13774

CASE NO. 6497

U.S. FISH AND WILDLIFE SERVICE
MASSAPONAX CREEK SEDIMENT SAMPLES

0985B

Due to the poor quality of the original data copy, this table of analytes, listed in the same order as those reported by the laboratory, is enclosed.

CAS Number	BNA
106-95-2	Phenol
111-44-4	bis (2-Chloroethyl) Ether
95-57-8	2-Chlorophenol
541-73-1	1, 3-Dichlorobenzene
106-46-7	1, 4-Dichlorobenzene
100-51-6	Benzyl Aclohol
95-50-1	1, 2-Dichlorobenzene
95-48-7	2-Methylphenol
39638-32-9	bis (2-chlorosopropyl) Ether
106-44-5	4-Methylphenol
621-64-7	N-Nitroso-Di-n-Propylamine
67-72-1	Hexachloroethane
98-95-3	Nitrobenzene
78-59-1	Isophorone
88-75-5	2-Nitrophenol
106-67-9	2, 4-Dimethylphenol
85-85-0	Benzoic Acid (2)
111-91-1	bis (2-Chloroethoxy) Methane
120-83-2	2, 4-Dichlorophenol
120-82-1	1, 2, 4-Trichlorobenzene
91-20-3	Naphthalene
106-47-8	4-Chloroaniline
87-88-3	Hexachlorobutadiene
59-50-7	4-Chloro-3-Methylphenol
91-57-6	2-Methylnaphthalene
77-47-4	Hexachlorocyclopentadiene
88-06-2	2, 4, 6-Trichlorophonol
95-95-4	2, 4, 5-Trichlorophenol
91-58-7	2-Chloronaphthalene
88-74-4	2-Nitroaniline
131-11-3	Dimethyl Phthalate
208-96-8	Acenaphthylene
99-08-2	3-Nitroaniline
83-32-9	Acenaphthene
61-28-5	2, 4-Dinitrophenol
100-02-7	4-Nitrophenol
132-84-9	Dibenzofuran
121-14-2	2, 4-Dinitrotoluene
606-20-2	2, 6-Dinitrotoluene
84-65-2	Diethylphthalate
7005-72-3	4-Chlorophenyl-phenylether
96-73-7	Fluorene
100-01-4	4-Nitroaniline
634-52-1	4, 6-Dinitro-2-Methylphenol
86-30-6	N-Nitrosodiphenylamine
101-55-3	4-Bromophenyl-phenylether
118-74-1	Hexacholorbenzene
87-86-5	Pentachlorophenol
85-01-8	Phenanthrene
120-12-7	Anthracene
84-74-2	Di-n-Butylphthalate
206-44-0	Fluoranthene
129-00-0	Pyrene
85-58-7	Butylbenzylphthalate
91-94-1	3, 3-Dichlorobenzidine (3)
56-55-3	Benzo (a) Anthracene
117-81-7	bis (2-Ethylhexyl) Phthalate
218-01-9	Chrysene
117-84-0	Di-n-Octyl Phthalate
205-99-2	Benzo (b) Fluoranthene
207-08-9	Benzo (k) Fluoranthene
60-32-8	Benzo (a) Pyrene
193-39-5	Indeno (1, 2, 3-cd) Pyrene
53-70-3	Dibenzo (a, h) Anthracene
191-24-2	Benzo (g, h, i) Perylene

74-87-3	Chloromethane
74-83-9	Bromomethane
75-01-4	Vinyl Chloride
75-00-3	Chloroethane
75-00-2	Methylene Chloride
67-64-1	Acetone
75-15-0	Carbon Disulfide
75-36-4	1,1-Dichloroethene
75-34-3	1,1-Dichloroethane
156-60-5	Trans-1, 2-Dichloroethene
67-66-3	Chloroform
107-06-2	1, 2-Dichloroethane
78-83-3	1, 1, 1-Trichloroethane
56-23-5	Carbon Tetrachloride
108-05-4	Vinyl Acetane
75-27-4	Bromodichloromethane
78-87-5	1, 2-Dichloropropane
10061-02-6	Trans-1, 3-Dichloropropane
79-01-6	Trichloroethene
124-48-1	Dibromochloromethane
79-00-5	1, 1, 2-Trichloroethane
75-25-2	Bromoform
591-78-6	4-Methyl-2-Pentanone
108-10-1	2-Hexanone
127-18-4	Tetrachloroethene
79-34-5	1, 1, 2, 2-Tetrachloroethane
108-88-3	Toluene
108-90-7	Chlorobenzene
100-41-4	Ethylbenzene
100-42-5	Styrene
	Total Xylenes

METALS
Aluminum
Antimony
Arsenic
Barium
Beryllium
Cadmium
Cobalt
Copper
Iron
Lead
Magnesium
Mercury
Nickel
Potasium
Selenium
Silver
Sodium
Thallium
Tin
Vanadium
Zinc

CAS Number	ug/l or ug/kg (Circle One)	CD629 RW09-08	CD630 RW09-09	CD631 Blank (Chip Blk)		Method Blank (lab)	CADL
108 95 2	Phenol	3 N	3 J	2 N			10
111-44-4	bis(2-Chloroethyl)Ether						10
95 57 8	2-Chlorophenol						10
541 73 1	1,3-Dichlorobenzene						10
106 46 7	1,4-Dichlorobenzene						10
100 51 6	Benzyl Alcohol						10
95 50 1	1,2-Dichlorobenzene						10
95 48 7	2-Methylphenol						10
39638 32 9	bis(2 chloroisopropyl)Ether						10
106-44 5	4 Methylphenol						10
621-64 7	N-Nitroso-Di-n-Propylamine						10
67 72-1	Hexachloroethane						10
98 95 3	Nitrobenzene						10
78 59 1	Isophorone						10
88-75 5	2-Nitrophenol						10
105-67-9	2,4-Dimethylphenol						10
65-85-0	Benzoic Acid						50
111-91-1	bis(2-Chloroethoxy)Methane						10
120-83-2	2,4-Dichlorophenol						10
120-82-1	1,2,4-Trichlorobenzene						10
91-20-3	Naphthalene						10
106-47-8	4-Chloroaniline						10
87-68-3	Hexachlorobutadiene						10
59-50-7	4-Chloro-3-Methylphenol						10
91-57-6	2-Methylnaphthalene						10
77-47-4	Hexachlorocyclopentadiene						10
88-06-2	2,4,6-Trichlorophenol						10
95 95-4	2,4,5-Trichlorophenol						50
91-58-7	2-Chloronaphthalene						10
88 74-4	2-Nitroaniline						50
131-11-3	Dimethyl Phthalate						10
208 96-8	Acenaphthylene						10
99-09-2	3-Nitroaniline						50
83 32-9	Acenaphthene						10
51-28-5	2,4-Dinitrophenol						10
100-02-7	4-Nitrophenol						10
132-64 9	Dibenzofuran						10
121-14-2	2,4-Dinitrotoluene						50
606-20-2	2,6-Dinitrotoluene						50
84-66-2	Diethylphthalate						10
7005-72-3	4-Chlorophenyl-phenylether						10
86-73-7	Fluorene						10
100-01-6	4-Nitroaniline						50
534-52-1	4,6-Dinitro-2-Methylphenol						50
86-30-6	N-Nitrosodiphenylamine (1)						10
101-55-3	4-Bromophenyl-phenylether						10
118-74-1	Hexachlorobenzene						10
87-86-5	Pentachlorophenol						50
85-01-8	Phenanthrene						10
120-12-7	Anthracene						10
84 74 2	Di-n-Butylphthalate	2 UJ				35	10
206-44-0	Fluoranthene						10
							10
85-68 7	Butylbenzylphthalate						10
91-94-1	3,3-Dichlorobenzidine						20
56 55-3	Benzo(a)Anthracene						10
117-81-7	bis(2-Ethylhexyl)Phthalate	150 UJ		36 UJ		490	10
218-01-9	Chrysene						10
117-84-0	Di-n-Octyl Phthalate						10
205 99-2	Benzo(b)Fluoranthene						10
207-08-9	Benzo(k)Fluoranthene						10
50-32-8	Benzo(a)Pyrene						10
193-39 5	Indeno(1,2,3-cd)Pyrene						10
53-70-3	Dibenzo(a,h)Anthracene						10
191-24 2	Benzo(g,h,i)Perylene						10

(1) Cannot be separated from diphenylamine

CASE/SITE ID: 6497 / LA Clarke

DETECTION LIMITS: Must be multiplied by the respective conc/dil factor and, for soils, divided by the fraction solids (for dry weight correction).

CAS Number	VOA	WATER ug/L	SOIL ug/kg
74-87-3	Chloromethane	10	10
74-83-9	Bromomethane	10	10
75-01-4	Vinyl Chloride	10	10
75-00-3	Chloroethane	10	10
75-09-2	Methylene Chloride	5	5
67-64-1	Acetone	10	10
75-15-0	Carbon Disulfide	5	5
75-35-4	1, 1-Dichloroethene	5	5
75-34-3	1, 1-Dichloroethane	5	5
156-60-5	Trans-1, 2-Dichloroethene	5	5
67-66-3	Chloroform	5	5
107-06-2	1, 2-Dichloroethane	5	5
78-93-3	2-Butanone	10	10
71-55-6	1, 1, 1-Trichloroethane	5	5
56-23-5	Carbon Tetrachloride	5	5
108-05-4	Vinyl Acetate	10	10
75-27-4	Bromodichloromethane	5	5
78-87-5	1, 2-Dichloropropane	5	5
10061-02-6	Trans-1, 3-Dichloropropene	5	5
79-01-6	Trichloroethene	5	5
124-48-1	Dibromochloromethane	5	5
79-00-5	1, 1, 2-Trichloroethane	5	5
71-43-2	Benzene	5	5
10061-01-5	cis-1, 3-Dichloropropene	5	5
110-75-8	2-Chloroethylvinylether	10	10
75-25-2	Bromoform	5	5
591-78-6	4-Methyl-2-Pentanone	10	10
108-10-1	2-Hexanone	10	10
127-18-4	Tetrachloroethene	5	5
79-34-5	1, 1, 2, 2-Tetrachloroethane	5	5
108-88-3	Toluene	5	5
108-90-7	Chlorobenzene	5	5
100-41-4	Ethylbenzene	5	5
100-42-5	Styrene	5	5
	Total Xylenes	5	5

CAS Number	not requested	WATER ug/L	SOIL ug/kg
319-84-6	Alpha BHC	0.05	8.0
319-85-7	Beta-BHC	0.05	8.0
319-86-8	Delta-BHC	0.05	8.0
58-89-9	Gamma-BHC (Lindane)	0.05	8.0
76-44-8	Heptachlor	0.05	8.0
309-00-2	Aldrin	0.05	8.0
1024-57-3	Heptachlor Epoxide	0.05	8.0
959-98-8	Endosulfan I	0.05	8.0
60-57-1	Dieldrin	0.10	16
72-55-9	4, 4'-DDE	0.10	16
72-20-8	Endrin	0.10	16
33213-65-9	Endosulfan II	0.10	16
72-54-8	4, 4'-DDD	0.10	16
1031-07-8	Endosulfan Sulfate	0.10	16
50-29-3	4, 4'-DDT	0.10	16
72-43-5	Methoxychlor	0.5	80.
53494-70-5	Endrin Ketone	0.1	16
57-74-9	Chlordane	0.5	80.
8001-35-2	Toxaphene	1.0	160
12674-11-2	Aroclor-1016	0.5	80
11104-28-2	Aroclor-1221	0.5	80
11141-16-5	Aroclor-1232	0.5	80
53469-21-9	Aroclor-1242	0.5	80
12672-29-6	Aroclor-1248	0.5	80
11097-69-1	Aroclor-1254	1.0	160
11096-82-5	Aroclor-1260	1.0	160

CAS Number	BNA	WATER ug/L	SOIL ug/kg
108-95-2	Phenol	10	330
111-44-4	bis(2-Chloroethyl)Ether	10	330
95-57-8	2-Chlorophenol	10	330
541-73-1	1, 3-Dichlorobenzene	10	330
106-46-7	1, 4-Dichlorobenzene	10	330
100-51-6	Benzyl Alcohol	10	330
95-50-1	1, 2-Dichlorobenzene	10	330
95-48-7	2-Methylphenol	10	330
39638-32-9	bis(2-chloroisopropyl)Ether	10	330
106-44-5	4-Methylphenol	10	330
621-64-7	N-Nitroso-Di-n-Propylamine	10	330
67-72-1	Hexachloroethane	10	330
98-95-3	Nitrobenzene	10	330
78-59-1	Isophorone	10	330
88-75-5	2-Nitrophenol	10	330
105-67-9	2, 4-Dimethylphenol	10	330
65-85-0	Benzoic Acid (2)	50	1600
111-91-1	bis(2-Chloroethoxy)Methane	10	330
120-83-2	2, 4-Dichlorophenol	10	330
120-82-1	1, 2, 4-Trichlorobenzene	10	330
91-20-3	Naphthalene	10	330
106-47-8	4-Chloroaniline	10	330
87-68-3	Hexachlorobutadiene	10	330
59-50-7	4-Chloro-3-Methylphenol	10	330
91-57-6	2-Methylnaphthalene	10	330
77-47-4	Hexachlorocyclopentadiene	10	330
88-06-2	2, 4, 6-Trichlorophenol	10	330
95-95-4	2, 4, 5-Trichlorophenol (2)	50	1600
91-58-7	2-Chloronaphthalene	10	330
88-74-4	2-Nitroaniline (2)	50	1600
131-11-3	Dimethyl Phthalate	10	330
208-96-8	Acenaphthylene	10	330
99-09-2	3-Nitroaniline (2)	50	1600
83-32-9	Acenaphthene	10	330
51-28-5	2, 4-Dinitrophenol (2)	50	1600
100-02-7	4-Nitrophenol (2)	50	1600
132-64-9	Dibenzofuran	10	330
121-14-2	2, 4-Dinitrotoluene	10	330
606-20-2	2, 6-Dinitrotoluene	10	330
84-66-2	Diethylphthalate	10	330
7005-72-3	4-Chlorophenyl-phenylether	10	330
86-73-7	Fluorene	10	330
100-01-6	4-Nitroaniline (2)	50	1600
534-52-1	4, 6-Dinitro-2-Methylphenol (2)	50	1600
86-30-6	N-Nitrosodiphenylamine (1)	10	330
101-55-3	4-Bromophenyl-phenylether	10	330
118-74-1	Hexachlorobenzene	10	330
87-86-5	Pentachlorophenol (2)	50	1600
85-01-8	Phenanthrene	10	330
120-12-7	Anthracene	10	330
84-74-2	Di-n-Butylphthalate	10	330
206-44-0	Fluoranthene	10	330
129-00-0	Pyrene	10	330
85-68-7	Butylbenzylphthalate	10	330
91-94-1	3, 3'-Dichlorobenzidine (2)	20	660
56-55-3	Benzo(a)Anthracene	10	330
117-81-7	bis(2-Ethylhexyl)Phthalate	10	330
218-01-9	Chrysene	10	330
117-84-0	Di-n-Octyl Phthalate	10	330
205-99-2	Benzo(b)Fluoranthene	10	330
207-08-9	Benzo(k)Fluoranthene	10	330
50-32-8	Benzo(a)Pyrene	10	330
193-39-5	Indeno(1, 2, 3-cd)Pyrene	10	330
53-70-3	Dibenzo(a, h)Anthracene	10	330
191-24-2	Benzo(g, h, i)Perylene	10	330

(1) Cannot be separated from diphen[illegible]

CASE #/SITE ID: 6497 / LA Clarke

BNA 91-2

DATE SAMPLED:		9/29/86	9/29/86	9/29/86	9/29/86	9/29/86	9/29/86	9/29/86		
DATE SAMPLE RECD:		10/7/86	10/7/86	10/7/86	10/7/86	10/7/86	10/7/86	10/7/86		
DATE EXTR/PREP'D:		10/21/86	10/21/86	10/21/86	10/21/86	10/21/86	10/21/86	10/21/86		
DATE ANALYZED:		11/3/86	11/3/86	11/3/86	11/3/86	11/3/86	11/3/86	11/3/86		
CONC/OIL FACTOR:		1	1	1	1	1	1	1		
% MOISTURE:		25.2	29.4	23.1	20.9	25.3	41.4	0		
UNITS:		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg		
CAS Number	SAMPLE DESCRIPT.: / TRAFFIC REPORT #:	USFWS Mass Upstream CE6496	CE6497	USFWS Mass Central CE6498	CE6499	USFWS Mass Downstream CE6500	CE6501	Blank A-2		
108-95-2	Phenol									
111-44-4	bis 2-Chloroethylether									
95-57-8	2-Chlorophenol									
541-73-1	1,3-Dichlorobenzene									
106-46-7	1,4-Dichlorobenzene									
100-51-6	Benzyl Alcohol									
95-50-1	1,2-Dichlorobenzene									
95-48-7	2-Methylphenol									
39638-32-9	bis 2-Chloroisopropylether				4J					
106-44-5	4-Methylphenol									
621-64-7	N-Nitroso-Di-n-Propylamine									
67-72-1	Hexachloroethane									
98-95-3	Nitrobenzene									
78-59-1	Isophorone									
88-75-5	2-Nitrophenol									
105-67-9	2,4-Dimethylphenol									
65-85-0	Benzoic Acid (1)	579 J	348 J	278 J		238 J				
111-91-1	bis 2-Chloroethoxy Methane									
120-83-2	2,4-Dichlorophenol									
120-82-1	1,2,4-Trichlorobenzene									
91-20-3	Naphthalene									
106-47-8	4-Chloroaniline				4J					
87-68-3	Hexachlorobutadiene									
59-50-7	4-Chloro-3-Methylphenol									
91-57-6	2-Methylnaphthalene									
77-47-4	Hexachlorocyclopentadiene				4J					
88-06-2	2,4,6-Trichlorophenol									
95-95-4	2,4,5-Trichlorophenol (1)									
91-58-7	2-Chloronaphthalene									
88-74-4	2-Nitroaniline (2)									
131-11-3	Dimethyl Phthalate									
208-96-8	Acenaphthylene									
99-09-2	3-Nitroaniline (2)									
83-32-9	Acenaphthene			389 J	180 J					
51-28-5	2,4-Dinitrophenol (2)	4J	4J	4J		4J	4J	4J		
100-02-7	4-Nitrophenol (2)									
132-64-9	Dibenzofuran			455 J						
121-14-2	2,4-Dinitrotoluene				4J					
606-20-2	2,6-Dinitrotoluene									
84-66-2	Diethylphthalate									
7005-72-3	4-Chlorophenyl-phenylether									
86-73-7	Fluorene			340 J	98 J		240 J			
100-01-6	4-Nitroaniline (2)	4J	4J	4J	4J	4J	4J	4J		
534-52-1	4,6-Dinitro-2-Methylphenol (2)									
86-30-6	N-Nitrosodiphenylamine (1)									
101-55-3	4-Bromophenyl-phenylether									
118-74-1	Hexachlorobenzene									
87-86-5	Pentachlorophenol (2)									
85-01-8	Phenanthrene			500 J	350 J	190 J	180			
120-12-7	Anthracene			89 J	78 J		210 J			
84-74-2	Di-n-Butylphthalate			217 J						
206-44-0	Fluoranthene			1670	855	1500	3580			
129-00-0	Pyrene			1473	628	1160	2460			
85-68-7	Butylbenzylphthalate									
91-94-1	3,3-Dichlorobenzidine (2)	4J	4J	4J	4J	4J	4J			
56-55-3	Benzo(a)Anthracene			565 J	310 J	1000	1820			
117-81-7	bis 2-Ethylhexylphthalate	216 J	330 J	216 J	250 J	240 J	330			
218-01-9	Chrysene			430 J	290 J	680				
117-84-0	Di-n-Octyl Phthalate									
205-99-2	Benzo(b)Fluoranthene			515	260 J	1230	1945			
207-08-9	Benzo(k)Fluoranthene									
50-32-8	Benzo(a)Pyrene					370 J	585			
193-39-5	Indeno(1,2,3-cd)Pyrene					275 J				
53-70-3	Dibenz(a,h)Anthracene									
191-24-2	Benzo(g,h,i)Perylene					170 J				

(1) Cannot be separated from diphenylamine

CASE #/SITE ID:

BNA Pg 2-2

DATE SAMPLED:		9/21/86	9/21/86									
DATE SAMPLE RECD:		10/7/86	10/7/86									
DATE EXTR/PREP'D:		10/21/86	10/21/86									
DATE ANALYZED:		11/4/86	11/4/86									
CONC/DIL FACTOR:		1	1									
% MOISTURE:		25.8	25.8									
UNITS:		ug/kg	ug/kg									
CAS Number	SAMPLE DESCRIPT.: TRAFFIC REPORT #:	CEL60MS	CEL61MSD									
108-95-2	Phenol	12700	13200									
111-44-4	bis(2-Chloroethyl)Ether											
95-57-8	2-Chlorophenol	12700	12400									
541-73-1	1,3-Dichlorobenzene											
106-46-7	1,4-Dichlorobenzene	5450	5260									
100-51-6	Benzyl Alcohol											
95-50-1	1,2-Dichlorobenzene											
95-48-7	2-Methylphenol											
39638-32-9	bis(2-Chloroisopropyl)Ether	UJ	UJ									
106-44-5	4-Methylphenol											
621-64-7	N-Nitroso-Di-n-Propylamine	401	449									
67-72-1	Hexachloroethane											
98-95-3	Nitrobenzene											
78-59-1	Isophorone											
88-75-5	2-Nitrophenol											
105-67-9	2,4-Dimethylphenol											
65-85-0	Benzoic Acid (1)	86 J	168 J									
111-91-1	bis(2-Chloroethoxy)Methane											
120-83-2	2,4-Dichlorophenol											
120-82-1	1,2,4-Trichlorobenzene	5710	4940									
91-20-3	Naphthalene											
106-47-8	4-Chloroaniline	UJ	UJ									
87-68-3	Hexachlorobutadiene											
59-50-7	4-Chloro-3-Methylphenol	14200	13400									
91-57-6	2-Methylnaphthalene											
77-47-4	Hexachlorocyclopentadiene	UJ	UJ									
88-06-2	2,4,6-Trichlorophenol											
95-95-4	2,4,5-Trichlorophenol (1)											
91-58-7	2-Chloronaphthalene											
88-74-4	2-Nitroaniline (1)											
131-11-3	Dimethyl Phthalate											
208-96-8	Acenaphthylene											
99-09-2	3-Nitroaniline (1)											
83-32-9	Acenaphthene	7530	6870									
51-28-5	2,4-Dinitrophenol (1)											
100-02-7	4-Nitrophenol (1)	23300	16400									
132-64-9	Dibenzofuran											
121-14-2	2,4-Dinitrotoluene	5290 UJ	7963 UJ									
606-20-2	2,6-Dinitrotoluene											
84-66-2	Diethylphthalate											
7005-72-3	4-Chlorophenyl-phenylether											
86-73-7	Fluorene											
100-01-6	4-Nitroaniline (1)	UJ	UJ									
534-52-1	4,6-Dinitro-2-Methylphenol (1)											
86-30-6	N-Nitrosodiphenylamine (1)											
101-55-3	4-Bromophenyl-phenylether											
118-74-1	Hexachlorobenzene											
87-86-5	Pentachlorophenol (1)	2270	1970									
85-01-8	Phenanthrene	190 J	250 J									
120-12-7	Anthracene											
84-74-2	Di-n-Butylphthalate											
206-44-0	Fluoranthene	1275	1350									
129-00-0	Pyrene	9760	10900									
85-68-7	Butylbenzylphthalate											
91-94-1	3,3-Dichlorobenzidine (1)	UJ	UJ									
56-55-3	Benzo(a)Anthracene	780	918									
117-81-7	bis(2-Ethylhexyl)Phthalate	211 J	240 J									
218-01-9	Chrysene	570	740									
117-84-0	Di-n-Octyl Phthalate											
205-99-2	Benzo(b)Fluoranthene	1050	1240									
207-08-9	Benzo(k)Fluoranthene											
50-32-8	Benzo(a)Pyrene	390 J	340 J									
193-39-5	Indeno(1,2,3-cd)Pyrene	230 J	250 J									
53-70-3	Dibenzo(a,h)Anthracene											
191-24-2	Benzo(g,h,i)Perylene	174 J										

(1) Cannot be separated from diphenylamine

CASE #/SITE ID: 0497/C.A. Clarke

VOA
Pg 1-2

DATE SAMPLED:		9/21/86	9/21/86	9/21/86	9/21/86	9/21/86			
DATE SAMPLE RECD:		10/17/86	10/17/86	10/17/86	10/17/86	10/17/86			
DATE EXTR/PREP'D:									
DATE ANALYZED:		10/23/86	10/23/86	10/23/86	10/23/86	10/24/86			
CONC/DIL FACTOR:		1	1	1	1	1			
% MOISTURE:		25.2	29.2	23.1	0	0			
UNITS:		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg			
CAS Number	SAMPLE DESCRIPT.: / TRAFFIC REPORT #:	VS PLUS Mass Upstream CE686	VS PLUS CE687	US PLUS Mass Central CE688	Blank 1023	Blank 1024			
74-87-3	Chloromethane								
74-83-9	Bromomethane								
75-01-4	Vinyl Chloride								
75-00-3	Chloroethane					UJ			
75-09-2	Methylene Chloride	18.0	8.9	16.0					
67-64-1	Acetone	72.0 UJ	78.0 UJ	190 UJ	4.3 UJ				
75-15-0	Carbon Disulfide								
75-35-4	1, 1-Dichloroethene								
75-34-3	1, 1-Dichloroethane	UJ	UJ	UJ	UJ				
156-60-5	Trans-1, 2-Dichloroethene	UJ	UJ	UJ	UJ				
67-66-3	Chloroform					UJ			
107-06-2	1, 2-Dichloroethane								
78-93-3	2-Butanone	UJ	UJ	UJ	UJ	UJ			
71-55-6	1, 1, 1-Trichloroethane	UJ	UJ	UJ	UJ	UJ			
56-23-5	Carbon Tetrachloride	UJ	UJ	UJ	UJ	UJ			
108-05-4	Vinyl Acetate								
75-27-4	Bromodichloromethane					UJ			
78-87-5	1, 2-Dichloropropane	UJ	UJ	UJ	UJ				
10061-02-6	Trans-1, 3-Dichloropropene								
79-01-6	Trichloroethene								
124-48-1	Dibromochloromethane								
79-00-5	1, 1, 2-Trichloroethane								
71-43-2	Benzene								
10061-01-5	cis-1, 3-Dichloropropene	UJ	UJ	UJ	UJ	UJ			
110-75-8	2-Chloroethylvinylether	R	R	R	R	R			
75-25-2	Bromoform								
591-78-6	4-Methyl-2-Pentanone	UJ	UJ	UJ	6.0 UJ	3.8 UJ			
108-10-1	2-Hexanone	UJ	UJ	UJ	6.1 UJ	6.6 UJ			
127-18-4	Tetrachloroethene								
79-34-5	1, 1, 2, 2-Tetrachloroethane					UJ			
108-88-3	Toluene								
108-90-7	Chlorobenzene								
100-41-4	Ethylbenzene								
100-42-5	Styrene								
	Total Xylenes								

VOA

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CASE #/SITE ID: 6497 / L.A. Clarke

DATE SAMPLED:		9/21/96	9/21/96						
DATE SAMPLE RECD:		10/17/96	10/17/96						
DATE EXTR/PREP'D:									
DATE ANALYZED:		10/24/96	10/24/96						
CONC/DIL FACTOR:		1	1						
% MOISTURE:		25.2	25.2						
UNITS:		ug/kg	ug/kg						
CAS Number	SAMPLE DESCRIPT.: TRAFFIC REPORT #:	CE696MS	CE696MSD						
74-87-3	Chloromethane								
74-83-9	Bromomethane								
75-01-4	Vinyl Chloride								
75-00-3	Chloroethane								
75-09-2	Methylene Chloride	20.0 UJ	17 UJ						
67-64-1	Acetone	83.0	90						
75-15-0	Carbon Disulfide								
75-35-4	1,1-Dichloroethene	65	66						
75-34-3	1,1-Dichloroethane								
156-60-5	Trans-1,2-Dichloroethene								
67-66-3	Chloroform	UJ	UJ						
107-06-2	1,2-Dichloroethane								
78-93-3	2-Butanone	UJ	UJ						
71-55-6	1,1,1-Trichloroethane	UJ	UJ						
56-23-5	Carbon Tetrachloride	UJ	UJ						
108-05-4	Vinyl Acetate								
75-27-4	Bromodichloromethane	UJ	UJ						
78-87-5	1,2-Dichloropropane								
10061-02-6	Trans-1,3-Dichloropropene								
79-01-6	Trichloroethene	73	71						
124-48-1	Dibromochloromethane								
79-00-5	1,1,2-Trichloroethane								
71-43-2	Benzene	61	59						
10061-01-5	cis-1,3-Dichloropropene	UJ	UJ						
110-75-8	2-Chloroethylvinylether	R	R						
75-25-2	Bromoform								
591-78-6	4-Methyl-2-Pentanone								
108-10-1	2-Hexanone	UJ	UJ						
127-18-4	Tetrachloroethene								
79-34-5	1,1,2,2-Tetrachloroethane	UJ	UJ						
108-88-3	Toluene	86	87						
108-90-7	Chlorobenzene	69	72						
100-41-4	Ethylbenzene								
100-42-5	Styrene								
	Total Xylenes								

CASE #/SITE ID: C497/L.A. Clarke

YOA
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DATE SAMPLED:		9/21/86	9/21/86	9/21/86	9/21/86	9/21/86		
DATE SAMPLE RECD:		10/17/86	10/17/86	10/17/86	10/17/86	10/17/86		
DATE EXTR/PREP'D:								
DATE ANALYZED:		10/23/86	10/23/86	10/23/86	10/23/86	10/24/86		
CONC/DIL FACTOR:		1	1	1	1	1		
% MOISTURE:		25.2	29.2	23.1	0	0		
UNITS:		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg		
CAS Number	SAMPLE DESCRIPT.: / TRAFFIC REPORT #:	USFWS MASS UPSTREAM CE686	USFWS MASS UPSTREAM CE687	USFWS MASS CENTRAL CE688	Blank 423	Blank 424		
74-87-3	Chloromethane							
74-83-9	Bromomethane							
75-01-4	Vinyl Chloride							
75-00-3	Chloroethane					UJ		
75-09-2	Methylene Chloride	18.0	8.9	16.0				
67-64-1	Acetone	72.0 UJ	78.0 UJ	190 UJ	4.3 UJ			
75-15-0	Carbon Disulfide							
75-35-4	1,1-Dichloroethene							
75-34-3	1,1-Dichloroethane	UJ	UJ	UJ	UJ			
156-60-5	Trans-1,2-Dichloroethene	UJ	UJ	UJ	UJ			
67-66-3	Chloroform					UJ		
107-06-2	1,2-Dichloroethane							
78-93-3	2-Butanone	UJ	UJ	UJ	UJ	UJ		
71-55-6	1,1,1-Trichloroethane	UJ	UJ	UJ	UJ	UJ		
56-23-5	Carbon Tetrachloride	UJ	UJ	UJ	UJ	UJ		
108-05-4	Vinyl Acetate							
75-27-4	Bromodichloromethane					UJ		
78-87-5	1,2-Dichloropropane	UJ	UJ	UJ	UJ			
10061-02-6	Trans-1,3-Dichloropropene							
79-01-6	Trichloroethene							
124-48-1	Dibromochloromethane							
79-00-5	1,1,2-Trichloroethane							
71-43-2	Benzene							
10061-01-5	cis-1,3-Dichloropropene	UJ	UJ	UJ	UJ	UJ		
110-75-8	2-Chloroethylvinylether	R	R	R	R	R		
75-25-2	Bromoform							
591-78-6	4-Methyl-2-Pentanone	UJ	UJ	UJ	6.0 UJ	3.8 UJ		
108-10-1	2-Hexanone	UJ	UJ	UJ	6.1 UJ	6.6 UJ		
127-18-4	Tetrachloroethene							
79-34-5	1,1,2,2-Tetrachloroethane					UJ		
108-88-3	Toluene							
108-90-7	Chlorobenzene							
100-41-4	Ethylbenzene							
100-42-5	Styrene							
	Total Xylenes							

VOA
Pg 2-2

SE #/SITE ID: 6497 / L.A. Clarke

DATE SAMPLED:		9/21/96	9/21/96					
DATE SAMPLE RECD:		10/17/96	10/17/96					
DATE EXTR/PREP'D:								
DATE ANALYZED:		10/24/96	10/24/96					
CONC/DIL FACTOR:		1	1					
% MOISTURE:		25.2	25.2					
UNITS:		ug/kg	ug/kg					
CAS Number	SAMPLE DESCRIPT.: TRAFFIC REPORT #:	CE696MS	CE696MSD					
74-97-3	Chloromethane							
74-83-9	Bromomethane							
75-01-4	Vinyl Chloride							
75-00-3	Chloroethane							
75-09-2	Methylene Chloride	20.0 UJ	17 UJ					
67-64-1	Acetone	83.0	90					
75-15-0	Carbon Disulfide							
75-35-4	1, 1-Dichloroethene	65	66					
75-34-3	1, 1-Dichloroethane							
156-60-5	Trans-1, 2-Dichloroethene							
67-66-3	Chloroform	UJ	UJ					
107-06-2	1, 2-Dichloroethane							
78-93-3	2-Butanone	UJ	UJ					
71-55-6	1, 1, 1-Trichloroethane	UJ	UJ					
56-23-5	Carbon Tetrachloride	UJ	UJ					
108-05-4	Vinyl Acetate							
75-27-4	Bromodichloromethane	UJ	UJ					
78-87-5	1, 2-Dichloropropane							
10061-02-6	Trans-1, 3-Dichloropropene							
79-01-6	Trichloroethene	73	71					
124-48-1	Dibromochloromethane							
79-00-5	1, 1, 2-Trichloroethane							
71-43-2	Benzene	61	59					
10061-01-5	cis-1, 3-Dichloropropene	UJ	UJ					
110-75-8	2-Chloroethylvinylether	R	R					
75-25-2	Bromoform							
591-78-6	4-Methyl-2-Pentanone							
108-10-1	2-Hexanone	UJ	UJ					
127-18-4	Tetrachloroethene							
79-34-5	1, 1, 2, 2-Tetrachloroethane	UJ	UJ					
108-88-3	Toluene	86	87					
108-90-7	Chlorobenzene	69	72					
100-41-4	Ethylbenzene							
100-42-5	Styrene							
	Total Xylenes							

	SAMPLE DESCRIPT.:	US FWS Mass Upstream CE696	US FWS Mass Upstream CE697	US FWS Mass Central CE698	US FWS Mass Central CE699	US FWS Mass Downstream CE690	US FWS Mass Downstream CE691	Blind #40	
CAS Number	TRAFFIC REPORT #:								
108-95-2	Phenol								
111-44-4	bis(2-Chloroethyl)Ether								
95-57-8	2-Chlorophenol								
541-73-1	1,3-Dichlorobenzene								
106-46-7	1,4-Dichlorobenzene								
100-51-6	Benzyl Alcohol								
95-50-1	1,2-Dichlorobenzene								
95-48-7	2-Methylphenol								
39638-32-9	bis(2-chloroisopropyl)Ether				4J				
106-44-5	4-Methylphenol								
621-64-7	N-Nitroso-Di-n-Propylamine								
67-72-1	Hexachloroethane								
98-95-3	Nitrobenzene								
78-59-1	Isophorone								
88-75-5	2-Nitrophenol								
105-67-9	2,4-Dimethylphenol								
65-85-0	Benzoic Acid (1)	579 J	348 J	870 J		238 J			
111-91-1	bis(2-Chloroethoxy)Methane								
120-83-2	2,4-Dichlorophenol								
120-82-1	1,2,4-Trichlorobenzene								
91-20-3	Naphthalene								
106-47-8	4-Chloroaniline				4J				
87-68-3	Hexachlorobutadiene								
59-50-7	4-Chloro-3-Methylphenol								
91-57-6	2-Methylnaphthalene								
77-47-4	Hexachlorocyclopentadiene				4J				
88-06-2	2,4,6-Trichlorophenol								
95-95-4	2,4,5-Trichlorophenol (1)								
91-58-7	2-Chloronaphthalene								
88-74-4	2-Nitroaniline (1)								
131-11-3	Dimethyl Phthalate								
208-96-8	Acenaphthylene								
99-09-2	3-Nitroaniline (1)								
83-32-9	Acenaphthene			360 J	130 J				
51-28-5	2,4-Dinitrophenol (1)	4J	4J	4J		4J	4J	4J	
100-02-7	4-Nitrophenol (1)								
132-64-9	Dibenzofuran			155 J					
121-14-2	2,4-Dinitrotoluene				4J				
606-20-2	2,6-Dinitrotoluene								
84-66-2	Diethylphthalate								
7005-72-3	4-Chlorophenyl-phenylether								
86-73-7	Fluorene			210 J	98 J		220 J		
100-01-6	4-Nitroaniline (1)	4J	4J	4J	4J	4J	4J	4J	
534-52-1	4,6-Dinitro-2-Methylphenol (1)								
86-30-6	N-Nitrosodiphenylamine (1)								
101-55-3	4-Bromophenyl-phenylether								
118-74-1	Hexachlorobenzene								
87-86-5	Pentachlorophenol (1)								
85-01-8	Phenanthrene			520 J	350 J	190 J	180		
120-12-7	Anthracene			88 J	78 J		210 J		
84-74-2	Di-n-Butylphthalate			217 J					
206-44-0	Fluoranthene			1470	855	1500	3560		
129-00-0	Pyrene			1473	628	1160	2460		
85-68-7	Butylbenzylphthalate								
91-94-1	3,3'-Dichlorobenzidine (1)	4J	4J	4J	4J	4J	4J		
56-55-3	Benzo(a)Anthracene			565 J	210 J	1000	1820		
117-81-7	bis(2-Ethylhexyl)Phthalate	216 J	320 J	216 J	220 J	340 J	330		
218-01-9	Chrysene			430 J	250 J	660			
117-84-0	Di-n-Octyl Phthalate								
205-99-2	Benzo(b)Fluoranthene			515	260 J	1230	1915		
207-08-9	Benzo(k)Fluoranthene								
50-32-8	Benzo(a)Pyrene					370 J	585		
193-39-5	Indeno(1,2,3-cd)Pyrene					235 J			
53-70-3	Dibenz(a,h)Anthracene								
191-24-2	Benzo(g,h,i)Perylene					170 J			

(1) Cannot be separated from diphenylamine

	D:	9/21/86	9/21/86
	E RECD:	10/17/86	10/17/86
	TR/PREP'D:	10/21/86	10/21/86
	ANALYZED:	11/14/86	11/14/86
	C/DIL FACTOR:	1	1
	% MOISTURE:	25.8	25.8
	UNITS:	ug/kg	ug/kg

CAS Number	SAMPLE DESCRIPT.: / TRAFFIC REPORT #:	CC6[illegible]MS	CC6[illegible]MSD
108-95-2	Phenol	12700	13200
111-44-4	bis(2-Chloroethyl)Ether		
95-57-8	2-Chlorophenol	12700	12400
541-73-1	1,3-Dichlorobenzene		
106-46-7	1,4-Dichlorobenzene	5450	5260
100-51-6	Benzyl Alcohol		
95-50-1	1,2-Dichlorobenzene		
95-48-7	2-Methylphenol		
39638-32-9	bis(2-chloroisopropyl)Ether	u J	u J
106-44-5	4-Methylphenol		
621-64-7	N-Nitroso-Di-n-Propylamine	608	648
67-72-1	Hexachloroethane		
98-95-3	Nitrobenzene		
78-59-1	Isophorone		
88-75-5	2-Nitrophenol		
105-67-9	2,4-Dimethylphenol		
65-85-0	Benzoic Acid (2)	86 J	168 J
111-91-1	bis(2-Chloroethoxy)Methane		
120-83-2	2,4-Dichlorophenol		
120-82-1	1,2,4-Trichlorobenzene	5710	4920
91-20-3	Naphthalene		
106-47-8	4-Chloroaniline	u J	u J
87-68-3	Hexachlorobutadiene		
59-50-7	4-Chloro-3-Methylphenol	14200	13400
91-57-6	2-Methylnaphthalene		
77-47-4	Hexachlorocyclopentadiene	u J	u J
88-06-2	2,4,6-Trichlorophenol		
95-95-4	2,4,5-Trichlorophenol (2)		
91-58-7	2-Chloronaphthalene		
88-74-4	2-Nitroaniline (2)		
131-11-3	Dimethyl Phthalate		
208-96-8	Acenaphthylene		
99-09-2	3-Nitroaniline (2)		
83-32-9	Acenaphthene	7530	6870
51-28-5	2,4-Dinitrophenol (2)		
100-02-7	4-Nitrophenol (2)	23300	16400
132-64-9	Dibenzofuran		
121-14-2	2,4-Dinitrotoluene	8290 uJ	8783 uJ
606-20-2	2,6-Dinitrotoluene		
84-66-2	Diethylphthalate		
7005-72-3	4-Chlorophenyl-phenylether		
86-73-7	Fluorene		
100-01-6	4-Nitroaniline (2)	u J	u J
534-52-1	4,6-Dinitro-2-Methylphenol (2)		
86-30-6	N-Nitrosodiphenylamine (1)		
101-55-3	4-Bromophenyl-phenylether		
118-74-1	Hexachlorobenzene		
87-86-5	Pentachlorophenol (2)	22700	19700
85-01-8	Phenanthrene	190 J	250 J
120-12-7	Anthracene		
84-74-2	Di-n-Butylphthalate		
206-44-0	Fluoranthene	1275	1350
129-00-0	Pyrene	9860	10900
85-68-7	Butylbenzylphthalate		
91-94-1	3,3'-Dichlorobenzidine (2)	u J	u J
56-55-3	Benzo(a)Anthracene	780	918
117-81-7	bis(2-Ethylhexyl)Phthalate	218 J	240 J
218-01-9	Chrysene	570	740
117-84-0	Di-n-Octyl Phthalate		
205-99-2	Benzo(b)Fluoranthene	1050	1240
207-08-9	Benzo(k)Fluoranthene		
50-32-8	Benzo(a)Pyrene	290 J	340 J
193-39-5	Indeno(1,2,3-cd)Pyrene	230 J	251 J
53-70-3	Dibenz(a,h)Anthracene		
191-24-2	Benzo(g,h,i)Perylene	174 J	

(1) Cannot be separated from diphenylamine

CASE NO. 6777

0985B

Due to the poor quality of the original data copy, this table of analytes, listed in the same order as those reported by the laboratory, is enclosed.

CAS Number	BNA
106-95-2	Phenol
111-44-4	bis (2-Chloroethyl) Ether
95-57-8	2-Chlorophenol
541-73-1	1, 3-Dichlorobenzene
106-46-7	1, 4-Dichlorobenzene
100-51-6	Benzyl Aclohol
95-50-1	1, 2-Dichlorobenzene
95-48-7	2-Methylphenol
39638-32-9	bis (2-chlorosopropyl) Ether
106-44-5	4-Methylphenol
621-64-7	N-Nitroso-Di-n-Propylamine
67-72-1	Hexachloroethane
98-95-3	Nitrobenzene
78-59-1	Isophorone
88-75-5	2-Nitrophenol
106-67-9	2, 4-Dimethylphenol
85-85-0	Benzoic Acid (2)
111-91-1	bis (2-Chloroethoxy) Methane
120-83-2	2, 4-Dichlorophenol
120-82-1	1, 2, 4-Trichlorobenzene
91-20-3	Naphthalene
106-47-8	4-Chloroaniline
87-88-3	Hexachlorobutadiene
59-50-7	4-Chloro-3-Methylphenol
91-57-6	2-Methylnaphthalene
77-47-4	Hexachlorocyclopentadiene
88-06-2	2, 4, 6-Trichlorophonol
95-95-4	2, 4, 5-Trichlorophenol
91-58-7	2-Chloronaphthalene
88-74-4	2-Nitroaniline
131-11-3	Dimethyl Phthalate
208-96-8	Acenaphthylene
99-08-2	3-Nitroaniline
83-32-9	Acenaphthene
61-28-5	2, 4-Dinitrophenol
100-02-7	4-Nitrophenol
132-84-9	Dibenzofuran
121-14-2	2, 4-Dinitrotoluene
606-20-2	2, 6-Dinitrotoluene
84-65-2	Diethylphthalate
7005-72-3	4-Chlorophenyl-phenylether
96-73-7	Fluorene
100-01-4	4-Nitroaniline
634-52-1	4, 6-Dinitro-2-Methylphenol
86-30-6	N-Nitrosodiphenylamine
101-55-3	4-Bromophenyl-phenylether
118-74-1	Hexacholorbenzene
87-86-5	Pentachlorophenol
85-01-8	Phenanthrene
120-12-7	Anthracene
84-74-2	Di-n-Butylphthalate
206-44-0	Fluoranthene
129-00-0	Pyrene
85-58-7	Butylbenzylphthalate
91-94-1	3, 3-Dichlorobenzidine (3)
56-55-3	Benzo (a) Anthracene
117-81-7	bis (2-Ethylhexyl) Phthalate
218-01-9	Chrysene
117-84-0	Di-n-Octyl Phthalate
205-99-2	Benzo (b) Fluoranthene
207-08-9	Benzo (k) Fluoranthene
60-32-8	Benzo (a) Pyrene
193-39-5	Indeno (1, 2, 3-cd) Pyrene
53-70-3	Dibenzo (a, h) Anthracene
191-24-2	Benzo (g, h, i) Perylene

74-87-3	Chloromethane
74-83-9	Bromomethane
75-01-4	Vinyl Chloride
75-00-3	Chloroethane
75-00-2	Methylene Chloride
67-64-1	Acetone
75-15-0	Carbon Disulfide
75-36-4	1,1-Dichloroethene
75-34-3	1,1-Dichloroethane
156-60-5	Trans-1, 2-Dichloroethene
67-66-3	Chloroform
107-06-2	1, 2-Dichloroethane
78-83-3	1, 1, 1-Trichloroethane
56-23-5	Carbon Tetrachloride
108-05-4	Vinyl Acetane
75-27-4	Bromodichloromethane
78-87-5	1, 2-Dichloropropane
10061-02-6	Trans-1, 3-Dichloropropane
79-01-6	Trichloroethene
124-48-1	Dibromochloromethane
79-00-5	1, 1, 2-Trichloroethane
75-25-2	Bromoform
591-78-6	4-Methyl-2-Pentanone
108-10-1	2-Hexanone
127-18-4	Tetrachloroethene
79-34-5	1, 1, 2, 2-Tetrachloroethane
108-88-3	Toluene
108-90-7	Chlorobenzene
100-41-4	Ethylbenzene
100-42-5	Styrene
	Total Xylenes

METALS
Aluminum
Antimony
Arsenic
Barium
Beryllium
Cadmium
Cobalt
Copper
Iron
Lead
Magnesium
Mercury
Nickel
Potasium
Selenium
Silver
Sodium
Thallium
Tin
Vanadium
Zinc

DATA SUMMARY

Case No. 6777 / L.A. Clarke

Laboratory Chemtech

Matrix Soil

Units mg/kg

EPA TR #	SL-MH1-001 MCH600	SL-WES-002 MCH602	SL-MH1-003 MCH604		Detection limits (mg/kg) CRDL	Lab IDL						
Lab I.D.	G2-100-01	G2-100-02	G2-100-03									
Aluminum	5420 J	3650 J	1490 J		40	3.2						J-SD=12%
Antimony					12	9.4						
Arsenic					2.0	1.8						
Barium	115	63.8	[17.3]		40	8.4						
Beryllium					1.0	0.8						
Cadmium	2.2	1.5	2.5		1.6	1.6						
Calcium	1510	[477]	[691]		1000	123						
Chromium	10.6	3.8	5.8		2.0	1.8						
Cobalt	[12.3]		[3]		10	2.0						
Copper	[5.3]	[5.6]	6.5		5.0	3.4						
Iron	10800	3630	4960		20	7.8						
Lead	20	16.3	4.8		1.0	0.6						
Magnesium	[612]	[200]	[412]		1000	87						
Manganese	965 J	366 J	141 J		3.0	1.6						J = %R=66
Mercury					0.02	0.1						
Nickel					8.0	3.4						
Potassium	[374]	[143]	[369]		1000	100						
Selenium					1.0	0.6						
Silver	6 J	UJ	UJ		2.6	1.6						J or UJ - %R = 32
Sodium					1000	400						
Thallium	UJ	UJ	2.0 J		2.0	1.8						J or UJ - %R = 61
Tin					8.0	3.4						
Vanadium	22.4	[9]	[7.1]		10	2.0						
Zinc	50.1	21.8	22.7		20	4.6						
Cyanide					2.5	0.25						
% Solids	67.7	78.4	88.0									

PEST

CASE #/SITE ID: 6777 / L.A. Clarke

DATE SAMPLED:		1/24/87						
DATE SAMPLE RECD:		1/29/87	1/29/87	1/29/87	1/29/87			
DATE EXTR/PREP'D:		1/30/87	1/30/87	1/30/87	1/30/87			
DATE ANALYZED:		2/17/87	2/17/87	2/17/87	2/17/87			
CONC/DIL FACTOR:		1	1	1	1			
% MOISTURE:		35.71	24.11	14.02	—			
UNITS:		ug/kg	ug/kg	ug/kg	ug/kg			
CAS Number	SAMPLE DESCRIPT.: / TRAFFIC REPORT #:	LAC-SL-M09-001 CF 707	SL-M03-002 CF 709	SL-M11-003 CF 711	Blank			
319-84-6	Alpha-BHC							
319-85-7	Beta-BHC							
319-86-8	Delta-BHC							
58-89-9	Gamma-BHC (Lindane)							
76-44-8	Heptachlor		9.8 u*					
309-00-2	Aldrin							
1024-57-3	Heptachlor Epoxide							
959-98-8	Endosulfan I							
60-57-1	Dieldrin							
72-55-9	4,4'-DDE							
72-20-8	Endrin							
33213-65-9	Endosulfan II							
72-54-8	4,4'-DDD							
1031-07-8	Endosulfan Sulfate							
50-29-3	4,4'-DDT							
72-43-5	Methoxychlor							
53494-70-5	Endrin Ketone							
57-74-9	Chlordane							
8001-35-2	Toxaphene							
12674-11-2	Aroclor-1016							
11104-28-2	Aroclor-1221							
11141-16-5	Aroclor-1232							
53469-21-9	Aroclor-1242							
12672-29-6	Aroclor-1248							
11097-69-1	Aroclor-1254							
11096-82-5	Aroclor-1260							

* Raised detection limit due to interference

CASE #/SITE ID: 6777/L.A. Clarke

BNA

DATE SAMPLED:		1/29/87			
DATE SAMPLE RECD:		1/29/87	1/29/87	1/29/87	1/29/87
DATE EXTRACTED:		2/4/87	2/4/87	2/4/87	2/4/87
DATE ANALYZED:		2/11/87	2/11/87	2/11/87	2/11/87
CONC/DIL FACTOR:		1	1	1	1
% MOISTURE:		35.71	24.11	14.02	—
UNITS:		ug/kg	ug/kg	ug/kg	ug/kg
CAS Number	SAMPLE DESCRIPT.: / TRAFFIC REPORT #:	LAC-2L-M09-001 CF307	LAC-3L-M03-002 CF309	LAC-2L-M11-003 CF 711	Blank
108-95-2	Phenol				
111-44-4	bis(2-Chloroethyl)Ether				
95-57-8	2-Chlorophenol				
541-73-1	1,3-Dichlorobenzene				
106-46-7	1,4-Dichlorobenzene				
100-51-6	Benzyl Alcohol				
95-50-1	1,2-Dichlorobenzene				
95-48-7	2-Methylphenol				
39638-32-9	bis(2-chloroisopropyl)Ether				
106-44-5	4-Methylphenol				
621-64-7	N-Nitroso-Di-n-Propylamine	UJ	UJ	UJ	UJ
67-72-1	Hexachloroethane				
98-95-3	Nitrobenzene				
78-59-1	Isophorone				
88-75-5	2-Nitrophenol				
105-67-9	2,4-Dimethylphenol				
65-85-0	Benzoic Acid (1)	250 J			
111-91-1	bis(2-Chloroethoxy)Methane				
120-83-2	2,4-Dichlorophenol				
120-82-1	1,2,4-Trichlorobenzene	UJ	UJ	UJ	UJ
91-20-3	Naphthalene				
106-47-8	4-Chloroaniline	UJ	UJ	UJ	UJ
87-68-3	Hexachlorobutadiene				
59-50-7	4-Chloro-3-Methylphenol				
91-57-6	2-Methylnaphthalene	UJ	UJ	UJ	UJ
77-47-4	Hexachlorocyclopentadiene	UJ	UJ	UJ	UJ
88-06-2	2,4,6-Trichlorophenol				
95-95-4	2,4,5-Trichlorophenol (1)	UJ	UJ	UJ	UJ
91-58-7	2-Chloronaphthalene				
88-74-4	2-Nitroaniline (1)				
131-11-3	Dimethyl Phthalate				
208-96-8	Acenaphthylene				
99-09-2	3-Nitroaniline (1)	UJ	UJ	UJ	UJ
83-32-9	Acenaphthene				
51-28-5	2,4-Dinitrophenol (1)	UJ	UJ	UJ	UJ
100-02-7	4-Nitrophenol (1)	UJ	UJ	UJ	UJ
132-64-9	Dibenzofuran				
121-14-2	2,6-Dinitrotoluene				
606-20-2	2,6-Dinitrotoluene				
84-66-2	Diethylphthalate	UJ	UJ	UJ	UJ
7005-72-3	4-Chlorophenyl-phenylether	UJ	UJ	UJ	UJ
86-73-7	Fluorene				
100-01-6	4-Nitroaniline (1)	UJ	UJ	UJ	UJ
534-52-1	4,6-Dinitro-2-Methylphenol (1)	UJ	UJ	UJ	UJ
86-30-6	N-Nitrosodiphenylamine (1)				
101-55-3	4-Bromophenyl-phenylether	UJ	UJ	UJ	UJ
118-74-1	Hexachlorobenzene				
87-86-5	Pentachlorophenol (1)				
85-01-8	Phenanthrene				
120-12-7	Anthracene				
84-74-2	Di-n-Butylphthalate	698 J	498 J	578 J	36 J
206-44-0	Fluoranthene		71 J		
129-00-0	Pyrene	UJ	70 J	UJ	UJ
85-68-7	Butylbenzylphthalate				
91-94-1	3,3-Dichlorobenzidine (1)	UJ	UJ	UJ	UJ
56-55-3	Benzo(a)Anthracene				
117-81-7	bis(2-Ethylhexyl)Phthalate	79 UJ	75 UJ	35 UJ	71 J
218-01-9	Chrysene	UJ	46 J	UJ	UJ
117-84-0	Di-n-Octyl Phthalate				
205-99-2	Benzo(b)Fluoranthene	UJ	46 J	UJ	UJ
207-08-9	Benzo(k)Fluoranthene	UJ	UJ	UJ	UJ
50-32-8	Benzo(a)Pyrene				
193-39-5	Indeno(1,2,3-cd)Pyrene	UJ	UJ	UJ	UJ
53-70-3	Dibenz(a,h)Anthracene	UJ	UJ	UJ	UJ
191-24-2	Benzo(g,h,i)Perylene	UJ	UJ	UJ	UJ

(1) Cannot be separated from diphenylamine

VOA

CASE #/SITE ID: 6777/LA Clarke

DATE SAMPLED:		1/29/87						
DATE SAMPLE RECD:		1/29/87	1/29/87	1/29/87	1/29/87	1/29/87	1/29/87	1/29/87
DATE EXTR/PREP'D:		2/2/87	2/2/87	2/2/87	2/2/87	2/2/87	2/2/87	2/2/87
DATE ANALYZED:		2/2/87	2/2/87	2/2/87	2/2/87	2/2/87	2/2/87	2/2/87
CONC/DIL FACTOR:		1	1	1	20	26	1	1
% MOISTURE:		35.71	24.11	14.82	—	—	—	—
UNITS:		ug/kg	ug/kg	ug/kg	ug/L	ug/L	ug/kg	ug/L
CAS Number	SAMPLE DESCRIPT.: TRAFFIC REPORT #:	LAC-SL-M09-001 CF707	SL-W03-002 CF709	SL-M11-003 CF711	field blank CF715	Trip blank CF716	blank	blank
74-87-3	Chloromethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ
74-83-9	Bromomethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ
75-01-4	Vinyl Chloride							
75-00-3	Chloroethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ
75-09-2	Methylene Chloride	53 UJ	38 UJ	34 UJ	2000 J	2100 J	24 J	6 J
67-64-1	Acetone				230 UJ		37 J	13
75-15-0	Carbon Disulfide	UJ	34 J	UJ	UJ	UJ	UJ	UJ
75-35-4	1,1-Dichloroethene							
75-34-3	1,1-Dichloroethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ
156-60-5	Trans-1,2-Dichloroethene	UJ	UJ	UJ	UJ	UJ	UJ	UJ
67-66-3	Chloroform							
107-06-2	1,2-Dichloroethane							
78-93-3	2-Butanone	UJ	UJ	UJ	UJ	UJ	UJ	UJ
71-55-6	1,1,1-Trichloroethane							
56-23-5	Carbon Tetrachloride							
108-05-4	Vinyl Acetate	UJ	UJ	UJ	UJ	UJ	UJ	UJ
75-27-4	Bromodichloromethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ
78-87-5	1,2-Dichloropropane							
10061-02-6	Trans-1,3-Dichloropropene	UJ	UJ	UJ	UJ	UJ	UJ	UJ
79-01-6	Trichloroethene							
124-48-1	Dibromochloromethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ
79-00-5	1,1,2-Trichloroethane							
71-43-2	Benzene	UJ	UJ	UJ	UJ	UJ	UJ	UJ
10061-01-5	cis-1,3-Dichloropropene	UJ	UJ	UJ	UJ	UJ	UJ	UJ
110-75-8	2-Chloroethylvinylether							
75-25-2	Bromoform	UJ	UJ	UJ	UJ	UJ	UJ	UJ
591-78-6	4-Methyl-2-Pentanone	UJ	UJ	UJ	UJ	UJ	UJ	UJ
108-10-1	2-Hexanone	UJ	UJ	UJ	UJ	UJ	UJ	UJ
127-18-4	Tetrachloroethene	100	29 J	16 J				
79-34-5	1,1,2,2-Tetrachloroethane							
108-88-3	Toluene							
108-90-7	Chlorobenzene							
100-41-4	Ethylbenzene							
100-42-5	Styrene							
	Total Xylenes							

CASE NO. 7131

PHASE III SOILS SAMPLES

0985B

Due to the poor quality of the original data copy, this table of analytes, listed in the same order as those reported by the laboratory, is enclosed.

