915043

June 1990
Supplemental Sampling

Volume II

Pfohl Brothers Landfill
Cheektowaga, New York, Erie County
Site No. 09-15-043

ISSUED: January 1991

Reported by:
New York State Department of Environmental Conservation
Division of Hazardous Waste Remediation
Bureau of Western Remedial Action
New York State Department of Health

APPENDIX A
Tabulated Analytical Results

TABLE 2

PFOHL BROTHERS LANDFILL
ELLICOTT CREEK SEDIMENT SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not detected

COMPOUND	STR19	STR20	STR21	STR22
UNITS	ug/kg	ug/kg	ug/kg	ug/kg
COMPOUND				
Chloromethane	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND
Choroethane	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND
Acetone	ND	ND	ND	ND
Carbon disulfide	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND
Carbontetrachloride	ND	ND	ND	ND
Vinyl Acetate	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND
Trichloroethene	ND	8.75	9.00	8.00
Debromochloromethane	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND
Benzene	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND
2-Chloroethylvinylether	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND
4-Methyl-2-pentanone	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND

TABLE 5

PFOHL BROTHERS LANDFILL
ELLICOTT CREEK SEDIMENT SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not detected

COMPOUND	STR19	STR20	STR21	STR22
UNITS	ug/kg	ug/kg	ug/kg	ug/kg
COMPOUND				
Phenol	ND	ND	ND	ND
2-Chlorophenol	ND	ND	ND	ND
Aniline	ND	ND	ND	ND
Bis (2-Chloroethyl) Ether	ND	ND	ND	ND
1 3-Dichlorobenzene	ND	ND	ND	ND
1 4-Dichlorobenzene	ND	ND	ND	ND
1 2-Dichlorobenzene	ND	ND	ND	ND
Benzyl Alcohol	ND	ND	ND	ND
2-Methylphenol	ND	ND	ND	ND
bis(2-chloroisopropyl)Ether	ND	ND	ND	ND
Hexachloroethane	ND	ND	ND	ND
4-Methylphenol	ND	ND	ND	ND
N-Nitrophenol	ND	ND	ND	ND
Nitrobenzene	ND	ND	ND	ND
Isophorone	58.00	ND	ND	ND
2-Nitrophenol	ND	ND	ND	ND
2 4-Dimethylphenol	ND	ND	ND	ND
bis(2-chloroethoxy)Methane	ND	ND	ND	ND
2 4-Chlorophenol	ND	ND	ND	ND
1 2 4-Trichlorobenzene	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND
Benzoic acid	ND	ND	ND	ND
4-Chloroaniline	ND	ND	ND	ND
Hexachlorodutadiene	ND	ND	ND	ND
4-Chloro-3-Methylphenol	ND	ND	ND	ND
2-Methylnaphthalene	ND	ND	ND	ND
Hexachlorocyclopentadiene	ND	ND	ND	ND
2,4,6-Trichlorophenol	ND	ND	ND	ND
2,4,5-trichlorophenol	ND	ND	ND	ND
2-Chloronaphthalene	ND	ND	ND	ND
2-Nitroaniline	ND	ND	ND	ND
Acenaphthylene	51.00	32.00	ND	63.00
Acenaphthene	24.00			
Dimethyl Phthalate	ND	ND	ND	ND
2,4-Dinitrophenol	ND	ND	ND	ND
Dibenzofuran	ND	ND	ND	ND
4-Nitrophenol	ND	ND	ND	ND
2,4-Dinitrotoluene	ND	ND	ND	ND
Fluorene	33.00	ND	ND	16.00
4-Chlorophenyl-phenylether	ND	ND	ND	ND
Diethylphthalate	35.00	ND	28.00	21.00
2 Methyl 4,6-Dinitrophenol	ND	ND	ND	ND
N-Nitrosodiphenylamine	ND	ND	ND	ND
4-Nitroaniline	ND	ND	ND	ND
4-Bromophenyl-phenylether	ND	ND	ND	ND
Alpha-BHC	ND	ND	ND	ND

TABLE 3 (cont'd)

