 232-2207

Received: 05/08/86

REPORT
06/16/86 08:52:47

Work Order # 86-05-056

REPORT TO: Camp, Dresser & McKee, Inc.
One Center Plaza
Boston, MA 02108

ATTEN: Mr Robert Dangel

CLIENT: CDM_BOSTON SAMPLES: 22
COMPANY: Camp, Dresser & McKee, Inc.
FACILITY: One Center Plaza
Boston, MA 02108

WORK ID: 1121-5-RT-GEAD (Buckley)
TAKEN: By Client
TRANS: By Client
TYPE: Aqueous & Sludge
P.O. #: 36710
INVOICE: under separate cover

PREPARED BY: Cambridge Analytical Assoc.
Environmental Division
1106 Commonwealth Avenue
Boston, MA 02215

ATTEN:
PHONE: 617-232-2207

Edward A. Lawler
CERTIFIED BY

CONTACT LAWLER

This report is approved for release by the following staff:
Laboratory Director:
Inorganic Laboratory:
Organic Laboratory:

SAMPLE IDENTIFICATION

01	GW-3
02	SW-5
03	SW-4
04	MW-3A
05	GW-1
06	SW-6
07	MW-3
08	GW-2
09	MW-4
10	MW-5
11	MW-6
12	MW-2
13	SW-3
14	SW-2
15	SW-1
16	Ss-4A
17	SS-5
18	SS-5A
19	SS-1
20	SS-4

TEST CODES and NAMES used on this report

AG_I_A	Silver (Ag)-ICP
AG_I_S	Silver (Ag)-ICP
AL_I_A	Aluminum (Al)-ICP
AL_I_S	Aluminum (Al)-ICP
AS_GFA	Arsenic (As)-furnace AAS
AS_I_A	Arsenic (As)-ICP
AS_I_S	Arsenic (As)-ICP
CD_GFA	Cadmium (Cd)-furnace AAS
CD_GFS	Cadmium (Cd)-furnace AAS
CR_I_A	Chromium (Cr)-ICP
CR_I_S	Chromium (Cr)-ICP
DIGSOL	Acid digestion-soil-SW846
DIG_AQ	Acid digestion-aqueous-EPA
FE_I_A	Iron (Fe)-ICP
FE_I_S	Iron (Fe)-ICP
HG_CVA	Mercury (Hg)-cold vapor
NA_I_A	Sodium (Na)-ICP
NA_I_S	Sodium (Na)-ICP
PB_GFA	Lead (Pb)-furnace AAS
PB_GFS	Lead (Pb)-furnace AAS
SE_GFA	Selenium (Se)-furnace
SE_GFS	Selenium (Se)-furnace
ZN_I_A	Zinc (Zn)-ICP
ZN_I_S	Zinc (Zn)-ICP

	SAMPLE IDENTIFICATION
21	SS-3
22	SS-2

REPORT
Work Order # 86-05-056

Results By Test

TEST CODE default units	Sample 01 (entered units)	Sample 02 (entered units)	Sample 03 (entered units)	Sample 04 (entered units)	Sample 05 (entered units)
AG_I_A mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
AL_I_A mg/l	0.11	<0.1	0.61	<0.1	<0.1
AS_GFA mg/l	<0.016	<0.016	<0.016	<0.016	<0.016
CD_GFA mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
CR_I_A mg/l	<0.025	<0.025	0.72	<0.025	<0.025
DIG_AQ date complete	05/29/86	05/29/86	05/29/86	05/29/86	05/29/86
FE_I_A mg/l	0.13	0.16	0.76	<0.025	0.44
NA_I_A mg/l	31	21	180	8.3	14
PB_GFA mg/l	0.005	<0.003	0.03	<0.003	0.004
SE_GFA mg/l	<0.003	<0.003	<0.003	<0.003	<0.003
ZN_I_A mg/l	<0.02	<0.02	0.23	<0.02	0.02

TEST CODE default units	Sample 06 (entered units)	Sample 07 (entered units)	Sample 08 (entered units)	Sample 09 (entered units)	Sample 10 (entered units)
AG_I_A mg/l	<0.01	<0.01	<0.01	<0.01	<0.01
AL_I_A mg/l	0.13	0.15	0.22	0.12	0.31
AS_GFA mg/l	<0.016	<0.016	<0.016	<0.016	<0.016
CD_GFA mg/l	<0.001	<0.001	<0.001	<0.001	<0.001
CR_I_A mg/l	<0.025	<0.025	<0.025	<0.025	<0.025

REPORT
Results By Test

Work Order # 86-05-056
Continued From Above

TEST CODE default units					
DIG_AQ date complete	05/29/86	05/29/86	05/29/86	05/29/86	05/29/8
FE_I_A mg/l	0.13	<0.025	<0.025	0.11	0.9
NA_I_A mg/l	20	9.5	21	6.1	9.1
PB_GFA mg/l	<0.003	<0.003	0.006	0.007	<0.003
SE_GFA mg/l	<0.003	<0.003	<0.003	<0.003	<0.003
ZN_I_A mg/l	<0.02	0.03	<0.02	<0.02	<0.02

TEST CODE default units	Sample 11 (entered units)	Sample 12 (entered units)	Sample 13 (entered units)	Sample 14 (entered units)	Sample 15 (entered units)
AG_I_A mg/l	<0.01	<0.01	<0.01		<0.01
AL_I_A mg/l	0.32	0.21	0.27		0.29
AS_GFA mg/l	<0.016	<0.016	<0.016		
AS_I_A mg/l					<0.016
CD_GFA mg/l	<0.001	<0.001	<0.001		<0.001
CR_I_A mg/l	<0.025	<0.025	0.09		<0.025
DIG_AQ date complete	05/29/86	05/29/86	05/29/86	05/29/86	05/29/86
FE_I_A mg/l	1.9	<0.025	2.1	4.5	2.8
HG_CVA mg/l					<0.0004
NA_I_A mg/l	18	8.1	73	260	20
PB_GFA mg/l	0.003	<0.003	0.009		0.004
SE_GFA mg/l	<0.003	<0.003	<0.003		<0.003

ZN_I_A mg/l	<0.02	<0.02	0.10	<0.02

TEST CODE default units	Sample 16 (entered units)	Sample 17 (entered units)	Sample 18 (entered units)	Sample 19 (entered units)	Sample 20 (entered units)
AG_I_S ug/g (dry wt)	<1.0 ug/g (dry wt	5.7	<1.0	16	<1.0
AL_I_S ug/g (dry wt)	5900	6700	13000	27000	7600
AS_I_S ug/g (dry wt)	2.9	4.7	2.7	21	2.1
CD_GFS ug/g (dry wt)	<3.8	18	2.9	28	<2.5
CR_I_S ug/g (dry wt)	1300	450	62	1000	270
DIGSOL date complete	05/23/86	05/23/86	05/23/86	05/23/86	05/23/86
FE_I_S ug/g (dry wt)	8400	7600	5800	110000	10000
NA_I_S ug/g (dry wt)	850	200	96	1300	250
PB_GFS ug/g (dry wt)	19	670	88	1200	12
SE_GFS ug/g (dry wt)	0.57	0.97	0.44	0.35	<0.19
ZN_I_S ug/g (dry wt)	4600	920	260	8200	930

TEST CODE default units	Sample 21 (entered units)	Sample 22 (entered units)
AG_I_S ug/g (dry wt)	<1.0	<1.0
AL_I_S ug/g (dry wt)	5900	11000
AS_I_S ug/g (dry wt)	1.3	12

REPORT
Results By Test

CD_GFS ug/g (dry wt)	<2.8	<2.5
CR_I_S ug/g (dry wt)	430	2100
DIGSOL date complete	05/23/86	05/23/86
FE_I_S ug/g (dry wt)	7700	13000
NA_I_S ug/g (dry wt)	310	97
PB_GFS ug/g (dry wt)	12	38
SE_GFS ug/g (dry wt)	<0.21	0.50
ZN_I_S ug/g (dry wt)	230	110

COMPUCHEM
LABORATORIES

ANALYTICAL REPORT OF DATA
SUBMITTED TO:

Ms. Eileen Kireilis
Camp, Dresser, and McKee
One Center Plaza
Boston, MA 02108

METHOD REFERENCE

CompuChem® employs Method 625 for GC/MS analysis of base/neutral organics in liquid matrices. This method is published in Volume 49, October 26, 1984 Federal Register.