CAS Number	BNA
106-95-2	Phenol
111-44-4	bis (2-Chloroethyl) Ether
95-57-8	2-Chlorophenol
541-73-1	1, 3-Dichlorobenzene
106-46-7	1, 4-Dichlorobenzene
100-51-6	Benzyl Aclohol
95-50-1	1, 2-Dichlorobenzene
95-48-7	2-Methylphenol
39638-32-9	bis (2-chlorosopropyl) Ether
106-44-5	4-Methylphenol
621-64-7	N-Nitroso-Di-n-Propylamine
67-72-1	Hexachloroethane
98-95-3	Nitrobenzene
78-59-1	Isophorone
88-75-5	2-Nitrophenol
106-67-9	2, 4-Dimethylphenol
85-85-0	Benzoic Acid (2)
111-91-1	bis (2-Chloroethoxy) Methane
120-83-2	2, 4-Dichlorophenol
120-82-1	1, 2, 4-Trichlorobenzene
91-20-3	Naphthalene
106-47-8	4-Chloroaniline
87-88-3	Hexachlorobutadiene
59-50-7	4-Chloro-3-Methylphenol
91-57-6	2-Methylnaphthalene
77-47-4	Hexachlorocyclopentadiene
88-06-2	2, 4, 6-Trichlorophonol
95-95-4	2, 4, 5-Trichlorophenol
91-58-7	2-Chloronaphthalene
88-74-4	2-Nitroaniline
131-11-3	Dimethyl Phthalate
208-96-8	Acenaphthylene
99-08-2	3-Nitroaniline
83-32-9	Acenaphthene
61-28-5	2, 4-Dinitrophenol
100-02-7	4-Nitrophenol
132-84-9	Dibenzofuran
121-14-2	2, 4-Dinitrotoluene
606-20-2	2, 6-Dinitrotoluene
84-65-2	Diethylphthalate
7005-72-3	4-Chlorophenyl-phenylether
96-73-7	Fluorene
100-01-4	4-Nitroaniline
634-52-1	4, 6-Dinitro-2-Methylphenol
86-30-6	N-Nitrosodiphenylamine
101-55-3	4-Bromophenyl-phenylether
118-74-1	Hexacholorbenzene
87-86-5	Pentachlorophenol
85-01-8	Phenanthrene
120-12-7	Anthracene
84-74-2	Di-n-Butylphthalate
206-44-0	Fluoranthene
129-00-0	Pyrene
85-58-7	Butylbenzylphthalate
91-94-1	3, 3-Dichlorobenzidine (3)
56-55-3	Benzo (a) Anthracene
117-81-7	bis (2-Ethylhexyl) Phthalate
218-01-9	Chrysene
117-84-0	Di-n-Octyl Phthalate
205-99-2	Benzo (b) Fluoranthene
207-08-9	Benzo (k) Fluoranthene
60-32-8	Benzo (a) Pyrene
193-39-5	Indeno (1, 2, 3-cd) Pyrene
53-70-3	Dibenzo (a, h) Anthracene
191-24-2	Benzo (g, h, i) Perylene

74-87-3	Chloromethane
74-83-9	Bromomethane
75-01-4	Vinyl Chloride
75-00-3	Chloroethane
75-00-2	Methylene Chloride
67-64-1	Acetone
75-15-0	Carbon Disulfide
75-36-4	1,1-Dichloroethene
75-34-3	1,1-Dichloroethane
156-60-5	Trans-1, 2-Dichloroethene
67-66-3	Chloroform
107-06-2	1, 2-Dichloroethane
78-83-3	1, 1, 1-Trichloroethane
56-23-5	Carbon Tetrachloride
108-05-4	Vinyl Acetane
75-27-4	Bromodichloromethane
78-87-5	1, 2-Dichloropropane
10061-02-6	Trans-1, 3-Dichloropropane
79-01-6	Trichloroethene
124-48-1	Dibromochloromethane
79-00-5	1, 1, 2-Trichloroethane
75-25-2	Bromoform
591-78-6	4-Methyl-2-Pentanone
108-10-1	2-Hexanone
127-18-4	Tetrachloroethene
79-34-5	1, 1, 2, 2-Tetrachloroethane
108-88-3	Toluene
108-90-7	Chlorobenzene
100-41-4	Ethylbenzene
100-42-5	Styrene
	Total Xylenes

METALS
Aluminum
Antimony
Arsenic
Barium
Beryllium
Cadmium
Cobalt
Copper
Iron
Lead
Magnesium
Mercury
Nickel
Potasium
Selenium
Silver
Sodium
Thallium
Tin
Vanadium
Zinc

VOA

CASE #/SITE ID: 7431 / L.A. Clarke

DATE SAMPLED:		4/21/87	4/21/87	4/21/87	4/21/87	4/21/87	4/21/87	4/21/87
DATE SAMPLE RECD:		4/25/87	4/25/87	4/25/87	4/25/87	4/25/87	4/25/87	4/25/87
DATE EXTR/PREP'D:		4/27/87	4/27/87	4/27/87	4/27/87	4/27/87	4/27/87	5/1/87
DATE ANALYZED:		4/27/87	4/27/87	4/27/87	4/27/87	4/27/87	4/27/87	5/1/87
CONC/DIL FACTOR:		1	1	1	1	1	1	1
% MOISTURE:		18.8	19.4	24.2	32.4	32.4	20.8	6.1
UNITS:		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
CAS Number	SAMPLE DESCRIPT.: / TRAFFIC REPORT #:	SS-TRA-01-03 CG 101	SS-TRA-02-1.5 CG 102	SS-TRA-02-03 CG 103	← field duplicate → SS-TRB-01-01 CG 104	CG 104RE	SS-TRB-01-01 CG 105	CG 105RE
74-87-3	Chloromethane							UJ
74-83-9	Bromomethane							UJ
75-01-4	Vinyl Chloride							
75-00-3	Chloroethane							
75-09-2	Methylene Chloride	14 UJ	11 UJ	11 UJ	13 UJ	14 UJ	10 UJ	19 UJ
67-64-1	Acetone	29 UJ	33 UJ	17 UJ	26 UJ	52 UJ	13 UJ	31 UJ
75-15-0	Carbon Disulfide							
75-35-4	1, 1-Dichloroethene							
75-34-3	1, 1-Dichloroethane							
156-60-5	Trans-1, 2-Dichloroethene							
67-66-3	Chloroform	2 UJ	3 UJ	6 UJ	5 UJ	7 UJ	4 UJ	2 UJ
107-06-2	1, 2-Dichloroethane							
78-93-3	2-Butanone	2 UJ	2 UJ	1 UJ	3 UJ	2 UJ	2 UJ	2 UJ
71-55-6	1, 1, 1-Trichloroethane	2 UJ	2 UJ	2 UJ	4 UJ	3 UJ	3 UJ	
56-23-5	Carbon Tetrachloride							
108-05-4	Vinyl Acetate							
75-27-4	Bromodichloromethane							
78-87-5	1, 2-Dichloropropane							
10061-02-6	Trans-1, 3-Dichloropropene							
79-01-6	Trichloroethene	4 J	3 J	2 J	9	9	9	17
124-48-1	Dibromochloromethane							
79-00-5	1, 1, 2-Trichloroethane							
71-43-2	Benzene							
10061-01-5	cis-1, 3-Dichloropropene							
110-75-8	2-Chloroethylvinylether							
75-25-2	Bromoform							
591-78-6	4-Methyl-2-Pentanone							
108-10-1	2-Hexanone							
127-18-4	Tetrachloroethene							
79-34-5	1, 1, 2, 2-Tetrachloroethane							
108-88-3	Toluene	2 UJ	2 UJ	2 UJ	3 UJ	3 UJ	2 UJ	3 UJ
108-90-7	Chlorobenzene							
100-41-4	Ethylbenzene							
100-42-5	Styrene							
	Total Xylenes							

CASE #/SITE ID: 7131 / L.A. Clarke

DATE SAMPLED:		4/21/87	4/21/87	4/21/87	4/22/87	4/22/87	4/22/87	4/22/87
DATE SAMPLE RECD:		4/25/87	4/25/87	4/25/87	4/25/87	4/25/87	4/25/87	4/25/87
DATE EXTR/PREP'D:		4/28/87	4/28/87	4/28/87	4/28/87	4/28/87	4/28/87	4/28/87
DATE ANALYZED:		4/28/87	4/28/87	4/28/87	4/28/87	4/28/87	4/28/87	4/28/87
CONC/DIL FACTOR:		1	1	1	1	1	1	1
% MOISTURE:		20.4	25.6	25.4	16.6	18.7	18.7	28.4
UNITS:		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
CAS Number	SAMPLE DESCRIPT.: / TRAFFIC REPORT #:	SS-TP8-01-9.5 CG106	SS-TPC 01 08 CG107	SS-TPB 01-C CG108	SS-TPF 01-C CG109	SS-TP4 01-02 CG110	CG110RE	SS-TP4 -02-03 CG111
74-87-3	Chloromethane							
74-83-9	Bromomethane							
75-01-4	Vinyl Chloride							
75-00-3	Chloroethane	UJ	UJ	UJ	UJ	UJ	UJ	UJ
75-09-2	Methylene Chloride	10 UJ	13 UJ	16 UJ	15 UJ	52 UJ	21 UJ	28 UJ
67-64-1	Acetone	53 UJ	59 UJ	81 UJ	100 UJ	51 UJ	39 UJ	79 UJ
75-15-0	Carbon Disulfide							
75-35-4	1, 1-Dichloroethene							
75-34-3	1, 1-Dichloroethane							
156-60-5	Trans-1, 2-Dichloroethene							
67-66-3	Chloroform	2 UJ	3 UJ	2 UJ	2 UJ	3 UJ	2 UJ	2 UJ
107-06-2	1, 2-Dichloroethane							
78-93-3	2-Butanone	2 UJ	2 UJ	2 UJ	3 UJ	3 UJ	3 UJ	3 UJ
71-55-6	1, 1, 1-Trichloroethane							
56-23-5	Carbon Tetrachloride							
108-05-4	Vinyl Acetate							
75-27-4	Bromodichloromethane							
78-87-5	1, 2-Dichloropropane							
10061-02-6	Trans-1, 3-Dichloropropene							
79-01-6	Trichloroethene	2 J	3 J	2 J		28	21	4 J
124-48-1	Dibromochloromethane							
79-00-5	1, 1, 2-Trichloroethane							
71-43-2	Benzene					2 J	1 J	
10061-01-5	cis-1, 3-Dichloropropene							
110-75-8	2-Chloroethylvinylether							
75-25-2	Bromoform							
591-78-6	4-Methyl-2-Pentanone							
108-10-1	2-Hexanone							
127-18-4	Tetrachloroethene							
79-34-5	1, 1, 2, 2-Tetrachloroethane							
108-88-3	Toluene	1 UJ	1 UJ	2 UJ	1 UJ	9	7	3 UJ
108-90-7	Chlorobenzene							
100-41-4	Ethylbenzene					1 J		
100-42-5	Styrene							
	Total Xylenes							

VOA

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DATE SAMPLED:		4/23/87	4/23/87	4/23/87	4/24/87	4/24/87	4/24/87	4/24/87
DATE SAMPLE RECD:		4/25/87	4/25/87	4/25/87	4/25/87	4/25/87	4/30/87	4/30/87
DATE EXTR/PREP'D:		4/30/87	5/1/87	4/27/87	4/27/87	4/27/87	5/1/87	5/1/87
DATE ANALYZED:		4/30/87	5/1/87	4/27/87	4/27/87	4/27/87	5/1/87	5/1/87
CONC/DIL FACTOR:		417	1	1	1	1	1	1
% MOISTURE:		35.9	23.2				23.0	22.1
UNITS:		ug/kg	ug/kg	ug/L	ug/L	ug/L	ug/kg	ug/kg
CAS Number	SAMPLE DESCRIPT.: / TRAFFIC REPORT #:	SS-TPJ 01-03 CG112	SS-TPJ 02-04 CG113	rinse blank CG114	water blank CG115	trip blank CG116	SS-B09-02 CG117	SS-B09-01 CG118
74-87-3	Chloromethane		UJ	UJ	UJ	UJ	UJ	UJ
74-83-9	Bromomethane		UJ	UJ	UJ	UJ	UJ	UJ
75-01-4	Vinyl Chloride							
75-00-3	Chloroethane			UJ	UJ	UJ		
75-09-2	Methylene Chloride	3100 UJ	9 UJ	14 UJ	3 UJ	UJ	19 UJ	16 UJ
67-64-1	Acetone	11000 UJ	33 UJ	11 UJ			19 UJ	23 UJ
75-15-0	Carbon Disulfide							
75-35-4	1, 1-Dichloroethene							
75-34-3	1, 1-Dichloroethene							
156-60-5	Trans-1, 2-Dichloroethene							
67-66-3	Chloroform				45			
107-06-2	1, 2-Dichloroethane							
78-93-3	2-Butanone	14000 UJ	J				1 UJ	J
71-55-6	1, 1, 1-Trichloroethane							
56-23-5	Carbon Tetrachloride							
108-05-4	Vinyl Acetate							
75-27-4	Bromodichloromethane				6			
78-87-5	1, 2-Dichloropropane							
10061-02-6	Trans-1, 3-Dichloropropene							
79-01-6	Trichloroethene							
124-48-1	Dibromochloromethane							
79-00-5	1, 1, 2-Trichloroethane							
71-43-2	Benzene	4400			7 J			
10061-01-5	cis-1, 3-Dichloropropene							
110-75-8	2-Chloroethylvinylether							
75-25-2	Bromoform			UJ	UJ	UJ		
591-78-6	4-Methyl-2-Pentanone			UJ	UJ	UJ		
108-10-1	2-Hexanone			UJ	UJ	UJ		
127-18-4	Tetrachloroethene			UJ	UJ	UJ		
79-34-5	1, 1, 2, 2-Tetrachloroethane							
108-88-3	Toluene	35000	2 UJ		2 UJ		1 UJ	1 UJ
108-90-7	Chlorobenzene							
100-41-4	Ethylbenzene	44000						
100-42-5	Styrene							
	Total Xylenes	79000	1 J					

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DATE SAMPLED:		4/25/87	4/25/87	4/26/87	4/26/87	4/26/87	4/26/87	4/26/87
DATE SAMPLE RECD:		4/30/87	4/30/87	4/30/87	4/30/87	4/30/87	4/30/87	4/30/87
DATE EXTR/PREP'D:		5/1/87	5/1/87	5/1/87	5/4/87	5/6/87	5/4/87	5/6/87
DATE ANALYZED:		5/1/87	5/1/87	5/1/87	5/4/87	5/6/87	5/4/87	5/6/87
CONC/DIL FACTOR:		1	1	1	1	208	1	179
% MOISTURE:		18.2	22.7	23.5	20.1	10.5	23.3	19.2
UNITS:		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
CAS Number	SAMPLE DESCRIPT.: TRAFFIC REPORT #:	SS-B10-01 CG 119	SS B10-02 CG 120	SS-B11-01 CG 121	SS-B11-02 CG 122	SS-B12-01 CG 123	SS-B12-02 CG 124	field dup of CG 120 CG 125
74-87-3	Chloromethane			UJ	UJ		UJ	
74-83-9	Bromomethane			UJ				
75-01-4	Vinyl Chloride							
75-00-3	Chloroethane				UJ		UJ	
75-09-2	Methylene Chloride	7 UJ	12 UJ	11 UJ	5 UJ	2400 UJ	4 UJ	1300 UJ
67-64-1	Acetone	35 UJ	85 UJ	38 UJ	62 UJ	5400 UJ	110 UJ	4500 UJ
75-15-0	Carbon Disulfide							
75-35-4	1, 1-Dichloroethene							
75-34-3	1, 1-Dichloroethane							
156-60-5	Trans-1, 2-Dichloroethene							#
67-66-3	Chloroform		2 UJ	1 UJ		1200 UJ	2 UJ	320 UJ
107-06-2	1, 2-Dichloroethane							
78-93-3	2-Butanone	3 UJ	3 UJ	2 UJ	2 UJ	4700 UJ	6 UJ	4100 UJ
71-55-6	1, 1, 1-Trichloroethane							
56-23-5	Carbon Tetrachloride							
108-05-4	Vinyl Acetate							
75-27-4	Bromodichloromethane							
78-87-5	1, 2-Dichloropropane							
10061-02-6	Trans-1, 3-Dichloropropene							
79-01-6	Trichloroethene							
124-48-1	Dibromochloromethane							
79-00-5	1, 1, 2-Trichloroethane							
71-43-2	Benzene							4100
10061-01-5	cis-1, 3-Dichloropropene							
110-75-8	2-Chloroethylvinylether							
75-25-2	Bromoform							
591-78-6	4-Methyl-2-Pentanone		1 J				3 J	
108-10-1	2-Hexanone							
127-18-4	Tetrachloroethene							
79-34-5	1, 1, 2, 2-Tetrachloroethane							
108-88-3	Toluene	1 UJ	2 UJ	1 UJ	1 UJ	15000	3 UJ	21000
108-90-7	Chlorobenzene							
100-41-4	Ethylbenzene					12000		16000
100-42-5	Styrene					7600	1 J	25000
	Total Xylenes					52000		69000

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DATE SAMPLED:		4/26/87	4/26/87	4/26/87	4/26/87	4/26/87	4/26/87	4/26/87
DATE SAMPLE RECD:		4/30/87	4/30/87	4/30/87	4/30/87	4/30/87	4/30/87	4/30/87
DATE EXTR/PREP'D:		5/4/87	5/4/87	5/4/87	5/4/87	5/4/87	5/4/87	5/4/87
DATE ANALYZED:		5/6/87	5/5/87	5/4/87	5/4/87	5/4/87	5/4/87	5/4/87
CONC/DIL FACTOR:		250	1	1	1	1	1	1
% MOISTURE:		19.2	15.6	24.8	22.1	24.3	-	-
UNITS:		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/L	ug/L
CAS Number	SAMPLE DESCRIPT.:	Field Dup of CG125	SS-B12-04	SS-B12-05	SS-B12-06	SS-B13-01	With blank	trip blank
	TRAFFIC REPORT #:	CG126	CG127	CG128	CG129	CG130	CG131	CG132
74-87-3	Chloromethane			UJ	UJ	UJ	UJ	UJ
74-83-9	Bromomethane		UJ		UJ		UJ	UJ
75-01-4	Vinyl Chloride							
75-00-3	Chloroethane			UJ		UJ	UJ	UJ
75-09-2	Methylene Chloride	3200 UJ	12 UJ	7 UJ	15 UJ	5 UJ	9 UJ	9 UJ
67-64-1	Acetone	11000 UJ	71 UJ	85 UJ	58 UJ	13 UJ	17 UJ	UJ
75-15-0	Carbon Disulfide							
75-35-4	1,1-Dichloroethene							
75-34-3	1,1-Dichloroethane							
156-60-5	Trans-1,2-Dichloroethene							
67-66-3	Chloroform						130	
107-06-2	1,2-Dichloroethane							
78-93-3	2-Butanone	7300 UJ	5 UJ	3 UJ	J	2 UJ		
71-55-6	1,1,1-Trichloroethane							
56-23-5	Carbon Tetrachloride							
108-05-4	Vinyl Acetate							
75-27-4	Bromodichloromethane							
78-87-5	1,2-Dichloropropane							
10061-02-6	Trans-1,3-Dichloropropene							
79-01-6	Trichloroethene							
124-48-1	Dibromochloromethane							
79-00-5	1,1,2-Trichloroethane							
71-43-2	Benzene	2440			3 J			
10061-01-5	cis-1,3-Dichloropropene							
110-75-8	2-Chloroethylvinylether							
75-25-2	Bromoform						UJ	UJ
591-78-6	4-Methyl-2-Pentanone		1 J	1 J				
108-10-1	2-Hexanone						UJ	UJ
127-18-4	Tetrachloroethene							
79-34-5	1,1,2,2-Tetrachloroethane							
108-88-3	Toluene	19000	2 J	2 UJ	44	2 UJ	3 UJ	
108-90-7	Chlorobenzene							
100-41-4	Ethylbenzene	12000			180			
100-42-5	Styrene	21000	4 J		180			
	Total Xylenes	55000	5		500			

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DATE SAMPLED:								
DATE SAMPLE RECD:								
DATE EXTR/PREP'D:		4/27/87	4/28/87	5/1/87	4/27/87	4/28/87	5/1/87	5/1/87
DATE ANALYZED:		4/27/87	4/28/87	5/1/87	4/27/87	4/28/87	5/1/87	5/1/87
CONC/DIL FACTOR:		1	1	1	1	1	1	1
% MOISTURE:								
UNITS:		ug/L	ug/L	ug/L	ug/kg	ug/kg	ug/kg	ug/kg
CAS Number	SAMPLE DESCRIPT.: TRAFFIC REPORT #:	method blank-1	method blank-2	method blank-3	method blank-4	method blank-5	method blank-6	method blank-7
74-87-3	Chloromethane	UJ	UJ	UJ			UJ	
74-83-9	Bromomethane	UJ	UJ	UJ			UJ	
75-01-4	Vinyl Chloride							
75-00-3	Chloroethane	UJ	UJ	UJ		UJ		
75-09-2	Methylene Chloride	3 J	7 J	UJ	6	6	5 J	6 J
67-64-1	Acetone		28 J	UJ	8 J	20 J	10 J	8 J
75-15-0	Carbon Disulfide							
75-35-4	1, 1-Dichloroethene							
75-34-3	1, 1-Dichloroethane							
156-60-5	Trans-1, 2-Dichloroethene							
67-66-3	Chloroform							
107-06-2	1, 2-Dichloroethane							
78-93-3	2-Butanone				2 J	2 J	2 J	2 J
71-55-6	1, 1, 1-Trichloroethane				2 J	2 J	1 J	
56-23-5	Carbon Tetrachloride							
108-05-4	Vinyl Acetate							
75-27-4	Bromodichloromethane							
78-87-5	1, 2-Dichloropropane							
10061-02-6	Trans-1, 3-Dichloropropene							
79-01-6	Trichloroethene							
124-48-1	Dibromochloromethane							
79-00-5	1, 1, 2-Trichloroethane							
71-43-2	Benzene							
10061-01-5	cis-1, 3-Dichloropropene							
110-75-8	2-Chloroethylvinylether							
75-25-2	Bromoform	UJ	UJ	UJ				
591-78-6	4-Methyl-2-Pentanone	UJ	UJ					
108-10-1	2-Hexanone	UJ	UJ	UJ				
127-18-4	Tetrachloroethene	UJ						
79-34-5	1, 1, 2, 2-Tetrachloroethane							
108-88-3	Toluene				1 J	1 J	1 J	1 J
108-90-7	Chlorobenzene							
100-41-4	Ethylbenzene							
100-42-5	Styrene							
	Total Xylenes				0.8 J	1 J		

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DATE SAMPLED:									
DATE SAMPLE RECD:									
DATE EXTR/PREP'D:		5/4/87	5/5/87		4/30/87	5/6/87	4/28/87	5/1/87	5/1/87
DATE ANALYZED:		5/4/87	5/5/87		4/30/87	5/6/87	4/28/87	5/1/87	5/1/87
CONC/DIL FACTOR:		1	1		125	125	1	1	1
% MOISTURE:									
UNITS:		ug/kg	ug/kg		ug/kg	ug/kg	ug/L	ug/L	ug/kg
CAS Number	SAMPLE DESCRIPT.: TRAFFIC REPORT #:	Method Blank-9	Method Blank-9		Method Blank-10	Method Blank-11	Holding Blank-1	Holding Blank-2	Holding Blank-3
74-87-3	Chloromethane	UJ					UJ	UJ	UJ
74-83-9	Bromomethane		UJ				UJ	UJ	UJ
75-01-4	Vinyl Chloride								
75-00-3	Chloroethane	UJ					UJ	UJ	
75-09-2	Methylene Chloride	3 J	6 J		950	790	UJ	UJ	11 J
67-64-1	Acetone	11	11		2100 J	1800 J	UJ	UJ	9 J
75-15-0	Carbon Disulfide								
75-35-4	1, 1-Dichloroethene								
75-34-3	1, 1-Dichloroethane								
156-60-5	Trans-1, 2-Dichloroethene								
67-66-3	Chloroform					150 J			
107-06-2	1, 2-Dichloroethane								
78-93-3	2-Butanone	2 J	2 J		2300 J	2300 J			1 J
71-55-6	1, 1, 1-Trichloroethane	2 J							
56-23-5	Carbon Tetrachloride								
108-05-4	Vinyl Acetate								
75-27-4	Bromodichloromethane								
78-87-5	1, 2-Dichloropropane								
10061-02-6	Trans-1, 3-Dichloropropene								
79-01-6	Trichloroethene								
124-48-1	Dibromochloromethane								
79-00-5	1, 1, 2-Trichloroethane								
71-43-2	Benzene								
10061-01-5	cis-1, 3-Dichloropropene								
110-75-8	2-Chloroethylvinylether								
75-25-2	Bromoform						UJ	UJ	
591-78-6	4-Methyl-2-Pentanone						UJ		
108-10-1	2-Hexanone						UJ	UJ	
127-18-4	Tetrachloroethene								
79-34-5	1, 1, 2, 2-Tetrachloroethane								
108-88-3	Toluene	1 J	1 J		190 J	170 J			1 J
108-90-7	Chlorobenzene								
100-41-4	Ethylbenzene								
100-42-5	Styrene								
	Total Xylenes								

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CAS Number											
DATE SAMPLED:		4/21/87	4/21/87	4/21/87	4/21/87	4/21/87	4/21/87	4/21/87	4/21/87	4/22/87	4/22/87
DATE SAMPLE RECD:		4/25/87	4/25/87	4/25/87	4/25/87	4/25/87	4/25/87	4/25/87	4/25/87	4/25/87	4/25/87
DATE EXTR/PREP'D:		4/28/87	4/28/87	4/28/87	4/28/87	4/28/87	4/28/87	4/28/87	4/28/87	4/28/87	4/30/87
DATE ANALYZED:		5/6/87	5/6/87	5/6/87	5/6/87	5/6/87	5/6/87	5/6/87	5/8/87	5/6/87	5/12/87
CONC/DIL FACTOR:		1	1	1	10	10	1	1	1	1	10
% MOISTURE:		18.8	19.4	24.2	32.4	20.3	20.4	25.6	25.4	16.6	18.7
UNITS:		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
	SAMPLE DESCRIPT.:	SS-THA	SS-THA	SS-RA	← Field Duplicate →		SS-THD	SS-THE	SS-THE	SS-THF	SS-THG
		01-03	02-11.5	01-03			01-9.5	01-08	01-C	01-C	01-03
	TRAFFIC REPORT #:	CG101	CG102	CG103	CG104	CG105	CG106	CG107	CG108	CG109	CG110
108-95-2	Phenol										
111-44-4	bis(2-Chloroethyl)Ether										
95-57-8	2-Chlorophenol										
541-73-1	1,3-Dichlorobenzene										
106-46-7	1,4-Dichlorobenzene										
100-51-6	Benzyl Alcohol	UJ			UJ	UJ		UJ	UJ	UJ	UJ
95-50-1	1,2-Dichlorobenzene										
95-48-7	2-Methylphenol										
39638-32-9	bis(2-chloroisopropyl)Ether	UJ						UJ	UJ	UJ	
106-44-5	4-Methylphenol										
621-64-7	N-Nitroso-Di-n-Propylamine										
67-72-1	Hexachloroethane										
98-95-3	Nitrobenzene										
78-59-1	Isophorone										
88-75-5	2-Nitrophenol										
105-67-8	2,4-Dimethylphenol										
65-85-0	Benzoic Acid (2)										
111-91-1	bis(2-Chloroethoxy)Methane										
120-83-2	2,4-Dichlorophenol										
120-82-1	1,2,4-Trichlorobenzene										
91-20-3	Naphthalene										
106-47-8	4-Chloroaniline										
87-68-3	Hexachlorobutadiene										
59-50-7	4-Chloro-3-Methylphenol										
91-57-6	2-Methylnaphthalene										
77-47-4	Hexachlorocyclopentadiene	UJ						UJ		UJ	
88-06-2	2,4,6-Trichlorophenol										
95-95-4	2,4,5-Trichlorophenol (2)										
91-58-7	2-Chloronaphthalene										
88-74-4	2-Nitroaniline (2)										
131-11-3	Dimethyl Phthalate										
208-96-8	Acenaphthylene			13 J	3100 J	4700					
99-09-2	3-Nitroaniline (2)										
83-32-9	Acenaphthene										
51-28-5	2,4-Dinitrophenol (2)	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
100-02-7	4-Nitrophenol (2)								UJ		
132-64-9	Dibenzofuran										
121-14-2	2,4-Dinitrotoluene										
606-20-2	2,6-Dinitrotoluene										
84-66-2	Diethylphthalate										
7005-72-3	4-Chlorophenyl-phenylether								UJ		
86-73-7	Fluorene										
100-01-6	4-Nitroaniline (2)	UJ	UJ	UJ			UJ	UJ	UJ	UJ	
534-52-1	4,6-Dinitro-2-Methylphenol (2)	UJ						UJ		UJ	
86-30-6	N-Nitrosodiphenylamine (1)					1000 J			21 J		
101-55-3	4-Bromophenyl-phenylether	UJ						UJ		UJ	
118-74-1	Hexachlorobenzene	UJ						UJ	UJ	UJ	
87-86-5	Pentachlorophenol (2)										
85-01-8	Phenanthrene				1200 J	1700 J					
120-12-7	Anthracene				3200 J	5500					190000 J
84-74-2	Di-n-Butylphthalate	1000 UJ	1100 UJ	1400 UJ	3200 UJ	1800 UJ	1000 UJ	1100 UJ	1200 UJ	640 UJ	
206-44-0	Fluoranthene			39 J	20000	20000					220000
129-00-0	Pyrene	9 J		47 J	17000	17000		UJ		UJ	200000
85-68-7	Butylbenzylphthalate										
91-94-1	3,3'-Dichlorobenzidine (2)	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
56-55-3	Benzo(a)Anthracene				11000	12000					220000 J
117-81-7	bis(2-Ethylhexyl)Phthalate	35 J									
218-01-9	Chrysene				20000	23000					
117-84-0	Di-n-Octyl Phthalate										
205-99-2	Benzo(b)Fluoranthene				58000	60000					240000 J
207-08-9	Benzo(k)Fluoranthene										
50-32-8	Benzo(a)Pyrene				22000	24000					
193-39-5	Indeno(1,2,3-cd)Pyrene	UJ	UJ	UJ	14000 J	UJ	UJ	UJ	UJ	UJ	UJ
53-70-3	Dibenz(a,h)Anthracene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
191-24-2	Benzo(g,h,i)Perylene				14000 J	UJ					UJ

(1) Cannot be separated from diphenylamine

BNA

CASE #/SITE ID: 7/31/L.A. Clarke

M

DATE SAMPLED:		4/22/87	4/23/87	4/23/87	4/23/87	4/24/87	4/24/87	4/24/87	4/24/87	4/25/87	4/25/87	
DATE SAMPLE RECD:		4/25/87	4/25/87	4/25/87	4/25/87	4/25/87	4/25/87	4/30/87	4/24/87	4/30/87	4/30/87	
DATE EXTR/PREP'D:		4/28/87	4/30/87	4/28/87	4/28/87	4/28/87	4/28/87	5/1/87	5/1/87	5/1/87	5/1/87	
DATE ANALYZED:		5/12/87	5/12/87	5/5/87	5/1/87	5/1/87	5/1/87	5/6/87	5/6/87	5/6/87	5/7/87	
CONC/DIL FACTOR:		5	20	1	1	1	1	1	1	1	1	
% MOISTURE:		28.4	35.9	23.2				23.0	22.1	10.2	22.7	
UNITS:		ug/kg	ug/kg	ug/kg	ug/L	ug/L	ug/L	ug/kg	ug/kg	ug/kg	ug/kg	
CAS Number	SAMPLE DESCRIPT.: / TRAFFIC REPORT #:	SS-T/S 02-03 CG-111	SS-T/S 01-03 CG-112	SS-T/S 02-04 CG-113	Rinse Blank CG-114	Water Blank CG-115	Dup Blank CG-116	SS 80-90 CG-117	SS-001 01 CG-118	SS-002 01 CG-119	SS-GW-LL CG-120	
108-95-2	Phenol					104						
111-44-4	bis(2-Chloroethyl)Ether											
95-57-8	2-Chlorophenol					56						
541-73-1	1,3-Dichlorobenzene											
106-46-7	1,4-Dichlorobenzene											
100-51-6	Benzyl Alcohol	UJ	UJ		UJ	UJ	UJ				UJ	
95-50-1	1,2-Dichlorobenzene											
95-48-7	2-Methylphenol											
39638-32-9	bis(2-chloroisopropyl)Ether							UJ	UJ	UJ	UJ	
106-44-5	4-Methylphenol											
621-64-7	N-Nitroso-Di-n-Propylamine										UJ	
67-72-1	Hexachloroethane											
98-95-3	Nitrobenzene											
78-59-1	Isophorone											
88-75-5	2-Nitrophenol											
105-67-9	2,4-Dimethylphenol											
65-85-0	Benzoic Acid (2)							R UJ	R UJ	R UJ		
111-91-1	bis(2-Chloroethoxy)Methane											
120-83-2	2,4-Dichlorophenol					21						
120-82-1	1,2,4-Trichlorobenzene											
91-20-3	Naphthalene		6100000	1200						34 J		
106-47-8	4-Chloroaniline											
87-68-3	Hexachlorobutadiene											
59-50-7	4-Chloro-3-Methylphenol											
91-57-6	2-Methylnaphthalene		2300000	250 J						69 J		
77-47-4	Hexachlorocyclopentadiene							UJ	UJ	UJ	UJ	
88-06-2	2,4,6-Trichlorophenol											
95-95-4	2,4,5-Trichlorophenol (2)											
91-58-7	2-Chloronaphthalene											
88-74-4	2-Nitroaniline (2)											
131-11-3	Dimethyl Phthalate											
208-96-8	Acenaphthylene			9 J					20 J	40 J		
99-09-2	3-Nitroaniline (2)											
83-32-9	Acenaphthene		1400000	240 J						500		
51-28-5	2,4-Dinitrophenol (2)	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ		
100-02-7	4-Nitrophenol (2)											
132-64-9	Dibenzofuran		1400000	310 J						350 J	32 J	
121-14-2	2,4-Dinitrotoluene											
606-20-2	2,6-Dinitrotoluene											
84-66-2	Diethylphthalate											
7005-72-3	4-Chlorophenyl-phenylether											
86-73-7	Fluorene		1900000	330 J						430		
100-01-6	4-Nitroaniline (2)			UJ	UJ	UJ	UJ					
534-52-1	4,6-Dinitro-2-Methylphenol (2)											
86-30-6	N-Nitrosodiphenylamine (1)											
101-55-3	4-Bromophenyl-phenylether											
118-74-1	Hexachlorobenzene											
87-86-5	Pentachlorophenol (2)											
85-01-8	Phenanthrene	2500	5700000	1400					87 J	3000	140 J	
120-12-7	Anthracene	1100 J	1500000	190 J						480		
84-74-2	Di-n-Butylphthalate	1400 BJ		7400 UJ	1 UJ	3 UJ	2 UJ	1200 UJ	790 UJ	31000 UJ	1100 UJ	
206-44-0	Fluoranthene	3700	3400000	650					940	3500	110 J	
129-00-0	Pyrene	2300	11000000	420 J					840	2500	85 J	
85-68-7	Butylbenzylphthalate											
91-94-1	3,3'-Dichlorobenzidine (2)	UJ	UJ	UJ	UJ	UJ	UJ					
56-55-3	Benzo(a)Anthracene	3000	462000						330 J	770		
117-81-7	bis(2-Ethylhexyl)Phthalate			41 J								
218-01-9	Chrysene	3600	560000	120 J					530	930		
117-84-0	Di-n-Octyl Phthalate											
205-99-2	Benzo(b)Fluoranthene	3300	440000 J						1100	2300		
207-08-9	Benzo(k)Fluoranthene											
50-32-8	Benzo(a)Pyrene								220 J	530		
193-39-5	Indeno(1,2,3-cd)Pyrene	UJ	UJ	UJ					310 J	340 J		
53-70-3	Dibenzo(a,h)Anthracene	UJ	UJ	UJ	UJ	UJ	UJ			250 J		
191-24-2	Benzo(g,h,i)Perylene	UJ	UJ						230 J	370		

(1) Cannot be seen

CASE #/SITE ID: 7131 / L.A. Clarke

					M		M	M	M			
DATE SAMPLED:		4/26/87	4/26/87	4/26/87	4/26/87	4/26/87	4/26/87	4/26/87	4/26/87	4/26/87	4/26/87	4/26/87
DATE SAMPLE RECD:		4/30/87	4/30/87	4/30/87	4/30/87	4/30/87	4/30/87	4/30/87	4/30/87	4/30/87	4/30/87	4/30/87
DATE EXTR/PREP'D:		5/1/87	5/1/87	5/5/87	5/1/87	5/5/87	5/5/87	5/5/87	5/6/87	5/1/87	5/1/87	5/1/87
DATE ANALYZED:		5/7/87	5/15/87	5/7/87	5/7/87	5/7/87	5/15/87	5/7/87	5/15/87	5/15/87	5/15/87	5/15/87
CONC/DIL FACTOR:		1	1	10	1	25	20	1	1	2	1	
% MOISTURE:		23.5	20.0	10.5	23.3	19.2	19.3	15.6	24.1	22.1	24.3	
UNITS:		ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	
CAS Number	SAMPLE DESCRIPT.: / TRAFFIC REPORT #:	SS-B11 01 CG121	SS B11-02 CG122	SS-B12 01 CG123	SS B12 02 CG124	← lab duplicate → CG125	CG126	SS-B12 04 CG127	SS-B12 03 CG128	SS B12 02 CG129	SS-B13 01 CG130	
108-95-2	Phenol											
111-44-4	bis(2-Chloroethyl)Ether											
95-57-8	2-Chlorophenol											
541-73-1	1,3-Dichlorobenzene											
106-46-7	1,4-Dichlorobenzene											
100-51-6	Benzyl Alcohol	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	
95-50-1	1,2-Dichlorobenzene											
95-48-7	2-Methylphenol											
39638-32-9	bis(2-chloroisopropyl)Ether	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	
106-44-5	4-Methylphenol											
621-64-7	N-Nitroso-Di-n-Propylamine	UJ		UJ	UJ	UJ		UJ				
67-72-1	Hexachloroethane											
98-95-3	Nitrobenzene											
78-59-1	Isophorone											
88-75-5	2-Nitrophenol											
105-67-9	2,4-Dimethylphenol											
65-85-0	Benzoic Acid (1)		UJ				UJ		UJ	UJ	UJ	
111-91-1	bis(2-Chloroethoxy)Methane											
120-83-2	2,4-Dichlorophenol											
120-82-1	1,2,4-Trichlorobenzene											
91-20-3	Naphthalene			1200000	1600	4400000	4000000	5900 J	23 J	5400		
106-47-8	4-Chloroaniline											
87-68-3	Hexachlorobutadiene											
59-50-7	4-Chloro-3-Methylphenol											
91-57-6	2-Methylnaphthalene			34000	92 J	1600000	2000000	2300 J		3200		
77-47-4	Hexachlorocyclopentadiene	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	
88-06-2	2,4,6-Trichlorophenol											
95-95-4	2,4,5-Trichlorophenol (1)											
91-58-7	2-Chloronaphthalene											
88-74-4	2-Nitroaniline (1)											
131-11-3	Dimethyl Phthalate											
208-96-8	Acenaphthylene											
99-09-2	3-Nitroaniline (1)											
83-32-9	Acenaphthene			300000	250 J	2500000	3000000	7200 J	35 J	5600		
51-28-5	2,4-Dinitrophenol (1)											
100-02-7	4-Nitrophenol (1)											
132-64-9	Dibenzofuran			260000	320 J	1700000	2200000	4200 J		4200		
121-14-2	2,4-Dinitrotoluene											
606-20-2	2,6-Dinitrotoluene											
84-66-2	Diethylphthalate											
7005-72-3	4-Chlorophenyl-phenylether											
86-73-7	Fluorene			310000	440	1300000	2100000	4800 J	77 J			
100-01-6	4-Nitroaniline (1)											
534-52-1	4,6-Dinitro-2-Methylphenol (1)											
86-30-6	N-Nitrosodiphenylamine (1)											
101-55-3	4-Bromophenyl-phenylether											
118-74-1	Hexachlorobenzene											
87-86-5	Pentachlorophenol (1)											
85-01-8	Phenanthrene	96 J		900000	1900	5500000	6400000	19000 J	440	5000	39 J	
120-12-7	Anthracene	240 J		106000 J	140 J	340000 J	450000 J			1100		
84-74-2	Di-n-Butylphthalate	740 UJ	760 UJ		1000 UJ				1140 UJ	800 UJ	1160 UJ	
206-44-0	Fluoranthene	990	17 J	470000	1300	3400000	4000000	13000 J	360 J	9600	48 J	
129-00-0	Pyrene	770	25 J	370000	930	2600000	2700000	9700 J	280 J	7900	46 J	
85-68-7	Butylbenzylphthalate											
91-94-1	3,3'-Dichlorobenzidine (1)											
56-55-3	Benzo(a)Anthracene			79000 J	200 J	540000 J	690000		56 J	1900		
117-81-7	bis(2-Ethylhexyl)Phthalate											
218-01-9	Chrysene			90000 J	180 J	480000 J	660000			1900		
117-84-0	Di-n-Octyl Phthalate											
205-99-2	Benzo(b)Fluoranthene	1330 J		790000 J	1200 J	1430000 J	1600000			1700		
207-08-9	Benzo(k)Fluoranthene											
50-32-8	Benzo(a)Pyrene			44000 J		350000 J	220000 J			300 J		
193-39-5	Indeno(1,2,3-cd)Pyrene									210 J		
53-70-3	Dibenz(a,h)Anthracene											
191-24-2	Benzo(g,h,i)Perylene									150 J		

(1) Cannot be separated from diphenylamine

CASE #/SITE ID: 7131 / L.A. Clarke

DATE SAMPLED:		4/24/87								
DATE SAMPLE RECD:		4/30/87								
DATE EXTR/PREP'D:		4/30/87	4/28/87	4/30/87	4/28/87	5/1/87	5/2/87	4/30/87	5/5/87	
DATE ANALYZED:		5/4/87	4/30/87	5/1/87	5/4/87	5/4/87	5/5/87	5/5/87	5/7/87	
CONC/DIL FACTOR:		1	1	1	1	1	1	1	1	
% MOISTURE:										
UNITS:		ug/L	ug/L	ug/L	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	
CAS Number	SAMPLE DESCRIPT.: / TRAFFIC REPORT #:	water blank CG-131	method blank-1	method blank-2	method blank4	method blank5	method blank	method blank10	method blank11	
108-95-2	Phenol									
111-44-4	bis(2-Chloroethyl)Ether									
95-57-8	2-Chlorophenol									
541-73-1	1,3-Dichlorobenzene									
106-46-7	1,4-Dichlorobenzene									
100-51-6	Benzyl Alcohol		UJ	UJ			UJ	UJ	UJ	
95-50-1	1,2-Dichlorobenzene									
95-48-7	2-Methylphenol									
39638-32-9	bis(2-chloroisopropyl)Ether		UJ	UJ		UJ	UJ	UJ	UJ	
106-44-5	4-Methylphenol		UJ							
621-64-7	N-Nitroso-Di-n-Propylamine								UJ	
67-72-1	Hexachloroethane									
98-95-3	Nitrobenzene									
78-59-1	Isophorone									
88-75-5	2-Nitrophenol									
105-67-9	2,4-Dimethylphenol									
65-85-0	Benzoic Acid (2)					R	UJ			
111-91-1	bis(2-Chloroethoxy)Methane									
120-83-2	2,4-Dichlorophenol									
120-82-1	1,2,4-Trichlorobenzene									
91-20-3	Naphthalene									
106-47-8	4-Chloroaniline									
87-68-3	Hexachlorobutadiene									
59-50-7	4-Chloro-3-Methylphenol									
91-57-6	2-Methylnaphthalene									
77-47-4	Hexachlorocyclopentadiene					UJ	UJ		UJ	
88-06-2	2,4,6-Trichlorophenol									
95-95-4	2,4,5-Trichlorophenol (2)									
91-58-7	2-Chloronaphthalene									
88-74-4	2-Nitroaniline (2)									
131-11-3	Dimethyl Phthalate									
208-96-8	Acenaphthylene									
99-09-2	3-Nitroaniline (2)									
83-32-9	Acenaphthene									
51-28-5	2,4-Dinitrophenol (2)	UJ	UJ	UJ	UJ	UJ		UJ		
100-02-7	4-Nitrophenol (2)			UJ				UJ		
132-64-9	Dibenzofuran									
121-14-2	2,4-Dinitrotoluene									
606-20-2	2,6-Dinitrotoluene									
84-66-2	Diethylphthalate									
7005-72-3	4-Chlorophenyl-phenylether			UJ				UJ		
86-73-7	Fluorene									
100-01-6	4-Nitroaniline (2)		UJ	UJ				UJ		
534-52-1	4,6-Dinitro-2-Methylphenol (2)									
86-30-6	N-Nitrosodiphenylamine (1)			R J						
101-55-3	4-Bromophenyl-phenylether									
118-74-1	Hexachlorobenzene			UJ				UJ		
87-86-5	Pentachlorophenol (2)									
85-01-8	Phenanthrene									
120-12-7	Anthracene									
84-74-2	Di-n-Butylphthalate	1 UJ	1 J	1 J		1000 J	1800	1100 J		
206-44-0	Fluoranthene									
129-00-0	Pyrene									
85-68-7	Butylbenzylphthalate									
91-94-1	3,3'-Dichlorobenzidine (2)	UJ	UJ	UJ	UJ			UJ		
56-55-3	Benzo(a)Anthracene									
117-81-7	bis(2-Ethylhexyl)Phthalate									
218-01-9	Chrysene									
117-84-0	Di-n-Octyl Phthalate									
205-99-2	Benzo(b)fluoranthene									
207-08-9	Benzo(k)fluoranthene									
50-32-8	Benzo(a)Pyrene									
193-39-5	Indeno(1,2,3-cd)Pyrene	UJ		UJ	UJ			UJ		
53-70-3	Dibenz(a,h)Anthracene	UJ	UJ	UJ	UJ			UJ		
191-24-2	Benzo(g,h,i)Perylene									

(1) Cannot be separated from diphenylamine

DATA SUMMARY FORM : INORGANICS

Page 1 of 2

Case Number: 7131

Site Name: L.A. Clarke

Date of Seeping: 4/21 - 4/22/87

SOIL SAMPLES (mg/Kg)

+Due to dilution, sample quantition limit is affected. See dilution table for specifics.