PFOHL BROTHERS LANDFILL
ELLICOTT CREEK SEDIMENT SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not detected

COMPOUND	STR19	STR20	STR21	STR22
Hexachlorobenzene	ND	ND	ND	ND
Pentachlorophenol	ND	ND	ND	ND
Beta-BHC/Gamma-BHC*	ND	ND	ND	ND
Phenanthrene	230.00	96.00	42.00	200.00
Anthracene	93.00	47.00	14.00	89.00
Delta-BHC	ND	ND	ND	ND
Heptachlor	ND	ND	ND	ND
Di-N-Butylphthalate	51.00	31.00	ND	ND
Aldrin	ND	ND	ND	ND
Heptachlor Epoxide	ND	ND	ND	ND
Fluoranthene	380.00	210.00	98.00	420.00
Pyrene	340.00	200.00	91.00	290.00
Endosulfan I	ND	ND	ND	ND
4,4'-DDE	ND	ND	ND	ND
Dieldrin	ND	ND	ND	ND
Endrin	ND	ND	ND	ND
Endrin Aldehyde	ND	ND	ND	ND
Endosulfan II	ND	ND	ND	ND
4,4"-DDD	ND	ND	ND	ND
Butylbenzylphthalate	85.00	ND	ND	ND
Endosulfan Sulfate	ND	ND	ND	ND
4,4'-DDT	ND	ND	ND	ND
Chrysene	170.00	150.00	61.00	170.00
Benzo (a) Anthracene	120.00	110.00	54.00	130.00
bis(2-Ethylhexyl)Phthalate	780.00	1600.00	950.00	800.00
Di-N-Octyl Phthalate	ND	ND	ND	ND
Benzo(b/k)Fluoranthene	370.00	140.00	28.00	55.00
Benzo(a)Pyrene	140.00	110.00	53.00	94.00
Indeno(1,2,3-cd)Pyrene	273.00	83.00	41.00	170.00
Dibenz(a,h)Anthracene	257.00	54.00	17.00	ND
Benzo(g,h,i)Perylene	320.00	190.00	63.00	220.00

TABLE 4

PFOHL BROTHERS LANDFILL
ELLICOTT CREEK SEDIMENT SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not detected

COMPOUND	STR19	STR20	STR21	STR22
UNITS	ug/kg	ug/kg	ug/kg	ug/kg
COMPOUND				
Aroclor-1016	ND	ND	ND	ND
Aroclor-1221	ND	ND	ND	ND
Aroclor-1232	ND	ND	ND	ND
Aroclor-1242	ND	ND	ND	ND
Aroclor-1248	ND	ND	ND	ND
Aroclor-1254	ND	ND	ND	ND
Aroclor-1260	ND	ND	ND	ND

TABLE 5

PFOHL BROTHERS LANDFILL
ELLICOTT CREEK SEDIMENT SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not detected

COMPOUND	STR19	STR20	STR21	STR22
UNITS	pg/g	pg/g	pg/g	pg/g
TCDFs (total)				
2,3,7,8-TCDF	1.40	ND	ND	0.56
PeCDFs (total)				
1,2,3,7,8-PeCDF				
2,3,4,7,8-PeCDF				
HxCDFs (total)				
1,2,3,4,7,8-HxCDF				
1,2,3,6,7,8-HxCDF				
2,3,4,6,7,8-HxCDF				
1,2,3,7,8,9-HxCDF				
HpCDFs (total)				
1,2,3,4,6,7,8-HpCDF				
1,2,3,4,7,8,9-HpCDF				
OCDF				
TCDDs (total)				
2,3,7,8-TCDD	ND	ND	ND	ND
PeCDDs (total)				
1,2,3,7,8-PeCDD				
HxCDDs (total)				
1,2,3,4,7,8-HxCDD				
1,2,3,6,7,8-HxCDD				
1,2,3,7,8,9-HxCDD				
HpCDDs (total)				
1,2,3,4,6,7,8-HpCDD				
OCDD				

TABLE 6

PFOHL BROTHERS LANDFILL
ELLICOTT CREEK SEDIMENT SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not detected