METHOD SUMMARY

As stated in the October 1984 reference, "A measured volume of sample, approximately one-liter, is serially extracted with methylene chloride at a pH greater than 11 and again at pH less than 2 using a separatory funnel or a continuous extractor. The methylene chloride extract is dried and concentrated to a volume of 1 ml."

"Qualitative identification is performed using the retention time and the relative abundance of three characteristic ions. Quantitative analysis is performed using either external or internal standard techniques."

Semi-quantitative analysis (library search) is performed by automatic comparison of the unknown peak spectrum to the National Bureau of Standards (NBS) mass spectral library. Estimated concentration is calculated using the known concentration and peak area of the closest internal standard while assuming a response factor of one for the unknown compound.

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES

SAMPLE IDENTIFIER: 18615
COMPUCHEM® SAMPLE NUMBER: 84917

		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
1B.	N-NITROSODIMETHYLAMINE	BDL	10
2B.	BIS (2-CHLOROETHYL) ETHER	BDL	10
3B.	1,3-DICHLOROBENZENE	BDL	10
4B.	1,4-DICHLOROBENZENE	BDL	10
5B.	1,2-DICHLOROBENZENE	BDL	10
6B.	BIS (2-CHLOROISOPROPYL) ETHER	BDL	10
7B.	N-NITROSODI-N-PROPYLAMINE	BDL	10
8B.	HEXACHLOROETHANE	BDL	10
9B.	NITROBENZENE	BDL	10
10B.	ISOPHORONE	BDL	10
11B.	BIS(2-CHLOROETHOXY) METHANE	BDL	10
12B.	1,2,4-TRICHLOROBENZENE	BDL	10
13B.	NAPHTHALENE	BDL	10
14B.	HEXACHLOROBUTADIENE	BDL	10
15B.	HEXACHLOROCYCLOPENTADIENE	BDL	10
16B.	2-CHLORONAPHTHALENE	BDL	10
17B.	DIMETHYLPHTHALATE	BDL	10
18B.	ACENAPHTHYLENE	BDL	10
19B.	2,6-DINITROTOLUENE	BDL	10
20B.	ACENAPHTHENE	BDL	10
21B.	2,4-DINITROTOLUENE	BDL	10
22B.	DIETHYLPHTHALATE	BDL	10
23B.	4-CHLOROPHENYL PHENYL ETHER	BDL	10
24B.	FLUORENE	BDL	10
25B.	DIPHENYLAMINE (N-NITROSO)	BDL	10
26B.	1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	BDL	10
27B.	4-BROMOPHENYL PHENYL ETHER	BDL	10
28B.	HEXACHLOROBENZENE	BDL	10

(Continued)

BDL=BELOW DETECTION LIMIT

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES (Page Two)

SAMPLE IDENTIFIER: 18615
COMPUCHEM® SAMPLE NUMBER: 84917

		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
29B.	PHENANTHRENE	BDL	10
30B.	ANTHRACENE	BDL	10
31B.	DI-N-BUTYLPHTHALATE	BDL	10
32B.	FLUORANTHENE	BDL	10
33B.	PYRENE	BDL	10
34B.	BENZIDINE	BDL	50
35B.	BUTYLBENZYLPHTHALATE	BDL	10
36B.	3,3'-DICHLOROBENZIDINE	BDL	20
37B.	BENZO(A)ANTHRACENE	BDL	10
38B.	BIS(2-ETHYLHEXYL)PHTHALATE	BDL	10
39B.	CHRYSENE	BDL	10
40B.	DI-N-OCTYLPHTHALATE	BDL	10
41B.	BENZO(B)FLUORANTHENE	BDL	10
42B.	BENZO(K)FLUORANTHENE	BDL	10
43B.	BENZO(A)PYRENE	BDL	10
44B.	INDENO(1,2,3-C,D)PYRENE	BDL	10
45B.	DIBENZO(A,H)ANTHRACENE	BDL	10
46B.	BENZO(G,H,I)PERYLENE	BDL	10

Surrogates Recoveries - Introduced at the beginning of the extraction, surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of extraction efficiency and analytical response for the individual sample.

	%Recovery	Control Range%
D_5-Nitrobenzene	75	(41-120)
2-Fluorobiphenyl	75	(44-119)
D_{14}-Terphenyl	122	(33-128)
D_{10}-Pyrene*	119	*

BDL=BELOW DETECTION LIMIT
*Advisory Surrogate; therefore no control range

SAMPLE IDENTIFIER: 18615
COMPUCHEM® SAMPLE NUMBER: 84917

15 PEAK IDENTIFICATION - Base/Neutral

Exclusive of any priority pollutants (specific to this analysis), surrogate standard, and internal standard peaks, no compounds greater than 10% of the closest internal standard were tentatively identified by mass spectral library search.

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES

SAMPLE IDENTIFIER: 18621
COMPUCHEM® SAMPLE NUMBER: 84920

		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
1B.	N-NITROSODIMETHYLAMINE	BDL	10
2B.	BIS (2-CHLOROETHYL) ETHER	BDL	10
3B.	1,3-DICHLOROBENZENE	BDL	10
4B.	1,4-DICHLOROBENZENE	BDL	10
5B.	1,2-DICHLOROBENZENE	BDL	10
6B.	BIS (2-CHLOROISOPROPYL) ETHER	BDL	10
7B.	N-NITROSODI-N-PROPYLAMINE	BDL	10
8B.	HEXACHLOROETHANE	BDL	10
9B.	NITROBENZENE	BDL	10
10B.	ISOPHORONE	BDL	10
11B.	BIS(2-CHLOROETHOXY) METHANE	BDL	10
12B.	1,2,4-TRICHLOROBENZENE	BDL	10
13B.	NAPHTHALENE	BDL	10
14B.	HEXACHLOROBUTADIENE	BDL	10
15B.	HEXACHLOROCYCLOPENTADIENE	BDL	10
16B.	2-CHLORONAPHTHALENE	BDL	10
17B.	DIMETHYLPHTHALATE	BDL	10
18B.	ACENAPHTHYLENE	BDL	10
19B.	2,6-DINITROTOLUENE	BDL	10
20B.	ACENAPHTHENE	BDL	10
21B.	2,4-DINITROTOLUENE	BDL	10
22B.	DIETHYLPHTHALATE	BDL	10
23B.	4-CHLOROPHENYL PHENYL ETHER	BDL	10
24B.	FLUORENE	BDL	10
25B.	DIPHENYLAMINE (N-NITROSO)	BDL	10
26B.	1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	BDL	10
27B.	4-BROMOPHENYL PHENYL ETHER	BDL	10
28B.	HEXACHLOROBENZENE	BDL	10

(Continued)

BDL=BELOW DETECTION LIMIT

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES - (Page Two)

SAMPLE IDENTIFIER: 18621
COMPUCHEM® SAMPLE NUMBER: 84920

		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
29B.	PHENANTHRENE	BDL	10
30B.	ANTHRACENE	BDL	10
31B.	DI-N-BUTYLPHTHALATE	BDL	10
32B.	FLUORANTHENE	BDL	10
33B.	PYRENE	BDL	10
34B.	BENZIDINE	BDL	50
35B.	BUTYLBENZYLPHTHALATE	BDL	10
36B.	3,3'-DICHLOROBENZIDINE	BDL	20
37B.	BENZO(A)ANTHRACENE	BDL	10
38B.	BIS(2-ETHYLHEXYL)PHTHALATE	BDL	10
39B.	CHRYSENE	BDL	10
40B.	DI-N-OCTYLPHTHALATE	BDL	10
41B.	BENZO(B)FLUORANTHENE	BDL	10
42B.	BENZO(K)FLUORANTHENE	BDL	10
43B.	BENZO(A)PYRENE	BDL	10
44B.	INDENO(1,2,3-C,D)PYRENE	BDL	10
45B.	DIBENZO(A,H)ANTHRACENE	BDL	10
46B.	BENZO(G,H,I)PERYLENE	BDL	10

Surrogates Recoveries - Introduced at the beginning of the extraction, surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of extraction efficiency and analytical response for the individual sample.

	%Recovery	Control Range%
D_5-Nitrobenzene	83	(41-120)
2-Fluorobiphenyl	79	(44-119)
D_{14}-Terphenyl	110	(33-128)
D_{10}-Pyrene*	109	*

BDL=BELOW DETECTION LIMIT
*Advisory Surrogate; therefore no control range.