SEE GLOSSARY FOR CODE DEFINITIONS

	Sample No.	MCH 101		MCH 102		MCH 103		MCH 104		MCH 105		MCH 106		MCH 107		MCH 108		MCH 109		MCH 110	
	% Solids	80.6		80.0		74.3		79.7		72.1		79.2		69.5		75.8		83.2		83.4	
	Location	2892-1 SS-TPA 01 0.5		2892-2 SS-TPA 02-11.5		2892-3 SS-TPA 02-03		2892-4 ← field		dup → 2892-5		2892-6 SS-TPA- 01-9.5		2892-7 SS-TPC- 01-08		2892-8 SS-TPF 01-C		2892-9 SS-TPF 01-C		2892-10 SS-TPG 01-02	
CRQL*	ANALYTE																				
40	Aluminum	2050		2580		3010		6250		5490		1390		4010		2140		1500		6340	
12	Antimony		R		R		R	[15]	L	26	L		R		R		R		R		R
2	Arsenic		R		R	[2.4]	L	33	L	98	L	[2.1]	L		R		R		R		R
40	Barium	[24]	J	[24]	J	[25]	J	159	J	74	J	[23]	J	44	J	[23]	J			46	
1	Beryllium					[.49]		[1.3]		[.82]				[.41]				[.19]		[.61]	
1	Cadmium			5.0				1.5		2.2											
1000	Calcium	[650]	J	1260	J	1500	J	2690	J	2500	J	[939]	J	1520	J	[969]	J	[312]	J	1420	J
2	Chromium	4.5	J	3.3	J	5.1	J	26	J	552	J	7.1	J	13	J	3.5	J			17	J
10	Cobalt					[3.4]	J	6.5	J	21	J			[4.3]	J	3.3	J	24	J	[5.1]	J
5	Copper			11	J	[4.6]	J	115	J	667	J	[3.8]	J	20	J	8.2	J	[2.9]	J	8.1	J
20	Iron	3520	J	3940	J	11200	J	29100	J	377000	J	6210	J	14100	J	5300	J	1420	J	28700	J
1	*LEAD	4.8	J	4.9	J	4.6	J	134	J	94	J	4.5	J	5.8	J	2.7	J	3.4	J	12	J
1000	Magnesium	[561]	J	1090	J	[560]	J	[675]	J	[1040]	J	[581]	J	1320	J	[661]	J	[174]	J	1220	J
3	Manganese	51	J	38	J	88	J	214	J	928	J	64	J	453	J	76	J	100	J	199	J
0.2	Mercury									.19											
8	Nickel			[5.9]	J			19	J	18.2	J	[4.8]	J	[4.7]	J	[4.9]	J			[8.1]	
1000	Potassium	114000		[1000]		[413]		[821]		[179]		[379]		1160		[540]		[139]		1180	
1	Selenium		R	[1.2]	L		R	1.5	L	1.7	L		R		R		R	[1.1]	L		R
.2	Silver																				
1000	Sodium	[178]		[330]		[234]		[429]		[327]		[275]		[310]		[285]		[252]		[211]	
2	Thallium									[2.5]											
8	Tin																				
10	Vanadium	[8.7]		[8.5]		[10]		24		24		[10]		19		[7.5]		[4.7]		29	
4	Zinc	8.2	J	13	J	13	J	175	J	347	J	10	J	24	J	15	J	8.7	J	69	J
2	Cyanide	N.R.		N.R.		N.R.		N.R.		N.R.		N.R.		N.R.		N.R.		N.R.		N.R.	

Case Number: 7131 DATA SUMMARY FORM: INORGANICS Page 4 of 5

Site Name: L.A. Clarke

Date of Sampling: 4/22/87 – 4/26/87

SOIL SAMPLES (mg/Kg)

+Due to dilution, sample quantition limit is effected. See dilution table for specifics.

SEE GLOSSARY FOR CODE DEFINITIONS

	Sample No.	MCH 111		MCH 112		MCH 113		MCH 117		MCH 118		MCH 119		MCH 120		MCH 121		MCH 122		MCH 123	
	% Solids	70.0		66.5		78.1		72.9		79.4		88.3		76.5		83.3		77.1		88.0	
	Location	2892-11 SS-TP6 02-03		2892-12 SS-TP5 01-02		2892-13 SS-TP5 02-04		2892-17 SS-B09 02		2892-18 SS-B09 01		2892-19 SS-B10 01		2892-20 SS-B10 02		2892-21 SS-B11 01		2892-22 SS-B11 02		2892-23 SS-B12 01	
CRDL*	ANALYTE																				
40	Aluminum	11900		12900		1410		1930		2970		6890		11200		1410		16100		3080	
12	Antimony		R		R		R		R		R		R		R		R		R		R
2	Arsenic		R	8.0	L		R		R	[2.2]	L	[1.9]	L		R		R		R		R
40	Barium	59	J	67	J	[20]	J	[34]	J	[25]	J	[17]	J	59	J	[19]	J	157	J	[32]	J
1	Beryllium	1.9		[1.1]								[0.19]		[1.0]				2.2		[0.22]	
1	Cadmium			[0.15]																	
1000	Calcium	2650	J	[570]	J	1470	J	[453]	J	[851]	J	[475]	J	3350	J	[435]	J	4320	J	[446]	J
2	Chromium	33	J	22	J	7.6	J	3.3	J	6.8	J	19	J	20	J	8.6	J	27	J	9.0	J
10	Cobalt	[6.9]	J	21	J							[2.6]	J	[6.1]	J			12	J	16	J
5	Copper	14	J	17	J			[5.3]	J	[5.5]	J	6.9	J	7.6	J	[3.8]	J	24	J	[4.7]	J
20	Iron	29800	J	17900	J	6580	J	3350	J	3020	J	5240	J	34000	J	2420	J	38200	J	9790	J
1	LEAD	13	J	21	J	5.3	J	4.6	J	4.1	J	7.1	J	5.7	J	3.0	J	12	J	6.1	J
1000	Magnesium	3130		[530]	J	[634]	J	[457]	J	[648]	J	[560]	J	3300		[265]	J	6170		[263]	J
3	Manganese	153	J	101	J	26	J	251	J	113	J	67	J	166	J	38	J	218	J	241	J
0.2	Mercury																				
8	Nickel	14	J	[10]	J									[8.6]	J	[4.8]	J	18	J		
1000	Potassium	2670		[613]		[495]		[533]		[483]		[369]		2790		[471]		7850		[254]	
1	Selenium		R	[1.2]	L		R		R		R		R		R		R		R		R
2	Silver																				
1000	Sodium	[344]		[547]		[356]		[490]		[504]		[412]		[629]		[375]		[204]		[80]	
2	Thallium																				
8	Tin																				
10	Vanadium	50		42		[9.0]		[11]		[11]		14		18		[7.4]		48		12	
4	Zinc	58	J	62	J	14	J	[4.8]	J	7.8	J	15	J	14	J	6.2	J	91	J	7.2	J
2	Cyanide	N.A.		N.A.		N.A.		N.A.		N.A.		N.A.		N.A.		N.A.		N.A.		N.A.	

Case Number: 7151

Site Name: L.A. [illegible]

Date of Sampling: [illegible]

DATA SUMMARY FORM : INORGANICS

SOIL SAMPLES (mg/Kg)

Page 3 of 3

+Due to dilution, sample quantition limit is effected. See dilution table for specifics.

SEE GLOSSARY FOR CODE DEFINITIONS

CRQL**	Sample No.	MCH 124		MCH 126		MCH 136		MCH 137		MCH 138		MCH 139		MCH 130	
	% Solids	78.0		80.7		79.9		83.7		81.9		74.5		74.0	
	Location	2892-24 SS-B12 -02		2892-25 SS-B12 -03		2892-26		2892-27 SS-B12 04		2892-28 SS-B12 05		2892-29 SS-B12 06		2892-30 SS-B13 -01	
	← field dup →														
40	Aluminum	13400		1090		993		1120		5250		21700		22800	
12	Antimony		R		R		R		R		R		R		R
2	Arsenic		R		R		R		R		R		R		R
40	Barium	[24]	J	[24]	J	[28]	J	[29]	J	[48]	J	[2.7]	L	132	J
1	Beryllium			[0.25]				[0.24]		[0.98]		194	J		
1	Cadmium											3.5			
1000	Calcium	[598]	J	[613]	J	[563]	J	[506]	J	29600		9130		5920	
2	Chromium	3.5	J	2.6	J			3.3	J	9.8	J	29	J	38	J
10	Cobalt									[11]	J	16	J	[12]	J
5	Copper	7.6	J	11	J	6.5	J	9.2	J	100	J	51	J	18	J
20	Iron	4220	J	11900	J	4460	J	14000	J	7730	J	57800	J	38400	J
1	*LEAD	8.2	J	3.3	J	4.3	J	2.4	J	15	J	18	J	14	J
1000	Magnesium	[306]	J	[241]	J	[298]	J	[303]	J	1950		1080		7700	
5	Manganese	24	J	21	J	18	J	13	J	190	J	249	J	196	J
0.2	Mercury					.16		.19							
8	Nickel	[3.9]	J							[7.3]	J	20	J	16	J
1000	Potassium	[398]		[207]		[301]		[357]		1540		8100		7810	
1	Selenium		R		R		R		R		R		R		R
2	Silver														
1000	Sodium					[94]		[43]		[543]		[617]		[465]	
2	Thallium											[2.7]		[2.7]	
8	Tin														
10	Vanadium	[3.1]		[5.8]		[3.7]		[4.3]		[12]		47		38	
4	Zinc	6.1	J	6.3	J	4.9	J	5.0	J	75	J	107	J	96	J
2	Cyanide	N.R.		N.R.		N.R.		N.R.		N.R.		N.R.		N.R.	

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AR302674

DATA SUMMARY FORM : INORGANICS

Page 1 of 1

Case Number: 7131

Site Name: L.A. Clarke

Date of Sampling: 4/03/87, 4/04/87, 4/06/87

WATER SAMPLES (ug/L)

+Due to dilution, sample quantition limit is affected. See dilution table for specifics.

SEE GLOSSARY FOR CODE DEFINITIONS

CROL*	ANALYTE	Sample No. / Location	MCH 114 2892-14 SS-SB 01		MCH 115 2892-15 AQ-WB 01		MCH 116 2892-16 AQTB-01		MCH 131 2892-01 AQ-WB-02	
200	Aluminum		1430		[156]				3480	
60	Antimony									
10	#ARSENIC								10	K
200	Barium								[58]	
5	Beryllium									
5	#CADMIUM									
5000	Calcium		[764]		11200		[563]		72100	
10	#CHROMIUM									
50	Cobalt									
25	Copper								37	
100	Iron		2550		135		[36]		4070	
5	#LEAD				41				43	
5000	Magnesium		[459]		[1680]		[228]		[3540]	J
15	Manganese		21		[11]				58	
0.2	Mercury									
40	#NICKEL		[20]		[13]					B
5000	Potassium		[496]		[920]				[2610]	
5	Selenium									
10	Silver									
5000	Sodium		[1230]		5940		[1060]		5860	
10	Thallium									
40	Tin									
50	Vanadium									
20	Zinc		[8]		298				298	
10	Cyanide		NR		NR		NR		NR	

* CROL = Contract Required Quantitation Limit

Action Level Exists.

D-140

CASE NO. 7324

PHASE III SURFACE WATER AND
SEDIMENT SAMPLING

0985B

Due to the poor quality of the original data copy, this table of analytes, listed in the same order as those reported by the laboratory, is enclosed.

CAS Number	BNA
106-95-2	Phenol
111-44-4	bis (2-Chloroethyl) Ether
95-57-8	2-Chlorophenol
541-73-1	1, 3-Dichlorobenzene
106-46-7	1, 4-Dichlorobenzene
100-51-6	Benzyl Aclohol
95-50-1	1, 2-Dichlorobenzene
95-48-7	2-Methylphenol
39638-32-9	bis (2-chlorosopropyl) Ether
106-44-5	4-Methylphenol
621-64-7	N-Nitroso-Di-n-Propylamine
67-72-1	Hexachloroethane
98-95-3	Nitrobenzene
78-59-1	Isophorone
88-75-5	2-Nitrophenol
106-67-9	2, 4-Dimethylphenol
85-85-0	Benzoic Acid (2)
111-91-1	bis (2-Chloroethoxy) Methane
120-83-2	2, 4-Dichlorophenol
120-82-1	1, 2, 4-Trichlorobenzene
91-20-3	Naphthalene
106-47-8	4-Chloroaniline
87-88-3	Hexachlorobutadiene
59-50-7	4-Chloro-3-Methylphenol
91-57-6	2-Methylnaphthalene
77-47-4	Hexachlorocyclopentadiene
88-06-2	2, 4, 6-Trichlorophonol
95-95-4	2, 4, 5-Trichlorophenol
91-58-7	2-Chloronaphthalene
88-74-4	2-Nitroaniline
131-11-3	Dimethyl Phthalate
208-96-8	Acenaphthylene
99-08-2	3-Nitroaniline
83-32-9	Acenaphthene
61-28-5	2, 4-Dinitrophenol
100-02-7	4-Nitrophenol
132-84-9	Dibenzofuran
121-14-2	2, 4-Dinitrotoluene
606-20-2	2, 6-Dinitrotoluene
84-65-2	Diethylphthalate
7005-72-3	4-Chlorophenyl-phenylether
96-73-7	Fluorene
100-01-4	4-Nitroaniline
634-52-1	4, 6-Dinitro-2-Methylphenol
86-30-6	N-Nitrosodiphenylamine
101-55-3	4-Bromophenyl-phenylether
118-74-1	Hexacholorbenzene
87-86-5	Pentachlorophenol
85-01-8	Phenanthrene
120-12-7	Anthracene
84-74-2	Di-n-Butylphthalate
206-44-0	Fluoranthene
129-00-0	Pyrene
85-58-7	Butylbenzylphthalate
91-94-1	3, 3-Dichlorobenzidine (3)
56-55-3	Benzo (a) Anthracene
117-81-7	bis (2-Ethylhexyl) Phthalate
218-01-9	Chrysene
117-84-0	Di-n-Octyl Phthalate
205-99-2	Benzo (b) Fluoranthene
207-08-9	Benzo (k) Fluoranthene
60-32-8	Benzo (a) Pyrene
193-39-5	Indeno (1, 2, 3-cd) Pyrene
53-70-3	Dibenzo (a, h) Anthracene
191-24-2	Benzo (g, h, i) Perylene

74-87-3	Chloromethane
74-83-9	Bromomethane
75-01-4	Vinyl Chloride
75-00-3	Chloroethane
75-00-2	Methylene Chloride
67-64-1	Acetone
75-15-0	Carbon Disulfide
75-36-4	1,1-Dichloroethene
75-34-3	1,1-Dichloroethane
156-60-5	Trans-1, 2-Dichloroethene
67-66-3	Chloroform
107-06-2	1, 2-Dichloroethane
78-83-3	1, 1, 1-Trichloroethane
56-23-5	Carbon Tetrachloride
108-05-4	Vinyl Acetane
75-27-4	Bromodichloromethane
78-87-5	1, 2-Dichloropropane
10061-02-6	Trans-1, 3-Dichloropropane
79-01-6	Trichloroethene
124-48-1	Dibromochloromethane
79-00-5	1, 1, 2-Trichloroethane
75-25-2	Bromoform
591-78-6	4-Methyl-2-Pentanone
108-10-1	2-Hexanone
127-18-4	Tetrachloroethene
79-34-5	1, 1, 2, 2-Tetrachloroethane
108-88-3	Toluene
108-90-7	Chlorobenzene
100-41-4	Ethylbenzene
100-42-5	Styrene
	Total Xylenes

METALS
Aluminum
Antimony
Arsenic
Barium
Beryllium
Cadmium
Cobalt
Copper
Iron
Lead
Magnesium
Mercury
Nickel
Potasium
Selenium
Silver
Sodium
Thallium
Tin
Vanadium
Zinc

ALL water samples are qualified L, LL (kw) due to unpreserved samples.

DATA SUMMARY FORM: INORGANICS

Page 1 of 3

Number: 7344

Name: LA Clarke

Date of Sampling: 5/18 - 5/20/87

WATER SAMPLES (ug/L)

*Due to dilution, sample quantition limit is effected. See dilution table for specifics.

SEE GLOSSARY FOR CODE DEFINITIONS

	Sample No.	MCH 133		MCH 134		MCH 135		MCH 136		MCH 137		MCH 140		MCH 137		MCH 138		MCH 139		MCH 140	
	Location	GW-W10-01		GW-W09-01		SW-DD1-01		SW-DD1-02		SW-DD2-01		SW-DD2-02		GW-W07-01		GW-W04-01		GW-W05-01		GW-W06-01	
CRQL*	ANALYTE																				
200	Aluminum	1086				6705		361		[40]		[98]									
60	Antimony																				
10	*ARSENIC					29.0		30.0													
200	Barium	[32]		[40]		[80]		[71]		[35]		[40]		[96]		[53]		[27]		[36]	
5	Beryllium					[0.6]										[0.7]					
5	*CADMIUM																				
5000	Calcium	[7055]		9168		8612		14750		[3057]		[2382]		12170		[1728]		8887		19730	
10	*CHROMIUM					10		[7]													
50	Cobalt	[9]				[12]						[12]				[12]					
25	Copper	37		[9]		25						[9]		[5]	B	[22]	B	[8]	B	[6]	B
100	Iron	2895		236		16510		13930		1506		7581		[46]		[27]		325		144	
5	*LEAD	13.0	J		UJ	13.0	J		UJ		UJ		UJ		UJ		UJ		UJ		UJ
5000	Magnesium	[1162]		[3788]		[2772]		[3955]		[1016]		[1060]		[3815]		[1509]		[3781]		8286	
15	Manganese	586		144		740		1179		270		1340		[1]		[10]		49		118	
0.2	Mercury																				
40	*NICKEL																				
5000	Potassium			[4599]		10120		[4272]		[1237]		[966]		43490		[982]		5387		[4837]	
5	Selenium																				
10	Silver																				
5000	Sodium	[4013]		13270		21670		6365		[3766]		[1892]		34150		[2291]		9712		7599	
10	Thallium																				
40	Tin	49																			
50	Vanadium					[25.5]															
20	Zinc	63		136		251		60		25		31		[9]		137		91		88	
10	Cyanide	N/R		N/R		N/R		N/R		N/R		N/R		N/R		N/R		N/R		N/R	

* CRQL = Contract Required Quantitation Limit

D-142

AR302678

Case Number: 7324 DATA SUMMARY FORM I INORGANICS Page 1 of 1

Site Name: LA Clarke

Date of Sampling: 5/11/87

SOIL SAMPLES (ug/Kg)

+Due to dilution, sample quantition limit is affected. See dilution table for specifics.

SEE GLOSSARY FOR CODE DEFINITIONS

CRQL*	ANALYTE	Sample No.		MCH 837		MCH 841		MCH 842		MCH 845		MCH 846		MCH 850		MCH 851		MCH 852	
		% Solids		57		77		65		42		70		24		58		53	
		Location		SB-DD1-01		SB-DD1-02		SB-VP-01		SB-VP-01 Dup / SB-DD2-02		SB-VP-02 / SD-DD3-01		← field dup → SD-DD3-02		SD-VP01		SD-VP-01 Dup		SD-VP-02	
100	Aluminum			11000	J	5452	J	6420	J	2389	J	3055	J	12816	J	2599	J	3841	J	6904	J
30	Antimony				UL		UL		UL		UL		UL		UL		UL		UL		UL
5	Arsenic			18.0	L		UL		UL	37.0	L	10.0	L	415.0	L		UL		UL		UL
100	Barium			116		[60]		[27]		[50]		[30]		141		[40]		[54]		108	
2.5	Beryllium			[2.1]		[1.6]		[1.2]				[0.3]		[1.3]							
2.5	Cadmium																				
2500	Calcium			2896		[1417]		[223]		[988]		[823]		3075		[881]		[1104]		[387]	
5	Chromium			30		19		30				7	B	23		6	B	9	B		
25	Cobalt			[14]		[8]		[21]		[13]				31							
12.5	Copper			33		[7]		[3]		16		[9]		27		[8]		[12]		[10]	
50	Iron			52581		26916		8294		41107		10414		74875		5675		7223		8406	
2.5	LEAD			33.0	J	8.0	J		UJ	16.0	J	8.5	J	29.0	J	22.0	J	36.0	J	80.0	J
2500	Magnesium			2884		[1484]		[936]		[452]	B	[603]		2865		[702]		[1016]		[391]	B
7.5	Manganese			291		159		207		1302		121		2016		100		104		37	
0.1	Mercury																				
20	Nickel			32																	
2500	Potassium			4007		2625		[1391]										[895]			
25	Selenium				UL		UL		UL		UL		UL		UL		UL		UL		UL
6	Silver			5.6		[3.8]		6.5													
2500	Sodium			[40]						[60]		[18]		[135]		[72]		[138]		[75]	
5	Thallium														+						
20	Tin																				
25	Vanadium			63.2		39.5		28.3	B	[14.4]	B	11.9	B	54.6		[9.7]	B	[13.4]	B	[21.7]	B
10	Zinc			328		219		32		54		32		363		56		52		35	
2	Cyanide			N/R		N/R		N/R		N/R		N/R		N/R		N/R		N/R		N/R	

* CRQL = Contract Required Quantitation Limit

D-140

D-143

AR302679

ALL water samples are qualified L, UL (low) due to unpreserved samples.

DATA SUMMARY FORM: INORGANICS

Case Number: 7334

Site Name: L A Clarke

Date of Sampling: 5/18 - 5/19/87

WATER SAMPLES (ug/L)

+Due to dilution, sample quantition limit is affected. See dilution table for specifics.

SEE GLOSSARY FOR CODE DEFINITIONS

CRQL*	Sample No.	MCH 843		MCH 844		MCH 847		MCH 848		MCH 849		MCH 853		MCH 854		MCH 855		MCH 856		MCH 861	
	Location	SW-DD1-01		SW-DD1-02		← Field Dup → SW-UP-01		SW-UP01-D		SW-UP02		GW-WD1-01		GW-WD2-01		Rinsate Blank		Trip Blank		GW-WD7-01	
	ANALYTE																				
200	Aluminum	396		[47]		1615		1704		903										405	
60	Antimony																				
10	*ARSENIC	21.0		26.0																	
200	Barium	[111]		[31]		[55]		[51]		[35]		[81]		[64]						[45]	
5	Beryllium																				
5	*CADMIUM																				
5000	Calcium	[4465]		[4256]		[4604]		[4366]		[2209]		25810		5526						10630	
10	*CHROMIUM					[6]		[7]		[4]											
50	Cobalt	[24]								[10]											
25	Copper	[9]		[4]		[7]		[10]		[7]											
100	Iron	13310		6552		3480		3358		28910		[53]	B	[35]	B	[35]	B			331	
5	*LEAD		UJ		UJ	14.0	J	13.0	J	9.6	J		UJ		UJ		UJ		UJ		R UJ
5000	Magnesium	[1540]		[1498]		[2503]		[2357]		[1256]		[146]		[2087]						[4100]	
15	Manganese	[243]		896		112		107		113		[1]		59						137	
0.2	Mercury																				
40	*NICKEL																				
5000	Potassium	[1677]		[1459]		[2615]		[2404]		[1457]		60370		[2824]						5210	
5	Selenium																				
10	Silver																				
5000	Sodium	[3560]		[3433]		[3959]		[3817]		[2473]		44400		6815						13760	
10	Thallium																				
40	Tin																				
50	Vanadium	[5.6]				[6.9]		[8.0]		[9.3]											
20	Zinc	63		53		50		59		27		21		76		[12]		[11]		28	
10	Cyanide	N/R		N/R		N/R		N/R		N/R		N/R		N/R		N/R		N/R		N/R	

* CRQL = Contract Required Quantitation Limit

* Action Level Exists

D-141

D-144

All water samples are qualified L, UL(10w) due to unpreserved samples.

DATA SUMMARY FORM : INORGANICS

Case Number: 2324

Site Name: L.A. Clarke

Date of Sampling: 5/19 - 5/20/87

WATER SAMPLES (ug/L)

+Due to dilution, sample quantition limit is affected. See dilution table for specifics.

SEE GLOSSARY FOR CODE DEFINITIONS

CRQL*	Sample No. / Location / ANALYTE	MCH 862 GW-W08-01	MCH 863 GW-W15-01	MCH 864 GW-W22-01	MCH 865 GW-W05-02	MCH 866 ← field dup → GW-W06-02	MCH 867 GW-W06-03
200	Aluminum	[38]	[32]	[34]	[28]	[44]	[41]
60	Antimony						
10	*ARSENIC						
200	Barium	[35]	[143]	[31]	[40]	[124]	[126]
5	Beryllium						[0.5]
5	*CADMIUM						
5000	Calcium	28600	38120	8024	9231	27340	27760
10	*CHROMIUM		[5]		[5]	[7]	[8]
50	Cobalt		[25]				[8]
25	Copper						
100	Iron	[86]	4968	1256	1312	2209	2295
5	*LEAD	UJ	UJ	UJ	UJ	UJ	UJ
5000	Magnesium	[785]	10590	[3608]	[3799]	11880	12010
15	Manganese	[1]	364	91	88	204	209
0.2	Mercury						
40	*NICKEL						
5000	Potassium	[3892]	7127	5374	5420	6545	6973
5	Selenium						
10	Silver					[4.4]	[5.9]
5000	Sodium	6605	8097	9193	9749	7815	7751
10	Thallium						
40	Tin						
50	Vanadium	[7.1]	[5.1]		[4.5]	[6.6]	[7.6]
20	Zinc	[6]	[19]	[15]	[6]	[8]	[6]
10	Cyanide	N/R	N/R	N/R	N/R	N/R	N/R

* CRQL = Contract Required Quantitation Limit

* Action Level Exists

VOA

CASE #/SITE ID: 7347 / LA Clarke

DATE SAMPLED:		5/13/87	5/13/87	5/13/87	5/13/87	5/13/87	5/13/87	5/19/87
DATE SAMPLE RECD:		5/21/87	5/21/87	5/21/87	5/21/87	5/21/87	5/21/87	5/21/87
DATE EXTR/PREP'D:		5/26/87	5/26/87	5/26/87	5/27/87	5/27/87	5/27/87	5/26/87
DATE ANALYZED:		5/26/87	5/26/87	5/26/87	5/27/87	5/27/87	5/27/87	5/26/87
CONC/DIL FACTOR:		1	1	1	1	1	1	1
% MOISTURE:		-	-	-	58	27	84	-
UNITS:		ug/L	ug/L	ug/L	ug/kg	ug/kg	ug/kg	ug/L
CAS Number	SAMPLE DESCRIPT.: / TRAFFIC REPORT #:	SW-UP-01 CG 077	SW-UP-01D CG 078	SW-UP-02 CG 079	SD-UP-01 CG 080	SD-UP-01D CG 081	SD-UP-02 CG 082	GW-MW1-01 CG 083
74-87-3	Chloromethane				UJ	UJ	UJ	
74-83-9	Bromomethane				UJ	UJ	UJ	
75-01-4	Vinyl Chloride							
75-00-3	Chloroethane							
75-09-2	Methylene Chloride					28 J	33 UJ	
67-64-1	Acetone				44 J	15 UJ	110 UJ	
75-15-0	Carbon Disulfide							
75-35-4	1,1-Dichloroethene							
75-34-3	1,1-Dichloroethane							
156-60-5	Trans-1,2-Dichloroethene							
67-66-3	Chloroform							
107-06-2	1,2-Dichloroethane							
78-93-3	2-Butanone							
71-55-6	1,1,1-Trichloroethane							
56-23-5	Carbon Tetrachloride							
108-05-4	Vinyl Acetate							
75-27-4	Bromodichloromethane							
78-87-5	1,2-Dichloropropane							
10061-02-6	Trans-1,3-Dichloropropene							
79-01-6	Trichloroethene							
124-48-1	Dibromochloromethane							
79-00-5	1,1,2-Trichloroethane							
71-43-2	Benzene							
10061-01-5	cis-1,3-Dichloropropene							
110-75-8	2-Chloroethylvinylether							
75-25-2	Bromoform							
591-78-6	4-Methyl-2-Pentanone							
108-10-1	2-Hexanone							
127-18-4	Tetrachloroethene							
79-34-5	1,1,2,2-Tetrachloroethane							
108-88-3	Toluene				170	97	160	1 UJ
108-90-7	Chlorobenzene							
100-41-4	Ethylbenzene							
100-42-5	Styrene							
	Total Xylenes							

VOA

CASE #/SITE ID: 7324 / LA Chiles

DATE SAMPLED:		5/19/87	5/19/87	5/19/87	5/19/87	5/19/87	5/20/87	5/20/87
DATE SAMPLE RECD:		5/21/87	5/21/87	5/21/87	5/21/87	5/21/87	5/21/87	5/21/87
DATE EXTR/PREP'D:		5/26/87	5/26/87	5/26/87	5/27/87	5/27/87	5/27/87	5/27/87
DATE ANALYZED:		5/26/87	5/26/87	5/28/87	5/27/87	5/27/87	5/27/87	5/27/87
CONC/DIL FACTOR:		1	1	1	1	1	1	1
% MOISTURE:		-	-	-	-	-	-	-
UNITS:		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
CAS Number	SAMPLE DESCRIPT.: / TRAFFIC REPORT #:	GW-002-01 CG 084	Method blank CG 085	Trip blank CG 086	GW-003-01 CG 087	GW-003-01 CG 088	GW-004-01 CG 089	GW-006-01 CG 090
74-87-3	Chloromethane							
74-83-9	Bromomethane							
75-01-4	Vinyl Chloride							
75-00-3	Chloroethane		UJ	UJ				
75-09-2	Methylene Chloride							
67-64-1	Acetone	3 UJ	16 UJ	23 UJ	11 UJ	13 UJ	8 UJ	8 UJ
75-15-0	Carbon Disulfide							
75-35-4	1,1-Dichloroethene							
75-34-3	1,1-Dichloroethane							
156-60-5	Trans-1,2-Dichloroethene							
67-66-3	Chloroform							
107-06-2	1,2-Dichloroethane							
78-93-3	2-Butanone	5 UJ	4 UJ	5 UJ	3 UJ	2 UJ	2 UJ	2 UJ
71-55-6	1,1,1-Trichloroethane							
56-23-5	Carbon Tetrachloride							
108-05-4	Vinyl Acetate							
75-27-4	Bromodichloromethane							
78-87-5	1,2-Dichloropropane							
10061-02-6	Trans-1,3-Dichloropropene							
79-01-6	Trichloroethene							
124-48-1	Dibromochloromethane							
79-00-5	1,1,2-Trichloroethane							
71-43-2	Benzene							3 J
10061-01-5	cis-1,3-Dichloropropene							
110-75-8	2-Chloroethylvinylether							
75-25-2	Bromoform		UJ	UJ				
591-78-6	4-Methyl-2-Pentanone		UJ	UJ				
108-10-1	2-Hexanone		UJ	UJ				
127-18-4	Tetrachloroethene							
79-34-5	1,1,2,2-Tetrachloroethane							
108-88-3	Toluene	2 UJ	1 UJ	1 UJ	2 UJ			1 UJ
108-90-7	Chlorobenzene							
100-41-4	Ethylbenzene							
100-42-5	Styrene							
	Total Xylenes							

VOA

CASE #/SITE ID: 7324 / LA Clarke

DATE SAMPLED:		5/19/87	5/19/87	5/20/87	5/21/87	5/20/87	5/20/87	5/20/87
DATE SAMPLE RECD:		5/21/87	5/21/87	5/21/87	5/21/87	5/21/87	5/21/87	5/21/87
DATE EXTR/PREP'D:		5/27/87	5/27/87	5/27/87	5/27/87	5/27/87	5/27/87	5/27/87
DATE ANALYZED:		5/27/87	5/27/87	5/27/87	5/27/87	5/27/87	5/27/87	5/27/87
CONC/DIL FACTOR:		1	1	1	1	1	1	1
% MOISTURE:		-	-	-	-	-	-	-
UNITS:		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
CAS Number	SAMPLE DESCRIPT.: TRAFFIC REPORT #:	GW-W07-01 CK091	GW-W08-01 CK092	GW-W15-01 CK093	GW-W22-01 CK094	GW-W05-02 CK095	W16 DUP CK096	W16 CK097
74-87-3	Chloromethane							
74-83-9	Bromomethane							
75-01-4	Vinyl Chloride							
75-00-3	Chloroethane							
75-09-2	Methylene Chloride							
67-64-1	Acetone	9 UJ	13 UJ	8 UJ	5 UJ	6 UJ	9 UJ	7 UJ
75-15-0	Carbon Disulfide							
75-35-4	1,1-Dichloroethene							
75-34-3	1,1-Dichloroethane							
156-60-5	Trans-1,2-Dichloroethene							
67-66-3	Chloroform							
107-06-2	1,2-Dichloroethane							
78-93-3	2-Butanone	3 UJ	3 UJ		1 UJ			
71-55-6	1,1,1-Trichloroethane							
56-23-5	Carbon Tetrachloride							
108-05-4	Vinyl Acetate							
75-27-4	Bromodichloromethane							
78-87-5	1,2-Dichloropropane							
10061-02-6	Trans-1,3-Dichloropropene							
79-01-6	Trichloroethene							
124-48-1	Dibromochloromethane							
79-00-5	1,1,2-Trichloroethane							
71-43-2	Benzene			4 J			42	47
10061-01-5	cis-1,3-Dichloropropene							
110-75-8	2-Chloroethylvinylether							
75-25-2	Bromoform	UJ	UJ	UJ	UJ	UJ	UJ	UJ
591-78-6	4-Methyl-2-Pentanone	UJ	UJ	UJ	UJ	UJ	UJ	UJ
108-10-1	2-Hexanone	UJ	UJ	UJ	UJ	UJ	UJ	UJ
127-18-4	Tetrachloroethene							
79-34-5	1,1,2,2-Tetrachloroethane							
108-88-3	Toluene		2 UJ				7	10
108-90-7	Chlorobenzene							
100-41-4	Ethylbenzene						16	19
100-42-5	Styrene							
	Total Xylenes						10	15

AR302684

YAA

CASE #/SITE ID: 7324 /L A Chem

DATE SAMPLED:		5/20/87	5/18/87	5/18/87	5/18/87	5/18/87	5/18/87	5/18/87
DATE SAMPLE RECD:		5/21/87	5/21/87	5/21/87	5/21/87	5/21/87	5/21/87	5/21/87
DATE EXTR/PREP'D:		5/27/87	5/27/87	5/27/87	5/27/87	5/27/87	5/27/87	5/26/87
DATE ANALYZED:		5/27/87	5/27/87	5/27/87	5/27/87	5/27/87	5/27/87	5/26/87
CONC/DIL FACTOR:		1	1	1	1	1	1	1
% MOISTURE:		-	-	-	-	-	52	34
UNITS:		ug/L	ug/L	ug/L	ug/L	ug/L	ug/kg	ug/kg
CAS Number	SAMPLE DESCRIPT.: / TRAFFIC REPORT #:	Trip Blank CG 049	GW-WO-01 CG 133	GW-WO9-01 CG 134	SW-DD1 CG 135	SW-DD1 02 CG 136	SB-DD1-01 CG 137	SB-DD1-02 CG 138
74-87-3	Chloromethane						UJ	
74-83-9	Bromomethane						UJ	UJ
75-01-4	Vinyl Chloride							
75-00-3	Chloroethane							
75-09-2	Methylene Chloride	6 UJ				1 UJ		14 UJ
67-64-1	Acetone	13 UJ	22 UJ	17 UJ	24 UJ	18 UJ	11 UJ	53 UJ
75-15-0	Carbon Disulfide							
75-35-4	1,1-Dichloroethene							
75-34-3	1,1-Dichloroethane							
156-60-5	Trans-1,2-Dichloroethene							
67-66-3	Chloroform							
107-06-2	1,2-Dichloroethane							
78-93-3	2-Butanone							34 UJ
71-55-6	1,1,1-Trichloroethane							
56-23-5	Carbon Tetrachloride							
108-05-4	Vinyl Acetate							
75-27-4	Bromodichloromethane							
78-87-5	1,2-Dichloropropane							
10061-02-6	Trans-1,3-Dichloropropene							
79-01-6	Trichloroethene							
124-48-1	Dibromochloromethane							
79-00-5	1,1,2-Trichloroethane							
71-43-2	Benzene						7	
10061-01-5	cis-1,3-Dichloropropene							
110-75-8	2-Chloroethylvinylether							
75-25-2	Bromoform	UJ	UJ	UJ	UJ	UJ		
591-78-6	4-Methyl-2-Pentanone	UJ	UJ	UJ	UJ	UJ		
108-10-1	2-Hexanone	UJ	UJ	UJ	UJ	UJ		
127-18-4	Tetrachloroethene							
79-34-5	1,1,2,2-Tetrachloroethane							
108-88-3	Toluene				2 J		15	16
108-90-7	Chlorobenzene							
100-41-4	Ethylbenzene				1 J		40	12
100-42-5	Styrene						3 J	
	Total Xylenes				4 J		79	

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CASE #/SITE ID: 7234 / LA Clarke

DATE SAMPLED:		5/18/87	5/18/87	5/18/87	5/18/87	5/19/87	5/18/87	5/18/87
DATE SAMPLE RECD:		5/21/87	5/21/87	5/21/87	5/21/87	5/21/87	5/21/87	5/21/87
DATE EXTR/PREP'D:		5/28/87	5/28/87	5/27/87	5/27/87	5/28/87	5/27/87	5/27/87
DATE ANALYZED:		5/28/87	5/28/87	5/27/87	5/27/87	5/28/87	5/27/87	5/27/87
CONC/DIL FACTOR:		1	1	1	1	1	1	1
% MOISTURE:		—	—	26	56	—	—	24
UNITS:		ug/L	ug/L	ug/kg	ug/kg	ug/L	ug/L	ug/kg
CAS Number	SAMPLE DESCRIPT.: / TRAFFIC REPORT #:	SW-DD2 -01 CG-139	SW-DD2-02 CG-140	SD-DD2-01 CG-141	SD-DD2-02 CG-142	SW-DD3 -01 CG-143	SW-DD3 -02 CG-144	SD-DD3 -01 CG-145
74-87-3	Chloromethane			UJ	UJ			UJ
74-83-9	Bromomethane			UJ	UJ			UJ
75-01-4	Vinyl Chloride							
75-00-3	Chloroethane	UJ	UJ				UJ	
75-09-2	Methylene Chloride			2 UJ	3UJ			2 UJ
67-64-1	Acetone	11 UJ	11 UJ	6 UJ	17 UJ	10 UJ	10 UJ	5 UJ
75-15-0	Carbon Disulfide							
75-35-4	1, 1-Dichloroethene							
75-34-3	1, 1-Dichloroethane							
156-60-5	Trans-1, 2-Dichloroethene							
67-66-3	Chloroform							
107-06-2	1, 2-Dichloroethane							
78-93-3	2-Butanone	5 UJ	4 UJ			5 UJ		
71-55-6	1, 1, 1-Trichloroethane							
56-23-5	Carbon Tetrachloride							
108-05-4	Vinyl Acetate							
75-27-4	Bromodichloromethane							
78-87-5	1, 2-Dichloropropane							
10061-02-6	Trans-1, 3-Dichloropropene							
79-01-6	Trichloroethene							
124-48-1	Dibromochloromethane							
79-00-5	1, 1, 2-Trichloroethane							
71-43-2	Benzene							
10061-01-5	cis-1, 3-Dichloropropene							
110-75-8	2-Chloroethylvinylether							
75-25-2	Bromoform	UJ	UJ				UJ	
591-78-6	4-Methyl-2-Pentanone	UJ	UJ				UJ	
108-10-1	2-Hexanone	UJ	UJ				UJ	
127-18-4	Tetrachloroethene							
79-34-5	1, 1, 2 2-Tetrachloroethane							
108-88-3	Toluene							
108-90-7	Chlorobenzene							
100-41-4	Ethylbenzene							
100-42-5	Styrene							
	Total Xylenes							

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CASE #/SITE ID: 7324/LA Channel

DATE SAMPLED:		5/18/87						
DATE SAMPLE RECD:		5/21/87	5/21/87	5/21/87	5/21/87	5/21/87	5/21/87	5/21/87
DATE EXTR/PREP'D:		5/27/87	5/26/87	5/27/87	5/27/87	5/27/87	5/26/87	5/27/87
DATE ANALYZED:		5/27/87	5/26/87	5/27/87	5/27/87	5/28/87	5/26/87	5/27/87
CONC/DIL FACTOR:		1	1	1	1	1	1	1
% MOISTURE:		72	-	-	-	-	0	0
UNITS:		ug/kg	ug/L	ug/L	ug/L	ug/L	ug/kg	ug/kg
CAS Number	SAMPLE DESCRIPT.: / TRAFFIC REPORT #:	SD-003-02 / CG146	VBK927BLK6 VBA BLANK	VBK927BLK7 VBA BLANK	VBK927BLK8 VBA BLANK	VBK927BLK9 VBA BLANK	VBBK927BLK6 VBA BLANK	VBBK927BLK7 VBA VIAL BLANK
74-87-3	Chloromethane	UJ						
74-83-9	Bromomethane	UJ						
75-01-4	Vinyl Chloride							
75-00-3	Chloroethane							
75-09-2	Methylene Chloride							1 J
67-64-1	Acetone	9 UJ		11	10	16	8 J	3 J
75-15-0	Carbon Disulfide							
75-35-4	1,1-Dichloroethene							
75-34-3	1,1-Dichloroethane							
156-60-5	Trans-1,2-Dichloroethene							
67-66-3	Chloroform							
107-06-2	1,2-Dichloroethane							
78-93-3	2-Butanone			1 J	4 J	6 J	3 J	
71-55-6	1,1,1-Trichloroethane							
56-23-5	Carbon Tetrachloride							
108-05-4	Vinyl Acetate							
75-27-4	Bromodichloromethane							
78-87-5	1,2-Dichloropropane							
10061-02-6	Trans-1,3-Dichloropropene							
79-01-6	Trichloroethene							
124-48-1	Dibromochloromethane							
79-00-5	1,1,2-Trichloroethane							
71-43-2	Benzene							
10061-01-5	cis-1,3-Dichloropropene							
110-75-8	2-Chloroethylvinylether							
75-25-2	Bromoform							
591-78-6	4-Methyl-2-Pentanone							
108-10-1	2-Hexanone							
127-18-4	Tetrachloroethene							
79-34-5	1,1,2,2-Tetrachloroethane							
108-88-3	Toluene	2 UJ			1 J	1 J		1 J
108-90-7	Chlorobenzene							
100-41-4	Ethylbenzene							
100-42-5	Styrene							
	Total Xylenes							

CASE [illegible] SDG: [illegible] / LA [illegible]

		SW-VP01	VP01D	SW-VP02	SD-VP01	DW	VP02	GW-W01	[illegible]	RB	TB
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		1	1	1	2	1	1	1	1	1	1
[illegible]											
UNITS:		ug/L	ug/L	ug/L	ug/kg	ug/kg	ug/kg	ug/L	ug/L	ug/L	ug/L
	SAMPLE DESCRIPT.:	field duplicate			field duplicate					rinse blank	trip blank
CAS Number	TRAFFIC REPORT #:	C6077	C6078	C6079	C6080	C6081	C6082	C6083	C6084	C6085	C6086
[illegible]	[illegible]				240 J						
[illegible]	[illegible]	UJ	UJ	UJ	UJ						
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]	UJ	UJ	UJ	1700 J	1400 J	1300				
[illegible]	[illegible]	UJ	UJ	UJ	UJ						
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]	UJ	UJ	UJ	410 J	UJ	UJ	UJ	UJ	UJ	UJ
[illegible]	[illegible] (1)	UJ	UJ	UJ	1600 J	720 J	14000				
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]				180 J	290 J					
[illegible]	[illegible]										
[illegible]	[illegible]	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ	UJ
[illegible]	[illegible]										
[illegible]	[illegible]				160 J	530					
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible] (1)										
[illegible]	[illegible]										
[illegible]	[illegible] (1)										
[illegible]	[illegible]										
[illegible]	[illegible]					46 J					
[illegible]	[illegible] (1)										
[illegible]	[illegible]					82 J					
[illegible]	[illegible] (1)										
[illegible]	[illegible] (1)									UJ	
[illegible]	[illegible]				94 J	280 J					
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]					40 J					
[illegible]	[illegible] (1)	UJ	UJ	UJ	UJ						
[illegible]	[illegible] (1)										
[illegible]	[illegible] (1)										
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible] (1)										
[illegible]	[illegible]				360 J	940	330 J				
[illegible]	[illegible]				150 J	200 J					
[illegible]	[illegible]						760				
[illegible]	[illegible]				1500	3200	490 J				
[illegible]	[illegible]				1400	3900	240 J				
[illegible]	[illegible]										
[illegible]	[illegible] (1)	R	R	R	R	R	R	R	R	R	R
[illegible]	[illegible]				570 J	2100	240 J				
[illegible]	[illegible]	3 B		2 B	2400 B	430 UJ	1400 UJ	7 UJ	5 UJ	UJ	
[illegible]	[illegible]				570 J	2500	380 J				
[illegible]	[illegible]										
[illegible]	[illegible]				1000	2100	880				
[illegible]	[illegible]										
[illegible]	[illegible]				970	450					
[illegible]	[illegible]				110 J	400					
[illegible]	[illegible]					150 J					
[illegible]	[illegible]					330 J					

(1) Cannot be separated from diphenylamine

AR302688

		8/4/87	8/4/87	8/4/87	8/4/87	8/5/87	8/5/87	8/5/87	8/5/87	8/5/87	8/5/87
		8/4/87	8/4/87	8/4/87	8/4/87	8/5/87	8/5/87	8/5/87	8/5/87	8/5/87	8/5/87
		8/28/87	8/28/87	8/28/87	8/28/87	8/28/87	8/28/87	8/28/87	8/28/87	8/28/87	8/28/87
		8/14/87	8/14/87	8/14/87	8/14/87	8/14/87	8/14/87	8/14/87	8/14/87	8/14/87	8/14/87
		1	1	1	1	1	1	1	1	1	4
UNITS:		ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
	SAMPLE DESCRIPT.:	W03 01	W06 01	W05 01	W06 01	W07 01	W08 01	W15	W22 01	W15	[illegible]
CAS Number	TRAFFIC REPORT #:	CE087	CE088	CE089	CE090	CE091	CE092	CE093	CE094	CE095	CE096
	Phenol										
	bis(2-Chloroethyl)ether										
	2-Chlorophenol										
	1,3-Dichlorobenzene										
	1,4-Dichlorobenzene										
	Benzyl Alcohol										
	1,2-Dichlorobenzene										
	2-Methylphenol										59
	bis(2-chloroisopropyl)Ether										
	4-Methylphenol										
	N-Nitroso-Di-n-Propylamine										
	Hexachloroethane										
	Nitrobenzene										
	Isophorone										
	2-Nitrophenol										
	2,4-Dimethylphenol	U3	U3		U3	U3					110
	Benzoic Acid (1)										
	bis(2-Chloroethoxy)Methane										
	2,4-Dichlorophenol										
	1,2,4-Trichlorobenzene										
	Naphthalene										710
	4-Chloroaniline										
	Hexachlorobutadiene	U3	U3	U3	U3	U3	U3	U3	U3	U3	U3
	4-Chloro-3-Methylphenol										
	2-Methylnaphthalene										240
	Hexachlorocyclopentadiene										
	2,4,6-Trichlorophenol										
	2,4,5-Trichlorophenol (1)										
	2-Chloronaphthalene										
	2-Nitroaniline (1)										
	Dimethyl Phthalate										
	Acenaphthylene										
	2,6-Dinitrotoluene (1)										
	Acenaphthene				33			24	8 J		230
	3-Nitroaniline (1)										
	2,4-Dinitrophenol (1)				U3	U3					
	Dibenzofuran				6 J			14			140
	4-Nitrophenol (1)										
	2,4-Dinitrotoluene										
	Diethylphthalate										
	4-Chlorophenyl-phenylether										
	Fluorene				4 J			9 J			180
	4-Nitroaniline (1)										
	4,6-Dinitro-2-Methylphenol (1)										
	N-Nitrosodiphenylamine (1)										
	4-Bromophenyl-phenylether										
	Hexachlorobenzene										
	Pentachlorophenol (1)										
	Phenanthrene										43
	Anthracene										19 J
	Di-n-Butylphthalate	2 J									
	Fluoranthene								8 J		7 J
	Pyrene								4 J		
	Butylbenzylphthalate										
	3,3'-Dichlorobenzidine (1)	R	R	R	R	R	R	R	R	R	R
	Benzo(a)Anthracene										
	bis(2-Ethylhexyl)Phthalate	6 U3	8 U3	5 U3	5 U3	4 U3	4 U3	6 U3	6 U3 d	5 U3	9 U3
	Chrysene										
	Di-n-Octyl Phthalate										
	Benzo(b)fluoranthene										
	Benzo(k)fluoranthene										
	Benzo(a)Pyrene										
	Indeno(1,2,3-cd)Pyrene										
	Dibenz(a,h)anthracene										
	Benzo(g,h,i)perylene										