COMPOUND	STR19	STR20	STR21	STR22
UNITS	mg/kg	mg/kg	mg/kg	mg/kg
COMPOUND	ND			
Aluminium				
Antimony				
Arsenic	4.3	9.50	6.50	7.40
Barium		271.00	160.00	301.00
Beryllium				
Cadmium	0.60	3.10	1.90	3.70
Calcium				
Chromium	3.40	9.80	4.90	5.50
Cobalt				
Copper	ND	22.90	13.40	17.00
Iron				
Lead	46.70	62.00	51.00	50.10
Magnesium				
Manganese	149.00	103.00	130.00	158.00
Mercury	ND	0.20	0.10	0.10
Nickel				
Potassium				
Selenium				
Silver	ND	ND	ND	ND
Sodium				
Thallium				
Tin				
Vanadium				0.00
Zinc	103.00	157.00	123.00	134.00

TABLE 7

PPOHL BROTHERS LANDFILL
"AERO" CREEK SEDIMENT SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not detected

	STR01	STR02	STR03	STR04	STR05	STR06	STR07	STR08	STR09	STR10	STR11	STR12	STR13	STR14	STR15	STR16	STR17
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
COMPOUND																	
Chloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbontetrachloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Acetate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Debromochloromethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	15.00	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloroethylvinylether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	87.00	12.00	ND	ND	5.50	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Xylenes	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	49.00	15.00	ND	ND	ND	ND	ND	ND

TAL _ _ 8

PFOHL BROTHERS LANDFILL
"AERO" CREEK SEDIMENT SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not detected

	STR01	STR02	STR03	STR04	STR05	STR06	STR07	STR08	STR09	STR10	STR11	STR12	STR13	STR14	STR15	STR16	STR17
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
COMPOUND																	
Phenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	74.00	76.00	ND	ND	ND	ND	ND	ND
2-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bis (2-Chloroethyl) Ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1 3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1 4-Dichlorobenzene	ND	ND	ND	22.00	ND	ND	ND	ND	46.00	ND	70.00	ND	ND	20.00	ND	17.00	22.00
1 2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	95.00	ND	ND	ND	ND	ND	10.00	11.00
Benzyl Alcohol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-chloroisopropyl)Ether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachloroethane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nitrobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Isophorone	ND	ND	ND	ND	ND	ND	48.00	ND	ND	ND	30.00	32.00	10.00	16.00	46.00	13.00	30.00
2-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2 4-Dimethylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
bis(2-chloroethoxy)Methane	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2 4-Chlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1 2 4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzoic acid	ND	ND	660.00	ND	ND	ND	ND	ND	ND	79.00	770.00	ND	ND	ND	ND	ND	290.00
4-Chloroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorodutadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Chloro-3-Methylphenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	11.00
2-Methylnaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4,5-trichlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Chloronaphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	650.00	29.00	680.00	ND	97.00	130.00	390.00	150.00	39.00	270.00	380.00	ND	240.00	190.00	370.00	110.00	160.00
Acenaphthene	66.00		90.00		14.00	23.00			19.00	58.00	120.00		130.00	39.00			
Dimethyl Phthalate	ND	ND	ND	ND	ND	ND	ND	26.00	ND	ND	ND	ND	ND	ND	ND	140.00	ND
2,4-Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibenzofuran	ND	ND	ND	72.00	ND	ND	69.00	ND	390.00	800.00	2500.00	15.00	110.00	ND	ND	ND	ND
4-Nitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene	91.00	ND	110.00	18.00	16.00	23.00	77.00	ND	18.00	86.00	190.00	ND	160.00	57.00	60.00	ND	ND
4-Chlorophenyl-phenylether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Diethylphthalate	16.00	30.00	78.00	ND	30.00	30.00	77.00	29.00	35.00	42.00	ND	15.00	48.00	55.00	60.00	55.00	70.00
2 Methyl 4,6-Dinitrophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
N-Nitrosodiphenylamine	ND	ND	ND	ND	ND	ND	ND	ND	91.00	880.00	1900.00	ND	ND	45.00	ND	ND	ND
4-Nitroaniline	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4-Bromophenyl-phenylether	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Alpha-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 8 (cont'd)