COMPUCHEM ORGANICS ANALYSIS DATA SHEET

DATA FILENAME: BC084920C21

LIBRARY SEARCH RESULTS OF EXTRANEOUS PEAKS &
ESTIMATED CONCENTRATION OF TENTATIVELY IDENTIFIED COMPOUNDS
ANALYTICAL FRACTION: BASE1

SAMPLE # 84920

ITEM	SCAN NUMBER	CAS #	COMPOUND NAME	% PURITY	ASSESSMENT* RS	OI	UK	ESTIMATED CONC. IN UG PER L	KG	ML	G
1	929	42498-32-8	BENZAMIDE,N-(1,1-DIMETHYLETHYL)-4-METHYL-	74.4	☐	☒	☐	6.			
	1.000	40.00									

SPECTROSCOPIST [signature]

DATE 5/14/86

(*) RS - REASONABLE IDENTIFICATION, RETENTION TIME COMPATIBILITY
OI - ISOMER OR SIMILAR COMPOUND
UK - UNKNOWN, NOT IN NBS LIBRARY

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES

SAMPLE IDENTIFIER: 18612
COMPUCHEM® SAMPLE NUMBER: 84915

		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
1B.	N-NITROSODIMETHYLAMINE	BDL	10
2B.	BIS (2-CHLOROETHYL) ETHER	BDL	10
3B.	1,3-DICHLOROBENZENE	BDL	10
4B.	1,4-DICHLOROBENZENE	BDL	10
5B.	1,2-DICHLOROBENZENE	BDL	10
6B.	BIS (2-CHLOROISOPROPYL) ETHER	BDL	10
7B.	N-NITROSODI-N-PROPYLAMINE	BDL	10
8B.	HEXACHLOROETHANE	BDL	10
9B.	NITROBENZENE	BDL	10
10B.	ISOPHORONE	BDL	10
11B.	BIS(2-CHLOROETHOXY) METHANE	BDL	10
12B.	1,2,4-TRICHLOROBENZENE	BDL	10
13B.	NAPHTHALENE	BDL	10
14B.	HEXACHLOROBUTADIENE	BDL	10
15B.	HEXACHLOROCYCLOPENTADIENE	BDL	10
16B.	2-CHLORONAPHTHALENE	BDL	10
17B.	DIMETHYLPHTHALATE	BDL	10
18B.	ACENAPHTHYLENE	BDL	10
19B.	2,6-DINITROTOLUENE	BDL	10
20B.	ACENAPHTHENE	BDL	10
21B.	2,4-DINITROTOLUENE	BDL	10
22B.	DIETHYLPHTHALATE	BDL	10
23B.	4-CHLOROPHENYL PHENYL ETHER	BDL	10
24B.	FLUORENE	BDL	10
25B.	DIPHENYLAMINE (N-NITROSO)	BDL	10
26B.	1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	BDL	10
27B.	4-BROMOPHENYL PHENYL ETHER	BDL	10
28B.	HEXACHLOROBENZENE	BDL	10

(Continued)

BDL=BELOW DETECTION LIMIT

SAMPLE IDENTIFIER: 18612
COMPUCHEM® SAMPLE NUMBER: 84915

		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
29B.	PHENANTHRENE	BDL	10
30B.	ANTHRACENE	BDL	10
31B.	DI-N-BUTYLPHTHALATE	BDL	10
32B.	FLUORANTHENE	BDL	10
33B.	PYRENE	BDL	10
34B.	BENZIDINE	BDL	50
35B.	BUTYLBENZYLPHTHALATE	BDL	10
36B.	3,3'-DICHLOROBENZIDINE	BDL	20
37B.	BENZO(A)ANTHRACENE	BDL	10
38B.	BIS(2-ETHYLHEXYL)PHTHALATE	BDL	10
39B.	CHRYSENE	BDL	10
40B.	DI-N-OCTYLPHTHALATE	BDL	10
41B.	BENZO(B)FLUORANTHENE	BDL	10
42B.	BENZO(K)FLUORANTHENE	BDL	10
43B.	BENZO(A)PYRENE	BDL	10
44B.	INDENO(1,2,3-C,D)PYRENE	BDL	10
45B.	DIBENZO(A,H)ANTHRACENE	BDL	10
46B.	BENZO(G,H,I)PERYLENE	BDL	10

Surrogates Recoveries - Introduced at the beginning of the extraction, surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of extraction efficiency and analytical response for the individual sample.

	%Recovery	Control Range%
D_5-Nitrobenzene	78	(41-120)
2-Fluorobiphenyl	79	(44-119)
D_{14}-Terphenyl	118	(33-128)
D_{10}-Pyrene*	116	*

BDL=BELOW DETECTION LIMIT
*Advisory Surrogate; therefore no control range

SAMPLE IDENTIFIER: 18612
COMPUCHEM® SAMPLE NUMBER: 84915

15 PEAK IDENTIFICATION - Base/Neutral

Exclusive of any priority pollutants (specific to this analysis), surrogate standard, and internal standard peaks, no compounds greater than 10% of the closest internal standard were tentatively identified by mass spectral library search.

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES --

SAMPLE IDENTIFIER: 18617
COMPUCHEM® SAMPLE NUMBER: 84918

		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
1B.	N-NITROSODIMETHYLAMINE	BDL	10
2B.	BIS (2-CHLOROETHYL) ETHER	BDL	10
3B.	1,3-DICHLOROBENZENE	BDL	10
4B.	1,4-DICHLOROBENZENE	BDL	10
5B.	1,2-DICHLOROBENZENE	BDL	10
6B.	BIS (2-CHLOROISOPROPYL) ETHER	BDL	10
7B.	N-NITROSODI-N-PROPYLAMINE	BDL	10
8B.	HEXACHLOROETHANE	BDL	10
9B.	NITROBENZENE	BDL	10
10B.	ISOPHORONE	BDL	10
11B.	BIS(2-CHLOROETHOXY) METHANE	BDL	10
12B.	1,2,4-TRICHLOROBENZENE	BDL	10
13B.	NAPHTHALENE	BDL	10
14B.	HEXACHLOROBUTADIENE	BDL	10
15B.	HEXACHLOROCYCLOPENTADIENE	BDL	10
16B.	2-CHLORONAPHTHALENE	BDL	10
17B.	DIMETHYLPHTHALATE	BDL	10
18B.	ACENAPHTHYLENE	BDL	10
19B.	2,6-DINITROTOLUENE	BDL	10
20B.	ACENAPHTHENE	BDL	10
21B.	2,4-DINITROTOLUENE	BDL	10
22B.	DIETHYLPHTHALATE	BDL	10
23B.	4-CHLOROPHENYL PHENYL ETHER	BDL	10
24B.	FLUORENE	BDL	10
25B.	DIPHENYLAMINE (N-NITROSO)	BDL	10
26B.	1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	BDL	10
27B.	4-BROMOPHENYL PHENYL ETHER	BDL	10
28B.	HEXACHLOROBENZENE	BDL	10

(Continued)

BDL=BELOW DETECTION LIMIT

SAMPLE IDENTIFIER: 18617
COMPUCHEM® SAMPLE NUMBER: 84918

		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
29B.	PHENANTHRENE	BDL	10
30B.	ANTHRACENE	BDL	10
31B.	DI-N-BUTYLPHTHALATE	BDL	10
32B.	FLUORANTHENE	BDL	10
33B.	PYRENE	BDL	10
34B.	BENZIDINE	BDL	50
35B.	BUTYLBENZYLPHTHALATE	BDL	10
36B.	3,3'-DICHLOROBENZIDINE	BDL	20
37B.	BENZO(A)ANTHRACENE	BDL	10
38B.	BIS(2-ETHYLHEXYL)PHTHALATE	BDL	10
39B.	CHRYSENE	BDL	10
40B.	DI-N-OCTYLPHTHALATE	BDL	10
41B.	BENZO(B)FLUORANTHENE	BDL	10
42B.	BENZO(K)FLUORANTHENE	BDL	10
43B.	BENZO(A)PYRENE	BDL	10
44B.	INDENO(1,2,3-C,D)PYRENE	BDL	10
45B.	DIBENZO(A,H)ANTHRACENE	BDL	10
46B.	BENZO(G,H,I)PERYLENE	BDL	10

Surrogates Recoveries - Introduced at the beginning of the extraction, surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of extraction efficiency and analytical response for the individual sample.