(1) Known to be unextracted from diphenylamine

		W06-03	W10	W01	SW01	SW02	SD01	SD02	SW201	SD202	SD201
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]		6/15/87	6/15/87	6/15/87	6/15/87	6/15/87	6/15/87	6/15/87	6/15/87	6/15/87	6/15/87
[illegible]		25	1	1	1	1	4	2	1	1	1
[illegible]											
UNITS:		ug/L	ug/L	ug/L	ug/L	ug/L	ug/kg	ug/kg	ug/L	ug/L	ug/kg
CAS Number	SAMPLE DESCRIPT.:	[illegible]									
	TRAFFIC REPORT #:	CG097	CG133	CG134	CG135	CG136	CG137	CG138	CG139	CG140	CG141
[illegible]	[illegible]										
[illegible]	[illegible]									UJ	UJ
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]									UJ	UJ
[illegible]	[illegible]										
[illegible]	[illegible]	150								UJ	UJ
[illegible]	[illegible]									UJ	UJ
[illegible]	[illegible]									UJ	UJ
[illegible]	[illegible]										
[illegible]	[illegible]								UJ	UJ	UJ
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]	260 J	UJ	UJ	UJ	UJ					
[illegible]	[illegible] (1)										
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]	3200			17		170000	31000 J			120 J
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]	490			6 J		110000	14000 J			86 J
[illegible]	[illegible]	UJ	UJ	UJ	UJ	UJ			UJ		
[illegible]	[illegible]										
[illegible]	[illegible] (1)										
[illegible]	[illegible]										
[illegible]	[illegible] (1)								UJ	UJ	UJ
[illegible]	[illegible]										
[illegible]	[illegible]							13000 J			200 J
[illegible]	[illegible] (1)										
[illegible]	[illegible]	560	9 J	5 J	5 J		210000	27000 J			
[illegible]	[illegible] (1)										
[illegible]	[illegible] (1)	UJ	UJ	UJ	UJ	UJ			UJ	UJ	UJ
[illegible]	[illegible]	300			11		180000	63000			99 J
[illegible]	[illegible]								UJ	UJ	UJ
[illegible]	[illegible]										
[illegible]	[illegible]									UJ	UJ
[illegible]	[illegible]										
[illegible]	[illegible]	260 J			7 J		24000	73000			74 J
[illegible]	[illegible] (1)								UJ		
[illegible]	[illegible] (1)										
[illegible]	[illegible] (1)							13000 J			
[illegible]	[illegible]										
[illegible]	[illegible]								UJ		
[illegible]	[illegible] (1)										
[illegible]	[illegible]	170 J			33		1100000 J	550000 J			540
[illegible]	[illegible]				13		520000 J	300000 J			470
[illegible]	[illegible]									UJ	UJ
[illegible]	[illegible]		6 J		210	8 J	160000 J	1500000 J			850
[illegible]	[illegible]		3 J		21		130000 J	1400000 J			1300
[illegible]	[illegible]										
[illegible]	[illegible] (1)	R	R	R	R	R	R	R	R	R	R
[illegible]	[illegible]				77	2 J	570000 J	570000 J			1400
[illegible]	[illegible]	22 UJ	5 UJ	3 UJ	5 UJ	4 UJ	15000 UJ	120000 UJ	4 UJ	3 UJ	2700
[illegible]	[illegible]				78		550000 J	670000 J			4500
[illegible]	[illegible]										
[illegible]	[illegible]										
[illegible]	[illegible]				130		490000 J	490000 J			7200
[illegible]	[illegible]				55		200000 J	340000 J			4400
[illegible]	[illegible]				49		90000 J	91000 J			3100
[illegible]	[illegible]				6 J		44000 J	7200 J	UJ		460
[illegible]	[illegible]				4 J		110000 J	120000 J		UJ	2100 J

(1) Cannot be separated from diphenylamine

SENT BY:Xerox Telecopier 7020 ;10- 8-87 ; 8:10AM ; 2155247503→ Bldg. #8:#15

CAS Number	Compound										
	DATE SAMPLED:	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					
	DATE SAMPLE RECD:	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]					
	DATE EXTRACTED:	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
	DATE ANALYZED:	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
	CONC/DIL FACTOR:	1	1	1	1	1	1	1	1	1	
	% MOISTURE:										
	UNITS:	ug/kg	ug/L	ug/L	ug/kg	ug/kg	ug/L	ug/L	ug/kg	ug/kg	
	SAMPLE DESCRIPT.:	SD-DD202	SW-DD3-01	SD DD302	SD DD308	SD3-02	SD L33?MB	L33?MB	L33?MB	L3334	
	TRAFFIC REPORT #:	C6142	C6143	C6144	C6145	C6146	METHOD BLK	METHOD BLK	METHOD BLK	METHOD BLANK	
108-95-2	Phenol										
111-44-4	bis(2-Chloroethyl)Ether	UJ	UJ	UJ	UJ	UJ	UJ		UJ		
95-57-8	2-Chlorophenol										
541-73-1	1,3-Dichlorobenzene										
106-46-7	1,4-Dichlorobenzene										
100-51-6	Benzyl Alcohol	UJ	UJ	UJ	UJ	UJ					
95-50-1	1,2-Dichlorobenzene										
95-48-7	2-Methylphenol	UJ	UJ	UJ	UJ	UJ					
39638-32-9	bis(2-chloroisopropyl)Ether	UJ	UJ	UJ	UJ	UJ					
106-44-5	4-Methylphenol	UJ	UJ	UJ	UJ	UJ	UJ		UJ		
621-64-7	N-Nitroso-Di-n-Propylamine						UJ		UJ		
67-72-1	Hexachloroethane	UJ	UJ	UJ	UJ	UJ					
98-95-3	Nitrobenzene										
78-59-1	Isophorone										
88-75-5	2-Nitrophenol										
105-67-9	2,4-Dimethylphenol						UJ	UJ	UJ		
65-85-0	Benzoic Acid (1)				230 J		UJ		UJ		
111-91-1	bis(2-Chloroethoxy)Methane										
120-83-2	2,4-Dichlorophenol										
120-82-1	1,2,4-Trichlorobenzene										
91-20-3	Naphthalene	76 J			470	1000					
106-47-8	4-Chloroaniline										
87-68-3	Hexachlorobutadiene						UJ		UJ		
59-50-7	4-Chloro-3-Methylphenol										
91-57-6	2-Methylnaphthalene	74 J			280 J	670					
77-47-4	Hexachlorocyclopentadiene							UJ			
88-06-2	2,4,6-Trichlorophenol										
95-95-4	2,4,5-Trichlorophenol (1)										
91-58-7	2-Chloronaphthalene										
88-74-4	2-Nitroaniline (1)	UJ	UJ	UJ	UJ	UJ					
131-11-3	Dimethyl Phthalate										
208-96-8	Acenaphthylene	180 J			410	1100					
99-09-2	3-Nitroaniline (1)										
83-32-9	Acenaphthene	66 J			120 J	500					
51-28-5	2,4-Dinitrophenol (1)										
100-02-7	4-Nitrophenol (1)	UJ	UJ	UJ	UJ	UJ		UJ			
132-64-9	Dibenzofuran	110 J			340	1500					
121-14-2	2,4-Dinitrotoluene	UJ	UJ	UJ	UJ	UJ					
606-20-2	2,6-Dinitrotoluene										
84-66-2	Diethylphthalate	UJ	UJ	UJ	UJ	UJ					
7005-72-3	4-Chlorophenyl-phenylether										
86-73-7	Fluorene	250 J			180 J	440					
100-01-6	4-Nitroaniline (1)						UJ		UJ		
534-52-1	4,6-Dinitro-2-Methylphenol (1)										
86-30-6	N-Nitrosodiphenylamine (1)					320 J					
101-55-3	4-Bromophenyl-phenylether										
118-74-1	Hexachlorobenzene										
87-86-5	Pentachlorophenol (1)										
85-01-8	Phenanthrene	470			1100	4100					
120-12-7	Anthracene	270			1450	3200					
84-74-2	Di-n-Butylphthalate	380 J	UJ	UJ	97 J	170 J					
206-44-0	Fluoranthene	1600			2700	7100					
129-00-0	Pyrene	2400			3100	9100					
85-68-7	Butylbenzylphthalate										
91-94-1	3,3'-Dichlorobenzidine (1)	R	R	R	R	R	R	R	R	R	
56-55-3	Benzo(a)Anthracene	1900			4300	5300					
117-81-7	bis(2-Ethylhexyl)Phthalate	120 UJ	4 UJ	3 UJ	310 UJ	1000 UJ	2 J	4 J	34 J	2800 J	
218-01-9	Chrysene	2900			2200	9600					
117-84-0	Di-n-Octyl Phthalate					240					
205-99-2	Benzo(b)Fluoranthene	5700			10000	26000					
207-08-9	Benzo(k)Fluoranthene										
50-32-8	Benzo(a)Pyrene	2500			5700	14000					
193-39-5	Indeno(1,2,3-cd)Pyrene	1200			2570	4700					
53-70-3	Dibenz(a,h)Anthracene	510			830	8600					
191-24-2	Benzo(g,h,i)Perylene	1100 J	UJ	UJ	1570 J	8700 J					

(1) Cannot be separated from diphenylamine

CASE NO. 2329C

CHLORINATED DIOXIN AND FURAN SAMPLING

0985B

WORKSHEET TO CALCULATE TOXICITY EQUIVALENT FACTORS (TEF)

TEFs based on the OCTOBER 1986 EPA interim procedure for estimating risks of PCDDs and PCDFs

Table 1. Summary of SAS 2329C/L.A. Clarke
(page 1 of 2)

RESULTS FOR EACH SAMPLE ARE GIVEN ON TWO LINES: The top line is the concentration of the analyte in PPB.*
The bottom line equates that concentration to the toxic equivalent of 2,3,7,8-TCDD.

SAMPLE ID#	TOTAL TEF	ISOMER,HOMOLOG (TEF FACTOR) TCDD 0.01	2378-TCDD 1	PCDD 0.005	2378x-PCDD 0.5	HxCDD 0.0004	2378xHxCDD 0.04	HpCDD 0.00001	2378xHpCDD 0.001	OCDD 0	TCDF 0.001	2378-TCDF 0.1	PCDF 0.001	2378xPCDF 0.1	HxCDF 0.0001	2378xHxCDF 0.01	HpCDF 0.00001	2378xHpCDF 0.001	OCDF 0
BC-0311:																			
01:SOIL (SB-SS3)																			
	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:AQ(SS3-R)																			
	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:SOIL (SD-D11)																			
	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:SOIL (SD-D11-D)																			
	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04 DUP:SOIL (SD-D11-D)																			
	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:SOIL (SB-M02)**									0.56	2.4									
	0.001	0	0	0	0	0	0	0	0.00056	0	0	0	0	0	0	0	0	0	0
06:SOIL (SB-P01)																			
	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:SOIL (SB-P01-D)																			
	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:SOIL (SS1)																			
	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

* Detection limits: soil : 10 ng/g, except for OCDD and OCDF : 20 ng/g for samples 01 and 16.
aqueous : 10 pg/L, except for OCDD and OCDF : 20 ng/L for sample 02

** Detection limits for this particular sample allow valid reporting of these HpCDD and OCDD results.
Reported as 2378-isomer for worst case assessment.

WORKSHEET TO CALCULATE TOXICITY EQUIVALENT FACTORS (TEF)

TEFs based on the OCTOBER 1986 EPA interim procedure for estimating risks of PCDDs and PCDFs

Table 1. Summary of SAS 2329C/L.A. Clarke
(page 2 of 2)

RESULTS FOR EACH SAMPLE ARE GIVEN ON TWO LINES: The top line is the concentration of the analyte in PPB.*
The bottom line equates that concentration to the toxic equivalent of 2,3,7,8-TCDD.

		ISOMER,HOMOLOG (TEF FACTOR)																	
SAMPLE ID#	TOTAL TEF	TCDD 0.01	2378-TCDD 1	PCDD 0.005	2378x-PCDDs 0.5	HxCDD 0.0004	2378xHxCDD 0.04	HpCDD 0.00001	2378xHpCDD 0.001	OCDD 0	TCDF 0.001	2378-TCDF 0.1	PCDF 0.001	2378xPCDF 0.1	HxCDF 0.0001	2378xHxCDF 0.01	HpCDF 0.00001	2378xHpCDF 0.001	OCDF 0
DC-0311:																			
09:AQ (TRIP BLANK)																			
	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10:AQ (TRIP BLANK FOR SPIKING)																			
	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12:AQ (GW-B23)																			
	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13:AQ (GW-B13)																			
	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14:AQ (SW-LG1)																			
	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15:AQ (SW-LG1-D)																			
	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:SOIL (SD-LG1)																			
	0.000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DC-0307-24**	16.2	7.9	2.3	0.2	8.4	0.65	24.4	10.2	274										
	0.213	0.16	7.9	0.0115	0.1	0.00336	0.026	0.000244	0.0102	0	0	0	0	0	0	0	0	0	0
DC-0307-24**	15.8	8.2	2.6	0.29	8.2	0.7	23.4	10.1	276										
	0.558	0.15	8.2	0.013	0.145	0.00328	0.028	0.000234	0.0101	0	0	0	0	0	0	0	0	0	0

* Detection limits: soil : 10 ng/g, except for OCDD and OCDF : 20 ng/g for samples 10 and 16
aqueous : 10 ng/L, except for OCDD and OCDF : 20 ng/L for sample 02

** Blind performance sample for 2,3,7,8-TCDD in soil: recovery within acceptance window

Appendix E

APPENDIX E

CONTRACT LABORATORY PROGRAM DATA REVIEW NARRATIVES

CASE 7131

PHASE III

DATA REVIEW NARRATIVE

0985B

DRAFT

WESTON

Case #/Site ID: 7131/LA Clarke
Sample Numbers: CG101-CG132

Site Manager: Ralph Shapot

Data Reviewer: Dianne Therry
Report Date: 26 September 1987

OVERVIEW

The set of samples for Case 7131 contained five aqueous samples and twenty-seven soil samples which were analyzed through the Contract Laboratory Program (CLP) routine analytical services by one laboratory. The sample set included two trip blanks, two rinsate blanks, one water blank and two field duplicates.

SUMMARY

The laboratory performed the analyses in compliance with CLP protocols, including the required quality control procedures. However, for base/neutral/acid extractables, all detection limits are twice the contract required detection limits for the aqueous samples. Instrument tune and mass calibration were within specifications. Surrogate and matrix spike recoveries gave no indication of matrix problems. Holding times were met for all samples. Comparison of laboratory and field replicate analyses showed acceptable agreement for target compounds. The most significant problem in this data set was poor instrument response to benzoic acid, which precludes obtaining usable data for this compound in three soil samples. Other minor problems are associated with blank contamination, the laboratory's inability to distinguish between PNA isomers, and variable response during HSL calibration. Problems associated with data usability are discussed in the following sections according to the seriousness of the problem. The data summary table has been annotated with the appropriate qualifier codes.

MAJOR ISSUES

1. Benzoic acid data for samples CG117, CG118, and CG119 are rejected (R), as the relative response factor during continuing calibration was less than 0.05. Failure to detect benzoic acid under this condition does not confirm its absence in the samples. If this compound is critical to the site, follow-up analysis may be necessary.

MINOR ISSUES

1. Laboratory and/or field blanks contained methylene chloride, acetone, chloroform, 2-butanone, 1,1,1-trichloroethane, toluene, and di-N-butylphthalate at concentrations significant enough to question the reported results for some of the samples. These compounds have been qualified as not detected (U) and the quantification limit qualified as estimated (J) for the affected samples.

compound	affected sample results
methylene chloride	all reported results
acetone	all reported results
chloroform	all except CG115, CG131
2-butanone	all reported results
1,1,1-trichloroethane	all reported results
toluene	all except GC110, CG112, CG123, CG125, CG126, CG127, CG129
di-N-butylphthalate	all reported results

Notes:

a. Chloroform in samples CG123 and CG125 can be attributed to laboratory contamination.

   Chloroform reported in all other samples can be attributed to contamination from the rinse water used during sampling. Per discussion with the site manager, water used for equipment decontamination was from a chlorinated potable water supply. Analysis of this water (CG115 and CG131) indicates the presence of chloroform, which is commonly found in potable water supplies as a result of the chlorination processes used during water treatment.

b. 2-Butanone is commonly found as a contaminant in methanol, which is used in the sample preparation step for soil volatile analysis. Probable source of this compound in soil method blanks and soil samples is the methanol used for sample extraction.

c. Method blanks show a consistent 1-2 ug/kg level of toluene which for this particular compound, is generally indicative of instrument related contamination, and is not expected to vary

significantly over the course of the analytical shift. Therefore, all results for toluene of 1-3 ug/kg have been qualified due to lab contamination.

Toluene results greater than 3 ug/kg and/or with collaborating evidence of presence in the sample (i.e. the presence of other volatile aromatics) have not been qualified as possible blank contamination. In this reviewers opinion, the "10X" rule specified in the functional guidelines for data review does not apply.

d. Acid extractables reported in water blank CG115 (phenol, 2-chlorophenol, and 2,4-dichlorophenol) are not found in any other investigative samples or blanks. Phenol and 2-chlorophenol are matrix spike compounds, and may possibly be present due to sample cross-contamination. No explanation for the presence of 2,4-dichlorophenol was determined. There is no impact on data usability for the investigative samples.

2. The 10-day contract holding time for soils for BNA extraction was exceeded for samples CG122, CG128 and CG130 due to reanalysis after initial low surrogate recoveries for 2-fluorophenol and 2,4,6-tribromophenol. Only compliant data were provided.

Technical requirements for sample holding times/preservation have only been established for water matrices (i.e. 40 CFR 136), therefore, data for these three soil samples were not qualified due to these conditions. If holding times are critical for these analyses, base/neutral data from the initial analysis (within holding time) may be available from the laboratory. Acid extractables would require resampling/reanalysis.

3. The laboratory is unable to distinguish between the benzo(b)fluoranthene and benzo(k)fluoranthene isomers, which have similar mass spectra and retention times. The reported results for samples CG118, CG119 CG121, CG123, and CG129 represent the total benzo (b&k) fluoranthene present.

4. The response factors during initial and/or continuing calibration for up to ten VOA compounds and seventeen BNA compounds were variable. The sample results and detection limits have been qualified as estimated (J or UJ) for the effected compounds.

INFORMATION REGARDING REPORT CONTENT

These data were reviewed according to the National Functional Guidelines for Evaluating Organic Analyses. All data have been validated with regard to usability. The method used by the CLP must be evaluated by each individual user as to whether the scope, precision, and accuracy meet the needs of the project.

The text of this report has been formatted to address only those problem areas which affect the application of the data to the site investigation. Documentation of these problems and any other observed areas of laboratory contractual noncompliance are included in a separate report sent to the laboratory's CLP Project Officer. If you have questions or comments on this data review, please call me.

Enclosures

Glossary: Qualifier Codes

The data summary contains the following qualifier codes:

U - The material was analyzed for, but was not detected. The associated numerical value is the estimated sample quantitation limit.

J - The associated numerical value is an estimated quantity because quality control criteria were not met.

R - Quality control indicates that data are unusable (compound may or may not be present). Resampling and reanalysis is necessary for verification.

ORGANIC DATA VALIDATION SUMMARY · page 1 of 1 + attachments

Written up
Date Review Completed 26 Sept. 87
Case No. 7131 SAS No. —
Site Name LA Clarke
Sample Nos. CG101- CG132

Contract Lab Hazelton
Contract No. 68-01-7146
Lab DPO (V) Charles Elly
Reviewer Dianne B. Henry
from Region III Phone 215-524-7360
~~FTS~~ WESTON

MATRIX	CONCENTRATION low	med	TOTAL	MATRIX RELATED COMMENTS
soil/solid	23 VOA 21 BNA	4 VOA 6 BNA	= 27	includes 2 field duplicates
aqueous	5		= 5	all blanks
other				

VOLATILES	OK	FYI	ACTION	COMMENTS*
GC/MS tuning--BFB	✓			
Initial Calibration		✓		(4) see attached figure I A (pp 1+2) for non CCC outside criteria
Continuing Calibration		✓		
Surrogate Recovery	✓			(1)
Matrix Spikes	✓			
Reagent Blanks	✓			
Holding times	✓			

SEMI-VOLATILES	OK	FYI	ACTION	COMMENTS*
GC/MS tuning--DFTPP	✓	✓		(2)
Initial Calibration		✓		(4) see attached figure I B (pp 1+2) for non-CCC and non-SPEC outside criteria
Continuing Calibration		✓		
Surrogate Recovery	✓			
Matrix Spikes	✓			
Reagent Blanks		✓		Blank 6: di-N-butylphthalate > 5XCRDL.
Holding times		✓		(3)

OVERALL CASE				
Compound Identification	✓			
Data Completeness				(2)

*DOCUMENTATION ATTACHED (see following pages)

REVIEWER'S COMMENTS:

· Pest not requested.

(1) 3 of 5 soils: VOA surrogate toluene-d_8 outside criteria for initial and reanalysis ∴ matrix effect

(2) For DFTPP mass listing, lab needs to supply additional page for search of the low range which includes #68, 70, 197. Lab reports %Rel Abund. of 0.01 – 0.5 for some of these ions on form V, but the accompanying mass listing indicates these ions to be not present at all. See attached form V's.

(3) Exceeded by 2 days for 3 samples due to re-extraction for low acid surrogate recovery. Surrogate acceptable for re-ext, but holding time exceeded. 1st extraction within hold.

(4) All 5 initial calibration standards should be run the same day. On 5/11/87, 1st 4 standards were analyzed between 11pm – 3am, last std (5th std.) was run 7 hours later @ 10am.

FIGURE IA

CALIBRATION CRITERIA: VOA (p 1 of 2)
CASE: 7131 / ZAClarke
LAB: Hazelton

CCC * SPCC **	EXCEPTION CRITERIA: Initial: >30% RSD; Continuing: >25% D; Min. RF: 0.05	HP 5943 Initial 4-10-87 (water)	(24889) 4-27-87 16:10	(24899) 4-28-87 1552	(24937) 5-1-87 1135	5100A Initial 4-27-87 (Soil-L)	(APR214) 4-27-87 15:03	(APR223) 4-28-87 0810	Initial 4-29-87 Soil-M	(APR251) 4-30-87 0822	(MAY143) 5-6-87 0815
74-87-3 **	Chloromethane	65	48	48	44						
74-83-9	Bromomethane		42	39	39						
75-01-4 *	Vinyl Chloride										
75-00-3	Chloroethane		42	40	40			32			
75-09-2	Methylene Chloride		174	188	173						
67-64-1	Acetone			132	37	32			41		
75-15-0	Carbon Disulfide										
75-35-4 *	1, 1-Dichloroethene										
75-34-3 **	1, 1-Dichloroethane										
156-60-5	Trans-1, 2-Dichloroethene										
67-66-3 *	Chloroform										
107-06-2	1, 2-Dichloroethane										
78-93-3	2-Butanone	.031	.028	.029	.027				.04 39	.043	.045
71-55-6	1, 1, 1-Trichloroethane										
56-23-5	Carbon Tetrachloride										
108-05-4	Vinyl Acetate										
75-27-4	Bromodichloromethane										
78-87-5 *	1, 2-Dichloropropane										
10061-02-6	Trans-1, 3-Dichloropropene										
79-01-6	Trichloroethene										
124-48-1	Dibromochloromethane										
79-00-5	1, 1, 2-Trichloroethane										
71-43-2	Benzene										
10061-01-5	cis-1, 3-Dichloropropene										
110-75-8	2-Chloroethylvinylether										
75-25-2 **	Bromoform		40	34	32						
591-78-6	4-Methyl-2-Pentanone		28	28							
108-10-1	2-Hexanone		33	27	26						
127-18-4	Tetrachloroethene		28								
79-34-5 **	1, 1, 2, 2-Tetrachloroethane										
108-88-3 *	Toluene										
108-90-7 **	Chlorobenzene										
100-41-4 *	Ethylbenzene										
100-42-5	Styrene										
	Total Xylenes										
			Blank-3 CG114 CG115 CG116	Blank-2 CG116MS MSD Hall BIL -1	Blank-3 CG131 CG132 CG132MS MSD		Blank 4 CG101 - -CG105 CG104RE	Blank 5 CG106 - -CG111 CG106MS MSD		Blank-10 CG112 CG112MS MSD	Blank-11 CG123 CG123MS MSD CG125

E-141

AR302704

FIGURE IA

CALIBRATION CRITERIA: VOA (p. 2 of 2)
CASE: 7131 / XA Clarke
LAB: Hazelton 51004

CCC * SPCC **	EXCEPTION CRITERIA: Initial: >30% RSD Continuing: >25% D Min. RF: 0.05	Initial 4-30-87 Soil-L	(MAY100) 5-1-87 0816	(MAY113) 5-1-87 21:02	(MAY117) 5-4-87 0819	(MAY132) 5-5-87 0815					
74-87-3 **	Chloromethane		27		32						
74-83-9	Bromomethane		32			63					
75-01-4 *	Vinyl Chloride										
75-00-3	Chloroethane				50						
75-09-2	Methylene Chloride	32		36	53						
67-64-1	Acetone		30								
75-15-0	Carbon Disulfide										
75-35-4 *	1, 1-Dichloroethene										
75-34-3 **	1, 1-Dichloroethene										
156-60-5	Trans-1, 2-Dichloroethene										
67-66-3 *	Chloroform										
107-06-2	1, 2-Dichloroethene										
78-93-3	2-Butanone		40								
71-55-6	1, 1, 1-Trichloroethane										
56-23-5	Carbon Tetrachloride										
108-05-4	Vinyl Acetate										
75-27-4	Bromodichloromethane										
78-87-5 *	1, 2-Dichloropropane										
10061-02-6	Trans-1, 3-Dichloropropene										
79-01-6	Trichloroethene										
124-48-1	Dibromochloromethane										
79-00-5	1, 1, 2-Trichloroethane										
71-43-2	Benzene										
10061-01-5	cis-1, 3-Dichloropropene										
110-75-8	2-Chloroethylvinylether										
75-25-2 **	Bromoform										
591-78-6	4-Methyl-2-Pentanone										
108-10-1	2-Hexanone										
127-18-4	Tetrachloroethene										
79-34-5 **	1, 1, 2, 2-Tetrachloroethane										
108-88-3 *	Toluene										
108-90-7 **	Chlorobenzene										
100-41-4 *	Ethylbenzene										
100-42-5	Styrene										
	Total Xylenes										
		CG117 CG118 CG124 CG121 MS RD CG121	Blank-6 CG105 RE CG113 Hold Bk -3	Blank-7 CG119 CG120	Blank-8 CG122 CG124 CG128 CG117	Blank-9 CG127					

CALIBRATION CRITERIA: BNA (page 1 of 2) **FIGURE IB**

Case: 7131 / LA Clarke
Lab: Hazelton
FW51B

CCC * / SPCC **	Exception Criteria: Init/Cont < 30/25% Min. RF 0.05	Initial 4/30/87	BAN446 4-30-87 21:41	Initial 5/4/87	BAN474 5/4/87 21:50	BAN487 5-?-87 22:49	BAN535 5-8-87 12:35	Initial 5/11/87	BAN523 5/12/87 10:07
108-95-2 *	Phenol								
111-44-4	bis(-2-Chloroethyl)Ether								
95-57-8	2-Chlorophenol								
541-73-1	1, 3-Dichlorobenzene								
106-46-7 *	1, 4-Dichlorobenzene								
100-51-6	Benzyl Alcohol	32	28			43	33	55	
95-50-1	1, 2-Dichlorobenzene								
95-48-7	2-Methylphenol								
39638-32-9	bis(2-chloroisopropyl)Ether		31			31	26		
106-44-5	4-Methylphenol		36						
621-64-7 **	N-Nitroso-Di-n-Propylamine								
67-72-1	Hexachloroethane								
98-95-3	Nitrobenzene								
78-59-1	Isophorone								
88-75-5 *	2-Nitrophenol								
105-67-9	2, 4-Dimethylphenol								
65-85-0	Benzoic Acid (2)								
111-91-1	bis(-2-Chloroethoxy)Methane								
120-83-2	2, 4-Dichlorophenol								
120-82-1	1, 2, 4-Trichlorobenzene								
91-20-3	Naphthalene								
106-47-8	4-Chloroaniline								
87-68-3 *	Hexachlorobutadiene								
59-50-7 *	4-Chloro-3-Methylphenol								
91-57-6	2-Methylnaphthalene								
77-47-4 **	Hexachlorocyclopentadiene					30			
88-06-2 *	2, 4, 6-Trichlorophenol								
95-95-4	2, 4, 5-Trichlorophenol (2)								
91-58-7	2-Chloronaphthalene								
88-74-4	2-Nitroaniline (2)								
131-11-3	Dimethyl Phthalate								
208-96-8	Acenaphthylene								
99-09-2	3-Nitroaniline (2)								
83-32-9 *	Acenaphthene								
51-28-5 **	2, 4-Dinitrophenol (2)	43		39				37	
100-02-7 **	4-Nitrophenol (2)						29		
132-64-9	Dibenzofuran								
121-14-2	2, 4-Dinitrotoluene								
606-20-2	2, 6-Dinitrotoluene								
84-66-2	Diethylphthalate								
7005-72-3	4-Chlorophenyl-phenylether						26		
86-73-7	Fluorene								
100-01-6	4-Nitroaniline (2)	33	38		26		42		
534-52-1	4, 6-Dinitro-2-Methylphenol (2)					40			
86-30-6 *	N-Nitrosodiphenylamine (1)								
101-55-3	4-Bromophenyl-phenylether					26			
118-74-1	Hexachlorobenzene					27	31		
87-86-5 *	Pentachlorophenol (2)								
85-01-8	Phenanthrene								
120-12-7	Anthracene								
84-74-2	Di-n-Butylphthalate								
206-44-0 *	Fluoranthene								
129-00-0	Pyrene					32			
85-68-7	Butylbenzylphthalate								
91-94-1	3, 3'-Dichlorobenzidine (2)	40		45	58		70	42	
56-55-3	Benzo(a)Anthracene								
117-81-7	bis(2-Ethylhexyl)Phthalate								
218-01-9	Chrysene								
117-84-0 *	Di-n-Octyl Phthalate								
205-99-2	Benzo(b)Fluoranthene								
207-08-9	Benzo(k)Fluoranthene								
50-32-8 *	Benzo(a)Pyrene								
193-39-5	Indeno(1, 2, 3-cd)Pyrene			31				38	
53-70-3	Dibenz(a, h)Anthracene		42	42		30		31	
191-24-2	Benzo(g, h, i)Perylene							40	
			CG114, CG115, CG116, Blank 1	CG114MS, MSD, CG131, CG131MS, MSD, Blank-4	CG102, CG103, CG106, CG113	CG101, CG101MS, MSD, CG107, CG109	CG108, Blank-2, Blank-10	CG104, CG105, CG110, CG110MS, MSD, CG111, CG112	

50 ng std – 5th std of the initial calibration – analyzed 7 hours after the first 4 standards – all 5 initial cal standards should be analyzed in the same day

CALIBRATION CRITERIA: BNA (page 2 of 2)

FIGURE IB

Case 7431/LACLark

Lab: Paglum

HP5985

CCC * SPCC ##	Exception Criteria Init/Cont <30/<25% Min RF 0.05	Initial 2-24-87	29015 5-6-87 1439	29022 5-7-87 11:31	/	29068 5-15-87 0839
108-95-2 *	Phenol					
111-44-4	bis(2-Chloroethyl)Ether					
95-57-8	2-Chlorophenol					
541-73-1	1,3-Dichlorobenzene					
106-46-7 *	1,4-Dichlorobenzene					
100-51-6	Benzyl Alcohol			55		54
95-50-1	1,2-Dichlorobenzene					
95-48-7	2-Methylphenol					
39638-32-9	bis(2-chloroisopropyl)Ether		58	49		39
106-44-5	4-Methylphenol					
621-64-7 ##*	N-Nitroso-Di-n-Propylamine			28		
67-72-1	Hexachloroethane					
98-95-3	Nitrobenzene					
78-59-1	Isophorone					
88-75-5 *	2-Nitrophenol					
105-67-9	2,4-Dimethylphenol					
65-85-0	Benzoic Acid (2)		.027 69			31
111-91-1	bis(2-Chloroethoxy)Methane					
120-83-2	2,4-Dichlorophenol					
120-82-1	1,2,4-Trichlorobenzene					
91-20-3	Naphthalene					
106-47-8	4-Chloroaniline					
87-68-3 ##*	Hexachlorobutadiene					
59-50-7 *	4-Chloro-3-Methylphenol					
91-57-6	2-Methylnaphthalene					
77-47-4 ##*	Hexachlorocyclopentadiene		38	36		38
88-06-2 *	2,4,6-Trichlorophenol					
95-95-4	2,4,5-Trichlorophenol (2)					
91-58-7	2-Chloronaphthalene					
88-74-4	2-Nitroaniline (2)					
131-11-3	Dimethyl Phthalate					
208-96-8	Acenaphthylene					
99-09-2	3-Nitroaniline (2)					
83-32-9 *	Acenaphthene					
51-28-5 ##*	2,4-Dinitrophenol (2)		28			
100-02-7 ##*	4-Nitrophenol (2)					
132-64-9	Dibenzofuran					
121-14-2	2,4-Dinitrotoluene					
606-20-2	2,6-Dinitrotoluene					
84-66-2	Diethylphthalate					
7005-72-3	4-Chlorophenyl-phenylether					
86-73-7	Fluorene					
100-01-6	4-Nitroaniline (2)					
534-52-1	4,6-Dinitro-2-Methylphenol (2)					
86-30-6 *	N-Nitrosodiphenylamine (1)					
101-55-3	4-Bromophenyl-phenylether					
118-74-1	Hexachlorobenzene					
87-86-5 *	Pentachlorophenol (2)					
85-01-8	Phenanthrene					
120-12-7	Anthracene					
84-74-2	Di-n-Butylphthalate		28			
206-44-0 *	Fluoranthene					
129-00-0	Pyrene					
85-68-7	Butylbenzylphthalate					
91-94-1	3,3-Dichlorobenzidine (1)					
56-55-3	Benzo(a)Anthracene					
117-81-7	bis(2-Ethylhexyl)Phthalate					
218-01-9	Chrysene					
117-84-0 *	Di-n-Octyl Phthalate					
205-99-2	Benzo(b)Fluoranthene					
207-08-9	Benzo(k)Fluoranthene					
50-32-8 *	Benzo(a)Pyrene					
193-39-5	Indeno(1,2,3-cd)Pyrene					
53-70-3	Dibenz(a,h)Anthracene					
191-24-2	Benzo(g,h,i)Perylene					

Blank-5
CG117
CG117MS
MSD
CG118
CG119

CG120
CG121
CG123
CG124
CG125
CG127
CG127MD

Blank-11

Blank-6
CG122RE
CG126DL
CG128RE
CG129DL
CG130RE

GC/MS TUNING AND MASS CALIBRATION
Decafluorotriphenylphosphine (DFTPP)

Case No. 7181 Contractor HAZLETON LABORATORIES Contract No. 68-01-7146

Instrument ID Ban5100 Date 4/30/87 Time 15:38

Lab ID DFTP043087F Data Release Authorized By: Dennis L. Bean

m/e	ION ABUNDANCE CRITERIA		%RELATIVE ABUNDANCE	
51	30.0 - 80.0% of mass 198		40.8	
68	less than 2.0% of mass 69		0.0	6.0)[1]
69	mass 69 relative abundance		55.1	
70	less than 2.0% of mass 69	0	4.06	6.12[1]
127	40.0 - 60.0% of mass 198		49.8	
197	less than 1.0% of mass 198	0	0.04	
198	base peak, 100% relative abundance		100	
199	5.0 - 9.0% of mass 198		5.6	
275	10.0 - 30.0% of mass 198		17.3	
365	greater than 1.00% of mass 198		1.47	
441	present, but less than mass 443		6.9	
442	greater than 40.0% of mass 198		52.2	
443	17.0 - 23.0% of mass 442		9.01	(17.3)[2]

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

[1]Value in parenthesis is % mass 69.
[2]Value in parenthesis is % mass 442

SAMPLE ID	LAB ID	DATE OF ANALYSIS	TIME OF ANALYSIS
20 ng BAN STD	BAN441	4/30/87	16:32
50 ng BAN STD	BAN442	4/30/87	17:30
80 ng BAN STD	BAN443	4/30/87	18:26
120 ng BAN STD	BAN444	4/30/87	19:35
160 ng BAN STD	BAN445	4/30/87	20:45
50 ng ongoing STD	BAN446	4/30/87	21:41
Blank 4/28/87 (mo)	BAN447	4/30/87	23:51
CG114	BAN448	5/1/87	0:49
CG115	BAN449	5/1/87	1:47
CG116	BAN450	5/1/87	2:45

+12 / 3.38

FORM V 7/85

265.

GC/MS TUNING AND MASS CALIBRATION
Decafluorotriphenylphosphine (DFTPP)

Case No. 7131 Contractor HAZLETON LABORATORIES Contract No. 68-01-7146

Instrument ID Finn SIB Date 5/12/87 Time 9:25

Lab ID DFTP051287A Data Release Authorized By: Dennis L. Bean

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	36.6 ✓
68	less than 2.0% of mass 69	0.69 (1.5)[1] ✓
69	mass 69 relative abundance	46.6 ✓
70	less than 2.0% of mass 69	0.11 (0.23)[1] ✓
127	40.0 - 60.0% of mass 198	47.1 ✓
197	less than 1.0% of mass 198	0.0 ✓
198	base peak, 100% relative abundance	100 ✓
199	5.0 - 9.0% of mass 198	6.4 ✓
275	10.0 - 30.0% of mass 198	17.3 ✓
365	greater than 1.00% of mass 198	1.25 ✓
441	present, but less than mass 443	8.5 ✓
442	greater than 40.0% of mass 198	65.6 ✓
443	17.0 - 23.0% of mass 442	12.4 (18.9)[2] ✓

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

[1] Value in parenthesis is % mass 69.
[2] Value in parenthesis is % mass 442

SAMPLE ID	LAB ID	DATE OF ANALYSIS	TIME OF ANALYSIS
50 ng Inj. (BNIS)	BAN 525	5/12/87	10:07
CG 112	BAN 526	5/12/87	12:55
CG 111	BAN 527	5/12/87	13:55
CG 105	BAN 528	5/12/87	15:45
CG 109	BAN 529	5/12/87	16:46
CG 110	BAN 530	5/12/87	17:46
CG 110MS	BAN 531	5/12/87	18:45
CG 110MSD	BAN 532	5/12/87	19:45

FORM V 7/85

AR302709

GC/MS TUNING AND MASS CALIBRATION
Decafluorotriphenylphosphine (DFTPP)

Case No. 7131 Contractor HAZLETON LABORATORIES Contract No. 68-01-7146

Instrument ID Finn SIS Date 5/4/87 Time 8:40

Lab ID DFTPO50487A Data Release Authorized By: Dennis J Bean

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	34.9 ✓
68	less than 2.0% of mass 69	0.00 (0.00)[1]
69	mass 69 relative abundance	46.0
70	less than 2.0% of mass 69	0.13 (0.29)[1] ✓
127	40.0 - 60.0% of mass 198	47.8 ✓
197	less than 1.0% of mass 198	0.00
198	base peak, 100% relative abundance	100
199	5.0 - 9.0% of mass 198	6.36 ✓
275	10.0 - 30.0% of mass 198	17.3 ✓
365	greater than 1.00% of mass 198	1.76 ✓
441	present, but less than mass 443	10.0 ✓
442	greater than 40.0% of mass 198	74.2 ✓
443	17.0 - 23.0% of mass 442	14.32 (19.3)[2] ✓

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

[1] Value in parenthesis is % mass 69.
[2] Value in parenthesis is % mass 442

SAMPLE ID	LAB ID	DATE OF ANALYSIS	TIME OF ANALYSIS
20 ng BAN STD	BAN462	5/4/87	9:16
50 ng BAN STD	BAN463	5/4/87	10:14
80 ng BAN STD	BAN464	5/4/87	11:13
120 ng BAN STD	BAN465	5/4/87	12:10
160 ng BAN STD	BAN466	5/4/87	13:08
CG Y14 MS	BAN 467	5/4/87	14:43
CG 114 MSD	BAN 468	5/4/87	15:48
CG 131	BAN 470	5/4/87	17:36
CG 131 MS	BAN 471	5/4/87	18:34
CG 131 MSD	BAN 472	5/4/87	19:32
BLK 4/28/87 Soil	BAN 473	5/4/87	20:29

✓ 412 / 20.4

FORM V 7/85

no meta tuning

2650

GC/MS TUNING AND MASS CALIBRATION
Decafluorotriphenylphosphine (DFTPP)

Case No. 7131 Contractor HAZLETON LABORATORIES Contract No. 68-01-7146

Instrument ID Finn51B Date 5/4/87 Time 21:15

Lab ID DFTPSF04870 Data Release Authorized By: Dennis L. Beam

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	45.0 ✓
68	less than 2.0% of mass 69	0.0 (6.0)[1]
69	mass 69 relative abundance	58.7
70	less than 2.0% of mass 69	0.1 (6.2)[1]
127	40.0 - 60.0% of mass 198	53.7 ✓
197	less than 1.0% of mass 198	0.0
198	base peak, 100% relative abundance	100
199	5.0 - 9.0% of mass 198	5.6 ✓
275	10.0 - 30.0% of mass 198	14.6 ✓
365	greater than 1.00% of mass 198	1.18 ✓
441	present, but less than mass 443	5.4 ✓
442	greater than 40.0% of mass 198	41.7 ✓
443	17.0 - 23.0% of mass 442	7.4 (17.7)[2]

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

[1]Value in parenthesis is % mass 69.
[2]Value in parenthesis is % mass 442

SAMPLE ID	LAB ID	DATE OF ANALYSIS	TIME OF ANALYSIS
50 ng BAN std	BAN 479	5/4/87	21:50
CG-102	BAN 479	5/5/87	3:24
CG-106	BAN 480	5/5/87	4:22
CG-113	BAN 481	5/5/87	5:19
CG-103	BAN 485	5/5/87	9:10 ✓ +12 = 9:17

AR302711

GC/MS TUNING AND MASS CALIBRATION
Decafluorotriphenylphosphine (DFTPP)

265

Case No. 7131 Contractor HAZLETON LABORATORIES Contract No. 68-01-7146

Instrument ID Finn 51B Date 5/5/87 Time 22:12

Lab ID DFTPA5C5870 Data Release Authorized By: Dawn L. Beam

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	42.2 ✓
68	less than 2.0% of mass 69 0	0.0 (0.0)[1]
69	mass 69 relative abundance	58.3
70	less than 2.0% of mass 69 0	0.2 (0.4)[1] ✓
127	40.0 - 60.0% of mass 198	53.8
197	less than 1.0% of mass 198 0	0.71 ✓
198	base peak, 100% relative abundance	100
199	5.0 - 9.0% of mass 198	5.5 ✓
275	10.0 - 30.0% of mass 198	15.1 ✓
365	greater than 1.00% of mass 198	1.17 ✓
441	present, but less than mass 443	6.06 ✓
442	greater than 40.0% of mass 198	45.1 ✓
443	17.0 - 23.0% of mass 442	8.3 (18.4)[2] ✓

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

[1]Value in parenthesis is % mass 69.
[2]Value in parenthesis is % mass 442

SAMPLE ID	LAB ID	DATE OF ANALYSIS	TIME OF ANALYSIS
50ng BANSTD	BAN 487	5/5/87	22:49
CG101	BAN 491	5/6/87	1:12
CG101MS	BAN 492	5/6/87	2:10
CG101MSD	BAN 493	5/6/87	3:08
CG107	BAN 495	5/6/87	5:04
CG109	BAN 496	5/6/87	6:02

AR302712

GC/MS TUNING AND MASS CALIBRATION
Decafluorotriphenylphosphine (DFTPP)

26

Case No. 7131 Contractor HAZLETON LABORATORIES Contract No. 68-01-7146

Instrument ID Finn 51B Date 5/8/87 Time 9:30

Lab ID DFTPP050187A Data Release Authorized By: Dennis L. Bean

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
51	30.0 - 60.0% of mass 198	37.7 ✓
68	less than 2.0% of mass 69	0 0.02 (0.04)[1]
69	mass 69 relative abundance	52.2
70	less than 2.0% of mass 69	0 0.22 (0.42)[1]
127	40.0 - 60.0% of mass 198	49.9 ✓
197	less than 1.0% of mass 198	0.0
198	base peak, 100% relative abundance	100
199	5.0 - 9.0% of mass 198	6.4 ✓
275	10.0 - 30.0% of mass 198	14.7 ✓
365	greater than 1.00% of mass 198	1.16 ✓
441	present, but less than mass 443	6.4 ✓
442	greater than 40.0% of mass 198	53.0 ✓
443	17.0 - 23.0% of mass 442	9.7 (18.3)[2] 18.3 ✓

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

[1] Value in parenthesis is % mass 69.
[2] Value in parenthesis is % mass 442

SAMPLE ID	LAB ID	DATE OF ANALYSIS	TIME OF ANALYSIS
50ng BAN Std	BAN 505	5/8/87	12:35
Blk 4/30/87 H2O	BAN 506	5/8/87	14:45
BIS Med Level	BAN 507	5/8/87	16:52
GG108	BAN 508	5/8/87	17:50 ✓ +12 21:30

FORM V 7/85

GC/MS TUNING AND MASS CALIBRATION
Decafluorotriphenylphosphine (DFTPP)

265

Case No. 7131 Contractor HAZLETON LABORATORIES Contract No. 68-01-7146

Instrument ID Finn 51 B Date 5/11/87 Time 12:40

Lab ID DFTP05111B7A Data Release Authorized By: Dennis L. Bean

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
51	30.0 - 80.0% of mass 198	37.1 ✓
68	less than 2.0% of mass 69	0.3 ✓ (0.5)[1]
69	mass 69 relative abundance	50.8 ✓
70	less than 2.0% of mass 69	0.0 (0.0)[1]
127	40.0 - 60.0% of mass 198	49.3 ✓
197	less than 1.0% of mass 198	0.0
198	base peak, 100% relative abundance	100
199	5.0 - 9.0% of mass 198	6.3 ✓
275	10.0 - 30.0% of mass 198	15.4 ✓
365	greater than 1.00% of mass 198	1.36 ✓
441	present, but less than mass 443	6.3 ✓
442	greater than 40.0% of mass 198	49.0 ✓
443	17.0 - 23.0% of mass 442	9.1 V (18.6)[2] ✓

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

[1]Value in parenthesis is % mass 69.
[2]Value in parenthesis is % mass 442

+12 22:40

SAMPLE ID	LAB ID	DATE OF ANALYSIS	TIME OF ANALYSIS
80 ng BAN std	BAN 514	5/11	22:59
80 ng BAN std	BAN 516	5/12	9:55
120 ng BAN std	BAN 517	5/12	1:52
160 ng BAN std	BAN 518	5/12	2:50

where the is 50 m

50 ng run 7 hrs later on a different time

this is wrong the for the standa all 71

FORM V 7/85

GC/MS TUNING AND MASS CALIBRATION
Decafluorotriphenylphosphine (DFTPP)

Case No. 7131 Contractor HAZLETON LABORATORIES Contract No. 68-01-7146

Instrument ID FINS1B Date 5-11-87 Time 2204

Lab ID DFTP051157B Data Release Authorized By: David C. Stolk

m/e	ION ABUNDANCE CRITERIA	%RELATIVE ABUNDANCE
51	30.0 - 80.0% of mass 198	44.0 ✓
68	less than 2.0% of mass 69	0.83 (1.49)[1] ✓
69	mass 69 relative abundance	55.7 ✓
70	less than 2.0% of mass 69	0.12 (0.22)[1] ✓
127	40.0 - 80.0% of mass 198	52.7 ✓
197	less than 1.0% of mass 198	0.00 ✓
198	base peak, 100% relative abundance	100 ✓
199	5.0 - 9.0% of mass 198	6.04 ✓
275	10.0 - 30.0% of mass 198	15.2 ✓
365	greater than 1.00% of mass 198	1.32 ✓
441	present, but less than mass 443	5.62 ✓
442	greater than 40.0% of mass 198	40.3 ✓
443	17.0 - 23.0% of mass 442	7.04 (17.5)[2] ✓

THIS PERFORMANCE TUNE APPLIES TO THE FOLLOWING SAMPLES, BLANKS AND STANDARDS.

[1]Value in parenthesis is % mass 69.
[2]Value in parenthesis is % mass 442.

SAMPLE ID	LAB ID	DATE OF ANALYSIS	TIME OF ANALYSIS
20 ng BAN STD	BAN 514	5-11-87	2259
80 ng BAN STD	BAN 516	5-12-87	0055
120 ng BAN STD	BAN 517	5-12-87	0152
160 ng BAN STD	BAN 518	5-12-87	0250 ✓

22:04 +12 10:04

DRAFT

WESTON

Case #/Site I.D.: 7131/L.A. Clarke
Sample Numbers: MCH101-MCH131

Site Manager: Ralph Shapot

Data Reviewer: Terrie Barrett
Review Completed: 29 August 1987

OVERVIEW

The set of samples for Case 7131 contained twenty seven soil samples and four water samples which were analyzed for full HSL metals through the Contract Laboratory Program Routine Analytical Services. The sample set contained two water blanks, an aqueous trip blank, an aqueous rinsate blank, and two soil duplicates.

SUMMARY

All elements were successfully analyzed in all samples. Areas of concern with respect to data usability are listed below and also on Table 1.

MAJOR ISSUES

Possible false negatives and elevated detection limits due to extremely low spike recoveries for Sb, As, Mn and Se.

False positive result for nickel for sample MCH 131 due to a significant level of analyte found in the preparation blank.

MINOR PROBLEMS

Possible matrix effects or laboratory specific problems, indicated by the following:

- Poor spike recovery for Sb, As and Pb.
- Very high spike recovery for As and Mn.
- Variability in laboratory duplicate results for Cr and Pb.
- Variability in field duplicate results for As, Ba, Cr, Co, Cu, Fe, Pb, Mn, Ni and Zn.
- Poor results for serial dilution analyses for Ca and Mg.

NOTES

The reported result for nickel for sample MCH 131 was raised to the CRDL of 40 u due to significantly high preparation blank contamination.

Due to extremely low spike recoveries for antimony and arsenic the R qualifier on the non-detected values overrides the UL qualifier on these values for the low spike recoveries.

Since one spike recovery for manganese is extremely low and the other spike recovery is very high, the low (L) and high (K) qualifiers were not used. Reported results for manganese were qualified as estimated (J) instead.

Laboratory duplicate results for lead showed variability that may have contributed to the poor spike recovery. For this reason reported results are qualified as estimated (J), rather than low (L).

Serial dilution results for calcium and magnesium did not agree at lower concentrations, but did agree at higher concentrations. Therefore, reported results were qualified if they were below the initial sample concentrations found in those samples with poor serial dilution results. It appears that a matrix interference for calcium and magnesium exists at lower concentrations.

INFORMATION REGARDING REPORT CONTENT

These data were reviewed according to the National Functional Guidelines for Evaluating Inorganic Analyses. All data have been validated with regard to usability. The methods used by the Contract Lab Program (CLP) must be evaluated by each individual user as to whether the scope, precision and accuracy meet the needs of the project.