	%Recovery	Control Range%
D_5-Nitrobenzene	85	(41-120)
2-Fluorobiphenyl	83	(44-119)
D_{14}-Terphenyl	116	(33-128)
D_{10}-Pyrene*	116	*

BDL=BELOW DETECTION LIMIT
*Advisory Surrogate; therefore no control range.

SAMPLE IDENTIFIER: 18617
COMPUCHEM® SAMPLE NUMBER: 84918

15 PEAK IDENTIFICATION - Base/Neutral

Exclusive of any priority pollutants (specific to this analysis), surrogate standard, and internal standard peaks, no compounds greater than 10% of the closest internal standard were tentatively identified by mass spectral library search.

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES

SAMPLE IDENTIFIER: 18607
COMPUCHEM® SAMPLE NUMBER: 84911

		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
1B.	N-NITROSODIMETHYLAMINE	BDL	10
2B.	BIS (2-CHLOROETHYL) ETHER	BDL	10
3B.	1,3-DICHLOROBENZENE	BDL	10
4B.	1,4-DICHLOROBENZENE	BDL	10
5B.	1,2-DICHLOROBENZENE	BDL	10
6B.	BIS (2-CHLOROISOPROPYL) ETHER	BDL	10
7B.	N-NITROSODI-N-PROPYLAMINE	BDL	10
8B.	HEXACHLOROETHANE	BDL	10
9B.	NITROBENZENE	BDL	10
10B.	ISOPHORONE	BDL	10
11B.	BIS(2-CHLOROETHOXY) METHANE	BDL	10
12B.	1,2,4-TRICHLOROBENZENE	BDL	10
13B.	NAPHTHALENE	BDL	10
14B.	HEXACHLOROBUTADIENE	BDL	10
15B.	HEXACHLOROCYCLOPENTADIENE	BDL	10
16B.	2-CHLORONAPHTHALENE	BDL	10
17B.	DIMETHYLPHTHALATE	BDL	10
18B.	ACENAPHTHYLENE	BDL	10
19B.	2,6-DINITROTOLUENE	BDL	10
20B.	ACENAPHTHENE	BDL	10
21B.	2,4-DINITROTOLUENE	BDL	10
22B.	DIETHYLPHTHALATE	BDL	10
23B.	4-CHLOROPHENYL PHENYL ETHER	BDL	10
24B.	FLUORENE	BDL	10
25B.	DIPHENYLAMINE (N-NITROSO)	BDL	10
26B.	1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	BDL	10
27B.	4-BROMOPHENYL PHENYL ETHER	BDL	10
28B.	HEXACHLOROBENZENE	BDL	10

(Continued)

BDL=BELOW DETECTION LIMIT

SAMPLE IDENTIFIER: 18607
COMPUCHEM® SAMPLE NUMBER: 84911

		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
29B.	PHENANTHRENE	BDL	10
30B.	ANTHRACENE	BDL	10
31B.	DI-N-BUTYLPHTHALATE	BDL	10
32B.	FLUORANTHENE	BDL	10
33B.	PYRENE	BDL	10
34B.	BENZIDINE	BDL	50
35B.	BUTYLBENZYLPHTHALATE	BDL	10
36B.	3,3'-DICHLOROBENZIDINE	BDL	20
37B.	BENZO(A)ANTHRACENE	BDL	10
38B.	BIS(2-ETHYLHEXYL)PHTHALATE	BDL	10
39B.	CHRYSENE	BDL	10
40B.	DI-N-OCTYLPHTHALATE	BDL	10
41B.	BENZO(B)FLUORANTHENE	BDL	10
42B.	BENZO(K)FLUORANTHENE	BDL	10
43B.	BENZO(A)PYRENE	BDL	10
44B.	INDENO(1,2,3-C,D)PYRENE	BDL	10
45B.	DIBENZO(A,H)ANTHRACENE	BDL	10
46B.	BENZO(G,H,I)PERYLENE	BDL	10

Surrogates Recoveries - Introduced at the beginning of the extraction, surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of extraction efficiency and analytical response for the individual sample.

	%Recovery	Control Range%
D_5-Nitrobenzene	78	(41-120)
2-Fluorobiphenyl	74	(44-119)
D_{14}-Terphenyl	111	(33-128)
D_{10}-Pyrene*	112	*

BDL=BELOW DETECTION LIMIT
*Advisory Surrogate; therefore no control range.

SAMPLE IDENTIFIER: 18607
COMPUCHEM® SAMPLE NUMBER: 84911

15 PEAK IDENTIFICATION - Base/Neutral

Exclusive of any priority pollutants (specific to this analysis), surrogate standard, and internal standard peaks, no compounds greater than 10% of the closest internal standard were tentatively identified by mass spectral library search.

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES --

SAMPLE IDENTIFIER: 18614
COMPUCHEM® SAMPLE NUMBER: 84916

		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
1B.	N-NITROSODIMETHYLAMINE	BDL	10
2B.	BIS (2-CHLOROETHYL) ETHER	BDL	10
3B.	1,3-DICHLOROBENZENE	BDL	10
4B.	1,4-DICHLOROBENZENE	BDL	10
5B.	1,2-DICHLOROBENZENE	BDL	10
6B.	BIS (2-CHLOROISOPROPYL) ETHER	BDL	10
7B.	N-NITROSODI-N-PROPYLAMINE	BDL	10
8B.	HEXACHLOROETHANE	BDL	10
9B.	NITROBENZENE	BDL	10
10B.	ISOPHORONE	BDL	10
11B.	BIS(2-CHLOROETHOXY) METHANE	BDL	10
12B.	1,2,4-TRICHLOROBENZENE	BDL	10
13B.	NAPHTHALENE	BDL	10
14B.	HEXACHLOROBUTADIENE	BDL	10
15B.	HEXACHLOROCYCLOPENTADIENE	BDL	10
16B.	2-CHLORONAPHTHALENE	BDL	10
17B.	DIMETHYLPHTHALATE	BDL	10
18B.	ACENAPHTHYLENE	BDL	10
19B.	2,6-DINITROTOLUENE	BDL	10
20B.	ACENAPHTHENE	BDL	10
21B.	2,4-DINITROTOLUENE	BDL	10
22B.	DIETHYLPHTHALATE	BDL	10
23B.	4-CHLOROPHENYL PHENYL ETHER	BDL	10
24B.	FLUORENE	BDL	10
25B.	DIPHENYLAMINE (N-NITROSO)	BDL	10
26B.	1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	BDL	10
27B.	4-BROMOPHENYL PHENYL ETHER	BDL	10
28B.	HEXACHLOROBENZENE	BDL	10

(Continued)

BDL=BELOW DETECTION LIMIT

SAMPLE IDENTIFIER: 18614
COMPUCHEM® SAMPLE NUMBER: 84916

		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
29B.	PHENANTHRENE	BDL	10
30B.	ANTHRACENE	BDL	10
31B.	DI-N-BUTYLPHTHALATE	BDL	10
32B.	FLUORANTHENE	BDL	10
33B.	PYRENE	BDL	10
34B.	BENZIDINE	BDL	50
35B.	BUTYLBENZYLPHTHALATE	BDL	10
36B.	3,3'-DICHLOROBENZIDINE	BDL	20
37B.	BENZO(A)ANTHRACENE	BDL	10
38B.	BIS(2-ETHYLHEXYL)PHTHALATE	BDL	10
39B.	CHRYSENE	BDL	10
40B.	DI-N-OCTYLPHTHALATE	BDL	10
41B.	BENZO(B)FLUORANTHENE	BDL	10
42B.	BENZO(K)FLUORANTHENE	BDL	10
43B.	BENZO(A)PYRENE	BDL	10
44B.	INDENO(1,2,3-C,D)PYRENE	BDL	10
45B.	DIBENZO(A,H)ANTHRACENE	BDL	10
46B.	BENZO(G,H,I)PERYLENE	BDL	10

Surrogates Recoveries - Introduced at the beginning of the extraction, surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of extraction efficiency and analytical response for the individual sample.

	%Recovery	Control Range%
D_5-Nitrobenzene	78	(41-120)
2-Fluorobiphenyl	78	(44-119)
D_{14}-Terphenyl	119	(33-128)
D_{10}-Pyrene*	115	*

BDL=BELOW DETECTION LIMIT
*Advisory Surrogate; therefore no control range.

DATA FILENAME: BC084916C21

COMPUCHEM ORGANICS ANALYSIS DATA SHEET
LIBRARY SEARCH RESULTS OF EXTRANEOUS PEAKS &
ESTIMATED CONCENTRATION OF TENTATIVELY IDENTIFIED COMPOUNDS
ANALYTICAL FRACTION: BASE1

SAMPLE # 84916

ITEM	SCAN NUMBER	CAS #	COMPOUND NAME	% PURITY	ASSESSMENT* RS	OI	UK	ESTIMATED CONC. IN UG PER L	KG	ML	G
1	1034	3622-84-2	BENZENESULFONAMIDE,N-BUTYL-	92.7	☐	☒	☐	☑	☐	☐	☐
	1.000	~~40.00~~						32.			

SPECTROSCOPIST [signature]

DATE 5/14/86

(*) RS - REASONABLE IDENTIFICATION, RETENTION TIME COMPATIBILITY
OI - ISOMER OR SIMILAR COMPOUND
UK - UNKNOWN, NOT IN NBS LIBRARY

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES --

SAMPLE IDENTIFIER: 18611
COMPUCHEM® SAMPLE NUMBER: 84914

		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
1B.	N-NITROSODIMETHYLAMINE	BDL	10
2B.	BIS (2-CHLOROETHYL) ETHER	BDL	10
3B.	1,3-DICHLOROBENZENE	BDL	10
4B.	1,4-DICHLOROBENZENE	BDL	10
5B.	1,2-DICHLOROBENZENE	BDL	10
6B.	BIS (2-CHLOROISOPROPYL) ETHER	BDL	10
7B.	N-NITROSODI-N-PROPYLAMINE	BDL	10
8B.	HEXACHLOROETHANE	BDL	10
9B.	NITROBENZENE	BDL	10
10B.	ISOPHORONE	BDL	10
11B.	BIS(2-CHLOROETHOXY) METHANE	BDL	10
12B.	1,2,4-TRICHLOROBENZENE	BDL	10
13B.	NAPHTHALENE	BDL	10
14B.	HEXACHLOROBUTADIENE	BDL	10
15B.	HEXACHLOROCYCLOPENTADIENE	BDL	10
16B.	2-CHLORONAPHTHALENE	BDL	10
17B.	DIMETHYLPHTHALATE	BDL	10
18B.	ACENAPHTHYLENE	BDL	10
19B.	2,6-DINITROTOLUENE	BDL	10
20B.	ACENAPHTHENE	BDL	10
21B.	2,4-DINITROTOLUENE	BDL	10
22B.	DIETHYLPHTHALATE	BDL	10
23B.	4-CHLOROPHENYL PHENYL ETHER	BDL	10
24B.	FLUORENE	BDL	10
25B.	DIPHENYLAMINE (N-NITROSO)	BDL	10
26B.	1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	BDL	10
27B.	4-BROMOPHENYL PHENYL ETHER	BDL	10
28B.	HEXACHLOROBENZENE	BDL	10

(Continued)

BDL=BELOW DETECTION LIMIT

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES -- (Page Two)

SAMPLE IDENTIFIER: 18611
COMPUCHEM® SAMPLE NUMBER: 84914

		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
29B.	PHENANTHRENE	BDL	10
30B.	ANTHRACENE	BDL	10
31B.	DI-N-BUTYLPHTHALATE	BDL	10
32B.	FLUORANTHENE	BDL	10
33B.	PYRENE	BDL	10
34B.	BENZIDINE	BDL	50
35B.	BUTYLBENZYLPHTHALATE	BDL	10
36B.	3,3'-DICHLOROBENZIDINE	BDL	20
37B.	BENZO(A)ANTHRACENE	BDL	10
38B.	BIS(2-ETHYLHEXYL)PHTHALATE	BDL	10
39B.	CHRYSENE	BDL	10
40B.	DI-N-OCTYLPHTHALATE	BDL	10
41B.	BENZO(B)FLUORANTHENE	BDL	10
42B.	BENZO(K)FLUORANTHENE	BDL	10
43B.	BENZO(A)PYRENE	BDL	10
44B.	INDENO(1,2,3-C,D)PYRENE	BDL	10
45B.	DIBENZO(A,H)ANTHRACENE	BDL	10
46B.	BENZO(G,H,I)PERYLENE	BDL	10

Surrogates Recoveries - Introduced at the beginning of the extraction, surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of extraction efficiency and analytical response for the individual sample.

	%Recovery	Control Range%
D_5-Nitrobenzene	75	(41-120)
2-Fluorobiphenyl	76	(44-119)
D_{14}-Terphenyl	108	(33-128)
D_{10}-Pyrene*	111	*

BDL=BELOW DETECTION LIMIT
*Advisory Surrogate; therefore no control range

COMPUCHEM ORGANICS ANALYSIS DATA SHEET
LIBRARY SEARCH RESULTS OF EXTRANEOUS PEAKS &
ESTIMATED CONCENTRATION OF TENTATIVELY IDENTIFIED COMPOUNDS
ANALYTICAL FRACTION: Base/Neutral

DATA FILENAME: BC084914C21 SAMPLE # 84914

ITEM	SCAN NUMBER	CAS #	COMPOUND NAME	% PURITY	ASSESSMENT* RS	OI	UK	ESTIMATED CONC.(ug/l)
1	1034	3622-84-2	Benzenesulfonamide, N-Butyl-	93.8		x		11
	1.000	40.00						

SPECTROSCOPIST EB

DATE 5/14/86

(*) RS - REASONABLE IDENTIFICATION, RETENTION TIME COMPATIBILITY
OI - ISOMER OR SIMILAR COMPOUND
UK - UNKNOWN, NOT IN NBS LIBRARY

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES

SAMPLE IDENTIFIER: 18619
COMPUCHEM® SAMPLE NUMBER: 84919

		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
1B.	N-NITROSODIMETHYLAMINE	BDL	10
2B.	BIS (2-CHLOROETHYL) ETHER	BDL	10
3B.	1,3-DICHLOROBENZENE	BDL	10
4B.	1,4-DICHLOROBENZENE	BDL	10
5B.	1,2-DICHLOROBENZENE	BDL	10
6B.	BIS (2-CHLOROISOPROPYL) ETHER	BDL	10
7B.	HEXACHLOROETHANE	BDL	10
8B.	N-NITROSODI-N-PROPYLAMINE	BDL	10
9B.	NITROBENZENE	BDL	10
10B.	ISOPHORONE	BDL	10
11B.	BIS(2-CHLOROETHOXY) METHANE	BDL	10
12B.	1,2,4-TRICHLOROBENZENE	BDL	10
13B.	NAPHTHALENE	BDL	10
14B.	HEXACHLOROBUTADIENE	BDL	10
15B.	HEXACHLOROCYCLOPENTADIENE	BDL	10
16B.	2-CHLORONAPHTHALENE	BDL	10
17B.	DIMETHYLPHTHALATE	BDL	10
18B.	ACENAPHTHYLENE	BDL	10
19B.	2,6-DINITROTOLUENE	BDL	10
20B.	ACENAPHTHENE	BDL	10
21B.	2,4-DINITROTOLUENE	BDL	10
22B.	DIETHYLPHTHALATE	BDL	10
23B.	FLUORENE	BDL	10
24B.	4-CHLOROPHENYL PHENYL ETHER	BDL	10
25B.	DIPHENYLAMINE (N-NITROSO)	BDL	10
26B.	1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	BDL	10
27B.	4-BROMOPHENYL PHENYL ETHER	BDL	10
28B.	HEXACHLOROBENZENE	BDL	10

(Continued)

BDL=BELOW DETECTION LIMIT

SAMPLE IDENTIFIER: 18619
COMPUCHEM® SAMPLE NUMBER: 84919

		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
29B.	PHENANTHRENE	BDL	10
30B.	ANTHRACENE	BDL	10
31B.	DI-N-BUTYLPHTHALATE	BDL	10
32B.	FLUORANTHENE	BDL	10
33B.	BENZIDINE	BDL	50
34B.	PYRENE	BDL	10
35B.	BUTYLBENZYLPHTHALATE	BDL	10
36B.	BENZO(A)ANTHRACENE	BDL	10
37B.	3,3'-DICHLOROBENZIDINE	BDL	20
38B.	CHRYSENE	BDL	10
39B.	BIS(2-ETHYLHEXYL)PHTHALATE	BDL	10
40B.	DI-N-OCTYLPHTHALATE	BDL	10
41B.	BENZO(B)FLUORANTHENE	BDL	10
42B.	BENZO(K)FLUORANTHENE	BDL	10
43B.	BENZO(A)PYRENE	BDL	10
44B.	INDENO(1,2,3-C,D)PYRENE	BDL	10
45B.	DIBENZO(A,H)ANTHRACENE	BDL	10
46B.	BENZO(G,H,I)PERYLENE	BDL	10

Surrogates Recoveries - Introduced at the beginning of the extraction, surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of extraction efficiency and analytical response for the individual sample.