The text of this report has been formatted to address only those problem areas which affect the applications of the data to the site investigation. Documentation of these problems and any other observed areas of laboratory contractual noncompliance are included in a separate report sent to the laboratory's CLP Project Officer. If you have any questions or comments on this data review, please contact Dianne Therry.

Table 1 is a summary of qualifiers added to the laboratory's results during data validation. Table 2 is a summary of all samples which required dilution.

ATTACHMENTS:

1. Glossary of data qualifier codes.
2. Data Summary. This includes:
   a) All positive results with qualifier codes, if applicable;
   b) All unusable detection limits qualified with an "R"; and
   c) All estimated detection limits qualified with UJ or UL.
3. Appendix A - results as reported by the laboratory (no corrections were made during data validation).
4. Appendix B - DPO Report. This addresses laboratory compliance issues with respect to the Statement of Work.
5. Appendix C - Support Documentation includes details to support the statements in this report.

Table 1 - Summary of Qualifiers on Data Summary
After Data Validation

Analyte	Samples Affected	Qualifier Positive Values	Qualifier Non-Detected Values	Bias	Comments*
Sb	MCH101-MCH113 MCH117-MCH130	L	R	Extremely Low	1(22% R)
Sb	MCH101-MCH113 MCH117-MCH130	L	(UL)R	Low	2(39%,50%, 70% R)
As	MCH101-MCH113 MCH117-MCH130	L	R	Extremely Low	1(21% R)
As	MCH101-MCH113 MCH117-MCH130	L	(UL)R	Low	2(74% R)
As	MCH131	K		High	3(140% R)
Ba	MCH101-MCH108 MCH110-MCH113 MCH117-MCH130	J			4(62% RPD)
Ca	MCH101-MCH113 MCH117-MCH130	J			6(14% R
Cr	MCH101-MCH108 MCH110-MCH113 MCH117-MCH125 MCH127-MCH130	J			4(182% RPD)
Cr	MCH101-MCH108 MCH110-MCH113 MCH117-MCH125 MCH127-MCH130	J			5(53% RPD)
Co	MCH103-MCH105 MCH107-MCH112 MCH119,MCH120, MCH122,MCH123, MCH128-MCH130	J			4(> ±CRQL, and 107% RPD)
Cu	MCH102-MCH112 MCH117-MCH130	J			4(141 % RPD)
Fe	MCH101-MCH113 MCH117-MCH130	J			4(91% RPD, 171% RPD)
Pb	MCH101-MCH113	(L)J			2(62% R)
Pb	MCH101-MCH113 MCH117-MCH130	J			5(50% R

Table 1 - Summary of Qualifiers on Data Summary
After Data Validation

Analyte	Samples Affected	Qualifier		Bias	Comments*
		Positive Values	Non-Detected Values		
Mg	MCH101-MCH110 MCH112,MCH113 MCH117-MCH119 MCH121,MCH123-MCH127	J			6(17% D)
Mg	MCH131	J			6(18% D)
Mn	MCH101-MCH113 MCH117-MCH130	(L)J		Extremely Low	1(0% R)
Mn	MCH101-MCH113 MCH117-MCH130	(K)J		High	3(129% R)
Mn	MCH101-MCH113 MCH117-MCH130	J			4(125% RPD)
Ni	MCH102,MCH104- MCH108,MCH110- MCH112,MCH120- MCH122,MCH124, MCH128-MCH130				4(> ±CRDL and 162% RPD)
Ni	MCH131	B			7
Se	MCH101-MCH113 MCH117-MCH130	L	R		1(29% R)
Zn	MCH101-MCH113 MCH117-MCH130	J			4(76% RPD)

Table 2
Summary of Samples Requiring Dilution

Analyte	Samples Affected	Resultant Quantitation Limit (ug/L)
Fe	MCH111, MCH120, MCH129, MCH130	1000

*Codes Used in Comments Column for Table 1

1 = Due to an extremely low spike recovery (% recovery in parentheses), indicating a matrix interference, the reported results may be biased extremely low. The possibility of false negatives exists.

2 = Due to a low spike recovery (% recovery in parentheses), indicating a matrix interference, the reported results may be biased low.

3 = Due to a high spike recovery (% recovery in parentheses), indicating a matrix interference, the reported results may be biased high.

4 = Based on relative percent difference of the analysis of the field duplicates (>30% RPD), the reported results for these samples may not reflect the true average concentration.

5 = Based on relative percent difference of the analysis of the laboratory duplicates (>30% RPD), the reported results for these samples may not reflect the true average concentration.

6 = Serial dilution results do not agree within 10%, indicating a physical or chemical interference. Reported results for these samples are qualified as estimated.

7 = Due to high levels of nickel found in the preparation blank the reported result for sample MCH131 was raised to the CRQL of 40 u. Since this result was a concentration lower than the contaminated preparation blank, it was most likely a false positive result.

GLOSSARY OF DATA QUALIFIER CODES

CODES RELATING TO IDENTIFICATION
(confidence concerning presence or absence of compounds):

U = NOT DETECTED. THE ASSOCIATED NUMBER INDICATES APPROXIMATE SAMPLE CONCENTRATION NECESSARY TO BE DETECTED.

(NO CODE) = CONFIRMED IDENTIFICATION.

B = NOT DETECTED. SUBSTANTIALLY ABOVE THE LEVEL REPORTED IN LABORATORY OR FIELD BLANKS.

R = UNRELIABLE RESULT. ANALYTE MAY OR MAY NOT BE PRESENT IN THE SAMPLE. SUPPORTING DATA NECESSARY TO CONFIRM RESULT.

CODES RELATED TO QUANTITATION
(can be used for both positive results and sample quantitation limits):

J = ANALYTE PRESENT. REPORTED VALUE MAY NOT BE ACCURATE OR PRECISE.

K = ANALYTE PRESENT. REPORTED VALUE MAY BE BIASED HIGH. ACTUAL VALUE IS EXPECTED TO BE LOWER.

L = ANALYTE PRESENT. REPORTED VALUE MAY BE BIASED LOW. ACTUAL VALUE IS EXPECTED TO BE HIGHER.

UJ = NOT DETECTED. QUANTITATION LIMIT MAY BE INACCURATE OR IMPRECISE.

UL = NOT DETECTED. QUANTITATION LIMIT IS PROBABLY HIGHER.

OTHER CODES

Q = NO ANALYTICAL RESULT.

INORGANIC DATA VALIDATION SUMMARY page 1 of 1

Date Review Completed September 2, 1987
Case No. 7131 SAS No. ———
Site Name LA Clarke
Sample Nos. MCH101 - MCH131

Contract Lab CSMRI Analytic
Contract No. 68-01-7312
Lab DPO John Tilstra / VIII
Reviewer Terrie Barrett
from Region III Phone (215)524-7360
WESTON Analytics, div. of Roy F. Weston, Inc

MATRIX	CONCENTRATION low	med	high	MATRIX RELATED COMMENTS
soil/solid	27			
aqueous	4			two water blanks, one aqueous trip blank one aqueous rinsate blank
other				

ICP	OK	FYI	ACTION	COMMENTS
Holding Time	✓			
Calibration Blanks	✓			
Initial Calibration	✓			
Continuing Calibration	✓			
Preparation Blank			✓	water: Ni (57 ug/l) affects sample MCH131
Interference Check Sample	✓			
Lab Control Sample	✓			
Lab Duplicate			✓	Cr (53% RPD)
Matrix Spike			✓	Soil: Mn (0%R, 129%R)
Serial Dilution			✓	water: Mg (18%D) soil: Ca (14%D), Mg (17%D)

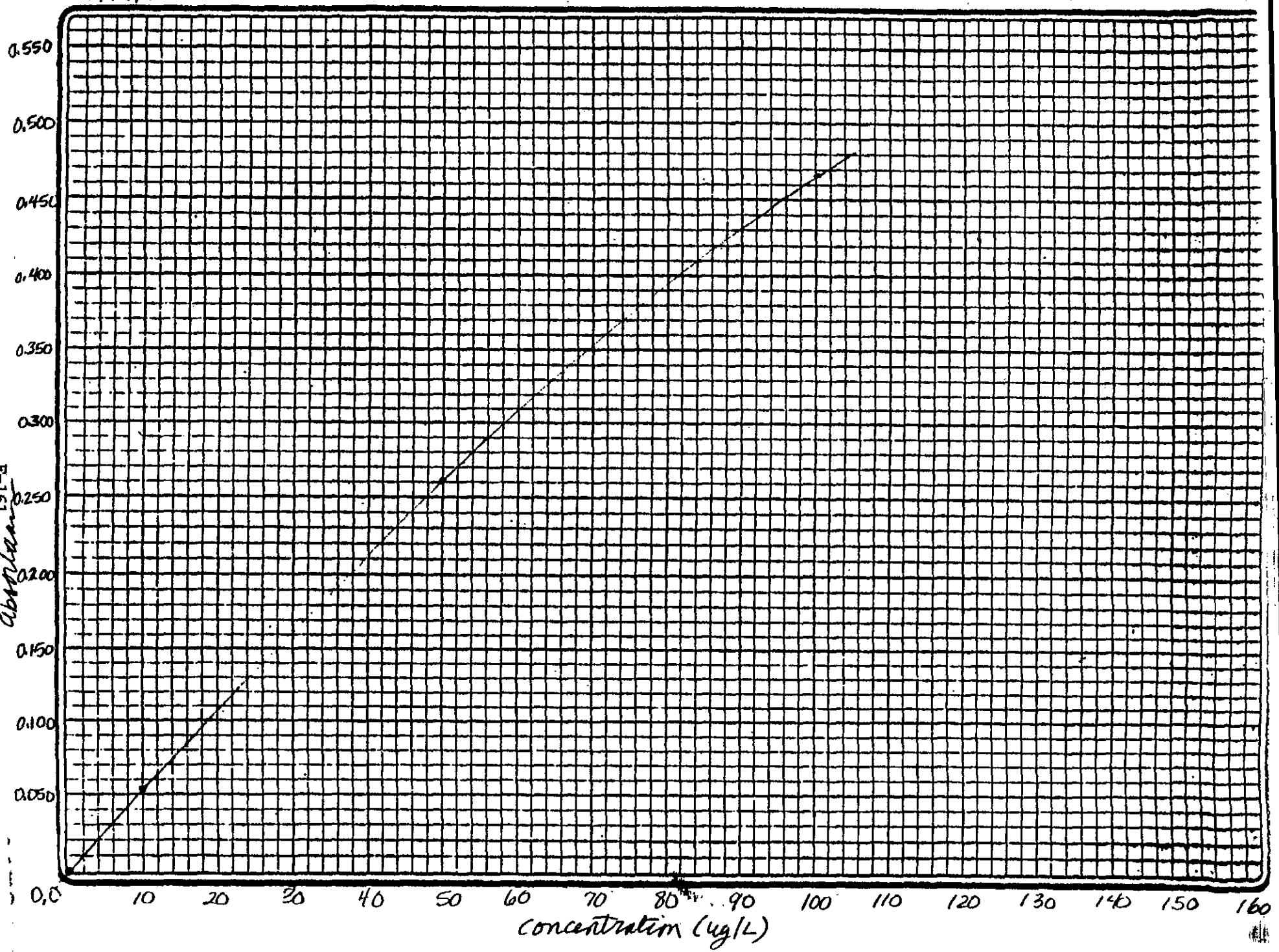
FURNACE	OK	FYI	ACTION	COMMENTS
Holding Time	✓			
Calibration Blanks	✓			
Initial Calibration	✓			
Continuing Calibration	✓			
Preparation Blank	✓			
Lab Control Sample	✓			
Lab Duplicate			✓	Pb (50% RPD)
Matrix Spike			✓	water: As (146%R) Soil: Sb (22%, 39%, 50%, 70%R), As (21%, 74%R), Pb (62%R), Se (29%R)
Duplicate Injections	✓			
Analytical Spike	✓			

MERCURY	OK	FYI	ACTION	COMMENTS
Holding Time	✓			
Calibration Blank	✓			
Initial Calibration	✓			
Continuing Calibration	✓			
Preparation Blank	✓			
Lab Duplicate	✓			
Matrix Spike	✓			

REVIEWER'S COMMENTS:

Lab states that values from zero to the CRQL standard are calculated using linear regression, while values from the CRQL to the highest standard are calculated using an unrestrained quadratic least squares program (second order regression of the absorbance values). It is the opinion of the reviewer that all values should be calculated using the same calculation and that the intent of the CLP SOW (Inorganics) is that

1/17/24 CASE 7131



CASE 7324

PHASE III

DATA REVIEW NARRATIVE

0985B

DRAFT

WESTON

Case #/Site I.D.: 7324/L.A. Clarke
Sample Numbers: MCH133-MCH140, MCH837-MCH856, MCH861-MCH867

Site Manager: Ralph Shapot

Data Reviewer: Terrie Barrett
Review Completed: 21 July 1987

OVERVIEW

The set of samples for Case 7324 contained 26 water samples and 9 soil samples which were analyzed for HSL metals through the Contract Laboratory Program Routine Analytical Services. The sample set contained three duplicates, a rinsate blank, and a trip blank.

SUMMARY

All elements were successfully analyzed in all samples. Areas of concern with respect to data usability are listed according to the seriousness of the problem. These include:

MINOR ISSUES

Irregularities in the calibration of the graphite furnace affecting the analysis of Pb.

Possible matrix interferences or laboratory specific problems, indicated by poor spike recoveries for Sb, As, Pb and Se.

Poor duplicate results for the field duplicate for Al and Pb.

Instrument instability indicated by a significant positive value in an initial calibration blank for Cu.

Low level preparation blank contamination for Cr, Fe, Mg and V.

Possible loss of analyte for all metals for all water samples due to fact that samples were not preserved at the time of sampling

NOTES

Two samples had elevated detection limits due to the dilution of the sample. For sample MCH852, the dilution was performed to overcome the effects of the matrix interferences. For sample

WESTON

MCH846, the dilution was required to bring the analyte concentration into the calibration range.

INFORMATION REGARDING REPORT CONTENT

These data were reviewed according to the National Functional Guidelines for Evaluating Inorganic Analyses. All data have been validated with regard to usability. The methods used by the Contract Lab Program (CLP) must be evaluated by each individual user as to whether the scope, precision and accuracy meet the needs of the project.

The text of this report has been formatted to address only those problem areas which affect the applications of the data to the site investigation. Documentation of these problems and any other observed areas of laboratory contractual noncompliance are included in a separate report sent to the laboratory's CLP Project Officer. If you have any questions or comments on this data review, please contact Dianne Therry.

Table I is a summary of qualifiers added to the laboratory's results during data validation. Table 2 is a summary of all samples which required dilution.

ATTACHMENTS:

1. Glossary of data qualifier codes.
2. Data Summary. This includes:
   a) All positive results with qualifier codes; and,
   b) All estimated detection limits qualified with UJ or UL.
3. Appendix A - results as reported by the laboratory (no corrections were made during data validation).
4. Appendix B - DPO Report addresses laboratory compliance to the Statement of Work.
5. Appendix C - Support Documentation includes details to support the statements in this report.

Table 1 - Summary of Qualifiers on Data Summary
After Data Validation

Analyte	Samples Affected		Qualifier: Positive Values	Qualifier: Non-Detected Values	Bias	Comments*
Al	MCH137,MCH138,MCH841, MCH842,MCH845,MCH846, MCH850-MCH852	soil	J			3 (RPD 38%)
Sb	MCH137,MCH138,MCH841, MCH842,MCH845,MCH846, MCH850-MCH852	soil		UL	Low	2 (52% R)
As	MCH137,MCH138,MCH841, MCH842,MCH845,MCH846, MCH850-MCH852	soil	L	UL	Low	2 (74% R)
Cr	MCH845,MCH850,MCH851	soil	B		High	1
Cu	MCH837-MCH840	water	B		High	1
Fe	MCH853-MCH855	water	B		High	1
Pb	MCH137,MCH138,MCH841, MCH842,MCH845,MCH846, MCH850-MCH852	soil	L J	UL	Low	2 (55% R) 3 (RPD 48% & >+CRQL)
	MCH135,MCH136,MCH139, MCH140,MCH837-MCH840, MCH843	water	J	UJ		4
Mg	MCH842,MCH852	soil	B		High	1
Se	MCH137,MCH138,MCH841, MCH842,MCH845,MCH846 MCH850-MCH852	soil		UL	Low	2 (55% R)
V	MCH841,MCH842,MCH845, MCH850-MCH852	soil	B		High	1
	MCH133-MCH136,MCH837-MCH840,MCH843-MCH844, MCH847-MCH849,MCH853-MCH856,MCH861-MCH867	all metals	L	UL	Low	5

*Codes Used in Comments Column for Table 1

1 = One or more of the blanks associated with these samples gave a positive response greater than twice the IDL (instrument detection limit). The reported results may be biased high.

2 = Due to a low spike recovery (% recovery in parentheses), indicating a matrix interference or laboratory specific problems, the reported results may be biased low.

3 = Based on relative percent difference of the analysis of the field duplicates (>30%), the reported results for these samples may not reflect the true average concentration.

4 = Due to irregularities in calibration the reported results may be estimated.

5 = Possible loss of analyte for all metals for all water samples due to the fact that samples were not preserved at the time of sampling.

Table 2
Summary of Samples Requiring Dilution

Analyte	Samples Affected	Resultant Quantitation Limit (ug/L)
As	MCH852	50
Tl	MCH846	50

GLOSSARY OF DATA QUALIFIER CODES

CODES RELATING TO IDENTIFICATION
(confidence concerning presence or absence of compounds):

U = NOT DETECTED. THE ASSOCIATED NUMBER INDICATES APPROXIMATE SAMPLE CONCENTRATION NECESSARY TO BE DETECTED.

(NO CODE) = CONFIRMED IDENTIFICATION.

B = NOT DETECTED AT LEVELS SUBSTANTIALLY ABOVE THE LEVEL REPORTED IN LABORATORY OR FIELD BLANKS.

R = UNRELIABLE RESULT. ANALYTE MAY OR MAY NOT BE PRESENT IN THE SAMPLE. SUPPORTING DATA NECESSARY TO CONFIRM RESULT.

CODES RELATED TO QUANTITATION
(can be used for both positive results and sample quantitation limits):

J = ANALYTE PRESENT. REPORTED VALUE MAY NOT BE ACCURATE OR PRECISE.

K = ANALYTE PRESENT. REPORTED VALUE MAY BE BIASED HIGH. ACTUAL VALUE IS EXPECTED TO BE LOWER.

L = ANALYTE PRESENT. REPORTED VALUE MAY BE BIASED LOW. ACTUAL VALUE IS EXPECTED TO BE HIGHER.

UJ = NOT DETECTED. QUANTITATION LIMIT MAY BE INACCURATE OR IMPRECISE.

UL = NOT DETECTED. QUANTITATION LIMIT IS PROBABLY HIGHER.

OTHER CODES

Q = NO ANALYTICAL RESULT.

Date Review Completed 21 July 1997
Case No. 7324 SAS No. —
Site Name LA Clarke
Sample Nos. MCH 133 - MCH 146, MCH 837 - MCH 856, MCH 861 - MCH 867

Contract Lab ENSECO - CAL
Contract No. 68-01-7170 Lot B
Lab DPO Kent Kitchingman / III
Reviewer Terrie Barrett
from Region III Phone (215)524-7360
WESTON Analytics, div. of Roy F. Weston, In

MATRIX	CONCENTRATION low	med	high	MATRIX RELATED COMMENTS
soil/solid	9			
aqueous	26			
other				

ICP	OK	FYI	ACTION	COMMENTS
Holding Time	✓			
Calibration Blanks			✓	ICB significantly high for copper
Initial Calibration	✓			
Continuing Calibration	✓			
Preparation Blank			✓	See comment # 2
Interference Check Sample	✓	✓		See comment # 1
Lab Control Sample	✓			
Lab Duplicate	✓			Soil: field duplicate Al (RPD 38%)
Matrix Spike	✓			
Serial Dilution	✓			

FURNACE				
Holding Time	✓			
Calibration Blanks	✓			
Initial Calibration	✓			
Continuing Calibration	✓	✓		Missing CCB & CCV for Tl see pages 53 & 62 (Form
Preparation Blank	✓			
Lab Control Sample	✓			
Lab Duplicate	✓	✓		Pb duplicate = 15 ≠ 5.0U see pg 71 (Form VI)
Matrix Spike	✓			Soil: As (74%R), Sb (52%R), Pb (5.5%R)
Duplicate Injections	✓	✓		Soil: Pb (RPD 48%, >= CRQL)
Analytical Spike	✓			

MERCURY & CYANIDE				
Holding Time	✓			
Calibration Blank	✓			
Initial Calibration	✓			
Continuing Calibration	✓			
Preparation Blank	✓			
Lab Duplicate	✓			
Matrix Spike	✓			

REVIEWER'S COMMENTS:

1. The lab had two calibrations for aluminum. All values except for the ICS were taken from AI-1. ICS values were taken from AI-2. ICS values for AI-1 were within acceptable limits. All values should be taken from the same calibration for Al.
2. Prep blank values were significantly high enough to qualify reported results for Cr, Mg, Fe and V.

REVIEWER'S COMMENTS (cont.)

3. Numerous rounding errors and improper significant figure on computer generated pages.

4. Multiple forms (of the same type) require identification (Form IIA, Form IIB, etc). (See attachment 1)

5. Although new SOW 787 only requires one injection of CB C: while running MSA's and allows 2 injections between continuing calibration samples (5 full MSA's), the lab is contracted under SOW 784 and should adhere to the practices stated in SOW 784 (See attachment 2)

6. Furnace calibration contained error messages regarding the shape of the curve. The resulting calibration is a non-linear, S-shaped curve. (See attachment 3)

Attachment 1

(e.g., 10U). Use an "E" as the footnote to indicate an estimated value or value not reported due to the presence of interference, and an explanatory note must be included on the cover page. If the duplicate sample analysis is not within the control limits, flag it with an asterisk (*). Use "S" as a footnote to indicate a value determined by Method of Standard Additions (MSA). If the correlation coefficient (r) for method of standard additions is less than 0.995, flag the value with a '+' sign. If duplicate injection precision criteria specified for Furnace AA analysis in Exhibit E cannot be met, flag the data with an "M". If the spike sample recovery is not within control limits, flag the data with the letter N. Report results to two significant figures for values from 0 to 100 and three significant figures for results greater than 100, with the exception of Mercury (see Mercury Methods - Exhibit D). For rounding rules, follow the EPA Handbook of Analytical Quality Control in Water and Wastewater Laboratories (EPA-600/4-79-019).

Under the comments section on Form I, provide a brief physical description of the sample using the following guidelines:

A. Water samples - Coloration and clarity

B. Solid samples - Coloration, texture and artifacts

Recommended Descriptive Terms

Coloration: Red, blue, yellow, green, orange, violet, white, colorless, brown, grey, black

Clarity: Clear, cloudy, opaque

Texture: Fine (powdery), Medium (sand), Coarse (large crystals or rocks)

Also note any significant changes that occur during sample preparation (i.e. coloration shifts, emulsion formation).

4) Analytical results for samples and spikes, duplicates, standards, ICP Interference Check Samples, reagent blanks, laboratory control samples, instrument detection limits and holding times on QA Forms II, III, IV, V, VI, VII, VIII, IX and X. Multiple forms require identification (i.e. Form IIA, Form IIB etc.) Summarize each full method of standard addition performed on Form VIII.

5) Legible photocopy of raw data (sequential measurement readout record) clearly labeled with sufficient information to unequivocally identify:

a) calibration standards (including prep date).

b) calibration blanks and preparation blanks.

Attachment 2

1. All furnace analyses, except during Full Methods of Standard Addition (MSA), will require duplicate injections for which the average absorbance or "concentration" will be reported. All analyses must fall within the calibration range. The raw data package must contain both absorbance or "concentration" values, the average value and the relative standard deviation (RSD) or coefficient of variation (CV). For concentrations greater than CRDL, the duplicate injection readings must agree within 20% RSD or CV, or the sample must be rerun once. If the readings are still out, flag the value with an "M" on Form I.

2. All furnace analyses for each sample will require at least a single analytical spike to determine if the MSA will be required for quantitation. Analytical spikes are not required on the predigest spike samples. The spike* will be required to be at a concentration (in the sample) twice the contract required detection limit (CRDL). The percent (%R) of the spike, calculated by the same formula as Spiked Sample analyses (Exhibit E), will then determine how the sample will be quantitated as follows:

   a) If the spike recovery is less than 40%, the sample must be diluted and rerun with another spike. Dilute the sample by a factor of 5 to 10 and rerun. This step must only be performed once. If after the dilution the spike recovery is still <40%, report data and flag with an "E" to indicate interference problems.

   b) If the spike recovery is greater than 40% and the sample absorbance or concentration is <50% of the spike+, report the sample as less than the CRDL or less than the CRDL times the dilution factor if the sample was diluted.

   c) If the sample absorbance or concentration is >50% of the spike+ and the spike recovery is between 85% and 115%, the sample should be quantitated directly from the calibration curve.

   d) If the sample absorbance or concentration is >50% of the spike+ and the spike recovery is less than 85% or greater than 115%, the sample must be quantitated by MSA.

3. The following procedures will be incorporated into MSA analyses.

   a) Data from MSA calculations must be within the linear range as determined by the calibration curve generated at the beginning of the analytical run.

*Spikes are post digest spikes to be prepared prior to analysis by adding a known quantity of the analyte to an aliquot of the digested sample. The unspiked sample aliquot must be compensated for any volume change in the spike samples by addition of deionized water to the unspiked sample aliquot.

+"Spike" is defined as (absorbance or concentration of spike sample) minus (absorbance or concentration of the sample).

Attachment 2

CHEMIST INITIAL: JS
DATE OF RUN: 6/8/87
INSTRUMENT ID: P.E. 3030
TYPE OF ANALYSIS: Pb
CALIBRATION STD: 80ppb, Spex 0486 MP, 2/18/87

EPA CASE NO's: 7324 (P498, 84day: 50ml/50ml; P4985-94: 100ml/100ml)

Energy: 63, r = 0.998

PB r = 0.9628

		AA	ZAA	BC
PEAK HEIGHT (ABSORBANCE)		0.161	0.007	0.164
PEAK AREA (ABS-SECONDS)		0.175	0.004	0.171
READ:	0.004			
PEAK HEIGHT (ABSORBANCE)		0.130	0.008	0.133
PEAK AREA (ABS-SECONDS)		0.188	0.005	0.183
READ:	0.006			

MEAN= 0.005 STD.DEV.= 0.001 COEF.VAR.= 20.54 %

0.000 AUTOZERO

PB

		AA	ZAA	BC
PEAK HEIGHT (ABSORBANCE)		0.178	0.064	0.180
PEAK AREA (ABS-SECONDS)		0.258	0.041	0.217
READ:	0.037			
PEAK HEIGHT (ABSORBANCE)		0.190	0.058	0.192
PEAK AREA (ABS-SECONDS)		0.256	0.036	0.220
PEAD:	0.031			

MEAN= 0.034 STD.DEV.= 0.004 COEF.VAR.= 11.83 %

5.00 STANDARD 1

PB

E-173

216

AR302736

STD.DEV.= 0.004 COEF.VAR.= 11.83 %

****

5.00 STANDARD 1

****

PB

	AA	ZAA	BC
PEAK HEIGHT (ABSORBANCE)	0.250	0.197	0.174
PEAK AREA (ABS-SECONDS)	0.361	0.123	0.238

READ: 17.47

	AA	ZAA	BC
PEAK HEIGHT (ABSORBANCE)	0.262	0.208	0.169
PEAK AREA (ABS-SECONDS)	0.358	0.119	0.239

READ: 16.87

MEAN= 17.17 STD.DEV.= 0.43 COEF.VAR.= 2.48 %

****

17.17

E-50: READING GREATER THAN HIGHEST STANDARD

****

20.00 STANDARD 2

****

PB

	AA	ZAA	BC
PEAK HEIGHT (ABSORBANCE)	0.499	0.394	0.176
PEAK AREA (ABS-SECONDS)	0.503	0.236	0.267

READ: 51.46

(CONTINUED)

	AA	ZAA	BC
PEAK HEIGHT (ABSORBANCE)	0.458	0.364	0.190
PEAK AREA (ABS-SECONDS)	0.522	0.232	0.290

READ: 50.19

MEAN= 50.83 STD.DEV.= 1.19 COEF.VAR.= 2.34 %

****

50.83

E-50: READING GREATER THAN HIGHEST STANDARD

****

40.07 STANDARD 3

E-54: S-SHAPED CURVE, [illegible]FF EQUATION USED

E-50: READING GREATER THAN HIGHEST STANDARD

40.07 STANDARD 3

E-54: S-SHAPED CURVE. 2-COEF EQUATION USED

PB

	AA	ZAA	BC
PEAK HEIGHT (ABSORBANCE)	0.809	0.632	0.179
PEAK AREA (ABS-SECONDS)	0.721	0.412	0.309

READ: 75.17

	AA	ZAA	BC
PEAK HEIGHT (ABSORBANCE)	0.804	0.624	0.181
PEAK AREA (ABS-SECONDS)	0.736	0.416	0.320

READ: 75.99

MEAN= 75.58 STD.DEV.= 0.64 COEF.VAR.= 0.85 %

75.58

E-50: READING GREATER THAN HIGHEST STANDARD

80.01 STANDARD 4

PB 0001

	AA	ZAA	BC
PEAK HEIGHT (ABSORBANCE)	0.217	0.008	0.218
PEAK AREA (ABS-SECONDS)	0.232	0.004	0.228

Blk

READ: -0.17

	AA	ZAA	BC
PEAK HEIGHT (ABSORBANCE)	0.158	0.008	0.160
PEAK AREA (ABS-SECONDS)	0.218	0.004	0.214

READ: -0.06

MEAN= -0.11 STD.DEV.= 0.08 COEF.VAR.= 71.38 %

PB 0002

	AA	ZAA	BC
PEAK HEIGHT (ABSORBANCE)	0.532	0.421	0.142
PEAK AREA (ABS-SECONDS)	0.519	0.260	0.269

Pb 45.85 ppb

READ: 45.19

ICV-4

E-175

AR302738

202

0002 (CONTINUED)

	AA	ZAA	BC
PEAK HEIGHT (ABSORBANCE)	0.519	0.411	0.139
PEAK AREA (ABS-SECONDS)	0.506	0.258	0.248

READ: 44.79

MEAN= 44.99 STD.DEV.= 0.32 COEF.VAR.= 0.72 %

****

PB 0003

PBlk 7324 (P4984-P5003, LW)

	AA	ZAA	BC
PEAK HEIGHT (ABSORBANCE)	0.181	0.012	0.177
PEAK AREA (ABS-SECONDS)	0.214	0.008	0.206

READ: 0.54

	AA	ZAA	BC
PEAK HEIGHT (ABSORBANCE)	0.188	0.010	0.183
PEAK AREA (ABS-SECONDS)	0.227	0.006	0.221

READ: 0.17

MEAN= 0.35 STD.DEV.= 0.26 COEF.VAR.= 74.49 %

****

PB 0004

LCS 7324 (P4984-P5003)

	AA	ZAA	BC
PEAK HEIGHT (ABSORBANCE)	0.222	0.169	0.139
PEAK AREA (ABS-SECONDS)	0.346	0.118	0.228

READ: 19.04

R = 97%

	AA	ZAA	BC
PEAK HEIGHT (ABSORBANCE)	0.220	0.171	0.142
PEAK AREA (ABS-SECONDS)	0.344	0.122	0.222

READ: 19.87

MEAN= 19.45 STD.DEV.= 0.61 COEF.VAR.= 3.11 %

Text from PE 5000 manual

10 CALIBRATION

10A. INTRODUCTION

The readout of the Model 5000 may be calibrated directly in units of concentration using a two-step process. First, enter the concentrations(s) of the standard(s) being used. Second, aspirate a blank plus each standard and press the appropriate standard button. The System equates the absorbance of each standard with the actual concentration, and constructs an appropriate calibration curve.

The selection of the number of standards, and their concentrations, is most important. Some useful guidelines are given below.

10B. SELECTING THE NUMBER OF STANDARDS

The Standard Conditions pages of the Analytical Methods manual indicate the linear working range for each element (i.e. the concentration range over which absorbance is linearly proportional to concentration).

a) If the analyte concentration of all the samples to be analyzed falls within the linear range, then calibration should be performed with a single standard.

b) If the analyte concentration in the samples is expected to exceed the linear range, then either two or three standards are recommended, depending on the degree to which the linear range is exceeded. As a general rule, if the analyte concentrations are expected to be less than three times the linear range, two standards are adequate. If the concentrations are expected to exceed three times the linear range, use three standards*.

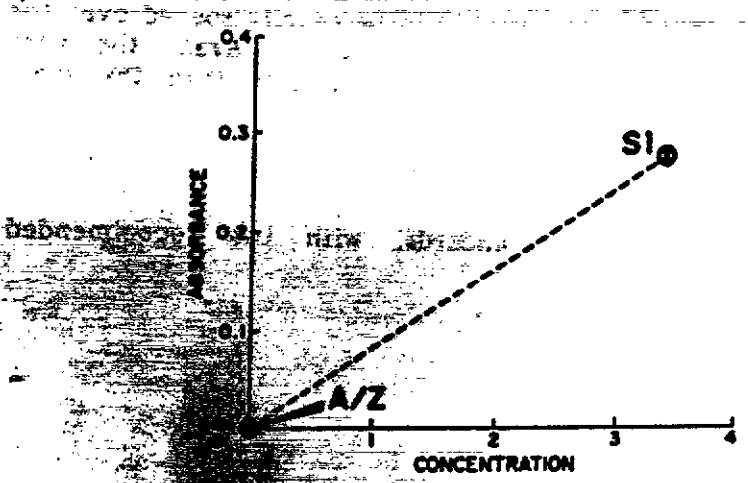


Figure 10-1A - One Standard - Linear Plot

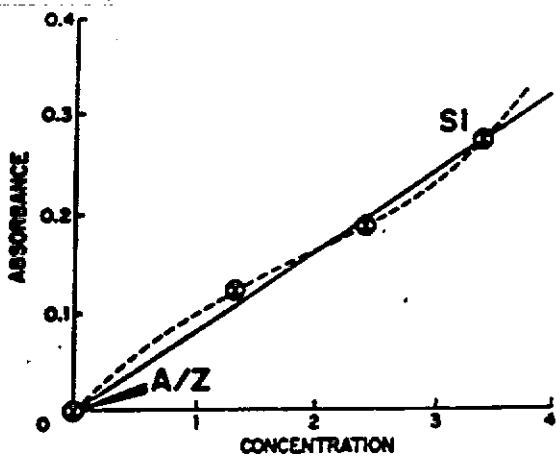


Figure 10-1B - Three Standards - S-Shaped Plot (Calibration Error).

* With three standards it is frequently possible to determine accurately analyte concentrations up to ten times the limit of the linear range, and in some cases even higher concentrations can be determined. However, the accuracy of the determinations may be degraded if too large a concentration range is used. If the accuracy obtained is insufficient, a change in analytical conditions may be required. For example, one of the alternative wavelengths given in the Analytical Methods manual may provide lower sensitivity, or the burner head may be rotated to reduce sensitivity, or the samples may have to be diluted further.

It is important to note that it is not necessarily an advantage to use more standards than the number recommended, and sometimes, the use of too many standards could give rise to erroneous or misleading results. For example, when operating within the linear range, one standard will give a linear plot as shown in Figure 10-1A. If three standards are used over the same range (as shown in Figure 10-1B), the resulting calibration curve could appear S-shaped because of variability of signals in the instrument, and will not be accepted. The Model 5000 is programmed to recognize invalid calibration attempts, and will display an error message when such an attempt is made. A full explanation of calibration errors is given in Section 14.

10C. SELECTING THE CONCENTRATIONS OF STANDARDS

If one standard is to be used, the concentration of S1 should be higher than the most concentrated sample, and should not exceed the upper limit of the linear range. The calibration curve then becomes a straight-line plot, with the auto zero point as the origin.

If multiple standards are to be used, the selection of their concentrations usually depends on whether the analyst requires a constant maximum relative error, or a constant maximum absolute error. With the former, all results will be accurate to within a specified percentage of the analyte concentration. With the latter, all results will be accurate to within a specified concentration over the selected concentration range.

For constant maximum relative error, select the number of standards required, with concentrations such that

S2 has approximately 3x the concentration of S1
and S3 has approximately 2x the concentration of S2.

Regardless of whether two or three standards are used, the most concentrated standard should have equal or greater concentration than the most concentrated sample.

For constant maximum absolute error, the standards should be equally spaced over the concentration range expected, i.e. S2 = 2 x S1, and S3 = 3 x S1. Again, the most concentrated standard should have equal or greater concentration than the most concentrated sample.

10D. CALIBRATION PROCEDURE FOR FLAME ANALYSES

1) Make up the appropriate numbers of standards, with the recommended concentrations.

2) Set up the instrument as described in Section 9.

3) Select CONC and HOLD

4) Enter the concentration of the first standard, and press S1. Then enter the concentrations of S2 and S3, if multiple standards are to be used.

Notes: (A) Four full digits may be entered, and a decimal point, to set any value between .0000 and 9999. If required, two additional leading zeroes are permitted before the four digits in order to position the decimal, e.g. values of .001234 or 0.01234 are permitted.

(B) The number of decimal places in the result is determined by the position of the decimal in the entry of S1. However, the position of the decimal for S2 and S3 is also determined by the entry for S1, so the values of the other standards must be considered when entering the value for S1. For example, if S1 were 5.000, than S2 could not be entered as 10.0, as this would in effect be a 5-digit number (10.000) and only 4 digits are allowed (see Note (A) above). S1 should have been entered as 5.0 or 5.00.

(C) The concentration entries for S1, S2 and S3 may be entered in any order (i.e., not necessarily in the sequence low, medium, high), provided that the standards are aspirated in the same order. To avoid confusion, enter the standards in the order S1, S2, S3.

(D) An entry of zero for S1 or S2 or S3 ensures that calibration using that standard cannot occur. This facility may be useful when using an auto sampler.

5) Enter the integration time ("READ" time) by pressing:

(Integration Time 0.2 to 60) [t]

6) Aspirate a blank solution and press the AZ key to initiate the READ cycle. Continue to aspirate the blank until the AZ indicator stops flashing and the READ light goes out.

7) Aspirate the first standard and press S1 to start the READ cycle. When the READ indicator is extinguished and the S1 lamp stops flashing and remains on, calibration using one standard is established (Figure 10-2).

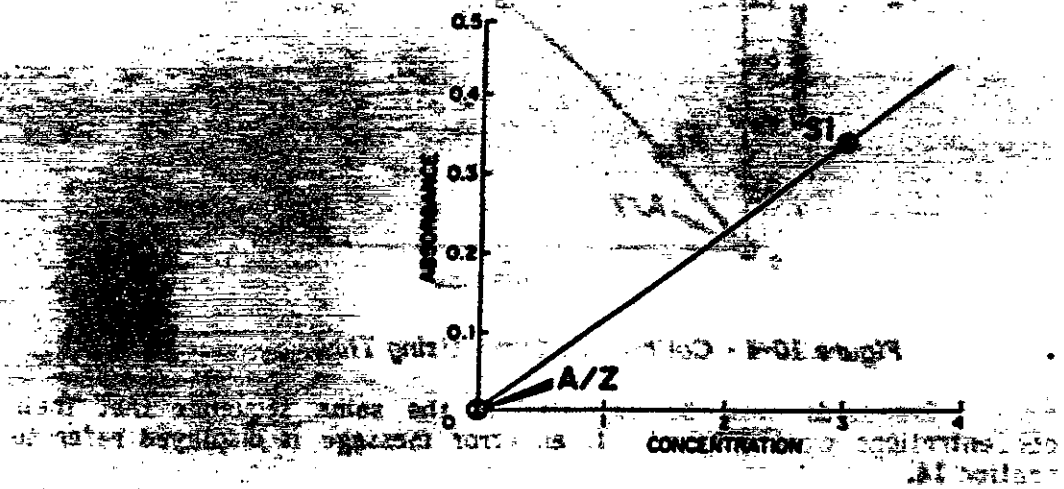


Figure 10-2 - Calibration Curve using a Single Standard

8) If two standards are being used, aspirate S2 and press S2 to start the READ cycle. When the READ indicator is extinguished and the S2 lamp stops flashing and remains on, calibration using two standards is established. (See Figure 10-3).

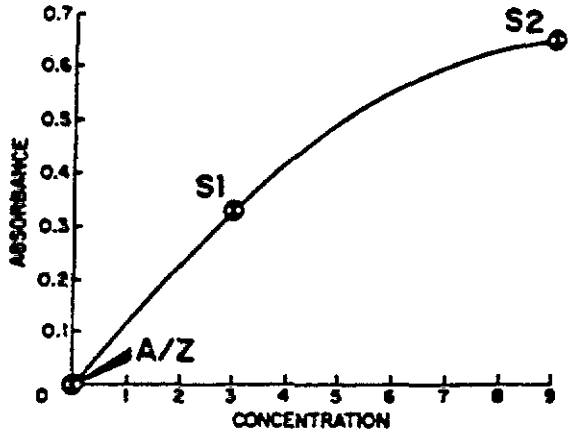


Figure 10-3 - Calibration Curve using Two Standards

9) If a third standard is being used, establish calibration for S3 as described in step 8. Figure 10-4 shows a typical three-standard calibration curve.

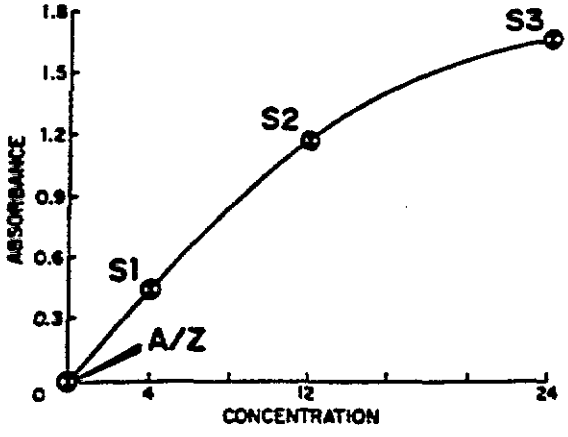


Figure 10-4 - Calibration Curve Using Three Standards

Note: Standards must be aspirated in the same sequence that their concentrations were entered. If an error message is displayed refer to Section 14.

With the appropriate calibration curve established, the Model 5000 is able to convert non-linear absorbance readings of the samples directly into concentrations, which are then displayed.

An E10 will also be displayed if an attempt is made to expand a negative absorbance value, and again it probably means that the wrong standard has been aspirated. (A negative absorbance means that the sample has less absorption than the blank used for autozero).

10H,2. Standards Out of Sequence (E-11)

The concentration values may be entered in any sequence, provided the standards are aspirated in the same sequence.

10H,3. S-Shaped Calibration Curve (E-12)

In some instances it is possible for the data to describe an S-shaped curve (see Figure 10-1). If this occurs, the System will not establish calibration using the most recently determined standard, and E12 will be displayed.

The most frequent causes of this error are the use of too many standards or improperly prepared standards.

10H,4. Reslope Standard Out of Range (E-13)

If the concentration of the standard used in Reslope is higher than the most concentrated standard used in the initial calibration, an E-13 error will be displayed. For best results the Reslope standard should be approximately in the middle of the calibrated range.

10H,5. S2, S3 Values Do Not Follow S1 Format (E-14)

As described in Section 10D, the value entered for the concentration of S1 determines the number of digits that may be entered for S2 and S3.

For example, if S1 is entered as:

5.000 (which is equivalent to 4 digits.)

then 10.0

will not be accepted as the value of S2, as this is interpreted as a 5 digit number. An E-59 will be displayed. S1 should have been entered as 5.00 or 5.0.

Also, if S1, S2 and S3 are entered correctly, for example:

and [illegible] calibrate, then changing S1 to 6.000 will cause an E-14 to be displayed if recalibration using S2 and S3 is attempted.

10I. AVERAGING AND STATISTICAL OPERATIONS

10I,1. Averaging

The Model 5600 has the facility to take a predetermined number of readings, average them and display the result or print the result on an external printer. When the number on the display is an averaged result the AVERAGE light comes on. On an external printer the letters AV are printed next to the averaged result; a sequence number is printed for the average only, and not for the individual results. To initiate averaging, proceed as follows:

E-12 S-Shaped Calibration Curve.

Explanation: The line used to describe the data points is S-Shaped. The system has no tolerance for lines with a sl[redacted] inversion. (Refer to Section 10B).

Causes:
1) Standards used for calibration have been prepared incorrectly.
2) Three standards have been used over a linear range. Owing to truncation of results or System noise, the resulting data points do not fall precisely on a straight line.

Remedy: If Cause 1), Prepare correct standards.
If Cause 2), Repeat the calibration using a single, or at the most two, standards.

E-13 Reslope Standard Out of Range.

Explanation: The absorbance of the Reslope standard is higher than that of the most concentrated standard.

Cause: The absorbance of the RESLOPE standard is excessive. It must fall within the range of the standards used in the initial calibration.

Remedy: A RESLOPE standard near the middle of the standard concentration range is recommended for the best results.

E-14 S2 or S3 Values Do Not Follow S1 Format.

Explanation: The location of the decimal point is not compatible w[redacted] the entry for S1.

Cause: As discussed in Section 10D, the values of S2 and S3 standards must be considered when entering the concentration value for S1. This error will be found and indicated if a new value is entered for S1 which makes S2 and S3 invalid, and then calibration is attempted using these incompatible values of S2 and S3.

Example: If S1, S2 and S3 are entered correctly, e.g.

S1 5.00
S2 10.00
S3 20.00

and used to calibrate, then changing S1 to 6.000 will cause an E14 to be displayed if recalibration using S2 and S3 is attempted.

Remedy: Re-enter a correct value for S1.

E-2(X) CATEGORY MAGNETIC CARD READER ERRORS.

Errors in this category are displayed only if the Card Reader Accessory is installed. The error message remains on the display until CE is pressed.

Draft

WESTON

USEPA - Region III
Organic QA Data Review
Page 1 of 4

Case #/Site ID: 7324/LA Clarke
Sample Numbers: CG077-CG098, CG133-CG146

Site Manager: Ralph Shapot

Data Reviewer: Dianna Therry
Report Date: 4 October 1987

OVERVIEW

The set of samples for Case 7324 contained twenty-seven aqueous samples and nine soil samples which were analyzed through the Contract Laboratory Program (CLP) routine analytical services by one laboratory. The sample set included two trip blanks, one rinsate blank, one water blank and three field duplicates.

SUMMARY

The laboratory performed the analyses in compliance with CLP protocols, including the required quality control procedures. Instrument tune and mass calibration were within specifications. Surrogate and matrix spike recoveries gave no indication of matrix problems, however, comparison of laboratory replicate analyses gave indication of sample non-homogeneity for some target compounds in the BNA fraction. Field duplicate results showed acceptable precision for values reported near the detection limits. Another significant problem in this data set was no instrument response to 3,3'-dichlorobenzidine, which precludes obtaining usable data for this compound in all samples. Other minor problems are associated with blank contamination, the laboratory's inability to distinguish between [illegible] isomers, and variable response during BNA calibration. Problems associated with data usability are discussed in the following sections according to the seriousness of the problem. The data summary table has been annotated with the appropriate qualifier codes.

MAJOR ~~ERRORS~~

1. [illegible]dichlorobenzidine data for all samples are rejected as no measurable response to this compound was evident during calibration. Failure to detect 3,3'-dichlorobenzidine under this condition does not confirm its absence in the samples. If this compound is critical to the site, follow-up analysis may be necessary.

WESTON

2. Two BNA samples, CG137 and CG138, were analyzed as medium level soils. The associated quality control replicates for these soils (CG138, CG138MS, CG138MSD) show good reproducibility between reported results in the MS/MSD. However, there is extreme variability in the results of the MS/MSD compared to the unspiked sample for polynuclear aromatic hydrocarbons (PAH's) which are of equal or greater molecular weight than phenanthrene. This indicates that the sample may not be homogeneous for these compounds. This situation may be magnified by the small sample size (one gram) required for medium level soil analysis, which makes it difficult to obtain a representative aliquot for analysis. The ensuing table shows a comparison of reported PAH's for which the sample may not be homogeneous. Associated results in the data summary for samples CG137 amd CG138 have been qualified as estimated (J). Reported results may not reflect the true average concentration of these compounds in the sample.

	Sample Results (ug/kg)			
Compound	CG138	CG138MS	CG138MSD	%RSD
phenanthrene	550,000	150,000	200,000	73%
anthracene	2,000,000	50,000	69,000	159%
fluoranthene	1,500,000	240,000	250,000	109%
pyrene*	1,400,000	(319,000)*	(338,000)*	90%
benzo(a) anthracene	570,000	77,000	62,000	122%
chrysene	670,000	71,000	70,000	128%
benzo(b+k) fluoranthene	470,000	110,000	73,000	101%
benzo(a)pyrene	240,000	34,000J	28,000J	120%
indeno(1,2,3-cd) pyrene	93,000	20,000J	13,000J	105%
dibenzo(ah) anthracene	7,200J	12,000J	6,000J	38%
benzo(ghi)perylene	100,000	22,000J	11,000J	109%

*Spike compound. Value in parentheses is amount of sample plus spike added. %RSD calculated assuming 0% recovery of spike amount.

MINOR ISSUES

1. Laboratory and/or field blanks contained methylene chloride, acetone, 2-butanone, toluene, and bis(2-ethylhexyl)phthalate at concentrations significant enough to question the reported results for some of the samples. These compounds have been qualified as not detected (U) and the quantification limit qualified as estimated (J) for the affected samples.

Compound	Affected sample results
methylene chloride	all reported results
acetone	all reported results
2-butanone	all reported results
toluene	all except GC080-CG081, CG096, CG097, CG135, CG137, CG138
bis(2-ethylhexyl) phthalate	all reported results except CG141

Note:

Method blanks show a consistent 1-2 ug/kg level of toluene which, for this particular compound, is generally indicative of instrument related contamination, and is not expected to vary significantly over the course of the analytical shift. Therefore, all results for toluene of 1-3 ug/kg have been qualified due to lab contamination.

Toluene results greater than 3 ug/kg and/or with collaborating evidence of presence in the sample (i.e. the presence of other volatile aromatics) have not been qualified as possible blank contamination. In this reviewers opinion, the "10X" rule specified in the functional guidelines for data review does not apply.

2. The laboratory is unable to distinguish between the benzo(b)fluoranthene and benzo(k)fluoranthene isomers, which have similar mass spectra and retention times. The reported results for samples CG080-CG082, CG135, CG137, CG138, CG141, CG142, CG145 and CG146 represent the total benzo (b&k) fluoranthene present.

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3. The response factors during initial and/or continuing calibration for up to four VOA compounds and twelve BNA compounds were variable in each sample. The sample results and detection limits have been qualified as estimated (J or UJ) for the affected compounds.

4. N-Nitrosodiphenylamine has been qualified as qualitatively questionable (J) for sample CG146. Sample spectra does not provide a good, clean identification due to the nature of the sample matrix, however, the compound may be present.

INFORMATION REGARDING REPORT CONTENT

These data were reviewed according to the National Functional Guidelines for Evaluating Organic Analyses. All data have been validated with regard to usability. The method used by the CLP must be evaluated by each individual user as to whether the scope, precision, and accuracy meet the needs of the project.

The text of this report has been formatted to address only those problem areas which affect the application of the data to the site investigation. Documentation of these problems and any other observed areas of laboratory contractual noncompliance are included in a separate report sent to the laboratory's CLP Project Officer. If you have questions or comments on this data review, please call me.

Enclosures

ORGANIC DATA VALIDATION SUMMARY

Date Review Completed
Case No. 7324 SAS No.
Site Name LA Clarke
Sample Nos.

Contract Lab ENSECO-CAL
Contract No. 68-01-7140
Lab DPO
Reviewer Dianne J. Berry
from Region III Phone 215-524-7360
FTS WESTON

MATRIX	CONCENTRATION low	med	high	MATRIX RELATED COMMENTS
soil/solid	7	2		includes 1 duplicate
aqueous	27			includes 4 blanks, 2 duplicates
other				

VOLATILES	OK	FYI	ACTION	COMMENTS
GC/MS tuning--BFB	✓			
Initial Calibration	✓	✓		② see attached Fig IA for non-CCC
Continuing Calibration	✓	✓		③ outside accept. criteria
Surrogate Recovery				
Matrix Spikes				
Reagent Blanks				
Holding times				

SEMI-VOLATILES				
GC/MS tuning--DFTPP			✓	6/5/87 initial, cont. FB.
Initial Calibration		✓	✓①	② see attached Fig. IB for non-CCC, non-SPCC outside accept. criteria
Continuing Calibration		✓	✓①	③
Surrogate Recovery	✓			
Matrix Spikes			✓③	
Reagent Blanks				
Holding times				

PESTICIDES				
Instrument Performance				not required
Initial Calibration				
Continuing Calibration				
Surrogate Recovery				
Matrix Spikes				
Reagent Blanks				
Holding times				

OVERALL CASE				
Compound Identification			✓②	
Data Completeness				

REVIEWER'S COMMENTS:

① Form VI + VII - compds are not listed in correct order per SOW 785 pp A-9 + A-5 section 2.

② Lab does not analyze for 3,3'-dichlorobenzidine, lab cannot distinguish between benzo(b)fluoranthene & benzo(k)fluoranthene (isomers)

③ Lab did not calculate %RPD for MS/MSD form correctly. Should be calc. based on the concentration of spike compound, not based on comparison of the % recoveries. This only makes a difference if there was compound present in the sample before spike addition.

L.A. Clarke

In Reference to Case No(s):

7324 Organic

Contract Laboratory Program
REGIONAL/LABORATORY COMMUNICATION SYSTEM

Telephone Record Log

Date of Call: 7/20/87 left message.

Laboratory Name: ENSEDO - Cal 916-372-1393

Lab Contact: Kevin Yee

Region: III - Data Review

Regional Contact: Dianne Thorp (WESTON : 215-524-7360)

Call Initiated By: ___ Laboratory ___ Region

RESUBMITTAL RECEIVED
AUG 24 1987
FOR QA DATA REVIEW

In reference to data for the following sample number(s):

DFTPP + initial calib.

Summary of Questions/Issues Discussed:

① package contains tune/initial calib for 6/5/87 instrument F15. Not applicable to this case. NEED tune/bar graph/mass listing + calib initial from VI + respective chromat for 6/5/87 for instrument F12

② schedule on RS of CG077MS.

Summary of Resolution:

Rec'd 7/24/87 DRM

1- will send out right away ← Rec'd 7/24/87 DRM

2- will send out in a couple weeks ← still due

Dianne J Thorp
Signature

7/21/87
Date

Distribution: (1) Lab Copy, (2) Region Copy, (3) SMO Copy

cc: Rosa Meyer

E-188

AR302751

7324 LA Clarke
(ENSECO - Cal Lab)

CALIBRATION CRITERIA FIG. IB

BNA

Instrument F12

CAS Number	ug/l or ug/kg (Dry Basis)	Initial 6-5-87	6-8-87 7:42	Initial 6-11-87	6-12-87 ?:00	6-13-87 11:00	6-15-87 7:56	6-15-87 20:38	6-18-87 11:28	6-19-87 7:55	6-24-87 7:19
108-95-2	Phenol										
111-44-4	bis(-2-Chloroethyl)Ether		-32							31	
95-57-8	2-Chlorophenol										
541-73-1	1, 3-Dichlorobenzene										
106-46-7	1, 4-Dichlorobenzene										
100-51-6	Benzyl Alcohol									27	
95-50-1	1, 2-Dichlorobenzene										
95-48-7	2-Methylphenol									32	
39638-32-9	bis(2-chloroisopropyl)Ether									27	
106-44-5	4-Methylphenol		-27							33	
621-64-7	N-Nitroso-Di-n-Propylamine		-29								
67-72-1	Hexachloroethane									33	34
98-95-3	Nitrobenzene										
78-59-1	Isophorone										
88-75-5	2-Nitrophenol										
105-67-9	2, 4-Dimethylphenol		-31		-26		-32				
65-85-0	Benzoic Acid (1)		26								
111-91-1	bis(-2-Chloroethoxy)Methane										
120-83-2	2, 4-Dichlorophenol										
120-82-1	1, 2, 4-Trichlorobenzene										
91-20-3	Naphthalene										
106-47-8	4-Chloroaniline										
87-68-3	Hexachlorobutadiene										
59-50-7	4-Chloro-3-Methylphenol										
91-57-6	2-Methylnaphthalene										
77-47-4	Hexachlorocyclopentadiene		-31		-30	-28	-35				32
88-06-2	2, 4, 6-Trichlorophenol										
95-95-4	2, 4, 5-Trichlorophenol (1)										
91-58-7	2-Chloronaphthalene										
88-74-4	2-Nitroaniline (1)					—			30	49	
131-11-3	Dimethyl Phthalate										
208-96-8	Acenaphthylene										
99-09-2	3-Nitroaniline (1)										
83-32-9	Acenaphthene										
51-28-5	2, 4-Dinitrophenol (1)										
100-02-7	4-Nitrophenol (1)						-34		32	29	29
132-64-9	Dibenzofuran										
121-14-2	2, 4-Dinitrotoluene								42	72	28
606-20-2	2, 6-Dinitrotoluene										
84-66-2	Diethylphthalate									29	
7005-72-3	4-Chlorophenyl-phenylether										
86-73-7	Fluorene										
100-01-6	4-Nitroaniline (1)	39							27		
534-52-1	4, 6-Dinitro-2-Methylphenol (1)										
86-30-6	N-Nitrosodiphenylamine (1)										
101-55-3	4-Bromophenyl-phenylether										
118-74-1	Hexachlorobenzene										31
87-86-5	Pentachlorophenol (1)										
85-01-8	Phenanthrene										
120-12-7	Anthracene										
84-74-2	Di-n-Butylphthalate									27	
206-44-0	Fluoranthene										
129-00-0	Pyrene										
85-68-7	Butylbenzylphthalate										
91-94-1	3, 3'-Dichlorobenzidine (1)	R	R	R	R	R	R	R	R	R	R
56-55-3	Benzo(a)Anthracene										
117-81-7	bis(2-Ethylhexyl)Phthalate										
218-01-9	Chrysene										
117-84-0	Di-n-Octyl Phthalate										
205-99-2	Benzo(b)Fluoranthene										
207-08-9	Benzo(k)Fluoranthene										
50-32-8	Benzo(a)Pyrene										
193-39-5	Indeno(1, 2, 3-cd)Pyrene										
53-70-3	Dibenz(a, h)Anthracene										27
191-24-2	Benzo(g, h, i)Perylene									27	
			MB1 L331 0EMDBB CG077 CG077MS MSD CG079 -CG010		CG081 -CG085 CG087 CG088	CG089 CG092 -CG096	CG076 CG090 CG091 CG097 CG133 -CG136 CG134(R)	MB L3314MM CG137 CG138	CG139MS MSD CG139 CG080MS MSD	CG140 -CG146 CG139MS MSD	CG139 CG077MS

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Case 7324 LAClarke
(ENSECO - Cal Lab.)

VOA CALIBRATION CRITERIA FIG. IA

CAS Number	ug/l or ug/Kg (Circle One)	Instrument F4 (soil) Initial 5-22-87	5-26-87 9:48	5-27-87 11:21	Instrument F9 (water) Initial 5-26-87	5-27-87 8:17	5-27-87 14:38	5-28-87 8:54			
74-87-3	Chloromethane			-30							
74-83-9	Bromomethane	36		-26							
75-01-4	Vinyl Chloride										
75-00-3	Chloroethane							30			
75-09-2	Methylene Chloride										
67-64-1	Acetone		31								
75-15-0	Carbon Disulfide										
75-35-4	1, 1-Dichloroethene										
75-34-3	1, 1-Dichloroethane										
156-60-5	Trans-1, 2-Dichloroethene										
67-66-3	Chloroform										
107-06-2	1, 2-Dichloroethane										
78-93-3	2-Butanone				0.034	0.037	0.033	0.031			
71-55-6	1, 1, 1-Trichloroethane										
56-23-5	Carbon Tetrachloride										
108-05-4	Vinyl Acetate										
75-27-4	Bromodichloromethane										
78-87-5	1, 2-Dichloropropane										
10061-02-6	Trans-1, 3-Dichloropropene										
79-01-6	Trichloroethene										
124-48-1	Dibromochloromethane										
79-00-5	1, 1, 2-Trichloroethane										
71-43-2	Benzene										
10061-01-5	cis-1, 3-Dichloropropene										
110-75-8	2-Chloroethylvinylether										
75-25-2	Bromoform						-46	-30			
591-78-6	4-Methyl-2-Pentanone						29	+36			
108-10-1	2-Hexanone						26	30			
127-18-4	Tetrachloroethene										
79-34-5	1, 1, 2, 2-Tetrachloroethane										
108-88-3	Toluene										
108-90-7	Chlorobenzene										
100-41-4	Ethylbenzene										
100-42-5	Styrene										
	Total Xylenes										
			BLK 10:57 CG138	BLK 12:[illegible] CG080 CG081		BLK 10:22 CG097 - CG090	BLK 15:25 CG091 - CG098 [illegible]	BLK 9:34 CG134 - CG140 144	CG085 CG086		

SENT BY Xerox Telecopier 7020 ;10- 8-87 ; 8:16PM ; 2155247503→ E-190 ;# 9/#20

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Appendix F

APPENDIX F

UV FLUORESCENCE SCREENING TECHNIQUES FOR SOIL AND WATER

METHOD VALIDATION OF UV FLUORESCENCE SCREENING TECHNIQUES FOR SOIL AND WATER SAMPLES FROM THE L.A. CLARKE SITE

SUBMITTED BY:
Edward P. McGovern, Ph.D.
Inorganic Section Manager
WESTON Analytical Laboratories

APPROVED BY:
Earl M. Hansen, Ph.D.
Manager
WESTON Analytical Laboratories

INTRODUCTION

This report describes the method validation of field screening techniques for rapid determination of the total Polynuclear Aromatic Hydrocarbon (PAH) concentration in soils and waters found at the L.A. Clarke Site.

The purpose of this work was to validate rapid (10-20 minutes), semi-quantitative analytical methods for the screening analysis of soil and water samples for total polynuclear aromatic hydrocarbons (PAHs) with a method target detection limit of 1-10 ug/g for soils and 1-10 ug/l for waters. This method measures a total concentration of PAHs which is comparable to those obtained using conventional analytical methods (eg., EPA-CLP Protocol and/or 8270). The technical approach described in the following sections focuses on the validation of a method for the rapid extraction of PAHs from soils and waters with analysis using UV fluorescence spectrophotometry.

The methods validated for rapid screening of total PAH at the L.A. Clarke site are based on similar work performed for the Southern Maryland Wood Treating Site (SMWTS). This work, consisting of both a method development and method validation phase was summarized in Preliminary Draft form on December 17, 1985 (Document Control No.: 193-RI1-RT-CALY-1). A background section has been included to summarize relevant method development steps taken during SMWTS method development and validation.

Abstract

Rapid field screening techniques for the determination of total Polynuclear Aromatic Hydrocarbons (PAHs) in soil and water samples have been validated for use at the L.A. Clarke Site. This method employs micro-extraction and UV fluorescence analysis techniques to yield an estimate of total PAH content.

Method accuracy and precision have been determined by analyzing a series of spikes prepared with background soil and water from the L.A. Clarke Site. This method validation step has been conducted using napthalene, acenapthene and phenanthrene as target compounds. These compounds are representative of PAH compounds in general as well as those found at the L.A. Clarke Site.

A mixture of seven PAH compounds, containing from two to six rings, has been prepared to estimate total PAH content of on-site and background soil and water samples. These results have been compared with GC/MS data.

Background

A rapid field screening technique for the determination of total Polynuclear Aromatic Hydrocarbons (PAHs) in soils and waters was developed and validated for use at the Southern Maryland Wood Treating Site. Initially, a literature search was performed to provide information on alternative extraction and analysis methods, UV fluorescence spectral characteristics of the PAHs of interest, and concentrations of interest. Based on the literature search, the method development phase was focused on the use of UV fluorescence detection for analysis of PAHs in the soil and water samples.

Naphthalene, acenapthene, and phenanthrene, which were found in samples from the Southern Maryland Wood Treating Site (ERT sampling, January 1985) were selected as target compounds in the Method Development and Method Validation phases of this project. These three compounds were used to spike laboratory reagent water and background soil to establish the accuracy and precision of rapid screening techniques for water and soil. Soil and water samples were extracted for analysis by UV fluorescence spectrophotometry.

The fluorescence spectra of seven PAH compounds found at the highest concentrations in the majority of samples from the SMWT site in January 1985 were examined, as an initial step towards analysis of soils and water samples. Based on the UV fluorescence spectra of the PAH compounds, excitation/emission wavelength pairs were selected which would most accurately quantify the mixture of PAH compounds present at the SMWT site.

Screening Method Validation - Compound Selection

Three PAH compounds, napthalene, acenapthene and phenanthrene, were selected as target compounds for method validation. These compounds have been identified at the L.A. Clarke Site in both water and soil samples (Draft Project Operations Plan, 6 December 1986, NUS-FIT III Report, 21 May 1984).

Naphthalene and acenaphthene contain two fused aromatic rings, phenanthrene contains three. These compounds are representative of PAH compounds present at the L.A. Clarke Site and should closely parallel the behavior of all PAH compounds of interest (ie., those with from two to six rings).

Spectral characteristics of the three compounds are given in Table 1. Napthalene and acenapthene are quantified simultaneously as total napthalene/acenapthene while phenanthrene is quantified at a different wavelength pair.

Table 1
UV FLUORESCENCE CHARACTERISTICS OF TARGET COMPOUNDS

COMPOUND	EXCITATION (Ex) and EMISSION (Em) MAXIMA		COMPROMISE WAVELENGTHS USED	
	Ex	Em	Ex	Em
Napthalene	275	355	280	340
Acenapthene	280	355	280	340
Phenanthrene	250	365	250	370

Method Validation - Soil

The initial method validation step for soil was to select one of the six blank soils received for spiking for the determination of method accuracy and precision. Due to varying appearance, all six blank soils were extracted and analyzed to determine the PAH background present in each soil. This was necessary to ensure that at the lower concentration used in the validation the spike would not be obscured by background concentrations.

Total PAH concentration in the blank soils ranged from an average of 2.6 ug/gm in BS-4 to an average of 45 ug/gm in BS-1. BS-4 was selected as the background soil to be used for spiking and method validation due to the relatively low background PAH concentration and its similarity in soil type (sandy loam) to on-site soils received from L.A. Clarke.

At this point, five sets of triplicate spikes were prepared and analyzed by UV fluorescence using BS-4 as a background soil. As previously discussed, napthalene, acenapthene and phenanthrene were selected as target compounds. Spike results are corrected for background contribution and are presented in Tables 2 and 3. A summary of the method used for rapid screening is listed below:

RAPID SCREENING OF SOIL FOR TOTAL PAH CONCENTRATION

1. Weigh 1.0 g wet soil into a 40 ml vial.
2. Add 1.0 g anhydrous sodium sulfate.
3. Add 10 ml UV grade acetonitrile.
4. Shake vigorously for 15 seconds.
5. Let sample settle for 1 minute.
6. Filter samples through 0.2 micron teflon filter (with in-line syringe).
7. Calibrate instrument from 0.1 to 1.0 ug/ml for each target compound.
8. Analyze extracts by UV fluorescence, diluting the extract into calibration range as necessary.
9. Standards must be prepared in acetonitrile, which is the same solvent used for extraction.

Table 2
RECOVERY OF PAH TARGET COMPOUNDS
FROM SOIL VALIDATION SAMPLES

Concentration of Each Analyte ug/g	Total PAH Concentration ug/g	% Recovery Napthalene/ Acenapthene	% Recovery Phenanthrene
2	6	82	85
2	6	86	88
2	6	86	88
5	15	62	77
5	15	64	78
5	15	62	76
10	30	81	79
10	30	76	75
10	30	80	79
50	150	89	85

Table 2 (Cont'd)
RECOVERY OF PAH TARGET COMPOUNDS
FROM SOIL VALIDATION SAMPLES

Concentration of Each Analyte ug/g	Total PAH Concentration ug/g	% Recovery Napthalene/ Acenapthene	% Recovery Phenanthrene
50	150	90	85
50	150	90	86
100	300	92	89
100	300	92	90
100	300	92	89

Note: L.A. Clarke BS-4 (May 5, 1986 sampling) used as background soil. Results are corrected for unspiked soil contribution.

Table 3
METHOD PRECISION AND ACCURACY
FOR TOTAL PAH IN SOIL SAMPLES

Total Concentration ug/g	Average Recovery(%) Napthalene/ Acenapthene	RSD(%)*	Average Recovery(%) Phenanthrene	RSD(%)*
6	85	2.5	87	2.0
15	63	1.8	77	1.3
30	79	3.3	78	3.0
150	90	0.6	85	0.7
300	92	0.0	89	0.6

*Relative Standard Deviation

Method Validation- Water Samples

Sample BW-6 was selected as the background water for validation of PAH screening techniques at the L.A. Clarke site. Background PAH levels of 8.3 ug/l found in this sample were sufficiently low to validate the water PAH screening method over a concentration range of 9 ug/L to 1800 ug/L total PAH concentration. Napthalene, acenapthene and phenanthrene were selected as target compounds, as previously discussed. The extraction method validated is summarized below:

RAPID SCREENING OF WATER FOR TOTAL PAH CONCENTRATION

1. Mix sample. Add 25 ml of sample to a 40 ml teflon capped vial.

2. Add 5 ml UV grade hexane. Shake for 1 minute.

3. Let sample settle for 5 minutes.

4. Filter extract through 1 inch column of anhydrous sodium sulfate to remove water.

5. Analyze hexane extract by UV fluorescence.

6. Prepare standards in hexane, which is the same solvent used for sample extraction.

Three sets of triplicate samples were prepared and analyzed for target compounds. Results are summarized in Tables 4 and 5. These results have been corrected for background contribution from water sample BW-6, used for spiking and validation.

Table 4
RECOVERY OF PAH TARGET COMPOUNDS
FROM WATER VALIDATION SAMPLES

Concentration of Each Analyte ug/l	Total Concentration ug/l	% Recovery Napthalene/ Acenapthene	% Recovery Phenanthrene
3	9	83	89
3	9	100	111
3	9	100	100
30	90	96	96
30	90	103	100
30	90	96	96
600	1800	105	104
600	1800	96	97
600	1800	102	101

Note: L.A. Clarke BW-6 (May 5, 1986 sampling) used as background water. Results are corrected for unspiked water contribution.

Table 5
METHOD PRECISION AND ACCURACY
FOR TOTAL PAHs IN WATER SAMPLES

Total Concentration ug/l	Average Recovery(%) Napthalene/ Acenapthene	RSD(%)*	Average Recovery(%) Phenanthrene	RSD(%)*
9	94	10	100	11
90	98	4.1	97	2.4
1800	101	4.5	101	3.5

*Relative Standard Deviation

Total PAH Screening

Samples were analyzed for total PAH content using a standard mixture containing seven PAH compounds. This mixture was diluted with acetonitrile for soil analysis and hexane for water analysis. The composition of this mixture is shown in Table 6. All seven compounds are among the prevalent PAH compounds found at the L.A. Clarke site.

Table 6
COMPOSITION OF TOTAL PAH SCREENING STANDARD MIX

Compound	Group No.	No. of Rings	Stock Concentration in ug/ml	Compromise Wavelength in nm Pairs	Wavelength Pair Group Concentration
napthalene	1	2	100	280/340	300 ug/ml
acenapthene	1	3	100	280/340	
fluorene	1	3	100	280/340	
phenanthrene	2	3	100	250/400	400 ug/ml
fluoranthene	2	4	100	250/400	
pyrene	2	4	100	250/400	
benzo(k)fluoranthene	2	6	100	250/400	

As depicted in Table 6, three compounds were detected using the 280 nm/340 nm wavelength pair and four compounds were detected using the 250 nm/400 nm wavelength pair. Serial dilutions were prepared to calibrate from 0.005 ng/ul to 1 ng/ul for each component. Thus, the calibration range was 0.015 ng/ul to 3 ng/ul for group 1 (3 components) and 0.020 ng/ul to 4 ng/ul for group 2 (4 components). Results from screening soil and water samples for total PAH concentrations are presented in Tables 7 and 8 respectively. It should be noted that sample preparation for these analyses is identical to the procedures outlined in the method validation sections.

Table 7
COMPARISON OF UV FLUORESCENCE RAPID SCREENING AND GC/MS DATA FOR TOTAL PAH IN WATER SAMPLES

Sample I.D.	Type	Technique	Total PAH ug/l Rep.#1	Rep.#2	Rep.#3	Average PAH Concentration ug/l
SW-1	On-site	UV	4800	2600	440	2600
SW-1	On-site	GC/MS	1200	---	---	1200
SW-2	On-site	UV	490,000	310,000	390,000	400,000
SW-2	On-site	GC/MS	150,000	---	---	150,000
BW-1	Background	UV	15	17	24	19
BW-1	Background	GC/MS	ND	---	---	ND
BW-2	Background	UV	23	27	143	64
BW-2	Background	GC/MS	ND	---	---	ND

*NOTE: ND=Not Detected
---=Not Analyzed
Rep.=Replicate

Table 8
COMPARISON OF UV FLUORESCENCE RAPID SCREENING AND GC/MS DATA FOR TOTAL PAHs IN SOIL SAMPLES

Sample I.D.	Type	Technique	Total PAH ug/gm (dry weight) Rep.#1	Rep.#2	Rep.#3	Average PAH Concentration ug/gm
SG-1	On-site	UV	490,000	420,000	370,000	390,000
SG-1	On-site	GC/MS	64,000	---	---	64,000
SG-2	On-site	UV	230,000	230,000	82,000	169,000
SG-2	On-site	GC/MS	19,000	---	---	19,000
BS-1	Background	UV	38	48	51	46
BS-1	Background	GC/MS	35	---	---	35
BS-2	Background	UV	4.2	9.5	5.4	6.4
BS-2	Background	GC/MS	19	---	---	19

*NOTE: ---=Not Analyzed
Rep.=Replicate

Conclusions and Recommendations

The rapid screening methodology for total PAH content in water and soil originally developed for SMWTS and validated for the L.A. Clarke site provides an estimation of PAH content which compares favorably to results obtained by conventional GC/MS techniques (Tables 7 and 8). In all cases UV fluorescence screening gave total PAH concentration within one order of magnitude of total PAH concentration derived from GC/MS analysis.

GC/MS results for total PAHs are the sum of the sixteen HSL PAH compounds. GC/MS operators have noted that some of these samples contained numerous PAH compounds not included on the HSL list. These compounds differ from HSL PAH compounds in either parent ring structure or degree of substitution (primarily alkyl) on the parent ring structure. In many cases these compounds were present at levels comparable to the sixteen HSL compounds used to obtain a sum representing total PAH concentration. Therefore, it is likely that GC/MS total PAH results actually represent a minimum for each sample. This offers at least partial explanation for the difference between UV fluorescence and GC/MS results for soil samples SG-1 and SG-2 (Table 8).

Minimal sample variation was observed for soil samples during UV fluorescence screening for total PAH concentration. However, water samples showed a much greater range as shown in Table 7. This variation was not observed during method validation but was apparent during sample screening for total PAH concentration. A much higher result can possibly be explained by the presence of soil or tar ball particles within the sample. We have no readily apparent explanation for variation much below the sample mean.

Filtering water samples through glass wool prior to analysis is an additional step we would recommend to reduce this variation in total PAH results for water sample. The analysis of all water samples in duplicate is also recommended.

In both background water samples, GC/MS analysis detected no PAH compounds of interest. These results are highly dependent upon GC/MS detection limits of 10 ug/l for individual PAH compounds. Therefore, GC/MS total PAH results of ND (Not Detected) for background water samples versus rapid screening results of 19 ug/l (BW-1) and 64 ug/l (BW-2) do not indicate a discrepancy between the two methods. Assuming individual PAH compounds are present in a water sample, total PAH concentration could approach 160 ug/l (10 ug/l for each HSL) and final results would be reported as "Not Detected".

In conclusion, this validation study has demonstrated that these methods offer a rapid, reliable technique for determination of total PAHs in water and soil samples. Method accuracy and precision, as well as comparison of results to conventional GC/MS techniques indicate that these methods yield a valid estimate of total PAH concentration.

COMPARISON OF UV FLUORESCENCE RAPID SCREENING
AND CLP ANALYSIS FOR TOTAL PNAs IN SOIL

Sample ID	UV, mg/kg	GC/MS mg/kg
SP-21-1	4.2	0
TP-7-1	701	35.4
TP-7-2	2.7	0.4
TP-7-4	39.6	1.0
TP-8-1	31.1	4.0
TP-8-2	7,038	1,241
TP-12-1	48.5	2.7
TP-13-1	3,686	153
TP-13-2	17.9	2.9
TR-1-1	44.6	14,983
TP-17-1	8.3	0.3
TP-17-2	9,062	4,610
TP-17-3	9.9	1.2
TP-18-2	1.3	737
TP-19-3	10.5	0
TP-19-3	9.2	0.1
TP-20-2	22.7	2.2
TP-22-2	307	8,304
VC-02	12.1	2.3

L.A.CLARKE & SON, INC. PHASE II SITE INVESTIGATION SEPT.15 - 22,1986
EPA CONTRACT NO. 68-01-0939
WORK ASSIGNMENT NO. 149-3HF9.0
UV FIELD SCREENING DATA - TOTAL PNAs
SAMPLE TYPE: SHALLOW PIT

SAMPLE NUMBER	SAMPLING DATE	TOTAL PNAs IN SAMPLE ppm	LOCATION	VAX Y COORD	VAX X COORD	SAMPLE DEPTH, INCHES	SAMPL. TIME	SAMPLE EXTRACTION DATE	SCREENING DATE	LOT NUMBER	WEIGHT gms	280/340 WAVELENGTH PAIR	280/340 ng/ul	250/400 WAVELENGTH PAIR	250/400 ng/ul
SP-01-01	9/16/86	19.221	B-25	2	25	0 - 6	09:45	9/16/86	9/20/86	UV-001	3.003	1.700	0.173	9.500	1.751
SP-01-02	9/16/86	1.489	B-25	2	25	12 - 18	09:45	9/16/86	9/20/86	UV-001	3.102	0.400	0.032	1.000	0.122
SP-02-01	9/16/86	5.202	B-24	2	24	0 - 6	09:45	9/16/86	9/20/86	UV-001	3.119	0.800	0.075	4.300	0.466
SP-02-02	9/16/86	29.967	B-24	2	24	6 - 12	09:45	9/16/86	9/20/86	UV-001	3.003	2.500	0.260	13.500	2.740
SP-02-03	9/16/86	44.217	B-24	2	24	12 - 18	09:45	9/16/86	9/20/86	UV-001	3.087	3.800	0.401	19.200	4.149
SP-02-03D	9/16/86	42.963	B-24	2	24	12 - 18		9/16/86	9/20/86	UV-001	3.028	3.200	0.336	18.600	4.001
SP-03-01	9/16/86	X.XXX	B-23	2	23	0 - 6	09:50	9/16/86	9/20/86	UV-001	3.156	0.000	0.000	0.000	0.000
SP-03-01Di (1/100 DILUT)	9/16/86	816.730	B-23	2	23	0 - 6		9/16/86	9/20/86	UV-001	3.156	1.000	0.097	5.500	0.762
SP-03-02	9/16/86	0.627	B-23	2	23	6 - 12	09:50	9/16/86	9/20/86	UV-001	3.064	0.400	0.032	0.300	0.032
SP-04-01	9/16/86	3.949	B-22	2	22	0 - 6	09:55	9/16/86	9/20/86	UV-001	3.024	0.400	0.032	2.900	0.366
SP-04-02	9/16/86	40.520	B-22	2	22	6 - 12	09:55	9/16/86	9/20/86	UV-001	3.276	4.100	0.424	18.600	4.001
SP-04-03	9/16/86	0.272	B-22	2	22	12 - 18	09:55	9/16/86	9/20/86	UV-001	3.026	0.300	0.021	0.100	0.006
SP-05-01	9/16/86	5.131	B-21	2	21	0 - 6	10:00	9/16/86	9/20/86	UV-001	3.044	0.700	0.064	3.600	0.456
SP-05-02	9/16/86	7.600	B-21	2	21	6 - 12	10:00	9/16/86	9/20/86	UV-001	3.099	1.000	0.097	5.200	0.688
SP-06-01	9/16/86	6.629	B-20	2	20	0 - 6	10:00	9/16/86	9/20/86	UV-001	3.007	0.800	0.075	4.800	0.589
SP-06-02	9/16/86	44.059	B-20	2	20	6 - 12	10:00	9/16/86	9/20/86	UV-001	3.000	3.700	0.331	18.900	4.075
SP-07-01	9/16/86	23.551	B-19	2	19	0 - 6	10:00	9/16/86	9/20/86	UV-001	3.000	1.800	0.184	11.200	2.171
SP-07-02	9/16/86	X.XXX	B-19	2	19	6 - 12	10:00	9/16/86	9/20/86	UV-001	3.138	0.000	0.000	0.600	0.071
SP-07-02Di (1/100 DILUT)	9/16/86	784.532	B-19	2	19	6 - 12		9/16/86	9/20/86	UV-001	3.138	1.100	0.108	5.300	0.713
SP-07-04	9/16/86	0.387	B-19	2	19	12 - 18	10:00	9/16/86	9/20/86	UV-001	3.121	0.300	0.021	0.200	0.019
SP-08-01	9/16/86	4.516	B-18	2	18	0 - 6	10:05	9/16/86	9/20/86	UV-001	3.058	0.500	0.043	3.300	0.418
SP-08-02	9/16/86	0.257	B-18	2	18	6 - 12	10:05	9/16/86	9/20/86	UV-001	3.208	0.300	0.021	0.100	0.006
SP-09-01	9/16/86	14.024	B-17	2	17	0 - 6	10:05	9/16/86	9/19/86	UV-002	2.942	1.200	0.119	7.500	1.257
SP-09-02	9/16/86	52.565	B-17	2	17	6 - 12	10:05	9/16/86	9/19/86	UV-002	2.981	7.000	1.099	19.100	4.124
SP-10-01	9/16/86	30.106	B-16	2	16	0 - 6	10:10	9/16/86	9/19/86	UV-002	2.932	2.200	0.227	13.400	2.715
SP-10-02	9/16/86	12.250	B-16	2	16	6 - 12	10:10	9/16/86	9/19/86	UV-002	2.971	1.300	0.130	6.800	1.084
SP-10-03	9/16/86	11.035	B-16	2	16	12 - 18	10:10	9/16/86	9/19/86	UV-002	3.231	1.300	0.130	6.700	1.059
SP-11-01	9/16/86	2.790	B-15	2	15	0 - 6	10:15	9/16/86	9/19/86	UV-002	2.899	0.400	0.032	1.900	0.238
SP-11-02	9/16/86	11.921	B-15	2	15	6 - 12	10:15	9/16/86	9/19/86	UV-002	2.886	1.600	0.162	6.400	0.985
SP-12-01	9/16/86	31.782	E-13	5	13	0 - 12	10:50	9/16/86	9/19/86	UV-002	2.992	2.700	0.282	14.100	2.888
SP-12-02	9/16/86	1.022	E-13	5	13	12 - 24	10:55	9/16/86	9/19/86	UV-002	3.330	0.500	0.043	0.600	0.071
SP-12-02D	9/16/86	0.730	E-13	5	13	12 - 24		9/16/86	9/19/86	UV-002	3.157	0.400	0.032	0.400	0.045
SP-13-01	9/16/86	X.XXX	E-12	5	12	0 - 6	11:05	9/16/86	9/19/86	UV-002	3.251	0.000	0.000	0.000	0.000
SP-13-01Di (1/100 DILUT)	9/16/86	27.892	E-12	5	12	0 - 6		9/16/86	9/19/86	UV-002	3.251	1.800	0.184	13.900	2.839
SP-13-02	9/16/86	8.908	E-12	5	12	6 - 18	11:07	9/16/86	9/19/86	UV-002	2.987	0.800	0.075	5.700	0.812
SP-13-03	9/16/86	3.413	E-12	5	12	30	11:08	9/16/86	9/19/86	UV-002	2.952	0.300	0.021	2.500	0.315
SP-14-01	9/16/86	22.263	E-12.5	5	12.5	0 - 6	11:15	9/16/86	9/19/86	UV-002	2.847	2.300	0.238	10.000	1.875
SP-14-02	9/16/86	0.525	E-12.5	5	12.5	6 - 24	11:17	9/16/86	9/19/86	UV-002	3.037	0.300	0.021	0.300	0.032
SP-15-01	9/16/86	X.XXX	E-11	5	11	0 - 7	11:20	9/16/86	9/19/86	UV-002	2.852	0.000	0.000	0.000	-0.006
SP-15-01Di (1/100 DILUT)	9/16/86	15.641	E-11	5	11	0 - 7		9/16/86	9/19/86	UV-002	2.852	2.000	0.206	7.600	1.281
SP-15-02	9/16/86	9.769	E-11	5	11	7 - 9	11:21	9/16/86	9/19/86	UV-002	2.972	2.000	0.206	5.500	0.762
SP-15-03	9/16/86	2.414	E-11	5	11	12 - 24	11:22	9/16/86	9/19/86	UV-002	3.301	0.600	0.054	1.700	0.212
SP-16-01	9/16/86	4.452	E-10	5	10	0 - 6	11:30	9/16/86	9/19/86	UV-002	3.235	0.800	0.075	3.200	0.405
SP-16-02	9/16/86	28.304	E-10	5	10	12 - 18	11:32	9/16/86	9/19/86	UV-002	3.340	2.300	0.238	14.200	2.913
SP-16-03	9/16/86	6.068	E-10	5	10	18 - 24	11:33	9/16/86	9/19/86	UV-002	3.023	1.300	0.130	3.800	0.482

L.A.CLARKE & SON, INC. PHASE II SITE INVESTIGATION SEPT.15 - 22,1986
EPA CONTRACT NO. 68-01-0939
WORK ASSIGNMENT NO. 149-3HF9.0
UV FIELD SCREENING DATA - TOTAL PNAs
SAMPLE TYPE: SHALLOW PIT

SAMPLE NUMBER	SAMPLING DATE	TOTAL PNAs IN SAMPLE ppm	LOCATION	VAX Y COORD	VAX X COORD	SAMPLE DEPTH, INCHES	SAMPL. TIME	SAMPLE EXTRACTION DATE	SCREENING DATE	LOT NUMBER	WEIGHT gms	280/340 WAVELENGTH PAIR	280/340 ng/ul	250/400 WAVELENGTH PAIR	250/400 ng/ul
SP-17-01	9/16/86	X.XXX	F-8	6	8	0 - 6	13:50	9/17/86	9/18/86	UV-003	3.160	4.700	0.564	30.200	6.868
SP-17-01DI (1/10 DILUT)	9/16/86	142.018	F-8	6	8	0 -6		9/17/86	9/18/86	UV-003	3.160	1.400	0.140	7.900	1.355
SP-17-02	9/16/86	X.XXX	F-8	6	8	12	13:55	9/17/86	9/18/86	UV-003	3.042	7.400	1.192	42.900	10.007
SP-17-02DI (1/10 DILUT)	9/16/86	255.568	F-8	6	8	12		9/17/86	9/18/86	UV-003	3.042	1.700	0.173	12.200	2.418
SP-17-03	9/16/86	37.675	F-8	6	8	24	13:57	9/17/86	9/18/86	UV-003	3.205	4.400	0.494	16.700	3.531
SP-18-01	9/16/86	X.XXX	F-7	6	7	6 - 8	14:00	9/18/86	9/18/86	UV-004	3.025	0.000	0.000	0.000	0.000
SP-18-01DI (1/100 DILUT)	9/16/86	X.XXX	F-7	6	7	6 - 8		9/18/86	9/18/86	UV-004	3.025	5.200	0.680	28.600	6.473
SP-18-01DI (1/1000 DILUT)	9/16/86	14267.306	F-7	6	7	6 - 8		9/18/86	9/18/86	UV-004	3.025	1.100	0.108	7.800	1.331
SP-18-02	9/16/86	X.XXX	F-7	6	7	24	14:05	9/18/86	9/18/86	UV-004	3.210	3.900	0.378	23.900	5.311
SP-18-02DI (1/10 DILUT)	9/16/86	153.387	F-7	6	7	24		9/18/86	9/18/86	UV-004	3.210	1.600	0.162	8.400	1.479
SP-19-01	9/16/86	29.444	F-6.5	6	6.5	0 - 6	14:09	9/18/86	9/18/86	UV-004	3.143	2.600	0.271	13.800	2.814
SP-19-01D	9/16/86	30.530	F-6.5	6	6.5	0 - 6		9/18/86	9/18/86	UV-004	3.139	2.700	0.282	14.200	2.913
SP-19-02	9/16/86	59.720	F-6.5	6	6.5	12 - 18	14:11	9/18/86	9/18/86	UV-004	3.085	18.700	3.822	11.800	2.320
SP-20-01	9/17/86	X.XXX	H 1/2 -6.75	8.5	6.75	0 - 6	07:55	9/18/86	9/18/86	UV-004	3.021	4.800	0.587	31.000	7.066
SP-20-01DI (1/10 DILUT)	9/17/86	125.380	H 1/2 -6.75	8.5	6.75	0 - 6		9/18/86	9/18/86	UV-004	3.021	1.300	0.130	7.000	1.133
SP-21-01	9/17/86	4.172	H 1/2 -6.5	8.5	6.5	0 - 6	08:00	9/18/86	9/18/86	UV-004	3.054	1.000	0.097	2.600	0.328
SP-22-01	9/17/86	X.XXX	H 1/2 -6.25	8.5	6.25	0 - 6	08:06	9/18/86	9/18/86	UV-004	3.044	4.300	0.471	28.700	6.497
SP-22-01DI (1/10 DILUT)	9/17/86	97.930	H 1/2 -6.25	8.5	6.25	0 -6		9/18/86	9/18/86	UV-004	3.044	1.100	0.108	6.000	0.886
SP-22-02	9/17/86	1.277	H 1/2 -6.25	8.5	6.25	18	08:10	9/18/86	9/18/86	UV-004	3.012	0.400	0.032	0.800	0.096
SP-25-01	9/17/86	43.782	H 1/2 -5.5	8.5	5.5	0 - 6	08:50	9/18/86	9/18/86	UV-004	3.216	3.300	0.347	20.000	4.347
SP-27-01	9/17/86	X.XXX	H 1/2 -5.25	8.5	5.25	0 - 6	09:00	9/18/86	9/18/86	UV-004	3.087	0.000	0.000	0.000	0.000
SP-27-01DI (1/100 DILUT)	9/17/86	4030.787	H 1/2 -5.25	8.5	5.25	0 - 6		9/18/86	9/18/86	UV-004	3.087	2.600	0.271	18.100	3.877
SP-27-02	9/17/86	48.498	H 1/2 -5.25	8.5	5.25	12 - 24	09:00	9/18/86	9/18/86	UV-004	3.083	3.700	0.390	21.000	4.594
SP-30-01	9/18/86	14.249	D-20	4	20	0 - 6	09:25	9/19/86	9/19/86	UV-005	3.006	1.000	0.097	7.800	1.331
SP-30-02	9/18/86	3.214	D-20	4	20	12 - 24	09:25	9/19/86	9/19/86	UV-005	3.042	0.800	0.075	2.000	0.251
SP-31-01	9/18/86	4.594	D-18	4	18	0 - 6	09:31	9/19/86	9/19/86	UV-005	3.006	0.500	0.043	3.300	0.418
SP-31-02	9/18/86	38.334	D-18	4	18	12 - 24	09:37	9/19/86	9/19/86	UV-005	3.061	2.700	0.282	17.100	3.630
SP-32-01	9/18/86	28.256	D-17	4	17	0 - 6	09:50	9/19/86	9/19/86	UV-005	3.165	2.100	0.216	13.600	2.765
SP-32-02	9/18/86	52.108	D-17	4	17	9	09:51	9/19/86	9/19/86	UV-005	3.203	3.800	0.401	23.300	5.162
SP-33-01	9/18/86	X.XXX	D-14	4	14	0 - 6	11:25	9/19/86	9/19/86	UV-005	3.201	0.100	0.000	0.100	0.000
SP-33-01DI (1/10 DILUT)	9/18/86	362.677	D-14	4	14	0 - 6		9/19/86	9/19/86	UV-005	3.201	3.000	0.314	16.800	3.556
SP-33-02	9/18/86	2.052	D-14	4	14	12 - 24	11:25	9/19/86	9/19/86	UV-005	3.132	0.600	0.054	1.300	0.161
SP-34-01	9/18/86	38.675	D-13	4	13	0 - 6	11:35	9/20/86	9/20/86	UV-006	3.070	2.900	0.303	17.200	3.654
SP-34-02	9/18/86	3.908	D-13	4	13	12	11:35	9/20/86	9/20/86	UV-006	2.995	0.800	0.075	2.500	0.315
SP-35-01	9/18/86	50.738	C-2	3	2	0 - 6	11:45	9/20/86	9/20/86	UV-006	3.051	3.500	0.369	21.800	4.792
SP-35-02	9/18/86	1.314	C-2	3	2	18	11:45	9/20/86	9/20/86	UV-006	2.927	0.400	0.032	0.800	0.096
SP-36-01	9/18/86	0.400	B-2	2	2	0 - 6	11:55	9/20/86	9/20/86	UV-006	3.019	0.300	0.021	0.200	0.019
SP-36-02	9/18/86	0.382	B-2	2	2	24	11:55	9/20/86	9/20/86	UV-006	3.166	0.300	0.021	0.200	0.019
SP-37-01	9/18/86	0.634	B-1	2	1	0 - 6	12:05	9/20/86	9/20/86	UV-006	3.026	0.400	0.032	0.300	0.032
SP-37-02	9/18/86	0.272	B-1	2	1	18	12:05	9/20/86	9/20/86	UV-006	3.023	0.300	0.021	0.100	0.006
SP-38-01	9/18/86	0.753	B-0	2	0	0 - 6	12:15	9/20/86	9/20/86	UV-007	2.984	0.500	0.043	0.300	0.032
SP-38-02	9/18/86	0.583	B-0	2	0	18	12:15	9/20/86	9/20/86	UV-007	3.193	0.500	0.043	0.200	0.019
SP-39-01	9/18/86	56.582	D-2	4	2	0 - 6	12:20	9/20/86	9/20/86	UV-007	3.015	5.000	0.540	22.300	5.147
SP-39-02	9/18/86	12.265	D-2	4	2	12 - 24	12:20	9/20/86	9/20/86	UV-007	2.940	2.200	0.227	6.100	0.977
SP-39-02D	9/18/86	8.944	D-2	4	2	12 - 24		9/20/86	9/20/86	UV-007	2.970	1.400	0.140	5.200	0.745

L.A.CLARKE & SON, INC. PHASE II SITE INVESTIGATION SEPT.15 - 22,1986
EPA CONTRACT NO. 68-01-0939
WORK ASSIGNMENT NO. 149-3HF9.0
UV FIELD SCREENING DATA - TOTAL PNAs
SAMPLE TYPE: SHALLOW PIT

SAMPLE NUMBER	SAMPLING DATE	TOTAL PNAs IN SAMPLE ppm	LOCATION	VAX Y COORD	VAX X COORD	SAMPLE DEPTH, INCHES	SAMPL. TIME	SAMPLE EXTRACTION DATE	SCREENING DATE	LOT NUMBER	WEIGHT gms	280/340 WAVELENGTH PAIR	280/340 ng/ul	250/400 WAVELENGTH PAIR	250/400 ng/ul
SP-40-01	9/18/86	47.427	E-0	5	0	0 - 6	12:30	9/20/86	9/20/86	UV-007	3.102	4.000	0.427	19.700	4.477
SP-40-02	9/18/86	0.633	E-0	5	0	12 - 24	12:30	9/20/86	9/20/86	UV-007	3.033	0.400	0.032	0.300	0.032
SP-41-01	9/18/86	40.173	E-5	5	5	0 - 6	12:35	9/20/86	9/20/86	UV-007	2.963	3.000	0.314	16.500	3.654
SP-42-01	9/21/86	X.XXX	B-7	2	7	0 - 6	14:40	9/22/86	9/22/86	UV-011	3.055				
SP-42-01DI (1/100 DILUT)	9/21/86	6962.769	B-7	2	7	0 - 6					3.055	21.000	4.518	12.300	2.573
SP-43-01	9/21/86	X.XXX	B 1/2 -1.5	2.5	1.5	0 - 6	14:45	9/22/86	9/22/86	UV-011	3.029				
SP-43-01DI (1/100 DILUT)	9/21/86	4604.490	B 1/2 -1.5	2.5	1.5	0 - 6					3.029	5.900	0.867	17.000	3.782
SP-44-01	9/21/86	X.XXX	B 1/2 -2	2.5	2	0 - 2	14:50	9/22/86	9/22/86	UV-011	3.004				
SP-44-01DI (1/100 DILUT)	9/21/86	7119.927	B 1/2 -2	2.5	2	0 - 2					3.004	11.900	2.318	21.000	4.812
SP-45-01	9/21/86	X.XXX	B 1/2 -6	2.5	6	0 - 2	15:00	9/22/86	9/22/86	UV-011	3.070				
SP-45-01DI (1/100 DILUT)	9/21/86	4398.958	B 1/2 -6	2.5	6	0 - 2					3.070	10.400	1.955	12.200	2.547
SP-46-01	9/21/86	X.XXX	B-15	2	15	0 - 2	15:15	9/22/86	9/22/86	UV-011	3.063				
SP-46-01DI (1/100 DILUT)	9/21/86	6880.411	B-15	2	15	0 - 2					3.063	8.700	1.544	23.600	5.481
SP-47-01	9/21/86	X.XXX	B-14	2	14	0 - 3	15:20	9/22/86	9/22/86	UV-011	3.045				
SP-47-01DI (1/100 DILUT)	9/21/86	3629.714	B-14	2	14	0 - 3					3.045	10.000	1.858	9.400	1.826
SP-48-01	9/21/86	X.XXX	B-13	2	13	0 - 3	15:25	9/22/86	9/22/86	UV-011	3.063				
SP-48-01DI (1/100 DILUT)	9/21/86	4883.428	B-13	2	13	0 - 3					3.063	10.700	2.027	13.800	2.959
SP-49-01	9/21/86	X.XXX	C-13	3	13	0 - 2	15:25	9/22/86	9/22/86	UV-011	3.044				
SP-49-01DI (1/100 DILUT)	9/21/86	3838.463	C-13	3	13	0 - 2					3.044	9.700	1.786	10.500	2.109
SP-50-01	9/21/86	X.XXX	C-14	3	14	0 - 2	15:27	9/22/86	9/22/86	UV-011	3.023				
SP-50-01DI (1/100 DILUT)	9/21/86	2493.483	C-14	3	14	0 - 2					3.023	5.900	0.867	8.700	1.646
SP-51-01	9/21/86	X.XXX	C-15	3	15	0 - 3	15:30	9/22/86	9/22/86	UV-011	3.073				
SP-51-01DI (1/100 DILUT)	9/21/86	4293.388	C-15	3	15	0 - 3					3.073	8.800	1.568	13.300	2.830
SS-01-01	9/21/86	46.719									3.078	11.500	2.221	12.300	2.573

L.A. CLARKE AND SON PHASE II SITE INVESTIGATION SEPT. 15-22, 1986
EPA CONTRACT NO. 68-01-6939
WORK ASSIGNMENT NO. 149-3HF9.0
UV FIELD SCREENING DATA - TOTAL PNAs
SAMPLE TYPE: TEST PIT, TRENCH AND VIBRACORE