	%Recovery	Control Range%
d_5-Nitrobenzene	76	(41-120)
2-Fluorobiphenyl	69	(44-119)
d_{14}-Terphenyl	115	(33-128)
d_{10}-Pyrene	106	(40-130)

BDL=BELOW DETECTION LIMIT

COMPUCHEM ORGANICS ANALYSIS DATA SHEET
LIBRARY SEARCH RESULTS OF EXTRANEOUS PEAKS &
ESTIMATED CONCENTRATION OF TENTATIVELY IDENTIFIED COMPOUNDS
ANALYTICAL FRACTION: BASE1

DATA FILENAME: BR084919C21

SAMPLE # 84919

ITEM	SCAN NUMBER	CAS #	COMPOUND NAME	% PURITY	ASSESSMENT* RS	OI	UK	ESTIMATED CONC. IN UG PER L	KG	ML	G
1	924	42498-32-8	BENZAMIDE,N-(1,1-DIMETHYLETHYL)-4-METHYL-	73.1	☐	☑	☐		27.		
	1.000	40.00									

SPECTROSCOPIST _____

DATE 5/19/86

(*) RS - REASONABLE IDENTIFICATION, RETENTION TIME COMPATIBILITY
OI - ISOMER OR SIMILAR COMPOUND
UK - UNKNOWN, NOT IN NBS LIBRARY

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES

SAMPLE IDENTIFIER: 18622
COMPUCHEM® SAMPLE NUMBER: 84921

		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
1B.	N-NITROSODIMETHYLAMINE	BDL	10
2B.	BIS (2-CHLOROETHYL) ETHER	BDL	10
3B.	1,3-DICHLOROBENZENE	BDL	10
4B.	1,4-DICHLOROBENZENE	BDL	10
5B.	1,2-DICHLOROBENZENE	BDL	10
6B.	BIS (2-CHLOROISOPROPYL) ETHER	BDL	10
7B.	HEXACHLOROETHANE	22	10
8B.	N-NITROSODI-N-PROPYLAMINE	BDL	10
9B.	NITROBENZENE	BDL	10
10B.	ISOPHORONE	BDL	10
11B.	BIS(2-CHLOROETHOXY) METHANE	BDL	10
12B.	1,2,4-TRICHLOROBENZENE	BDL	10
13B.	NAPHTHALENE	50	10
14B.	HEXACHLOROBUTADIENE	BDL	10
15B.	HEXACHLOROCYCLOPENTADIENE	BDL	10
16B.	2-CHLORONAPHTHALENE	BDL	10
17B.	DIMETHYLPHTHALATE	BDL	10
18B.	ACENAPHTHYLENE	BDL	10
19B.	2,6-DINITROTOLUENE	BDL	10
20B.	ACENAPHTHENE	73	10
21B.	2,4-DINITROTOLUENE	BDL	10
22B.	DIETHYLPHTHALATE	BDL	10
23B.	FLUORENE	47	10
24B.	4-CHLOROPHENYL PHENYL ETHER	BDL	10
25B.	DIPHENYLAMINE (N-NITROSO)	BDL	10
26B.	1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	BDL	10
27B.	4-BROMOPHENYL PHENYL ETHER	BDL	10
28B.	HEXACHLOROBENZENE	BDL	10

(Continued)

BDL=BELOW DETECTION LIMIT

SAMPLE IDENTIFIER: 18622
COMPUCHEM® SAMPLE NUMBER: 84921

		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
29B.	PHENANTHRENE	33	10
30B.	ANTHRACENE	BDL	10
31B.	DI-N-BUTYLPHTHALATE	BDL	10
32B.	FLUORANTHENE	BDL	10
33B.	PYRENE	BDL	10
34B.	BENZIDINE	BDL	50
35B.	BUTYLBENZYLPHTHALATE	BDL	10
36B.	3,3'-DICHLOROBENZIDINE	BDL	20
37B.	BENZO(A)ANTHRACENE	BDL	10
38B.	BIS(2-ETHYLHEXYL)PHTHALATE	BDL	10
39B.	CHRYSENE	BDL	10
40B.	DI-N-OCTYLPHTHALATE	BDL	10
41B.	BENZO(B)FLUORANTHENE	BDL	10
42B.	BENZO(K)FLUORANTHENE	BDL	10
43B.	BENZO(A)PYRENE	BDL	10
44B.	INDENO(1,2,3-C,D)PYRENE	BDL	10
45B.	DIBENZO(A,H)ANTHRACENE	BDL	10
46B.	BENZO(G,H,I)PERYLENE	BDL	10

Surrogates Recoveries - Introduced at the beginning of the extraction, surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of extraction efficiency and analytical response for the individual sample.

	%Recovery	Control Range%
D_5-Nitrobenzene	67	(41-120)
2-Fluorobiphenyl	54	(44-119)
D_{14}-Terphenyl	67	(33-128)
D_{10}-Pyrene*	62	*

BDL=BELOW DETECTION LIMIT
*Advisory Surrogate; therefore no control range

COMPUCHEM ORGANICS ANALYSIS DATA SHEET
LIBRARY SEARCH RESULTS OF EXTRANEOUS PEAKS &
ESTIMATED CONCENTRATION OF TENTATIVELY IDENTIFIED COMPOUNDS
ANALYTICAL FRACTION: Base/Neutral

DATA FILENAME: BC84921C21 SAMPLE # 84921

ITEM	SCAN NUMBER	CAS #	COMPOUND NAME	% PURITY	ASSESSMENT* RS	OI	UK	ESTIMATED CONC.(ug/l)
1	523	62-53-3	Benzenamine	90.3		X		53
2	617	1758-88-9	Benzene,2-Ethyl-1,4-Dimethyl-	87.6		X		110
3	644	1758-88-9	Benzene,2-Ethyl-1,4-Dimethyl-	87.6		X		82
4	768	91-57-6	Naphthalene,2-Methyl-	83.7		X		420
5	779	91-57-6	Naphthalene,2-Methyl-	88.5		X		110
6	821	92-52-4	1,1'-Biphenyl	83.7		X		340
7	862	629-78-7	Heptadecane	83.6		X		63
8	883	629-78-7	Heptadecane	70.9		X		230
9	902	132-64-9	Dibenzofuran	79.4		X		50
10	937	629-78-7	Heptadecane	72.5		X		120
11	988	629-78-7	Heptadecane	73.5		X		150
12	1118	19314-74-0	4,2-Cresoticacid,6-Methoxy-,Bimol. Ester,Methylester,	43.3			X	450
13	1136	713-46-2	Ethanol,2-[4-(1,1-Dimethylethyl) Phenoxy]-	68.2			X	250
14	1234	27193-86-8	Phenol,Dodecyl-	36.4			X	200
15	1280	57-11-4	Octadecanoicacid	57.0			X	360

1.000 40.00

SPECTROSCOPIST ESB

DATE 05/14/86

(*) RS - REASONABLE IDENTIFICATION, RETENTION TIME COMPATIBILITY
OI - ISOMER OR SIMILAR COMPOUND
UK - UNKNOWN, NOT IN NBS LIBRARY