SAMPLE NUMBER	SAMPLING DATE	TOTAL PNAs IN SAMPLE ppm	LOCATION	VAX Y COORD	VAX X COORD	SAMPLE DEPTH, feet	SAMPL. TIME	SAMPLE EXTRACTION DATE	SCREENING DATE	LOT NUMBER	WEIGHT (gms)	280/340 WAVELENGTH PAIR	280/340 ng/ul	250/400 WAVELENGTH PAIR	250/400 ng/ul
L.A. CLARKE AND SON PHASE II SITE INVESTIGATION SEPT. 15-22, 1986															
EPA CONTRACT NO. 68-01-6939															
WORK ASSIGNMENT NO. 149-3HF9.0															
UV FIELD SCREENING DATA - TOTAL PNAs															
SAMPLE TYPE: TEST PIT, TRENCH AND VIBRACORE															
SAMPLE NUMBER	SAMPLING DATE	TOTAL PNAs IN SAMPLE ppm	LOCATION	VAX Y COORD	VAX X COORD	SAMPLE DEPTH, feet	SAMPL. TIME	SAMPLE EXTRACTION DATE	SCREENING DATE	LOT NUMBER	WEIGHT (gms)	280/340 WAVELENGTH PAIR	280/340 ng/ul	250/400 WAVELENGTH PAIR	250/400 ng/ul
TP-01-01	9/16/86	4.322	H-9.5	8	9.5	0 - 0.5	08:50	9/17/86	9/18/86	UV-003	3.222	1.600	0.162	2.400	0.302
TP-01-02	9/16/86	0.273	H-9.5	8	9.5	3.5 - 4.0	08:55	9/17/86	9/18/86	UV-003	3.014	0.300	0.021	0.100	0.006
TP-01-03	9/16/86	0.508	H-9.5	8	9.5	8.5 - 9.0	09:00	9/17/86	9/18/86	UV-003	3.136	0.300	0.021	0.300	0.032
TP-02-01	9/16/86	3.601	H-10.5	8	10.5	0 - 0.5	09:30	9/17/86	9/18/86	UV-003	3.160	0.700	0.064	2.500	0.315
TP-02-02	9/16/86	0.694	H-10.5	8	10.5	3.5	09:35	9/17/86	9/18/86	UV-003	3.150	0.600	0.054	0.200	0.019
TP-02-03	9/16/86	0.392	H-10.5	8	10.5	4.5	09:40	9/17/86	9/18/86	UV-003	3.081	0.300	0.021	0.200	0.019
TP-02-030	9/16/86	27.765	H-10.5	8	10.5	4.5		9/17/86	9/18/86	UV-003	3.008	3.700	0.390	12.100	2.394
TP-02-04	9/16/86	X.XXX	H-10.5	8	10.5	8.5	09:45	9/17/86	9/18/86	UV-003	3.132	0.100	-0.001	1.100	0.135
TP-02-04Di (1/10 DILUT)	9/16/86	X.XXX	H-10.5	8	10.5	8.5		9/17/86	9/18/86	UV-003	3.132	20.100	4.147	35.600	8.203
TP-02-040i (1/100 DILUT)	9/16/86	3137.998	H-10.5	8	10.5	8.5		9/17/86	9/18/86	UV-003	3.132	4.900	0.610	13.200	2.666
TP-03-01	9/16/86	15.994	B-6	2	6	0 - 0.5	14:35	9/17/86	9/18/86	UV-003	3.108	2.200	0.227	8.200	1.430
TP-03-02	9/16/86	1.406	B-6	2	6	4.0	14:37	9/17/86	9/18/86	UV-003	3.284	0.400	0.032	1.000	0.122
TP-04-01	9/16/86	X.XXX	H-7	8	7	0 - 0.5	16:00	9/17/86	9/18/86	UV-003	3.185	3.100	0.325	27.800	6.275
TP-04-01Di (1/10 DILUT)	9/16/86	229.100	H-7	8	7	0 - 0.5		9/17/86	9/18/86	UV-003	3.185	1.600	0.162	11.600	2.270
TP-04-02	9/16/86	1.849	H-7	8	7	0 - 0.5	16:05	9/17/86	9/18/86	UV-003	3.009	1.400	0.140	0.400	0.045
TP-04-03	9/16/86	5.964	H-7	8	7	0 - 0.5	16:10	9/17/86	9/18/86	UV-003	3.115	4.800	0.587	0.300	0.032
TP-04-04	9/16/86	0.895	H-7	8	7	0 - 0.5	16:15	9/17/86	9/18/86	UV-003	3.072	0.300	0.021	0.600	0.071
TP-05-01	9/16/86	23.940	G-6.5	7	6.5	0 - 0.5	--	9/17/86	9/18/86	UV-003	3.147	2.100	0.216	11.700	2.295
TP-05-02	9/16/86	3.121	G-6.5	7	6.5	1.0	--	9/17/86	9/18/86	UV-003	3.028	0.700	0.064	2.000	0.251
TP-05-03	9/16/86	0.604	G-6.5	7	6.5	3.0	17:01	9/17/86	9/18/86	UV-003	3.277	0.300	0.021	0.400	0.045
TP-06-01	9/17/86	X.XXX	G-9	7	9	0 - 0.5	09:35	9/18/86	9/18/86	UV-004	3.018	0.000	0.000	0.000	0.000
TP-06-01Di (1/100 DILUT)	9/17/86	4024.254	G-9	7	9	0 - 0.5		9/18/86	9/18/86	UV-004	3.018	9.600	1.704	11.900	2.344
TP-06-02	9/17/86	42.514	G-9	7	9	1.5	09:45	9/18/86	9/18/86	UV-004	3.183	6.700	1.029	16.500	3.481
TP-06-03	9/17/86	X.XXX	G-9	7	9	4.5	09:50	9/18/86	9/18/86	UV-004	3.160	0.000	0.000	0.000	0.000
TP-06-03Di (1/100 DILUT)	9/17/86	X.XXX	G-9	7	9	4.5		9/18/86	9/18/86	UV-004	3.160	19.300	3.961	27.000	6.077
TP-06-03Di (1/1000 DILUT)	9/17/86	264984.000	G-9	7	9	4.5		9/18/86	9/18/86	UV-004	0.188	4.100	0.424	7.400	1.232
TP-07-01	9/17/86	X.XXX	G-10.5	7	10.5	0 - 1.0	13:00	9/18/86	9/18/86	UV-004	3.042	0.200	0.010	1.300	0.161
TP-07-01Di (1/100 DILUT)	9/17/86	701.065	G-10.5	7	10.5	0 - 1.0		9/18/86	9/18/86	UV-004	3.042	1.000	0.097	4.900	0.614
TP-07-02	9/17/86	2.740	G-10.5	7	10.5	4.0	13:10	9/18/86	9/18/86	UV-004	3.168	0.700	0.064	1.800	0.225
TP-07-04	9/17/86	39.657	G-10.5	7	10.5	8.0	13:20	9/18/86	9/18/86	UV-004	3.015	2.700	0.282	17.400	3.704
TP-08-01	9/17/86	31.101	E-6	5	6	0 - 0.5	14:15	9/18/86	9/18/86	UV-004	3.132	2.500	0.260	14.500	2.987
TP-08-02	9/17/86	X.XXX	E-6	5	6	5.0	14:30	9/18/86	9/18/86	UV-004	3.095	0.100	-0.001	0.900	0.109
TP-08-02Di (1/100 DILUT)	9/17/86	7037.826	E-6	5	6	5.0		9/18/86	9/18/86	UV-004	3.095	13.100	2.519	21.600	4.742

L.A. CLARKE AND SON PHASE II SITE INVESTIGATION SEPT. 15-22, 1986
EPA CONTRACT NO. 68-01-6939
WORK ASSIGNMENT NO. 149-3HF9.0
UV FIELD SCREENING DATA - TOTAL PNAs
SAMPLE TYPE: TEST PIT, TRENCH AND VIBRACORE

SAMPLE NUMBER	SAMPLING DATE	TOTAL PNAs IN SAMPLE ppm	LOCATION	VAX Y COORD	VAX X COORD	SAMPLE DEPTH, feet	SAMPL. TIME	SAMPLE EXTRACTION DATE	SCREENING DATE	LOT NUMBER	WEIGHT (gms)	280/340 WAVELENGTH PAIR	280/340 ng/ul	250/400 WAVELENGTH PAIR	250/400 ng/ul
TP-08-03	9/17/86	X.XXX	E-6	5	6	6.5	14:35	9/18/86	9/18/86	UV-004	3.142	0.000	0.000	0.000	0.000
TP-08-03Di (1/100 DILUT)	9/17/86	X.XXX	E-6	5	6	6.5		9/18/86	9/18/86	UV-004	3.142	13.100	2.519	29.100	6.596
TP-08-03Di (1/1000 DILUT)	9/17/86	26212.763	E-6	5	6	6.5		9/18/86	9/18/86	UV-004	3.142	5.700	0.797	10.300	1.949
TP-11-01	9/18/86	2.300	B1/2-25	2.5	25	0 - 0.5	15:15	9/19/86	9/19/86	UV-005	3.040	0.300	0.021	1.700	0.212
TP-11-02	9/18/86	35.648	B1/2-25	2.5	25	1.5	15:17	9/19/86	9/19/86	UV-005	3.042	2.700	0.282	15.900	3.333
TP-11-03	9/18/86	0.282	B1/2-25	2.5	25	2.75	15:18	9/19/86	9/19/86	UV-005	3.133	0.200	0.010	0.200	0.019
TP-11-04	9/18/86	0.250	B1/2-25	2.5	25	5.5	15:18	9/19/86	9/19/86	UV-005	3.292	0.300	0.021	0.100	0.006
TP-12-01	9/18/86	48.503	C-27	2.5	27	0 - 1.0	15:45	9/19/86	9/19/86	UV-005	3.032	3.400	0.358	20.800	4.544
TP-12-02	9/18/86	0.643	C-27	2.5	27	1.0	15:50	9/19/86	9/19/86	UV-005	3.080	0.300	0.021	0.400	0.045
TP-12-02D	9/18/86	0.488	C-27	2.5	27	1.0		9/19/86	9/19/86	UV-005	3.264	0.300	0.021	0.300	0.032
TP-12-03	9/18/86	1.118	C-27	2.5	27	4.5	15:55	9/19/86	9/19/86	UV-005	3.097	0.400	0.032	0.700	0.084
TP-13-01	9/18/86	X.XXX	D1/2-28	4.5	28	0 - 1.0	16:10	9/19/86	9/19/86	UV-005	3.118	0.000	0.000	0.000	0.000
TP-13-01Di (1/100 DILUT)	9/18/86	3686.190	D1/2-28	4.5	28	0 - 1.0		9/19/86	9/19/86	UV-005	3.118	3.100	0.325	16.600	3.506
TP-13-02	9/18/86	17.892	D1/2-28	4.5	28	1.0 -2.0	16:10	9/19/86	9/19/86	UV-005	3.032	2.000	0.206	8.900	1.603
TP-13-03	9/18/86	51.167	D1/2-28	4.5	28	3.0	16:11	9/19/86	9/19/86	UV-005	3.140	6.400	0.959	20.200	4.396
TP-14-01	9/19/86	9.348	D1/2-28	4.5	26.5	0 -0.5	07:50	9/19/86	9/19/86	UV-005	3.214	1.400	0.140	5.900	0.861
TP-14-02	9/19/86	0.739	D1/2-28	4.5	26.5	2.0	07:50	9/19/86	9/19/86	UV-005	3.118	0.400	0.032	0.400	0.045
TR-01-01	9/18/86	X.XXX	C-8	3	8	0 - 0.5	10:15	9/20/86	9/20/86	UV-006	3.148	0.000	0.000	0.000	0.000
TR-01-01Di (1/100 DILUT)	9/18/86	44.594	C-8	3	8	0 - 0.5		9/20/86	9/20/86	UV-006	3.148	12.200	2.390	11.200	2.289
TR-02-01	9/19/86	X.XXX	F1/2-4	6.5	4	0 - 0.5	16:40	9/20/86	9/20/86	UV-006	3.039	0.000	0.000	0.100	0.000
TR-02-01Di (1/100 DILUT)	9/19/86	61.563	F1/2-4	6.5	4	0 - 0.5		9/20/86	9/20/86	UV-006	3.039	18.000	3.793	11.800	2.444
TR-02-02	9/19/86	X.XXX	F1/2-4	6.5	4	2.5	16:40	9/20/86	9/20/86	UV-006	3.181	0.000	0.000	0.400	0.000
TR-02-02Di (1/100 DILUT)	9/19/86	80.839	F1/2-4	6.5	4	2.5		9/20/86	9/20/86	UV-006	3.181	20.100	4.300	18.900	4.271
TR-02-03	9/19/86	48.082	F1/2-4	6.5	4	0 - 0.5	16:40	9/20/86	9/20/86	UV-006	3.014	6.800	1.053	17.700	3.778
TR-02-04	9/19/86	X.XXX	F1/2-4	6.5	4	0 - 0.5	17:00	9/20/86	9/20/86	UV-006	3.105	0.000	0.000	0.000	0.000
TR-02-04Di (1/100 DILUT)	9/19/86	77.686	F1/2-4	6.5	4	0 - 0.5		9/20/86	9/20/86	UV-006	3.105	16.200	3.357	20.500	4.683
TR-02-05	9/20/86	35.869	F1/2-4	6.5	4	0 - 0.5	08:30	9/20/86	9/20/86	UV-006	2.976	5.900	0.843	13.400	2.715
TR-02-06	9/20/86	X.XXX	F1/2-4	6.5	4	2.5	08:35	9/20/86	9/20/86	UV-006	2.968	0.000	0.000	0.000	0.000
TR-02-06Di (1/100 DILUT)	9/20/86	54.434	F1/2-4	6.5	4	2.5		9/20/86	9/20/86	UV-006	2.968	14.800	3.019	11.500	2.367
TR-02-07	9/20/86	X.XXX	F1/2-4	6.5	4	2.5	08:40	9/20/86	9/20/86	UV-006	2.954	0.000	0.000	0.000	0.000
TR-02-07Di (1/100 DILUT)	9/20/86	101.611	F1/2-4	6.5	4	2.5		9/20/86	9/20/86	UV-006	2.954	17.300	3.623	27.100	6.382
TR-02-08	9/20/86	37.238	F1/2-4	6.5	4	0 - 0.5	08:40	9/20/86	9/20/86	UV-006	3.033	7.000	1.099	13.200	2.666
TR-02-08D	9/20/86	25.332	F1/2-4	6.5	4	0 - 0.5		9/20/86	9/20/86	UV-006	2.943	4.900	0.610	10.000	1.875
TR-02-09	9/20/86	38.580	F1/2-4	6.5	4	4.0	08:40	9/20/86	9/20/86	UV-006	2.940	9.300	1.634	11.100	2.147
TR-02-10	9/20/86	20.458	F1/2-4	6.5	4	2.5	08:50	9/20/86	9/20/86	UV-006	2.939	1.300	0.130	10.000	1.875
TR-02-11	9/20/86	2.158	F1/2-4	6.5	4	4.0	08:50	9/20/86	9/20/86	UV-006	2.950	0.700	0.064	1.200	0.148
TR-02-12	9/20/86	1.378	F1/2-4	6.5	4	0 - 0.5	08:50	9/20/86	9/20/86	UV-006	3.071	0.400	0.032	0.900	0.109
TP-17-01	9/20/86	8.279	J1/2-4.25	10.5	4.25	0 - 0.5	11:00	9/21/86	9/21/86	UV-007	3.042	4.200	0.448	3.100	0.392
TP-17-02	9/20/86	X.XXX	J1/2-4.25	10.5	4.25	4 - 6	11:00	9/21/86	9/21/86	UV-007	3.015	0.000	0.000	0.000	0.000
TP-17-02Di (1/100 DILUT)	9/20/86	9062.517	J1/2-4.25	10.5	4.25	4 - 6					3.015	19.300	3.961	22.300	5.147
TP-17-03	9/20/86	9.958	J1/2-4.25	10.5	4.25	6 - 7	11:20	9/21/86	9/21/86	UV-007	3.092	5.500	0.750	2.200	0.276
TP-18-01	9/20/86	11.878	K-5	11	5	0 - 0.5	14:00	9/21/86	9/21/86	UV-007	3.027	5.000	0.634	4.500	0.565
TP-18-02	9/20/86	1.292	K-5	11	5	5.0	14:10	9/21/86	9/21/86	UV-007	3.045	0.200	-0.004	1.100	0.135

L.A. CLARKE AND SON PHASE II SITE INVESTIGATION SEPT. 15-22, 1986
EPA CONTRACT NO. 68-01-6939
WORK ASSIGNMENT NO. 149-3HF9.0
UV FIELD SCREENING DATA - TOTAL PNAs
SAMPLE TYPE: TEST PIT, TRENCH AND VIBRACORE

SAMPLE NUMBER	SAMPLING DATE	TOTAL PNAs IN SAMPLE ppm	LOCATION	VAX Y COORD	VAX X COORD	SAMPLE DEPTH, feet	SAMPL. TIME	SAMPLE EXTRACTION DATE	SCREENING DATE	LOT NUMBER	WEIGHT (gms)	280/340 WAVELENGTH PAIR	280/340 ng/ul	250/400 WAVELENGTH PAIR	250/400 ng/ul
TP-18-03	9/20/86	X.XXX	K-5	11	5	7.0	14:10	9/21/86	9/21/86	UV-007	3.013	18.100	3.682	25.200	5.893
TP-18-03DI (1/10 DILUT)	9/20/86	88.876	K-5	11	5	7.0					3.013	2.900	0.302	4.600	0.591
TP-19-01	9/20/86	29.390	L-6	12	6	0 - 0.5	14:30	9/21/86	9/21/86	UV-007	3.051	6.500	0.983	10.100	2.006
TP-19-02	9/20/86	10.482	L-6	12	6	3.5 - 5.5	14:30	9/21/86	9/21/86	UV-007	3.002	5.100	0.657	3.100	0.392
TP-19-03	9/20/86	9.218	L-6	12	6	5.5	14:30	9/21/86	9/21/86	UV-007	3.079	5.100	0.657	2.300	0.289
TP-20-01	9/20/86	26.015	J1/2-8	10.5	8	0 - 0.5	15:15	9/21/86	9/21/86	UV-007	3.050	4.800	0.587	10.300	2.058
TP-20-01D	9/20/86	19.104	J1/2-8	10.5	8	0 - 0.5		9/21/86	9/21/86	UV-007	2.957	2.100	0.211	8.800	1.672
TP-20-02	9/20/86	22.745	J1/2-8	10.5	8	3.5	15:15	9/21/86	9/21/86	UV-007	3.048	7.900	1.309	6.200	1.002
TP-21-01	9/20/86	7.167	K1/2-8	11.5	8	0 - 3.0	15:30	9/21/86	9/21/86	UV-007	3.094	4.100	0.424	2.500	0.315
TP-21-02	9/21/86	6.005	K1/2-8	11.5	8	3.0 - 4.0	15:30	9/21/86	9/21/86	UV-007	2.969	2.700	0.279	2.500	0.315
TP-21-03	9/21/86	5.314	K1/2-8	11.5	8	4.5	15:30	9/21/86	9/21/86	UV-007	3.056	2.800	0.291	2.000	0.251
TP-22-01	9/21/86	0.000	B1/2-6	2.5	6	0 - 0.5	08:00	9/21/86	9/21/86	UV-008	3.021	0.100	0.000	0.500	0.000
TP-22-02	9/21/86	X.XXX	B1/2-6	2.5	6	2.5 - 4.5	08:00	9/21/86	9/21/86	UV-008	3.044	7.000	1.099	33.400	8.004
TP-22-02DI (1/10 DILUT)	9/21/86	307.301	B1/2-6	2.5	6	2.5 - 4.5		9/21/86	9/21/86	UV-008	3.044	4.400	0.494	12.500	2.624
TP-22-03	9/21/86	X.XXX	B1/2-6	2.5	6	5.0	08:00	9/21/86	9/21/86	UV-008	3.089	0.000	0.000	0.000	0.000
TP-22-03DI (1/100 DILUT)	9/21/86	3261.687	B1/2-6	2.5	6	5.0		9/21/86	9/21/86	UV-008	3.089	10.300	1.867	8.100	1.491
TP-22-04	9/21/86	X.XXX	B1/2-6	2.5	6	6.0	08:00	9/21/86	9/21/86	UV-008	3.045	17.500	3.542	27.900	6.588
TP-22-04DI (1/10 DILUT)	9/21/86	137.393	B1/2-6	2.5	6	6.0		9/21/86	9/21/86	UV-008	3.045	5.400	0.727	4.900	0.668
TP-23-01	9/21/86	2.261	B1/4-9	2.25	9	0 - 0.5	08:50	9/21/86	9/21/86	UV-009	3.063	0.400	0.019	1.700	0.212
TP-23-02	9/21/86	X.XXX	B1/4-9	2.25	9	1.5	08:50	9/21/86	9/21/86	UV-009	2.989	0.000	0.000	0.000	0.000
TP-23-02DI (1/100 DILUT)	9/21/86	8182.984	B1/4-9	2.25	9	1.5		9/21/86	9/21/86	UV-009	2.989	19.400	3.985	18.500	4.168
TP-23-03	9/21/86	12.242	B1/4-9	2.25	9	3.0	08:50	9/21/86	9/21/86	UV-009	3.025	1.600	0.155	6.500	1.080
TP-23-04	9/21/86	16.317	B1/4-9	2.25	9	4.0	08:50	9/21/86	9/21/86	UV-009	3.057	2.200	0.223	7.900	1.440
TP-23-05	9/21/86	6.588	B1/4-9	2.25	9	6.0	09:00	9/21/86	9/21/86	UV-009	3.019	1.100	0.098	4.500	0.565
TP-24-01	9/21/86	39.884	F1/2-3	6.5	3	0 - 0.5	10:00	9/21/86	9/21/86	UV-009	3.035	3.600	0.381	16.500	3.654
TP-24-01D	9/21/86	32.447	F1/2-3	6.5	3	0 - 0.5		9/21/86	9/21/86	UV-009	3.090	4.300	0.461	13.500	2.881
TP-24-02	9/21/86	X.XXX	F1/2-3	6.5	3	2.0	10:00	9/21/86	9/21/86	UV-009	3.029	0.000	0.000	0.000	0.000
TP-24-02DI (1/100 DILUT)	9/21/86	218.944	F1/2-3	6.5	3	2.0		9/21/86	9/21/86	UV-009	3.029	0.200	-0.004	1.800	0.225
TP-24-03	9/21/86	X.XXX	F1/2-3	6.5	3	4.0	10:00	9/21/86	9/21/86	UV-009	2.968	17.200	3.473	32.300	7.721
TP-24-03DI (1/10 DILUT)	9/21/86	88.781	F1/2-3	6.5	3	4.0		9/21/86	9/21/86	UV-009	2.968	4.300	0.461	3.300	0.418
TP-24-04	9/21/86	1.284	F1/2-3	6.5	3	6.0	10:00	9/21/86	9/21/86	UV-009	3.027	0.300	0.007	1.000	0.122
TP-24-05	9/21/86	1.642	F1/2-3	6.5	3	8.5	10:15	9/21/86	9/21/86	UV-009	3.099	0.200	-0.004	1.400	0.174
TP-24-06	9/21/86	X.XXX	F1/2-3	6.5	3	8.5	10:15	9/22/86	9/22/86	UV-011	2.130	0.000	0.000	0.000	0.000
TP-24-06DI (1/100 DILUT)	9/21/86	3351.113	F1/2-3	6.5	3	8.5		9/22/86	9/22/86	UV-011	2.130	9.300	1.634	5.200	0.745
TP-25-01	9/21/86	40.276	H-23	8	23	0 - 0.5	11:20	9/21/86	9/22/86	UV-010	3.000	17.600	3.566	4.100	0.462
TP-25-01D	9/21/86	3.708	H-23	8	23	0 - 0.5		9/21/86	9/22/86	UV-010	3.042	1.000	0.087	2.300	0.289
TP-25-02	9/21/86	0.639	H-23	8	23	8.0	11:20	9/21/86	9/22/86	UV-010	2.996	0.400	0.019	0.400	0.045
TP-26-01	9/21/86	2.133	H-19	8	19	0 - 0.5	11:50	9/21/86	9/22/86	UV-010	3.024	0.600	0.041	1.400	0.174
TP-26-02	9/21/86	0.504	H-19	8	19	1.0	11:50	9/21/86	9/22/86	UV-010	3.032	0.400	0.019	0.300	0.032
TP-26-03	9/21/86	0.743	H-19	8	19	3.0	11:50	9/21/86	9/22/86	UV-010	3.036	0.500	0.030	0.400	0.045
TP-26-04	9/21/86	0.379	H-19	8	19	9.0	12:15	9/21/86	9/22/86	UV-010	3.014	0.400	0.019	0.200	0.019
TP-26-05	9/21/86	3.994	H-19	8	19	6.0	12:15	9/22/86	9/22/86	UV-011	3.028	0.900	0.075	2.600	0.328
VC-01-01	9/20/86	X.XXX	J-4	10	4	0 - 4.5	11:30	9/21/86	9/21/86	UV-008	3.062	0.000	0.000	0.000	0.000
VC-01-01DI (1/100 DILUT)	9/20/86	2912.547	J-4	10	4	0 - 4.5		9/21/86	9/21/86	UV-008	3.062	8.200	1.378	8.500	1.594

L.A. CLARKE AND SON PHASE II SITE INVESTIGATION SEPT. 15-22, 1986
EPA CONTRACT NO. 68-01-6939
WORK ASSIGNMENT NO. 149-3HF9.0
UV FIELD SCREENING DATA - TOTAL PNAs
SAMPLE TYPE: TEST PIT, TRENCH AND VIBRACORE

SAMPLE NUMBER	SAMPLING DATE	TOTAL PNAs IN SAMPLE ppm	LOCATION	VAX Y COORD	VAX X COORD	SAMPLE DEPTH, feet	SAMPL. TIME	SAMPLE EXTRACTION DATE	SCREENING DATE	LOT NUMBER	WEIGHT (gms)	280/340 WAVELENGTH PAIR	280/340 ng/ul	250/400 WAVELENGTH PAIR	250/400 ng/ul
VC-01-02	9/20/86	X.XXX	J-4	10	4	0 - 4.5	11:30	9/21/86	9/21/86	UV-008	3.090	0.000	0.000	0.100	0.000
VC-01-02Di (1/100 DILUT)	9/20/86	X.XXX	J-4	10	4	0 - 4.5		9/21/86	9/21/86	UV-008	3.090	25.400	5.381	30.400	7.231
VC-01-02Di (1/1000 DILUT)	9/20/86	54034.854	J-4	10	4	0 - 4.5		9/21/86	9/21/86	UV-008	3.090	18.900	3.868	8.900	1.697
VC-01-03	9/20/86	X.XXX	J-4	10	4	0 - 4.5	11:30	9/21/86	9/21/86	UV-008	2.979	0.000	0.000	0.000	0.000
VC-01-03Di (1/100 DILUT)	9/20/86	X.XXX	J-4	10	4	0 - 4.5		9/21/86	9/21/86	UV-008	2.979	24.000	5.055	26.400	6.202
VC-01-03Di (1/1000 DILUT)	9/20/86	4295.267	J-4	10	4	0 - 4.5		9/21/86	9/21/86	UV-008	2.979	1.900	0.189	1.900	0.238
VC-02-01	9/20/86	12.086	I-14	9	14	0 - 2.0	17:30	9/21/86	9/21/86	UV-008	2.972	1.500	0.143	6.400	1.054
VC-02-02	9/20/86	X.XXX	I-14	9	14	0 - 2.0	17:30	9/21/86	9/21/86	UV-008	3.016	5.300	0.704	24.200	5.636
VC-02-02Di (1/10 DILUT)	9/20/86	377.201	I-14	9	14	0 - 2.0		9/21/86	9/21/86	UV-008	3.016	11.500	2.146	8.700	1.646
VC-02-03	9/20/86	50.310	I-14	9	14	0 - 2.0	17:30	9/21/86	9/21/86	UV-008	3.059	8.400	1.425	16.700	3.705
VC-02-03D	9/20/86	67.344	I-14	9	14	0 - 2.5		9/21/86	9/21/86	UV-008	3.084	9.800	1.751	22.400	5.172

COMPARISON OF UV FLUORESCENCE RAPID SCREENING AND CLP ANALYSIS FOR TOTAL PNAs IN SOIL

Sample ID No.	UV Result (mg/kg)	GC/MS Result (mg/kg)
TP-6-4	4,024	18,200
SP-21-1	4.2	0
TP-7-1	701	35.4
TP-7-2	2.7	0.4
TP-7-4	39.6	1.0
TP-8-1	31.1	4.0
TP-8-2	7,038	1,241
TP-8-3	26,213	768
TP-12-1	48.5	2.7
TP-13-1	3,686	153
TP-13-2	17.9	2.9
TP-17-1	44.6	14,983
TP-17-2	8.3	0.3
TP-17-3	9,062	4,610
TP-18-2	9.9	1.2
TP-19-2	1.3	737
TP-19-3	10.5	0
TP-20-2	9.2	0.1
TP-22-2	22.7	2.2
VC-02	307	8,304
	12.1	2.3

Note:CLP analysis of split soil samples confirmed an order-of-magnitude screening accuracy for UV fluorescence. In samples where the analytical differences exceeded an order-of-magnitude, insufficient homogenizing of the sample prior to sample splitting may have been a factor. Field mixing to uniformity is difficult in matrices consisting of separate phases, such as creosote and water in soils. It is expected that enhanced field mixing techniques can dramatically increase UV screening accuracy. In addition, the volume of sample utilized for the screening method is significantly smaller than for the CLP method, and this difference compounds the inaccuracies caused by poor homogenization.

Appendix G

APPENDIX G

AMBIENT AIR MONITORING PROGRAM: RESULTS AND ANALYTICAL METHODS

RESULTS

TABLE I

TOTAL PHENOL

Date	Sample #	Sample Location	Time Sampled (minutes)	Liters Sampled	Results
7/25/86	LAC-AR-1A	1	480.0	628.8	ND[a]
	2A	2	480.0	595.2	ND
	3A	3	480.0	657.6	ND
	4A	4	480.0	710.4	ND
	5A	5	480.0	585.6	ND
	6A	6	480.0	614.4	ND
	7A	7(Duplicate)	480.0	609.6	ND
	8A	Blank	NA[b]	0.0	ND
	9A	Blank	NA	0.0	ND
7/26/86	LAC-AR-11A	1	304.6	417.3	ND
	12A	2	347.4	437.7	ND
	13A	3	427.6	521.7	ND
	14A	4	410.6	537.6	ND
	15A	5	486.6	710.4	ND
	16A	6	420.8	534.4	ND
	17A	7(Duplicate)	279.9	358.3	ND
	18A	Blank	NA	0.0	ND
	19A	Blank	NA	0.0	ND

Notes: [a] ND - none detected
[b] NA - not applicable

ppr.tbl

TABLE I (cont'd)

Benzene, Toluene, Xylene

Date	Sample #	Sample Location	Time Sampled (minutes)	Liters Sampled	Results
7/25/86	LAC-AR-1B	1	480.0	44.2	ND
	2B	2	480.0	40.3	ND
	3B	3	480.0	47.0	ND
	4B	4	480.0	49.0	ND
	5B	5	480.0	45.1	ND
	6B	6	480.0	47.5	ND
	7B	7(Duplicate)	480.0	42.7	ND
	8B	Blank	NA[b]	0.0	ND
	9B	Blank	NA	0.0	ND
7/26/86	LAC-AR-11B	1	453.0	44.4	ND
	12B	2	480.0	49.0	ND
	13B	3	480.0	45.1	ND
	14B	4	480.0	42.7	ND
	15B	5	480.0	44.2	ND
	16B	6	480.0	40.3	ND
	17B	7(Duplicate)	308.7	30.6	ND
	18B	Blank	NA	0.0	ND
	19B	Blank	NA	0.0	ND

Notes: [a] ND - none detected
[b] NA - not applicable

ppr.tbl

TABLE I (cont'd)

Polynuclear Aromatic Hydrocarbons (filters)

Date	Sample #	Sample Location	Time Sampled (minutes)	Liters Sampled	Results
7/25/86	LAC-AR-1cf	1	480.0	801.6	ND[a]
	2cf	2	416.2	657.6	ND
	3cf	3	480.0	787.2	ND
	4cf	4	480.0	777.2	ND
	5cf	5	480.0	830.4	ND
	6cf	6	480.0	787.2	ND
	7cf	7(Duplicate)	480.0	801.6	ND
	8cf	Blank	NA[b]	0.0	ND
	9cf	Blank	NA	0.0	ND
7/26/86	LAC-AR-11cf	1	480.0	777.6	ND
	12cf	2	480.0	830.4	ND
	13cf	3	480.0	801.6	ND
	14cf	4	480.0	787.2	ND
	15cf	5	480.0	657.6	ND
	16cf	6	480.0	787.2	ND
	17cf	7(Duplicate)	480.0	801.6	ND
	18cf	Blank	NA	0.0	ND
	19cf	Blank	NA	0.0	ND

notes: [a] ND - none detected
[b] NA - not applicable

TABLE I (cont'd)

Polynuclear Aromatic Hydrocarbons (sorbent)

Date	Sample #	Sample Location	Time Sampled (minutes)	Liters Sampled	Results
7/25/86	LAC-AR-1CS	1	480.0	801.6	ND[a]
	2CS	2	416.2	657.6	ND
	3CS	3	480.0	787.2	ND
	4CS	4	480.0	777.6	ND
	5CS	5	480.0	830.4	ND
	6CS	6	480.0	787.2	ND
	7CS	7(Duplicate)	480.0	801.6	ND
	8CS	Blank	NA[b]	0.0	ND
	9CS	Blank	NA	0.0	ND
7/26/86	LAC-AR-11CS	1	480.0	777.6	ND
	12CS	2	480.0	830.4	ND
	13CS	3	480.0	801.6	ND
	14CS	4	480.0	787.2	ND
	15CS	5	480.0	657.6	ND
	16CS	6	480.0	787.2	ND
	17CS	7(Duplicate)	480.0	801.6	ND
	18CS	Blank	NA	0.0	ND
	19CS	Blank	NA	0.0	ND

Notes: [a] ND - none detected
[b] NA - not applicable

ppr.tbl

CASE* SAS 2277C

Table 1.

TOTAL PHENOLS, NIOSH Method 3502

Field ID	Radian ID	Results, ug/sample(25mL)
Lac-Ar-1A	13123	< 125
2A	13124	< 125
3A	13125	< 125
4A	13126	< 125
5A	13127	< 125
6A	13128	< 125
7A	13129	< 125
dup Mark - 8A	13130	< 125
Mark - 9A	13131	< 125
11A	13132	< 125
12A	13133	< 125
13A	13134	< 125
14A	13135	< 125
15A	13136	< 125
16A	13137	< 125
17A	13138	< 125
dup Mark - 18A	13139	< 125
Mark - 19A	13140	< 125

Detection Limit: 5 ug/mL

Table 3.

NIOSH Method P & CAM 127

Benzene, Toluene, o-Xylene Results

Field ID	Radian ID	Benzene	Toluene	o-Xylene
Lac-Ar-1B	13141	< 10ug	< 10ug	< 10ug
2B	13142	< 10ug	< 10ug	< 10ug
3B	13143	< 10ug	< 10ug	< 10ug
4B	13144	< 10ug	< 10ug	< 10ug
5B	13145	< 10ug	< 10ug	< 10ug
6B	13146	< 10ug	< 10ug	< 10ug
7B	13147	< 10ug	< 10ug	< 10ug
- 8B	13148	< 10ug	< 10ug	< 10ug
- 9B	13149	< 10ug	< 10ug	< 10ug
11B	13150	< 10ug	< 10ug	< 10ug
12B	13151	< 10ug	< 10ug	< 10ug
13B	13152	< 10ug	< 10ug	< 10ug
14B	13153	< 10ug	< 10ug	< 10ug
15B	13154	< 10ug	< 10ug	< 10ug
16B	13155	< 10ug	< 10ug	< 10ug
17B	13156	< 10ug	< 10ug	< 10ug
- 18B	13157	< 10ug	< 10ug	< 10ug
19B	13158	< 10ug	< 10ug	< 10ug

Detection Limits: 10 ug/mL

Polynuclear Aromatic Hydrocarbons

NIOSH Method 5515

The field ID's and Radian's ID's for the samples received were as follows:

Table 5.

Teflon filter:		XAD-2 sorbent tube:	
Field ID	Radian ID	Field ID	Radian ID
Lac-Ar-1cf	13177	Lac-Ar-1cs	13159
2	13178	2	13160
3	13179	3	13161
4	13180	4	13162
5	13181	5	13163
6	13182	6	13164
7	13183	7	13165
duplicate — 8	13184	8	13166
blank — 9	13185	9	13167
11	13186	11	13168
12	13187	12	13169
13	13188	13	13170
14	13189	14	13171
15	13190	15	13172
16	13191	16	13173
17	13192	17	13174
duplicate — 18	13193	18	13175
blank — 19	13194	19	13176

All samples and the six (6) blanks analyzed had less than detectable amounts of each PNA. The detection limits are listed in following table. Also included are the QC data tables of each PNA showing the calibration data and spiked recoveries for four (4) Teflon filters, and (4) XAD-2 sorbent tubes. Two injections of each spike were made, one at the beginning and one at the end of sample analysis. Calibration curve checks were done during and after analysis of the filters and sorbent tubes.

Table 6.

Polynuclear Aromatic Hydocarbons

NIOSH Method 5515

Compound	Detection Limits
1. Acenaphthene	50 ug/mL
2. Acenaphthylene	99
3. Anthracene	5
4. Benz[a]anthracene	4
5. Benzo[b]fluoranthene	5
6. Benzo[k]fluoranthene	6
7. Benzo[ghi]perylene	9
8. Benzo[a]pyrene	6
9. Benzo[e]pyrene	7
10. Chrysene	7
11. Dibenz[a,h]anthracene	10
12. Fluoranthene	9
13. Fluorene	11
14. Indeno[1,2,3-cd]pyrene	7
15. Naphthalene	8
16. Phenanthrene	6
17. Pyrene	4

APPENDIX A

ORGANIC DATA VALIDATION SUMMARY

Date Review Completed: 11-3-86
Case No. SAS No.: 2277C Contract Lab: Radian
Site Name: L.A. Clarke Lab DPO: Kent Kitchingman
Sample Nos.: 1A-9A, 11A-19A Reviewer: Dianne Therry/
1B-9B, 11B-19B Mike Taylor
1C-9C, 11C-19C from Region III
Phone 215 524-7360 WESTON

	CONCENTRATION			
MATRIX	low	med	high	MATRIX RELATED COMMENTS
soil/solid				
aqueous				
other AIR		18		includes 2 duplicates + 2 field blanks

deviations from SAS-specified QC:
phenols (NIOSH 3502)
1. 4 spikes at med range instead of 2 low/2 high, not different conc. than calib. std.
2. detection limit <125 ug/sample instead of 10 ug/sample
3. analysis date for holding time evaluation not supplied
4. % RSD listed and all <30%, but how obtained? only one set of target/found data.

BTX (P&CAM #127)
1. RF information for calibration not provided
2. detection limit <10 ug/mL - approved per 8-13-86 phone call.

PNA (NIOSH 5515)
1. spike recoveries exceed 60-140% SAS-criteria for napthalene, benzo(K)fluoranthene, benzo(E)pyrene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene*.
2. no RF to evaluate calibration criteria of <30% RSD.
3. per 8-13-86 phone call, got variance from the 5 pt. calib., however, variance stated 3 pt. curve to be done at beginning and end of analysis - only done at beginning.
4. analysis date for holding time evaluation not supplied.
5. determination of optimum extraction solvent - done per method?
6. filter weights for samples - done per method?
7. desorption efficiency - should be performed at five concentration levels.
8. any cleanups performed? sample all negative, so probably not required.
9. detection limit specified in SAS: 1 ug/sample - reported 4-99 ug/sample.

* variable %R for PNA would be expected from XAD tubes since adsorption/desorption efficiencies for these compounds is unknown.

Section 4.0 Deviations From Methods.

NIOSH Method P & CAM 127, "Organics in Air".

The SAS request stated that these analyses be completed within 14 days of sampling. The NIOSH method does not require any minimum holding times. Upon receipt, the charcoal tube samples were stored at 5 degrees C until desorbed. Analysis was completed the same day as desorption. All charcoal tubes were analyzed within 22 days of sampling. Based on Radian's experience and approximately 300 labs involved in NIOSH's Proficiency Analytical Testing (PAT) program, these compounds are stable on charcoal tubes for at least 45 days.

NIOSH Method 3502, "Total Phenols".

1) Four (4) spiked recoveries were done at the midpoint of the calibration curve instead of two at the low and two at the high ranges.

2) The detection limit based on the calibration curve's linear regression was 125 ug/sample.

NIOSH Method 5515, "Polynuclear Aromatic Hydrocarbons".

1) A three (3) point calibration curve was initially contructed instead on the method's (5) point curve. Calibration curve checks were done during and after sample analysis. The Method's detection limits for individual PNA's could not be obtained.

60-145%

UG/ML	AREA COUNT
100	371156
1000	1714600
2000	3827910

NAPHTHALENE

Regression Output:

Constant	85628.46
Std Err of Y Est	239911.3
R Squared	0.990522
No. of Observations	3
Degrees of Freedom	1
X Coefficient(s)	1824.767
Std Err of Coef.	178.4891

	SPIKE #	AREA CTS	UG/ML	AREA CTS	UG/ML	AVG	% RECOVER
FILTER	1.	169705	46	212851	70	58	58
	2.	207577	67	206033	67	67	67
	3.	189226	57	153645	37	47	47
	4.	209233	68	171267	47	57	57
XAD	1.	156030	39	150775	36	37	37
	2.	163306	43	163306	43	43	43
	3.	167177	45	167177	45	45	45
	4.	155616	38	155616	38	38	38
XAD Calibration Check:		267559	100	310625	123	112	112
Filter Calibration Check:		1597910	829	1545290	800	814	81
Detection Limit:		100000	8				

ACENAPHTHYLENE

UG/ML	AREA COUNT
200	266839
2000	3373980
4000	7302440

Regression Output:

Constant	-182925.
Std Err of Y Est	184044.9
R Squared	0.998637
No. of Observations	3
Degrees of Freedom	1
X Coefficient(s)	1853.554
Std Err of Coef.	68.46282

	SPIKE #	AREA CTS	UG/ML	AREA CTS	UG/ML	AVG	% RECOVER
FILTER	1.	329739	277	351466	288	282	141
	2.	331832	278	318074	270	274	137
	3.	300733	261	301643	261	261	131
	4.	301893	262	309606	266	264	132
XAD	1.	327099	275	318224	270	273	136
	2.	329681	277	317674	270	273	137
	3.	325970	275	315080	269	272	136
	4.	308332	265	322868	273	269	134
XAD Calibration Check:		262991	241	274774	247	244	122
Filter Calibration Check:		3140440	1793	3071740	1756	1774	89
Detection Limit:		1000	99				

ACENAPHTHENE

UG/ML	AREA COUNT
100	144908
1000	1832300
2000	3971240

Regression Output:

Constant	-100556.
Std Err of Y Est	102081.1
R Squared	0.998583
No. of Observations	3
Degrees of Freedom	1
X Coefficient(s)	2016.166
Std Err of Coef.	75.94627

	SPIKE #	AREA CTS	UG/ML	AREA CTS	UG/ML	AVG	% RECOVER
FILTER	1.	179793	139	190912	145	142	142
	2.	179809	139	173443	136	137	137
	3.	163330	131	164589	132	131	131
	4.	163733	131	168322	133	132	132
XAD	1.	178158	138	174737	137	137	137
	2.	179839	139	174569	136	138	138
	3.	178778	139	173693	136	137	137
	4.	169550	134	178519	138	136	136
XAD Calibration Check:		143315	121	149817	124	123	123
Filter Calibration Check:		1707200	897	1668860	878	887	89
Detection Limit:		1000	50				

BENZ(A)ANTHRACENE

10	12531
100	166488
200	340739

Regression Output:

Constant	-5275.20		
Std Err of Y Est	1232.298	XAD	1.
R Squared	0.999971		2.
No. of Observations	3		3.
Degrees of Freedom	1		4.
X Coefficient(s)	1727.689		
Std Err of Coef.	9.168045		

FILTER	1.	15315	12	16535	13	12	123
	2.	15611	12	16778	13	12	124
	3.	15198	12	16126	12	12	121
	4.	15450	12	15436	12	12	120
XAD	1.	16892	13	14754	12	12	122
	2.	15665	12	13029	11	11	114
	3.	18470	14	15196	12	13	128
	4.	15726	12	15817	12	12	122
XAD Calibration Check:		12301	10	11776	10	10	100
Filter Calibration Check:		158596	95	156866	94	94	94
Detection Limit:		1000	4				

BENZO(K)FLUORANTHENNE

10	22105
100	309958
200	682468

Regression Output:

Constant	-21443.4		
Std Err of Y Est	20362.62	XAD	1.
R Squared	0.998108		2.
No. of Observations	3		3.
Degrees of Freedom	1		4.
X Coefficient(s)	3480.198		
Std Err of Coef.	151.4937		

FILTER	1.	28423	14	33995	16	15	151
	2.	29540	15	30272	15	15	148
	3.	27610	14	29132	15	14	143
	4.	27154	14	29503	15	14	143
XAD	1.	26473	14	26052	14	14	137
	2.	27097	14	26327	14	14	138
	3.	27157	14	26223	14	14	138
	4.	27473	14	27451	14	14	141
XAD Calibration Check:		22310	13	21281	12	12	120
Filter Calibration Check:		312962	96	296321	91	94	94
Detection Limit:		1000	6				

BENZO(B)FLUORANTHENE

20	15933
200	165417
400	343448

Regression Output:

Constant	-3297.33		
Std Err of Y Est	4614.900	XAD	1.
R Squared	0.999603		2.
No. of Observations	3		3.
Degrees of Freedom	1		4.
X Coefficient(s)	862.4032		
Std Err of Coef.	17.16695		

FILTER	1.	18182	25	20871	28	26	132
	2.	18105	25	18771	26	25	126
	3.	17487	24	18498	25	25	123
	4.	17203	24	18881	26	25	124
XAD	1.	17532	24	16964	23	24	119
	2.	19048	26	16461	23	24	122
	3.	18062	25	16391	23	24	119
	4.	18438	25	17037	24	24	122
XAD Calibration Check:		14427	21	14095	20	20	102
Filter Calibration Check:		141745	168	154592	183	176	88
Detection Limit:		1000	5				

BENZO(E)PYRENE

10	9416										
100	111412			FILTER	1.	12229	16	11284	15	15	155
200	252906				2.	10743	15	13710	17	16	158
					3.	139421	115	147953	122	118	118
		Regression Output:			4.	273175	219	271960	218	219	109
		Constant	-8100.74								
		Std Err of Y Est	10888.15	XAD	1.	12777	16	12308	16	16	161
		R Squared	0.996035		2.	12279	16	12192	16	16	158
		No. of Observations	3		3.	12974	16	12484	16	16	162
		Degrees of Freedom	1		4.	13638	17	13082	16	17	167
				XAD Calibration Check:		106203	89				89
		X Coefficient(s)	1283.987	Filter Calibration Check:		118954	99	308641	247	115	
		Std Err of Coef.	81.00565	Detection Limit:		1000	7				

BENZO(A)PYRENE

10	10659										
100	144239			FILTER	1.	13604	14	16794	16	15	148
200	311618				2.	13534	14	14466	14	14	141
					3.	13871	14	13728	14	14	140
		Regression Output:			4.	13023	13	14080	14	14	138
		Constant	-8345.31								
		Std Err of Y Est	7328.369	XAD	1.	13053	13	12308	13	13	133
		R Squared	0.998819		2.	13392	14	12192	13	13	133
		No. of Observations	3		3.	13264	14	12484	13	13	134
		Degrees of Freedom	1		4.	13431	14	13082	14	14	136
				XAD Calibration Check:		10617	12	9938	12	12	120
		X Coefficient(s)	1585.651	Filter Calibration Check:		145624	97	138044	92	95	95
		Std Err of Coef.	54.52157	Detection Limit:		1000	6				

INDENO(1,2,3-cd)PYRENE

10	10415										
100	144039			FILTER	1.	13751	15	16404	16	15	153
200	316286				2.	13896	15	14640	15	15	148
					3.	13744	15	14287	15	15	147
		Regression Output:			4.	13431	14	14398	15	15	146
		Constant	-9652.27								
		Std Err of Y Est	9191.356	XAD	1.	12668	14	12683	14	14	139
		R Squared	0.998203		2.	13059	14	12911	14	14	140
		No. of Observations	3		3.	13127	14	12900	14	14	141
		Degrees of Freedom	1		4.	13683	14	13588	14	14	143
				XAD Calibration Check:		10788	13	10802	13	13	130
		X Coefficient(s)	1611.925	Filter Calibration Check:		137997	92	138941	92	92	92
		Std Err of Coef.	68.38181	Detection Limit:		1000	7				

Case #/Site I.D.: SAS 2277C/L.A. Clarke
Sample Numbers: 1A-9A, 11A-19A,
1B-9B, 11B-19B,
1C-9C, 11C-19C

Site Manager: Ralph Shapot

Data Reviewer: Dianne S. Therry/J. Michael Taylor
Review Completed: 3 November 1986

Introduction

The set of samples for SAS Case 2277C contained 19 air samples which were analyzed through the Contract Laboratory Program (CLP) special analytical services by one laboratory for total phenols, benzene/toluene/o-xylene (BTX), and polynuclear aromatic hydrocarbons (PNA's). The sample set included two field duplicates and two field blanks.

These data were reviewed according to criteria established in the National Functional Guidelines for Evaluating Organic Analyses, criteria specified in NIOSH Method 3502 for phenols, Physical and Chemical Analytical Method 127 (P&CAM #127) for BTX, NIOSH Method 5515 for PNA's, the SAS-Request and SAS-related deviations documented in a 13 August 1986 phone log. All data have been validated with regard to usability. The method used by the CLP must be evaluated by each individual user as to whether the scope, precision, and accuracy meet the needs of the project.

The laboratory performed the analyses in compliance with the SAS Request, with some deviations to the required quality control which did not affect data usability. Spike recoveries for phenols and BTX met SAS-specified criteria, blank analysis indicated no contamination above reported detection limits. Missed holding times and inability to obtain the SAS-specified detection limits were the most significant problems in this data set. Problems associated with data usability are discussed in the following section.

Qualifiers

1) The SAS-specified holding times were set to parallel CLP and 40CFR Part 136 recommendations, however, no specifications for air samples have been promulgated. A summary of holding time evaluation follows:

Compounds/Method	SAS-specified holding time from date of sampling*	laboratory analyses
phenols (NIOSH 3502)	5 days	not provided
BTX (P&CAM #127)	14 days	<22 days**
PNA (NIOSH 5515)	7 days (extraction) +30 days (analysis)	not provided

* 26-27 July 1986
** approved per 8-13-86 phone call w/Region III

2) All samples and blanks for the requested analyses were negative (less than reported detection limits). However, the laboratory was unable to obtain the SAS-specified detection limits for phenols and PNA's. The individual user must determine if the levels reported meet the needs of the project.

Compound	SAS-specified detection limit	lab-reported detection limit
phenols	10 ug/sample	125 ug/sample
BTX	10 ug/sample	10 ug/mL
PNA	1 ug/sample	4-99 ug/mL*

* see attached table for detection limits of individual compounds.

SUMMARY

Total phenols, BTX, and PNA's for all samples were successfully analyzed. Missed holding times, and inability to obtain SAS-specified detection limits were areas that affected the usability of the data.

The text of this report has been formatted to address only those problem areas which affect the application of the data to the site investigation. Documentation of these problems and any other observed areas of laboratory contractual noncompliance are included in a separate report sent to the laboratory's CLP Project Officer. If you have questions or comments on this data review, please call Dianne Therry.

Enclosures

ANALYTICAL METHODS

ORGANIC SOLVENTS IN AIR

Physical and Chemical Analysis Branch

Analytical Method

Analyte:	Organic Solvents (See Table 1)	**Method No.:**	P&CAM 127
Matrix:	Air	**Range:**	For the specific compound, refer to Table 1
Procedure:	Adsorption on charcoal desorption with carbon disulfide, GC		
Date Issued:	9/15/72	**Precision:**	10.5% RSD
Date Revised:	2/15/77	**Classification:**	See Table 1

1. **Principle of the Method**

   1.1 A known volume of air is drawn through a charcoal tube to trap the organic vapors present.

   1.2 The charcoal in the tube is transferred to a small, graduated test tube and desorbed with carbon disulfide.

   1.3 An aliquot of the desorbed sample is injected into a gas chromatograph.

   1.4 The area of the resulting peak is determined and compared with areas obtained from the injection of standards.

2. **Range and Sensitivity**

   The lower limit in mg/sample for the specific compound at 16 × 1 attenuation on a gas chromatograph fitted with a 10:1 splitter is shown in Table 1. This value can be lowered by reducing the attenuation or by eliminating the 10:1 splitter.

3. **Interferences**

   3.1 When the amount of water in the air is so great that condensation actually occurs in the tube, organic vapors will not be trapped. Preliminary experiments indicate that high humidity severely decreases the breakthrough volume.

   3.2 When two or more solvents are known or suspected to be present in the air, such information (including their suspected identities), should be transmitted with the sample, since with differences in polarity, one may displace another from the charcoal.

   3.3 It must be emphasized that any compound which has the same retention time as the specific compound under study at the operating conditions described in this method is an interference. Hence, retention time data on a single column, or even on a number of columns, cannot be considered as proof of chemical identity. For this reason it is important that a sample of the bulk solvent(s) be submitted at the same time so that identity(ies) can be established by other means.

3.4 If the possibility of interference exists, separation conditions (column packing, temperatures, etc.) must be changed to circumvent the problem.

4. Precision and Accuracy

4.1 The mean relative standard deviation of the analytical method is 8% (11.4).

4.2 The mean relative standard deviation of the analytical method plus field sampling using an approved personal sampling pump is 10% (11.4). Part of the error associated with the method is related to uncertainties in the sample volume collected. If a more powerful vacuum pump with associated gas-volume integrating equipment is used, sampling precision can be improved.

4.3 The accuracy of the overall sampling and analytical method is 10% (NIOSH–unpublished data) when the personal sampling pump is calibrated with a charcoal tube in the line.

5. Advantages and Disadvantages of the Method

5.1 The sampling device is small, portable, and involves no liquids. Interferences are minimal, and most of those which do occur can be eliminated by altering chromatographic conditions. The tubes are analyzed by means of a quick, instrumental method. The method can also be used for the simultaneous analysis of two or more solvents suspected to be present in the same sample by simply changing gas chromatographic conditions from isothermal to a temperature-programmed mode of operation.