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES

SAMPLE IDENTIFIER: 18627
COMPUCHEM® SAMPLE NUMBER: 84910

		CONCENTRATION (UG/KG)	DETECTION† LIMIT (UG/KG)
1B.	N-NITROSODIMETHYLAMINE	BDL	3300
2B.	BIS (2-CHLOROETHYL) ETHER	BDL	3300
3B.	1,3-DICHLOROBENZENE	BDL	3300
4B.	1,4-DICHLOROBENZENE	BDL	3300
5B.	1,2-DICHLOROBENZENE	BDL	3300
6B.	BIS (2-CHLOROISOPROPYL) ETHER	BDL	3300
7B.	N-NITROSODI-N-PROPYLAMINE	BDL	3300
8B.	HEXACHLOROETHANE	BDL	3300
9B.	NITROBENZENE	BDL	3300
10B.	ISOPHORONE	BDL	3300
11B.	BIS(2-CHLOROETHOXY) METHANE	BDL	3300
12B.	1,2,4-TRICHLOROBENZENE	16000	3300
13B.	NAPHTHALENE	10000	3300
14B.	HEXACHLOROBUTADIENE	BDL	3300
15B.	HEXACHLOROCYCLOPENTADIENE	BDL	3300
16B.	2-CHLORONAPHTHALENE	BDL	3300
17B.	DIMETHYLPHTHALATE	BDL	3300
18B.	ACENAPHTHYLENE	BDL	3300
19B.	2,6-DINITROTOLUENE	BDL	3300
20B.	ACENAPHTHENE	8600	3300
21B.	2,4-DINITROTOLUENE	BDL	3300
22B.	DIETHYLPHTHALATE	BDL	3300
23B.	4-CHLOROPHENYL PHENYL ETHER	BDL	3300
24B.	FLUORENE	3400	3300
25B.	DIPHENYLAMINE (N-NITROSO)	BDL	3300
26B.	1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	BDL	3300
27B.	4-BROMOPHENYL PHENYL ETHER	BDL	3300
28B.	HEXACHLOROBENZENE	BDL	3300

(Continued)

BDL=BELOW DETECTION LIMIT
†See Quality Assurance Notice - #1

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES (Page Two)

SAMPLE IDENTIFIER: 18627
COMPUCHEM® SAMPLE NUMBER: 84910

		CONCENTRATION (UG/KG)	DETECTION† LIMIT (UG/KG)
29B.	PHENANTHRENE	BDL	3300
30B.	ANTHRACENE	BDL	3300
31B.	DI-N-BUTYLPHTHALATE	BDL	3300
32B.	FLUORANTHENE	BDL	3300
33B.	PYRENE	BDL	3300
34B.	BENZIDINE	BDL	17000
35B.	BUTYLBENZYLPHTHALATE	BDL	3300
36B.	3,3'-DICHLOROBENZIDINE	BDL	6600
37B.	BENZO(A)ANTHRACENE	BDL	3300
38B.	BIS(2-ETHYLHEXYL)PHTHALATE	BDL	3300
39B.	CHRYSENE	BDL	3300
40B.	DI-N-OCTYLPHTHALATE	BDL	3300
41B.	BENZO(B)FLUORANTHENE	BDL	3300
42B.	BENZO(K)FLUORANTHENE	BDL	3300
43B.	BENZO(A)PYRENE	BDL	3300
44B.	INDENO(1,2,3-C,D)PYRENE	BDL	3300
45B.	DIBENZO(A,H)ANTHRACENE	BDL	3300
46B.	BENZO(G,H,I)PERYLENE	BDL	3300

Surrogates Recoveries - Introduced at the beginning of the extraction, surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of extraction efficiency and analytical response for the individual sample.

	%Recovery	Control Range%
D_5-Nitrobenzene	BDL†	(20-140)
2-Fluorobiphenyl	BDL†	(20-140)
D_{14}-Terphenyl	BDL†	(20-150)
D_{10}-Pyrene*	BDL†	*

BDL=BELOW DETECTION LIMIT
*Advisory Surrogate; therefore no control range.
†See Quality Assurance Notice - #1

JATA FILENAME: BD084910A21

COMPUCHEM ORGANICS ANALYSIS DATA SHEET
LIBRARY SEARCH RESULTS OF EXTRANEOUS PEAKS & ESTIMATED CONCENTRATION OF TENTATIVELY IDENTIFIED COMPOUNDS
ANALYTICAL FRACTION: BASE1

SAMPLE # 84910

ITEM	SCAN NUMBER	CAS #	COMPOUND NAME	% PURITY	ASSESSMENT* RS	OI	UK	ESTIMATED CONC. IN UG PER L	KG	ML	G
1	607	1758-88-9	BENZENE,2-ETHYL-1,4-DIMETHYL-	78.0	☐	☒	☐		7700.		
2	613	1758-88-9	BENZENE,2-ETHYL-1,4-DIMETHYL-	84.7	☐	☒	☐		11000.		
3	640	1758-88-9	BENZENE,2-ETHYL-1,4-DIMETHYL-	86.8	☐	☒	☐		3900.		
4	664	62338-57-2	1,4-CYCLOHEXADIENE,3-ETHENYL-1,2-DIMETHYL-	70.1	☐	☐	☒		2200.		
5	724	119-65-3	ISOQUINOLINE	83.5	☐	☒	☐		1400.		
6	764	91-57-6	NAPHTHALENE,2-METHYL-	86.4	☐	☒	☐		16000.		
7	775	91-57-6	NAPHTHALENE,2-METHYL-	90.1	☐	☒	☐		6500.		
8	816	92-52-4	1,1'-BIPHENYL	88.9	☐	☒	☐		23000.		
9	822	629-78-7	HEPTADECANE	76.7	☐	☒	☐		1500.		
10	832	581-40-8	NAPHTHALENE,2,3-DIMETHYL-	83.6	☐	☒	☐		1300.		
11	841	573-98-8	NAPHTHALENE,1,2-DIMETHYL-	84.1	☐	☒	☐		2100.		
12	898	132-64-9	DIBENZOFURAN	81.5	☐	☒	☐		4700.		
13	933	629-78-7	HEPTADECANE	75.3	☐	☒	☐		7600.		
14	984	629-78-7	HEPTADECANE	76.8	☐	☒	☐		7000.		
15	996	104-40-5	PHENOL,4-NONYL-	71.3	☐	☒	☐		10000.		
	333.000	40.00									

SPECTROSCOPIST _____

DATE 5/19/86

(*) RS - REASONABLE IDENTIFICATION, RETENTION TIME COMPATIBILITY
OI - ISOMER OR SIMILAR COMPOUND
UK - UNKNOWN, NOT IN NBS LIBRARY

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES

SAMPLE IDENTIFIER: 18623
COMPUCHEM® SAMPLE NUMBER: 84907

		CONCENTRATION (UG/KG)	DETECTION† LIMIT (UG/KG)
1B.	N-NITROSODIMETHYLAMINE	BDL	1700
2B.	BIS (2-CHLOROETHYL) ETHER	BDL	1700
3B.	1,3-DICHLOROBENZENE	3200	1700
4B.	1,4-DICHLOROBENZENE	9100	1700
5B.	1,2-DICHLOROBENZENE	5700	1700
6B.	BIS (2-CHLOROISOPROPYL) ETHER	BDL	1700
7B.	N-NITROSODI-N-PROPYLAMINE	BDL	1700
8B.	HEXACHLOROETHANE	BDL	1700
9B.	NITROBENZENE	BDL	1700
10B.	ISOPHORONE	BDL	1700
11B.	BIS(2-CHLOROETHOXY) METHANE	BDL	1700
12B.	1,2,4-TRICHLOROBENZENE	61000	1700
13B.	NAPHTHALENE	8700	1700
14B.	HEXACHLOROBUTADIENE	BDL	1700
15B.	HEXACHLOROCYCLOPENTADIENE	BDL	1700
16B.	2-CHLORONAPHTHALENE	BDL	1700
17B.	DIMETHYLPHTHALATE	BDL	1700
18B.	ACENAPHTHYLENE	BDL	1700
19B.	2,6-DINITROTOLUENE	BDL	1700
20B.	ACENAPHTHENE	5300	1700
21B.	2,4-DINITROTOLUENE	BDL	1700
22B.	DIETHYLPHTHALATE	BDL	1700
23B.	4-CHLOROPHENYL PHENYL ETHER	BDL	1700
24B.	FLUORENE	BDL	1700
25B.	DIPHENYLAMINE (N-NITROSO)	BDL	1700
26B.	1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	BDL	1700
27B.	4-BROMOPHENYL PHENYL ETHER	BDL	1700
28B.	HEXACHLOROBENZENE	BDL	1700

(Continued)

BDL=BELOW DETECTION LIMIT

†Sample analyzed using a 5:1 dilution, thus the higher than normal detection limits.

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES (Page Two)

SAMPLE IDENTIFIER: 18623
COMPUCHEM® SAMPLE NUMBER: 84907

		CONCENTRATION (UG/KG)	DETECTION† LIMIT (UG/KG)
29B.	PHENANTHRENE	BDL	1700
30B.	ANTHRACENE	BDL	1700
31B.	DI-N-BUTYLPHTHALATE	BDL	1700
32B.	FLUORANTHENE	BDL	1700
33B.	PYRENE	BDL	1700
34B.	BENZIDINE	BDL	8300
35B.	BUTYLBENZYLPHTHALATE	BDL	1700
36B.	3,3'-DICHLOROBENZIDINE	BDL	3300
37B.	BENZO(A)ANTHRACENE	BDL	1700
38B.	BIS(2-ETHYLHEXYL)PHTHALATE	BDL	1700
39B.	CHRYSENE	BDL	1700
40B.	DI-N-OCTYLPHTHALATE	BDL	1700
41B.	BENZO(B)FLUORANTHENE	BDL	1700
42B.	BENZO(K)FLUORANTHENE	BDL	1700
43B.	BENZO(A)PYRENE	BDL	1700
44B.	INDENO(1,2,3-C,D)PYRENE	BDL	1700
45B.	DIBENZO(A,H)ANTHRACENE	BDL	1700
46B.	BENZO(G,H,I)PERYLENE	BDL	1700

Surrogates Recoveries - Introduced at the beginning of the extraction, surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of extraction efficiency and analytical response for the individual sample.

	%Recovery	Control Range%
D_5-Nitrobenzene	74	(20-140)
2-Fluorobiphenyl	77	(20-140)
D_{14}-Terphenyl	85	(20-150)
D_{10}-Pyrene*	82	*

BDL=BELOW DETECTION LIMIT
*Advisory Surrogate; therefore no control range.

†Sample analyzed using a 5:1 dilution, thus the higher than normal detection limits.

DATA FILENAME: BD084907A21

COMPUCHEM ORGANICS ANALYSIS DATA SHEET
LIBRARY SEARCH RESULTS OF EXTRANEOUS PEAKS &
ESTIMATED CONCENTRATION OF TENTATIVELY IDENTIFIED COMPOUNDS
ANALYTICAL FRACTION: BASE1

SAMPLE # 84907

ITEM	SCAN NUMBER	CAS #	COMPOUND NAME	% PURITY	ASSESSMENT* RS	ASSESSMENT* OI	ASSESSMENT* UK	ESTIMATED CONC. IN UG PER KG
1	610	1758-88-9	BENZENE,2-ETHYL-1,4-DIMETHYL-	86.5	☐	☑	☐	3800.
2	638	527-53-7	BENZENE,1,2,3,5-TETRAMETHYL-	82.8	☐	☑	☐	5400.
3	706	87-61-6	BENZENE,1,2,3-TRICHLORO-	85.9	☐	☑	☐	4700.
4	761	91-57-6	NAPHTHALENE,2-METHYL-	89.7	☐	☑	☐	17000.
5	772	91-57-6	NAPHTHALENE,2-METHYL-	88.3	☐	☑	☐	8500.
6	813	92-52-4	1,1'-BIPHENYL	88.3	☐	☑	☐	29000.
7	930	629-78-7	HEPTADECANE	75.8	☐	☑	☐	5500.
8	939	54932-78-4	PHENOL,4-(2,2,3,3-TETRAMETHYLBUTYL)-	84.5	☐	☑	☐	4900.
9	981	629-78-7	HEPTADECANE	72.1	☐	☑	☐	7400.
10	993	104-40-5	PHENOL,4-NONYL-	73.1	☐	☑	☐	11000.
11	1012	54932-78-4	PHENOL,4-(2,2,3,3-TETRAMETHYLBUTYL)-	62.9	☐	☑	☐	7700.
12	1076	55334-42-4	DODECANE,1,2-DIBROMO-	42.6	☐	☐	☑	5400.
13	1312	55401-65-5	PENTALENE,OCTAHYDRO-1-(2-OCTYLDECYL)-	52.1	☐	☑	☑	7300.
14	1380	55401-65-5	PENTALENE,OCTAHYDRO-1-(2-OCTYLDECYL)-	50.5	☐	☐	☑	8200.
15	1444	55401-65-5	PENTALENE,OCTAHYDRO-1-(2-OCTYLDECYL)-	45.9	☐	☐	☑	5000.
	166.000	40.00						

ESTIMATED CONC. IN: ☐ L ☒ KG ☐ ML ☐ G

SPECTROSCOPIST [signature]

DATE 5/19/86

(*) RS - REASONABLE IDENTIFICATION, RETENTION TIME COMPATIBILITY
OI - ISOMER OR SIMILAR COMPOUND
UK - UNKNOWN, NOT IN NBS LIBRARY

COMPOUND LIST -- BASE-NEUTRAL EXTRACTABLES

SAMPLE IDENTIFIER: 18630A
COMPUCHEM® SAMPLE NUMBER: 84922

		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
1B.	N-NITROSODIMETHYLAMINE	BDL	10
2B.	BIS (2-CHLOROETHYL) ETHER	BDL	10
3B.	1,3-DICHLOROBENZENE	BDL	10
4B.	1,4-DICHLOROBENZENE	34	10
5B.	1,2-DICHLOROBENZENE	BDL	10
6B.	BIS (2-CHLOROISOPROPYL) ETHER	BDL	10
7B.	HEXACHLOROETHANE	BDL	10
8B.	N-NITROSODI-N-PROPYLAMINE	BDL	10
9B.	NITROBENZENE	BDL	10
10B.	ISOPHORONE	BDL	10
11B.	BIS(2-CHLOROETHOXY) METHANE	BDL	10
12B.	1,2,4-TRICHLOROBENZENE	BDL	10
13B.	NAPHTHALENE	BDL	10
14B.	HEXACHLOROBUTADIENE	BDL	10
15B.	HEXACHLOROCYCLOPENTADIENE	BDL	10
16B.	2-CHLORONAPHTHALENE	BDL	10
17B.	DIMETHYLPHTHALATE	BDL	10
18B.	ACENAPHTHYLENE	BDL	10
19B.	2,6-DINITROTOLUENE	BDL	10
20B.	ACENAPHTHENE	BDL	10
21B.	2,4-DINITROTOLUENE	BDL	10
22B.	DIETHYLPHTHALATE	BDL	10
23B.	FLUORENE	BDL	10
24B.	4-CHLOROPHENYL PHENYL ETHER	BDL	10
25B.	DIPHENYLAMINE (N-NITROSO)	BDL	10
26B.	1,2-DIPHENYLHYDRAZINE (AZOBENZENE)	BDL	10
27B.	4-BROMOPHENYL PHENYL ETHER	BDL	10
28B.	HEXACHLOROBENZENE	BDL	10

(Continued)

BDL=BELOW DETECTION LIMIT

SAMPLE IDENTIFIER: 18630A
COMPUCHEM® SAMPLE NUMBER: 84922

		CONCENTRATION (UG/L)	DETECTION LIMIT (UG/L)
29B.	PHENANTHRENE	BDL	10
30B.	ANTHRACENE	BDL	10
31B.	DI-N-BUTYLPHTHALATE	BDL	10
32B.	FLUORANTHENE	BDL	10
33B.	PYRENE	BDL	10
34B.	BENZIDINE	BDL	50
35B.	BUTYLBENZYLPHTHALATE	BDL	10
36B.	3,3'-DICHLOROBENZIDINE	BDL	20
37B.	BENZO(A)ANTHRACENE	BDL	10
38B.	BIS(2-ETHYLHEXYL)PHTHALATE	BDL	10
39B.	CHRYSENE	BDL	10
40B.	DI-N-OCTYLPHTHALATE	BDL	10
41B.	BENZO(B)FLUORANTHENE	BDL	10
42B.	BENZO(K)FLUORANTHENE	BDL	10
43B.	BENZO(A)PYRENE	BDL	10
44B.	INDENO(1,2,3-C,D)PYRENE	BDL	10
45B.	DIBENZO(A,H)ANTHRACENE	BDL	10
46B.	BENZO(G,H,I)PERYLENE	BDL	10

Surrogates Recoveries - Introduced at the beginning of the extraction, surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of extraction efficiency and analytical response for the individual sample.

	%Recovery	Control Range%
D_5-Nitrobenzene	71	(41-120)
2-Fluorobiphenyl	64	(44-119)
D_{14}-Terphenyl	76	(33-128)
D_{10}-Pyrene*	76	*

BDL=BELOW DETECTION LIMIT
*Advisory Surrogate; therefore no control range