5.2 One disadvantage of the method is that the amount of sample which can be taken is limited by the number of milligrams that the tube will hold before overloading. When the sample value obtained for the backup section of the charcoal tube exceeds 25% of that found on the front section, the possibility of sample loss exists. During sample storage, the more volatile compounds will migrate throughout the tube until equilibrium is reached (33% of the sample on the backup section).

5.3 Furthermore, the precision of the method is limited by the reproducibility of the pressure drop across the tubes. This drop will affect the flow rate and cause the volume to be imprecise, because the pump is usually calibrated for one tube only.

6. Apparatus

6.1 An approved and calibrated personal sampling pump for personal samples. For an area sample, any vacuum pump whose flow can be determined accurately at 1 liter per minute or less.

6.2 Charcoal tubes: glass tube with both ends flame sealed, 7 cm long with a 6-mm O.D. and a 4-mm I.D., containing 2 sections of 20/40 mesh activated charcoal separated by a 2-mm portion of urethane foam. The activated charcoal is prepared from coconut shells and is fired at 600°C prior to packing. The absorbing section contains 100 mg of charcoal, the backup section 50 mg. A 3-mm portion of urethane foam is placed between the outlet end of the tube and the backup section. A plug of silylated glass wool is placed in front of the absorbing section. The pressure drop across the tube must be less than one inch of mercury at a flow rate of 1 lpm.

6.3 Gas chromatograph equipped with a flame ionization detector.

6.4 Column (20 ft × ⅛ in) with 10% FFAP stationary phase on 80/100 mesh, acid-washed DMCS Chromosorb W solid support. Other columns capable of performing the required separations may be used.

6.5 A mechanical or electronic integrator or a recorder and some method for determining peak area.

6.6 Microcentrifuge tubes, 2.5 ml, graduated.

6.7 Hamilton syringes: 10 µl, and convenient sizes for making standards.

6.8 Pipets: 0.5-ml delivery pipets or 1.0-ml type graduated in 0.1-ml increments.

6.9 Volumetric flasks: 10 ml or convenient sizes for making standard solutions.

7. Reagents

7.1 Spectroquality carbon disulfide (Matheson Coleman and Bell).

7.2 Sample of the specific compound under study, preferably chromatoquality grade.

7.3 Bureau of Mines Grade A helium.

7.4 Prepurified hydrogen.

7.5 Filtered compressed air.

8. Procedure

8.1 **Cleaning of Equipment:** All glassware used for the laboratory analysis should be detergent washed and thoroughly rinsed with tap water and distilled water.

8.2 **Calibration of Personal Pumps.** Each personal pump must be calibrated with a representative charcoal tube in the line. This will minimize errors associated with uncertainties in the sample volume collected.

8.3 **Collection and Shipping of Samples**

8.3.1 Immediately before sampling, the ends of the tube should be broken to provide an opening at least one-half the internal diameter of the tube (2 mm).

8.3.2 The small section of charcoal is used as a back-up and should be positioned nearest the sampling pump.

8.3.3 The charcoal tube should be vertical during sampling to reduce channeling through the charcoal.

8.3.4 Air being sampled should not be passed through any hose or tubing before entering the charcoal tube.

8.3.5 The flow, time, and/or volume must be measured as accurately as possible. The sample should be taken at a flow rate of 1 lpm or less to attain the total sample volume required. The minimum and maximum sample volumes that should be collected for each solvent are shown in Table 1. The minimum volume quoted must be collected if the desired sensitivity is to be achieved.

8.3.6 The temperature and pressure of the atmosphere being sampled should be measured and recorded.

8.3.7 The charcoal tubes should be capped with the supplied plastic caps immediately after sampling. Under no circumstances should rubber caps be used.

8.3.8 One tube should be handled in the same manner as the sample tube (break, seal, and transport), except that no air is sampled through this tube. This tube should be labeled as a blank.

8.3.9 Capped tubes should be packed tightly before they are shipped to minimize tube breakage during shipping.

8.3.10 Samples of the suspected solvent(s) should be submitted to the laboratory for qualitative characterization. These liquid bulk samples should not be transported in the same container as the samples or blank tube. If possible, a bulk air sample (at least 50 l air drawn through tube) should be shipped for qualitative identification purposes.

8.4 Analysis of Samples

8.4.1 Preparation of Samples. In preparation for analysis, each charcoal tube is scored with a file in front of the first section of charcoal and broken open. The glass wool is removed and discarded. The charcoal in the first (larger) section is transferred to a small stoppered test tube. The separating section of foam is removed and discarded the second section is transferred to another test tube. These two sections are analyzed separately.

8.4.2 Desorption of Samples. Prior to analysis, one-half ml of carbon disulfide is pipetted into each test tube. (All work with carbon disulfide should be performed in a hood because of its high toxicity.) Tests indicate that desorption is complete in 30 minutes if the sample is stirred occasionally during this period.

8.4.3 GC Conditions. The typical operating conditions for the gas chromatograph are.

1. 85 cc/min. (70 psig) helium carrier gas flow.
2. 65 cc/min. (24 psig) hydrogen gas flow to detector.
3. 500 cc/min. (50 psig) air flow to detector.
4. 200°C injector temperature.
5. 200°C manifold temperature (detector).
6. Isothermal oven or column temperature — refer to Table 1 for specific compounds.

8.4.4 Injection. The first step in the analysis is the injection of the sample into the gas chromatograph. To eliminate difficulties arising from blowback or distillation within the syringe needle, one should employ the solvent flush injection technique. The 10 μl syringe is first flushed with solvent several times to wet the barrel and plunger. Three microliters of solvent are drawn into the syringe to increase the accuracy and reproducibility of the injected sample volume. The needle is removed from the solvent, and the plunger is pulled back about 0.2 μl to separate the solvent flush from the sample with a pocket of air to be used as a marker. The needle is then immersed in the sample, and a 5-μl aliquot is withdrawn, taking into consideration the volume of the needle, since the sample in the needle will be completely injected. After the needle is removed from the sample and prior to injection, the plunger is pulled back a short distance to minimize evaporation of the sample from the tip of the needle. Duplicate injections of each sample and standard should be made. No more than a 3% difference in area is to be expected.

8.4.5 Measurement of area. The area of the sample peak is measured by an electronic integrator or some other suitable form of area measurement, and preliminary results are read from a standard curve prepared as discussed below.

8.5 Determination of Desorption Efficiency

8.5.1 Importance of determination. The desorption efficiency of a particular compound can vary from one laboratory to another and also from one batch of charcoal to another. Thus, it is necessary to determine at least once the percentage of the specific compound that is removed in the desorption process for a given compound, provided the same batch of charcoal is used. NIOSH has found that the desorption efficiencies for the compounds in Table 1 are between 81% and 100% and vary with each batch of charcoal.

8.5.2 Procedure for determining desorption efficiency. Activated charcoal equivalent to the amount in the first section of the sampling tube (100 mg) is measured into a 5-cm, 4-mm I.D. glass tube, flame-sealed at one end (similar to commercially available culture tubes). This charcoal must be from the same batch as that used in obtaining the samples and can be obtained from unused charcoal tubes. The open end is capped with Parafilm. A known amount of the compound is injected directly into the activated charcoal with a microliter syringe, and the tube is capped with more Parafilm. The amount injected is usually equivalent to that present in a 10-liter sample at a concentration equal to the federal standard.

At least five tubes are prepared in this manner and allowed to stand for at least overnight to assure complete absorption of the specific compound onto the charcoal. These five tubes are referred to as the samples. A parallel blank tube should be treated in the same manner except that no sample is added to it. The sample and blank tubes are desorbed and analyzed in exactly the same manner as the sampling tube described in Section 8.4.

Two or three standards are prepared by injecting the same volume of compound into 0.5 ml of CS_2 with the same syringe used in the preparation of the sample. These are analyzed with the samples.

The desorption efficiency equals the difference between the average peak area of the samples and the peak area of the blank divided by the average peak area of the standards, or

$$\text{desorption efficiency} = \frac{\text{Area sample} - \text{Area blank}}{\text{Area standard}}$$

9. Calibration and Standards

It is convenient to express concentration of standards in terms of mg/0.5 ml CS_2 because samples are desorbed in this amount of CS_2. To minimize error due to the volatility of carbon disulfide, one can inject 20 times the weight into 10 ml of CS_2. For example, to prepare a 0.3 mg/0.5 ml standard, one would inject 6.0 mg into exactly 10 ml of CS_2 in a glass-stoppered flask. The density of the specific compound is used to convert 6.0 mg into microliters for easy measurement with a microliter syringe. A series of standards, varying in concentration over the range of interest, is prepared and analyzed under the same GC conditions and during the same time period as the unknown samples. Curves are established by plotting concentration in mg/0.5 ml versus peak area.

NOTE: Since no internal standard is used in the method, standard solutions must be analyzed at the same time that the sample analysis is done. This will minimize the effect of known day-to-day variations and variations during the same day of the FID response.

10. Calculations

10.1 The weight, in mg, corresponding to each peak area is read from the standard curve for the particular compound. No volume corrections are needed, because the standard curve is based on mg/0.5 ml CS_2 and the volume of sample injected is identical to the volume of the standards injected.

10.2 Corrections for the blank must be made for each sample.

$$\text{Correct mg} = \text{mg}_s - \text{mg}_b$$

where:

mg_f = mg found in front section of sample tube

mg_b = mg found in front section of blank tube

A similar procedure is followed for the backup sections.

10.3 The corrected amounts present in the front and backup sections of the same sample tube are added to determine the total measured amount in the sample.

10.4 This total weight is divided by the determined desorption efficiency to obtain the corrected mg per sample.

10.5 The concentration of the analyte in the air sampled can be expressed in mg per m^3.

$$mg/m^3 = \frac{\text{Corrected mg (Section 10.4)} \times 1000 \text{ (liters/m}^3\text{)}}{\text{Air volume sampled (liters)}}$$

10.6 Another method of expressing concentration is ppm (corrected to standard conditions of 25°C and 760 mm Hg).

$$\text{ppm} = mg/m^3 \times \frac{24.45}{MW} \times \frac{760}{P} \times \frac{(T + 273)}{298}$$

where:

P = pressure (mm Hg) of air sampled

T = temperature (°C) of air sampled

24.45 = molar volume (liter/mole) at 25°C and 760 mm Hg

MW = molecular weight

760 = standard pressure (mm Hg)

298 = standard temperature (°K)

11. References

11.1 White, L. D., D. G. Taylor, P. A. Mauer, and R. E. Kupel, "A Convenient Optimized Method for the Analysis of Selected Solvent Vapors in the Industrial Atmosphere", Am Ind Hyg Assoc J 31:225, 1970.

11.2 Young, D. M. and A. D. Crowell, Physical Adsorption of Gases, pp. 137-146, Butterworths, London, 1962.

11.3 Federal Register, 37:202:22139-22142, October 18, 1972.

11.4 NIOSH Contract HSM-99-72-98, Scott Research Laboratories, Inc., "Collaborative Testing of Activated Charcoal Sampling Tubes for Seven Organic Solvents", pp. 4-22, 4-27, 1973.

TABLE 1

Parameters Associated With P&CAB Analytical Method No. 127

Organic Solvent	Method Classification	Detection limit (mg/sample)	Sample Volume (liters) Minimum(a)	Sample Volume (liters) Maximum(b)	GC Column Temp.(°C)	Molecular Weight
Acetone	D	–	0.5	7.7	60	58.1
Benzene	A	0.01	0.5	55	90	78.1
Carbon tetrachloride	A	0.20	10	60	60	154.0
Chloroform	A	0.10	0.5	13	80	119
Dichloromethane	D	0.05	0.5	3.8	85	84.9
p-Dioxane	A	0.05	1	18	100	88.1
Ethylene dichloride	D	0.05	1	12	90	99.0
Methyl ethyl ketone	B	0.01	0.5	13	80	72.1
Styrene	D	0.10	1.5	34	150	104
Tetrachloroethylene	B	0.06	1	25	130	166
1,1,2-trichloroethane	B	0.05	10	97	150	133
1,1,1-trichloroethane (methyl chloroform)	B	0.05	0.5	13	150	133
Trichloroethylene	A	0.05	1	17	90	131
Toluene	B	0.01	0.5	22	120	92.1
Xylene	A	0.02	0.5	31	100	106

(a) Minimum volume, in liters, required to measure 0.1 times the OSHA standard

(b) These are breakthrough volumes calculated with data derived from a potential plot (11.2) for activated coconut charcoal. Concentrations of vapor in air at 5 times the OSHA standard (11.3) or 500 ppm, whichever is lower, 25°C, and 760 torr were assumed. These values will be as much as 50% lower for atmospheres of high humidity. The effects of multiple contaminants have not been investigated, but it is suspected that less volatile compounds may displace more volatile compounds (See 3.1 and 3.2)

POLYNUCLEAR AROMATIC HYDROCARBONS IN AIR

Physical and Chemical Analysis Branch

Analytical Method

Analyte: Polynuclear aromatic hydrocarbons (See Table on p. 184-13)	Method No.: P&CAM 184
Matrix: Air	Range: PAH content of 0 to 3 mg of benzene-soluble material
Procedure: Collection on a filter, extraction, column chromatography, spectrophotometric measurement	Precision: Not determined
Date Issued: 1/29/76	Classification: (D (Operational)
Date Revised:	

1. Principle of the Method

Polynuclear aromatic hydrocarbons are collected from air on a filter and extracted with benzene. The hydrocarbons are separated on an alumina column with *n*-pentane-diethyl ether mixtures as eluting solvents. The collected fractions are analyzed by a uv spectrophotometric method for nine hydrocarbons.

2. Range and Sensitivity

The range of the method depends upon the volume of air sampled, the amount of particulate matter collected, and the amount of organic material in the particulate matter. A normal sample size corresponds to 2 to 3 mg of benzene-soluble material. Larger amounts may be analyzed by diluting the sample solution and taking a small aliquot.

3. Interferences

Any substance that hinders the chromatographic separation or that absorbs radiation at the same wavelengths as the sample compounds may interfere.

4. Precision and Accuracy

The precision and accuracy of the method have not been determined. Precision for a similar procedure has been estimated to be ± 20% for samples taken at the same time and in the same vicinity. (See Reference 11.1.)

5. Advantages and Disadvantages of the Method

5.1 The method is sensitive and capable of measuring several polynuclear aromatic hydrocarbons in a single filter sample.

5.2 Careful attention to detail is required in performing the analytical procedure. Some practice and experience are necessary before an analyst can be expected to conduct a successful analysis with confidence.

5.3 The separation and quantification of the nine hydrocarbons is sensitive to the following factors: moisture content of the alumina; reproducibility of the packing of the columns; relative humidity of the laboratory air; quality of the solvents; interference from unknown compounds in the samples; photochemical effects; instrument performance; and contamination from extraneous sources.

6. Apparatus

6.1 Air Sampling Equipment

6.1.1 Glass fiber filters, 37 mm, free of organic binder, with an efficiency of at least 99% as determined by the DOP penetration test.

6.1.2 Silver membrane filters, 37 mm, 0.8 μm pore size, Selas Corporation of America, No. FM- 37-(0.8), or equivalent.

6.1.3 Disposable plastic filter holder (cassette) for 37-mm filters, Millipore [illegible]000 037 P0, or equivalent. In order to accommodate the two filters, the cassette must be held together with plastic tape or a shrinkable cellulose band.

6.1.4 Personal sampling pump capable of operating for 4 hr at 2.0 ℓ/min or of sampling about 0.5 m^3 of air. The pump should be calibrated with a representative filter assembly in the line. A wet or dry test meter or a glass rotameter capable of measuring the flow rate to within ± 5% may be used for the calibration.

6.2 Ultrasonic Bath. Dynasonics Corporation Model NT-201, 90 kHz, 60 W, or equivalent. The use of an ultrasonic bath operating at a lower frequency and having a higher power output may improve extraction efficiency. (See Reference 11.2.) A test tube support is needed for use in the ultrasonic bath.

6.3 Recording Spectrophotometer. Cary Model 14, Varian Associates, or equivalent.

6.3.1 Absorption Cells. Suprasil, 10-mm pathlength, Catalog No. 14-385-904C, Fisher Scientific Company, or equivalent. Calibrate the cells – except for one reference cell – by adding 1.00 mℓ of water and marking the meniscus level. Make another calibration mark with 3.00 mℓ of water.

6.3.2 Absorbance Screens Cary Part No. 1404109, Varian Associates, or equivalent. The set of screens has three absorbance values

6.4 Cuvette Washer. Catalog No. 2735-304, Chemical Rubber Company, or equivalent.

6.5 Column and Reservoir. The chromatographic column is a 1.2- by 43-cm glass tube. A 500-mℓ round-bottom flask attached to the top of the column serves as a solvent reservoir. A stopcock with a 6-cm tip is attached to the bottom of the column. This assembly is illustrated in Figure 1.

6.6 Glassware

6.6.1 Beakers, graduated, 150 mℓ.

6.6.2 Pasteur pipettes, 5.75 and 9 in.

6.6.3 Cylinders, graduated to deliver, 10 mℓ.

6.6.4 Buchner funnels, 18.5 cm diameter, with a No. 9 rubber stopper.

6.6.5 Filtering flask, 200 mℓ.

6.6.6 Funnel, 60°, long stem.

6.6.7 Bottles, jug-form, with caps, 1 gal.

6.6.8 Bottles, wide mouth, 1 qt.

6.6.9 Bottles, 2 oz.

6.6.10 Test tubes, 100 by 16 mm, with Teflon-lined screw caps.

6.6.11 Allihn tubes, fine-porosity fritted glass, 30 mℓ.

6.6.12 Small glass vials with Teflon-lined screw caps.

6.6.13 Glass trays, 23 by 33cm.

6.6.14 Assorted other laboratory glassware of various sizes, including microsyringes, volumetric pipettes, graduated pipettes, graduated cylinders, volumetric flasks, and beakers.

6.7 **Miscellaneous Items**

6.7.1 Wood applicator sticks, 6 in. long and 1/16 in. diameter.

6.7.2 Weighing paper, 3.5 by 4.5 in.

6.7.3 Forceps

6.7.4 Glass wool (Pyrex or equivalent), washed with chloroform.

6.7.5 Freezer.

6.7.6 Pipette filler.

6.7.7 Plastic rod, Plexiglas or equivalent.

6.7.8 Rubber bulb, atomizer, attached by rubber tubing to a glass rod in a No. 6 rubber stopper.

6.7.9 Steel rod, 3 mm by 70 cm.

6.7.10 Rubber bulbs, 1- and 2-cm volume.

7. **Reagents**

7.1 **Solvents.** Chloroform and *n*-pentane, Spectranalyzed® grade, Fisher Scientific Company, or equivalent; benzene, chloroform, methanol, acetone, and diethyl ether (anhydrous), ACS reagent grade.

7.2 Hydrochloric acid, ACS reagent grade.

7.3 **Silica Gel.** The silica gel should be 100/200 mesh. Fisher Scientific Company, or equivalent. Prepare the silica gel by slurrying 200 to 500 g with anhydrous ether and filtering through filter paper in a Buchner funnel with suction. Repeat this washing four times. Allow the ether to evaporate overnight in a hood and then heat the silica gel for 2 hr at 130°C in an oven. Store in a tightly capped bottle.

7.4 **Alumina.** Any acid-washed 100/200-mesh alumina that yields satisfactory separations may be used.

7.5 Elution Mixtures. The elution mixtures are listed below in order of increasing polarity. The mixtures are prepared by mixing *n*-pentane and diethyl ether in the ratios indicated. To prepare the first mixture, transfer 970 mℓ of *n*-pentane to a 1000-mℓ graduated cylinder, add 30 mℓ of ether, and pour into a 1-gal. glass jug. Repeat to fill the jug. Label this mixture 3%. Prepare and label the other mixtures in like fashion.

n-Pentane, mℓ	Ether, mℓ	Label
1000	0	0%
940	60	6%
910	90	9%
880	120	12%
850	150	15%
820	180	18%
750	250	25%

7.6 Polynuclear Aromatic Hydrocarbon Standards. Each of the compounds listed in the table on page 184-13 should be checked for purity by gas chromatography and by comparison with infrared and ultraviolet reference spectra. Impure compounds should be purified by liquid chromatography. (See Reference 11.3.)

7.7 Standard Solutions of Sample Compounds, 1 to 10 μg/ℓ. Weigh exactly 10 mg of each of the nine compounds listed in the table into separate 30-mℓ beakers. Dissolve each compound in *n*-pentane and transfer quantitatively to separate 100-mℓ volumetric flasks. Fill to the mark with *n*-pentane. Transfer 1.0 mℓ of this solution to 100-, 50-, and 25-mℓ volumetric flasks, and 5.0 mℓ to a 50-mℓ flask. Dilute to volume with *n*-pentane. These solutions will contain, respectively, 1, 2, 4, and 10 μg/mℓ. Cover the flasks with aluminum foil.

7.8 Mixed Standard, 50 μg/mℓ. Weigh exactly 5 mg of each of the nine compounds into separate 30-mℓ beakers. Dissolve each compound in a small volume of chloroform (Spectranalyzed® grade) and transfer all of the solutions quantitatively to the same 100-mℓ volumetric flask. Dilute to volume with chloroform. Use this solution to determine the recovery factor for each compound as described in Section 9.3.

8. Procedure

8.1 Cleaning of Equipment. Clean all new glassware by rinsing first with dilute hydrochloric acid, then with distilled water, methanol, and *n*-pentane. Glassware that has been used in the analysis should be rinsed twice with chloroform, then with methanol and *n*-pentane.

8.2 Collection and Shipping of Samples

8.2.1 Assemble the filters in the filter holder so that the air being sampled passes first through a glass fiber filter and then through a silver membrane filter. Remove the small plugs from the filter holder and connect the filter holder to the sampling pump by means of an adapter and a length of tubing. Sample at least 0.5 m^3 of air at 2.0 ℓ/min. The optimum sample volume will depend on the type of workroom environment being sampled. Since high concentrations of particulate material or certain types of mists may plug the filters, the flow rate should be checked about once every hour. On completion of sampling, reinsert the small plugs into the inlet and outlet of the filter holder.

8.2.2 With each group of samples prepare a blank consisting of a filter holder with representative filters that have been handled in the same manner as the sample filters, except that no air is drawn through them. The samples and the blank should be shipped promptly in a light-proof container to prevent photooxidation or damage during transit.

8.3 Analysis of Samples

8.3.1 Extraction

1. Remove the top portion of the filter holder. Hold the bottom portion containing the filters over a piece of weighing paper to catch any particulate material that may fall out. Remove the small plug from the bottom portion of the filter holder and insert an applicator stick through the hole. Gently raise the filters and grasp the unexposed edge with tweezers. Fold the filters in half and then into quarters lengthwise. Insert the folded filters into a test tube and push them to the bottom with the applicator stick. Add to the test tube any particulate material remaining in the filter holder or collected on the weighing paper.

2. Pipette 5.0 mℓ of benzene into the test tube. This amount of solvent should completely cover the filters.

3. Place the test tubes in the test tube support in the ultrasonic bath so that the level of water in the bath is above the level of the solvent. Turn on the ultrasonic bath and sonicate the sample for 5 min.

4. Decant the solvent into an Allihn tube and collect the filtrate in a small vial. Force the solvent through the Allihn filter under positive nitrogen pressure. This may be accomplished by connecting the nitrogen cylinder to a glass "T," leaving one arm of the "T" open and connecting the other arm to a No 4 one-hole rubber stopper, which is pressed against the top of the Allihn tube. pressure is controlled with a finger placed against the open arm of the "T." When the filtration has been completed, close the vial tightly with a Teflon-lined screw cap.

5. Insofar as possible, all subsequent operations should be carried out under yellow light.

8.3.2 Transfer a 3.0-mℓ aliquot of the benzene extract to a weighed 30-mℓ beaker and evaporate the solvent by gentle heating in a hood. Allow the beaker to cool to room temperature and record its weight to the nearest milligram. Calculate the number of milligrams of benzene-soluble material. Dissolve the residue in a known volume of chloroform (see note below) and transfer an appropriate aliquot to a 2-oz bottle containing 1.0 g of alumina (weighed under low humidity conditions and protected from atmospheric moisture). Allow the chloroform to evaporate in a hood. The alumina containing the adsorbed sample material is then ready for addition to the chromatography column.

Note: The volume of the chloroform in which the residue is dissolved and the size of the aliquot taken should be such that 2 to 3 mg of benzene-soluble material is transferred to the alumina. When the amount of benzene-soluble material is less than 3 mg, dissolve the residue in 5 mℓ of chloroform and transfer the entire sample to the alumina.

8.3.3 Preparation of Columns

1. Weigh into separate 2-oz bottles 9.0 g of alumina and 0.5 g of silica gel. The weighing should be done under low-humidity conditions, but not necessarily under dry-box conditions. Cover the bottles with aluminum foil and cap securely until the materials are used.

2. Attach the chromatography column securely to a ring stand at a convenient height to allow easy change of receiving bottles under the column. Tamp down a small amount of glass wool immediately above the stopcock. Pour the 9.0 g of alumina through a funnel into the column, keeping the stopcock open. Tap the funnel and column lightly so that all of the alumina falls into the lower portion of the column. Tamp down the alumina with the plastic rod.

3. Place a clean beaker under the column and add 130 mℓ of *n*-pentane to the column. Add the first 5 to 6 mℓ to the sides of the column with a dropper so that the alumina will not be disturbed. Using the atomizer bulb with stopper, apply pressure at the top of the column, forcing the solvent to flow through the alumina and driving out the entrapped air. Continue transferring *n*-pentane to the column and pressurizing until all air bubbles have been removed. Close the stopcock, leaving the *n*-pentane level 3 to 4 in. below the bottom of the reservoir.

4. With the funnel, add 0.5 g of silica gel slowly and evenly. Do not tap the column after the *n*-pentane has been added. With a medicine dropper filled with *n*-pentane, wash down any silica gel that has not fallen to the alumina. Carefully stir the silica gel (but not the alumina) with the steel rod until all air bubbles have risen.

5. Drain the *n*-pentane to a level about 1.5 in. above the silica gel. Adjust the volume of *n*-pentane in the beaker to 100 mℓ. Pour *n*-pentane from the beaker into the column until the solvent level is 3 to 4 in. below the reservoir.

6. With the aid of the funnel, add the 1.0 g of alumina containing the adsorbed sample. Add the alumina slowly and evenly so that no air is entrapped. Do not tap the column. Wash down any alumina adhering to the walls with *n*-pentane. Rinse the 2-oz sample bottle with *n*-pentane and transfer to the column. Rinse the funnel and remove it. Pour the remainder of the 100 mℓ of *n*-pentane from the beaker into the reservoir. Wrap the packed portion of the column with aluminum foil to protect the sample compounds from photooxidation.

8.3.4 Elution of Sample Compounds. As many as ten columns can be run at one time.

1. Separate the adsorbed compounds by eluting them from the column with successive additions of 100 to 150 mℓ of the elution mixtures (Section 7.5). Add the elution mixtures in order of increasing polarity (0 to 25% of ether). Add each elution mixture when the solvent level is about 2 in. above the packing. Add dropwise at first and then pour slowly so that the column packing is not disturbed.

2. Collect 15- to 20-mℓ fractions at the bottom of the column in numbered 2-oz bottles. About 45 to 50 fractions will be collected. Evaporate the solvent from the several collected fractions in a hood, cover the bottles, and store them in a freezer until ready for the next step.

3. The specific details of the elution process must be determined experimentally with a mixed standard prepared as described in Section 7.8. The details will depend upon the properties of the particular batch of alumina being used. The volumes of the elution mixtures and the number of elution mixtures needed to effect complete separation may vary from one batch of alumina to another. When the optimum conditions have been established for a given batch of alumina, they should be used with all columns packed with that alumina.

4. In a typical analysis, the nine compounds will be eluted in the order as listed in the table. Fluoranthene and benz(a)anthracene must be completely separated since their ultraviolet absorption peaks occur at the same wavelength, 287 nm.

8.3.5 Spectrophotometric Measurements

1. Remove a bottle containing a collected fraction from the freezer and allow it to come to room temperature. With a Pasteur pipette, a 1-mℓ rubber bulb, and *n*-pentane as solvent, quantitatively transfer the sample from the 2-oz bottle to a 1-cm absorption cell. Rinse the bottle several times with small amounts of *n*-pentane. Add *n*-pentane to the cell to bring the volume up to the 3-mℓ calibration mark and stir with the pipette.

2. Set the scan speed of the Cary 14 spectrophotometer at 10Å/sec and the slit control at 25. With *n*-pentane in the reference cell, record the spectrum of the sample solution over the wavelength range necessary to include the absorption peak for each compound present in the fraction. (See table). Using the baseline method as illustrated in Figure 2, measure the absorbances for each compound at the wavelengths indicated in the table.

3. If any absorption peak is off-scale, place one of the neutral density screens in the reference beam to lower both the baseline and the peak and record the spectrum again. If the peak is still off-scale, the solution must be diluted. Remove some of the solution from the cell with a pipette until the level is at the 1.0-mℓ mark. Add *n*-pentane to bring the level in the cell back to the 3.0-mℓ mark and mix. Record the spectrum of the diluted solution. If necessary, make additional dilutions and record the number (n) of dilution steps.

8.3.6 Analysis of Combined Fractions. After several column separations have been made and the absorption spectra have been recorded, various fractions found to contain the same compound may be combined in subsequent analyses. The number of spectra to be recorded will thereby be reduced and time will be saved. To combine fractions, dissolve the residues in the 2-oz bottles with *n*-pentane and transfer these solutions quantitatively to one bottle. Allow the solvent to evaporate and proceed with the analysis of the combined fractions as directed in Section 8.3.5.

9. Calibration and Standards

CAUTION: Benzo(a)pyrene and other aromatic hydrocarbons commonly associated with it are known carcinogens. Avoid skin contact with these compounds and their solutions. Perform the evaporations and other manipulations in a hood.

9.1 Determination of Absorptivities of the Individual Compounds. Transfer approximately 3 mℓ of the 1 μg/mℓ standard solution of pyrene (Section 7.7) to a 1-cm absorption cell. With *n*-pentane in the reference cell, record the spectrum as described in Section 8.3.5. Similarly, record the spectra of the other three pyrene standards and all of the standard solutions of the other eight compounds listed in the table. On each spectrum draw a baseline between the two wavelenths indicated in the table and subtract the absorbance value at the baseline from the absorbance value at the peak (see Figure 2).

Determine the absorptivity, a, at the wavelength of maximum absorbance for each compound by dividing absorbance by concentration for each standard solution and averaging the four values (the pathlength is 1 cm).

9.2 Determination of Recovery Factors. Transfer 0.5, 1.0, and 2.0 mℓ of the mixed standard solution (Section 7.8) to 2-oz bottles containing 1.0 g of alumina. Proceed with the analysis of these standards as directed in Section 8.3.2 and the subsequent sections. Analyze the standards on two or more columns. It is essential that all operating conditions be identical for the standards and for sample measurements. Calculate an average recovery factor, R, for each of the nine compounds by dividing the amount of the compound taken by the amount found.

10. Calculations

10.1 **Calculation When Separation is Complete.** When all of the compounds are completely separated on the column and all of each compound is completely contained in one fraction, calculate the amount of each compound in the sample by the following equation.

$$W = \left(\frac{A}{a} \times D\right) \times R \times \frac{V}{P} \times 1.67$$

where: W = amount (in μg) of compound on filter.

A = absorbance (Section 8.3.5).

a = absorptivity (Section 9.1).

D = volume (in mℓ) of *n*-pentane (normally 3.0 mℓ) in which the column fraction is dissolved for the absorbance measurement (Section 8.3.5). If this solution is diluted, $D = (3.0)^{n+1}$ where n = number of dilution steps.

R = recovery factor (Section 9.2).

V = total volume (in mℓ) of chloroform solution of sample (Section 8.3.2).

P = volume (in mℓ) of aliquot of chloroform solution added to alumina (Section 8.3.2).

1.67 = a correction for taking a 3.0-mℓ aliquot of the 5.0-mℓ benzene extract of the filter (Section 8.3.2).

If a compound is found in more than one fraction, the term $(\frac{A}{a} \times D)$ must be summed for all fractions in which that compound occurs.

10.2 **Calculation when Separation is Not Complete.** When the column separation is not complete and two or more compounds are found in the same fraction, the calculation becomes more complex. Under these circumstances, the absorptivity must be determined for each interfering compound at the wavelength of maximum absorbance of each other compound with which it interferes. If such interference is extensive, the result is a set of several simultaneous linear equations. These equations can best be solved by a suitably designed computer program.

11. References

11.1 "Tentative Method of Analysis for Polynuclear Aromatic Hydrocarbon Content of Atmospheric Particulate Matter," Health Lab. Sci., 7 (No. 1), 31 (1970).

11.2 Alliger, H., Am. Lab. 7 (10), 75 (1975).

11.3 Schulte, K. A., D. J. Larsen, R. W. Hornung, and J. V. Crable, "Report on Analytical Methods Used in a Coke Oven Effluent Study," National Institute for Occupational Safety and Health, Cincinnati, Ohio, May 1974.

Appendix H

APPENDIX H

RESULTS OF TOTAL ORGANIC CARBON (TOC) AND CATION EXCHANGE CAPACITY (CEC) ANALYSES

DATA SUMMARY

CASE NO. SAS #329C MATRIX Soil UNITS mg/kg

LABORATORY [redacted] COMMENTS

EPA TR#	3-130033-1	3-130034-2	3-130035-3	3-130036-4	3-130037-5	3-88142-6	3-88143-7	
LAB ID. #	⊥	⊥	⊥	⊥	⊥	⊥	⊥	
TOC (mg/kg)	874	233	206	214	385	502	203	
CEC (meg/100g)	0.1	9.7	0.2	1.7	16.8	0.8	13.1	
% SOLIDS	NA	NA	NA	NA	NA	NA	NA	

H-1

Case #/Site ID: SAS 2329C/LA CLARKE
Sample Numbers: 3-130033-1; 3-130034-2; 3-130035-3; 3-130036-4; 3-130037-5; 3-88122-6; 3-88123-7

Site Manager: Ralph Shapot

Data Reviewer: Dianne S. Therry
Review Completed: 1 December 1986

INTRODUCTION:

The set of samples for SAS Case 2329C contained 7 soil samples which were analyzed through the Contract Laboratory Program Special Analytical Services (SAS) by one laboratory for total organic carbon (TOC) and cation-exchange capacity (CEC).

These data were reviewed according to criteria established in the National Functional Guidelines for Evaluating Inorganic Analyses and the requirements specified in the SAS Request. All data have been validated with regard to usability. The methods used by the laboratory are a modification of TOC Method 505 from Standard Methods for the Examination of Water and Wastewater, 15th edition and CEC Method 57.2 from the American Society of Agromony's Methods of Soil Analysis, Part 2 using ammonium saturation followed by displacement/distillation of the adsorbed ammonium, per the SAS Request. Each individual user must evaluate whether the scope, precision, and accuracy meet the needs of the project.

The laboratory performed the analyses in compliance with the Contract Laboratory Program (CLP) SAS Request, including the required quality control. Criteria were met for calibration and blanks. All results are reported on a wet-weight basis, % solids were neither requested nor analyzed. Significant problems affecting usability are associated with variability of TOC replicates for sample #6. Problems associated with data usability are discussed in the following section. The data summary has been annotated with the appropriate qualifier codes.

QUALIFIERS:

1) The reviewer has no guidance for evaluation of the impact of holding times for these parameters in a soil matrix. Samples were collected 3-5 June 1986. CEC was determined on 21 August 1986 and TOC was determined on 2-8 September 1986.

2) All reported CEC results are based on 10g aliquots of soil. The method specifies use of 25g soil aliquots rather than 10g if the exchange capacity is very low, eg 3-5 meq/100g. Results for samples #1, 3, 4, and 6 range from 0.1-1.7 meq/100g. Failure to reanalyze using larger sample volume, which would reduce the detection limit, was not deemed critical, as the method detection limit specified in the SAS Request is 1 meq/100g.

3) Results of three duplicate TOC analyses run on 3 separate days for sample #6 consistently produced variable results (55% RPD, 140% RPD, 102% RPD). Individually, these results ranged from 200-1000 mg/kg. The reported result is the average of all six analyses, 580 mg/kg 62%±RSD, and has been qualified as estimated (J) due to the apparent non-homogeneity of the sample.

Other reported results represent the average of consecutive duplicate analyses with a maximum RPD of ±10%, per SAS Request. For five of seven samples more than one pair of analyses were required to obtain the desired precision. For comparison purposes, all available results for each sample were averaged in the following table. Precision was expressed as % RPD for duplicate results, and % RSD for 3 or more results.

Sample	# of individual analyses	TOC, mg/kg	% RPD or % RSD
1	2	874 ±	4% RPD
2	4	223 ±	11% RSD
3	4	317 ±	11% RSD
4	2	214 ±	4% RPD
5	6	442 ±	14% RSD
6	6	580 ±	62% RSD
7	4	190 ±	10% RSD

SUMMARY

Cation-exchange capacity (CEC) and total organic carbon (TOC) for all samples were successfully analyzed. Areas of concern with respect to usability include:

- uncertainty regarding the effects of holding times for CEC and TOC
- variable results for TOC in sample #6

The text of this report has been formatted to address only those problem areas which affect the applications of the data to the site investigation. Documentation of these problems and any other observed areas of laboratory contractual noncompliance are included in the attached Appendix A: Inorganic Data Validation Summary for the laboratory's CLP Project Officer. If you have any questions or comments on this data review, please contact Dianne Therry.

Enclosures

INORGANIC DATA VALIDATION SUMMARY

Date Review Completed 22 Dec 86
Case No. — SAS No. 2329C
Site Name LA Clarke
Sample Nos. 1&7:
3-130033-1; 3-130034-2; 3-130035-3; 3-130036-4; 3-130037-5; 3-88122-6; 3-88123-7

Contract Lab Hitman Ebasco
Contract No. 68-01-7280
Lab DPO Patricia Krantz (III)
Reviewer Denise J. Therry
from Region III Phone (215) 524-1160
~~FTS~~ WESTON

MATRIX	CONCENTRATION low	med	high	MATRIX RELATED COMMENTS
soil/solid	7			
aqueous				
other				

CEC (cation exchange capacity)	OK	FYI	ACTION	COMMENTS
Holding Time				no criteria
Calibration Blanks	✓			
Initial Calibration	✓			
Continuing Calibration	✓			
Preparation Blank				NA
~~Interference Check Sample~~				
Lab Control Sample	✓			NH_3N EPA check std
Lab Duplicate	✓			
Matrix Spike				NA
Comment - see below			*	see below

TOC	OK	FYI	ACTION	COMMENTS
Holding Time				no criteria
Calibration Blanks	✓			
Initial Calibration	✓			
Continuing Calibration	✓	✓		criteria ±10%, actual ±12%
Preparation Blank		✓	①✓	
Lab Control Sample	✓			
Lab Duplicate	✓		②✓	
Matrix Spike		✓	②✓	96%, 137%
Duplicate Injections	✓		②✓	
~~Analytical Spike~~				

Reviewer's Comments:

*CEC: method states that 25g (instead of 10g) be used if CEC is very low (1-5 meq/100g). Samples with low CEC (0.1-1.2 meq/100g) were not re-analyzed with 25g. [illegible] narrative, item 2.

TOC: ① Analyses run in 4 days; prep blank only 2 of 4 days.
② SAS request required consecutive results of ±10% for each sample. Except for sample 6, which appears to have a matrix effect, injection results meet this requirement. The duplicate and spike, however, do not agree within ±10% for the 2 injections: duplicate = 15% RPD
spike = 35% RPD
Acceptable precision between duplicates (14% RPD → all 4 results = 10% RSD ← criteria ±
Recovery calc from injection #1 of spike = 96%
" " from injection #2 of spike = 137% ← criteria ±25%

AR302821

U.S. EPA Contract Laboratory Program
Sample Management Office
P.O. Box 818 - Alexandria, VA 22313
703/557-2490 FTS: 8-557-2490

(1

Date 9/9/86

COVER PAGE
INORGANIC ANALYSES DATA PACKAGE

Lab Name BITTMAN ERASCO ASSOCIATES INC. Case No. SAS2329C

SOW No. ~~3/84~~-ES Q.C. Report No. 63

Sample Numbers

EPA No.	Lab ID No.	EPA No.	Lab ID No.
3-130033-1	Same as EPA No.		
3-130034-2			
3-130035-3			
3-130036-4			
3-130037-5			
3-88122-6			
3-88123-7			

Comments: SAS2329C consists of TOC and CEC on 7 soil samples. TOC analysis is by method 505 of Std. Methods 15th ed. with modification for soil analysis as per telephone conversation. CEC analysis is by method 57-2 of Methods of Soil Analysis Part 2, using Ammonium Saturation followed by displacement and distillation for absorbed ammonium.

ICP Interelement and background corrections applied? Yes ____ No ____.

If yes, corrections applied before ____ or after ____ generation of raw data.

Footnotes:

NR - not required by contract at this time
Form I:
Value - If the result is a value greater than or equal to the instrument detection limit but less than the contract required detection limit, report the value in brackets (i.e., [10]). Indicate the analytical method used with P (for ICP/Flame AA) or F (for Furnace).
U - Indicates element was analyzed for but not detected. Report with the detection limit value (e.g., 10U).
E - Indicates a value estimated or not reported due to the presence of interference. Explanatory note included on cover page.
S - Indicates value determined by Method of Standard Addition.
N - Indicates spike sample recovery is not within control limits.
* - Indicates duplicate analysis is not within control limits.
+ - Indicates the correlation coefficient for method of standard addition is less than 0.995

FORM I

U.S. EPA CONTRACT LABORATORY PROGRAM
SAMPLE MANAGEMENT OFFICE
P.O BOX 818 - ALEXANDRIA, VA 22313

EPA SAMPLE NO.
3-130033-1

DATE 9/9/86

INORGANIC ANALYSIS DATA SHEET

LAB NAME: HITTMAN ERASCO ASSOCIATES INC.
SDW NO. NA
LAB SAMPLE ID.NO. Same as EPA

CASE NO. SAS 2329 C
SC REPORT NO. 63

ELEMENTS IDENTIFIED AND MEASURED

CONCENTRATION: LOW ✓ MEDIUM_____
MATRIX: WATER_____ SOIL ✓ SLUDGE_____ OTHER_____

ug/L or (mg/kg) dry weight (Circle one)

1. TOTAL ORGANIC CARBON 874 * mg/kg
2. CATION EICHANGE CAPACITY 0.1 meq/100g

% SOLIDS NA

FOOTNOTES: FOR REPORTING RESULTS TO EPA, STANDARD RESULT QUALIFIERS ARE USED AS DEFINED ON COVER PAGE. ADDITIONAL FLAGS OR FOOTNOTES EXPLAINING RESULTS ARE ENCOURAGED. DEFINITION OF SUCH FLAGS MUST BE EXPLICIT AND CONTAINED ON COVER PAGE, HOWEVER.

COMMENTS:

LAB MANAGER: Gail Salomon

FORM I

U.S. EPA CONTRACT LABORATORY PROGRAM
SAMPLE MANAGEMENT OFFICE
P.O BOX 818 - ALEXANDRIA, VA 22313

EPA SAMPLE NO.
3-130034-2

DATE 9/9/86

INORGANIC ANALYSIS DATA SHEET

LAB NAME: HITTMAN ERASCO ASSOCIATES INC.
SDW NO. NA
LAB SAMPLE ID.NO. Same as EPA

CASE NO. SAS 2329C

QC REPORT NO. 63

ELEMENTS IDENTIFIED AND MEASURED

CONCENTRATION: LOW ✓ MEDIUM ____
MATRIX: WATER ____ SOIL ✓ SLUDGE ____ OTHER ____

ug/L or (ug/kg) dry weight (Circle one)

1. TOTAL ORGANIC CARBON 233 mg/kg
2. CATION EXCHANGE CAPACITY 9.7 meq/100g

% SOLIDS NA

FOOTNOTES: FOR REPORTING RESULTS TO EPA, STANDARD RESULT QUALIFIERS ARE USED AS DEFINED ON COVER PAGE. ADDITIONAL FLAGS OR FOOTNOTES EXPLAINING RESULTS ARE ENCOURAGED. DEFINITION OF SUCH FLAGS MUST BE EXPLICIT AND CONTAINED ON COVER PAGE, HOWEVER.

COMMENTS: _____

LAB MANAGER: Gil Solomon

FORM I

U.S. EPA CONTRACT LABORATORY PROGRAM
SAMPLE MANAGEMENT OFFICE
P.O BOX 818 - ALEXANDRIA, VA 22313

EPA SAMPLE NO.
3-130035-3

DATE 9/9/86

INORGANIC ANALYSIS DATA SHEET

LAB NAME: HITTMAN EBASCO ASSOCIATES INC.
SDG NO. NA
LAB SAMPLE ID.NO. Same as EPA

CASE NO. SAS 2329C
QC REPORT NO. 63

ELEMENTS IDENTIFIED AND MEASURED

CONCENTRATION: LOW ✓ MEDIUM ____
MATRIX: WATER ____ SOIL ✓ SLUDGE ____ OTHER ____

ug/L or (mg/kg) dry weight (Circle one)

1. TOTAL ORGANIC CARBON 206 mg/kg
2. CATION EXCHANGE CAPACITY 0.2 meq/100g

% SOLIDS NA

FOOTNOTES: FOR REPORTING RESULTS TO EPA, STANDARD RESULT QUALIFIERS ARE USED AS DEFINED ON COVER PAGE. ADDITIONAL FLAGS OR FOOTNOTES EXPLAINING RESULTS ARE ENCOURAGED. DEFINITION OF SUCH FLAGS MUST BE EXPLICIT AND CONTAINED ON COVER PAGE, HOWEVER.

COMMENTS: _____

LAB MANAGER: Neil Solomon

FORM I

U.S. EPA CONTRACT LABORATORY PROGRAM
SAMPLE MANAGEMENT OFFICE
P.O BOI 818 - ALEXANDRIA, VA 22313

EPA SAMPLE NO.
3-130036-4

DATE 9/9/86

INORGANIC ANALYSIS DATA SHEET

LAB NAME: HITTMAN ERASCO ASSOCIATES INC.
SDG NO. N/A
LAB SAMPLE ID.NO. Same as EPA

CASE NO. SAS2339C

RC REPORT NO. 63

ELEMENTS IDENTIFIED AND MEASURED

CONCENTRATION: LOW ✓ MEDIUM_____
MATRIX: WATER_____ SOIL_____ SLUDGE_____ OTHER_____

ug/L or (ug/kg) dry weight (Circle one)

1. TOTAL ORGANIC CARBON 214 mg/kg
2. CATION EXCHANGE CAPACITY 1.7 meq/100g

% SOLIDS N/A

FOOTNOTES: FOR REPORTING RESULTS TO EPA, STANDARD RESULT QUALIFIERS ARE USED AS DEFINED ON COVER PAGE. ADDITIONAL FLAGS OR FOOTNOTES EXPLAINING RESULTS ARE ENCOURAGED. DEFINITION OF SUCH FLAGS MUST BE EXPLICIT AND CONTAINED ON COVER PAGE, HOWEVER.

COMMENTS: _____

LAB MANAGER: Gail Solomon

FORM I

U.S. EPA CONTRACT LABORATORY PROGRAM
SAMPLE MANAGEMENT OFFICE
P.O BOX 818 - ALEXANDRIA, VA 22313

EPA SAMPLE NO.
3-132037-5

DATE 9/9/86

INORGANIC ANALYSIS DATA SHEET

LAB NAME: HITTMAN EBASCO ASSOCIATES INC.
SDG NO. N/A
LAB SAMPLE ID.NO. Same as EPA

CASE NO. SAS 2329C
QC REPORT NO. 63

ELEMENTS IDENTIFIED AND MEASURED

CONCENTRATION: LOW ✓ MEDIUM
MATRIX: WATER SOIL ✓ SLUDGE OTHER

ug/L or (mg/kg) dry weight (Circle one)

1. TOTAL ORGANIC CARBON 385 mg/kg
2. CATION EXCHANGE CAPACITY 16.8 meq/100g

% SOLIDS NA

FOOTNOTES: FOR REPORTING RESULTS TO EPA, STANDARD RESULT QUALIFIERS ARE USED AS DEFINED ON COVER PAGE. ADDITIONAL FLAGS OR FOOTNOTES EXPLAINING RESULTS ARE ENCOURAGED. DEFINITION OF SUCH FLAGS MUST BE EXPLICIT AND CONTAINED ON COVER PAGE, HOWEVER.

COMMENTS:

LAB MANAGER: Gil Solomon

FORM I

U.S. EPA CONTRACT LABORATORY PROGRAM
SAMPLE MANAGEMENT OFFICE
P.O BOX 818 - ALEXANDRIA, VA 22313

EPA SAMPLE NO.
3-88122-C

DATE 9/9/86

INORGANIC ANALYSIS DATA SHEET

LAB NAME: NITTMAN EBASCO ASSOCIATES INC.
SDG NO. NA
LAB SAMPLE ID.NO. same as EPA

CASE NO. SAS 2329C
QC REPORT NO. 63

ELEMENTS IDENTIFIED AND MEASURED

CONCENTRATION: LOW ✓ MEDIUM
MATRIX: WATER SOIL ✓ SLUDGE OTHER

ug/L or (ug/kg) dry weight (Circle one)

1. TOTAL ORGANIC CARBON 502 mg/kg
2. CATION EXCHANGE CAPACITY 0.8 meq/100g

% SOLIDS NA

FOOTNOTES: FOR REPORTING RESULTS TO EPA, STANDARD RESULT QUALIFIERS ARE USED AS DEFINED ON COVER PAGE. ADDITIONAL FLAGS OR FOOTNOTES EXPLAINING RESULTS ARE ENCOURAGED. DEFINITION OF SUCH FLAGS MUST BE EXPLICIT AND CONTAINED ON COVER PAGE, HOWEVER.

COMMENTS: TOC was run 3 times. Reported result is run that had smallest %RPD(552). High results may be due to incomplete elimination of inorganic carbon. See raw data

LAB MANAGER: Gail Solomon

FORM I

U.S. EPA CONTRACT LABORATORY PROGRAM
SAMPLE MANAGEMENT OFFICE
P.O BOX 818 - ALEXANDRIA, VA 22313

EPA SAMPLE NO.
3-88123-7

DATE 9/9/86

INORGANIC ANALYSIS DATA SHEET

LAB NAME: HITTMAN EBASCO ASSOCIATES INC.
SDW NO. NA
LAB SAMPLE ID.NO. same as EPA

CASE NO. SAS 2329C
RC REPORT NO. 63

ELEMENTS IDENTIFIED AND MEASURED

CONCENTRATION: LOW ✓ MEDIUM
MATRIX: WATER SOIL ✓ SLUDGE OTHER

ug/L or (ug/kg) dry weight (Circle one)

1. TOTAL ORGANIC CARBON 203 mg/kg
2. CATION EXCHANGE CAPACITY 13.1 meq/100g

% SOLIDS NA

FOOTNOTES: FOR REPORTING RESULTS TO EPA, STANDARD RESULT QUALIFIERS ARE USED AS DEFINED ON COVER PAGE. ADDITIONAL FLAGS OR FOOTNOTES EXPLAINING RESULTS ARE ENCOURAGED. DEFINITION OF SUCH FLAGS MUST BE EXPLICIT AND CONTAINED ON COVER PAGE, HOWEVER.

COMMENTS:

LAB MANAGER: Gail Solomon