PFOHL BROTHERS LANDFILL
"AERO" CREEK SEDIMENT SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not detected

	STR01	STR02	STR03	STR04	STR05	STR06	STR07	STR08	STR09	STR10	STR11	STR12	STR13	STR14	STR15	STR16	STR17
Hexachlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Pentachlorophenol	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Beta-BHC/Gamma-BHC*	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	810.00	71.00	510.00	1400.00	71.00	180.00	240.00	140.00	68.00	380.00	510.00	34.00	1000.00	110.00	200.00	69.00	180.00
Anthracene	650.00	28.00	700.00	3100.00	92.00	130.00	410.00	180.00	50.00	280.00	370.00	18.00	490.00	180.00	340.00	130.00	150.00
Delta-BHC	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-N-Butylphthalate	40.00	84.00	110.00	ND	93.00	33.00	130.00	94.00	51.00	55.00	ND	100.00	84.00	90.00	110.00	91.00	160.00
Aldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptachlor Epoxide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene	1600.00	230.00	2300.00	4900.00	300.00	470.00	1200.00	580.00	120.00	1100.00	1500.00	160.00	1600.00	470.00	990.00	190.00	440.00
Pyrene	1300.00	190.00	1300.00	2500.00	180.00	420.00	1100.00	490.00	96.00	920.00	1300.00	120.00	1300.00	390.00	870.00	180.00	370.00
Endosulfan I	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4'-DDE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dieldrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endrin Aldehyde	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Endosulfan II	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4"-DDD	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Butylbenzylphthalate	ND	ND	ND	ND	ND	39.00	ND	ND	ND	ND	ND	ND	ND	53.00	ND	23.00	ND
Endosulfan Sulfate	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
4,4'-DDT	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chrysene	720.00	72.00	880.00	1600.00	130.00	260.00	410.00	210.00	55.00	400.00	660.00	ND	770.00	190.00	410.00	81.00	220.00
Benzo (a) Anthracene	1100.00	140.00	640.00	1200.00	100.00	220.00	590.00	370.00	47.00	510.00	850.00	77.00	780.00	130.00	440.00	86.00	320.00
bis(2-Ethylhexyl)Phthalate	4200.00	1100.00	1900.00	1900.00	1200.00	1600.00	1100.00	2900.00	1300.00	320.00	850.00	190.00	1900.00	940.00	2500.00	1200.00	2300.00
Di-N-Octyl Phthalate	32.00	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo(b/k)Fluoranthene	1600.00		1800.00	4000.00	140.00	330.00	2300.00	1400.00	140.00	2000.00	3500.00	140.00	3000.00	400.00	1300.00	1800.00	1000.00
Benzo(a)Pyrene	770.00	250.00	590.00	1300.00	110.00	350.00	370.00	300.00	59.00	340.00	620.00	ND	670.00	160.00	360.00	710.00	340.00
Indeno(1,2,3-cd)Pyrene	480.00	ND	1600.00	3700.00	250.00	410.00	380.00	340.00	ND	270.00	530.00	ND	540.00	370.00	830.00	220.00	550.00
Dibenz(a,h)Anthracene	250.00	ND	1000.00	2300.00	130.00	130.00	150.00	200.00	60.00	120.00	250.00	ND	310.00	160.00	580.00	180.00	280.00
Benzo(g,h,i)Perylene	250.00	57.00	1100.00	3800.00	300.00	520.00	430.00	400.00	120.00	240.00	480.00	28.00	580.00	400.00	720.00	190.00	470.00

TABLE 9

PFOHL BROTHERS LANDFILL
"AERO" CREEK SEDIMENT SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not detected

	STR01	STR02	STR03	STR04	STR05	STR06	STR07	STR08	STR09	STR10	STR11	STR12	STR13	STR14	STR15	STR16	STR17
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
COMPOUND																	
Aroclor-1016	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1221	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1232	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1242	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	7	ND	ND	ND	ND	ND	ND
Aroclor-1248	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1254	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1260	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 10

PFOHL BROTHERS LANDFILL
"AERO" CREEK SEDIMENT SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not detected

	STR01	STR02	STR03	STR04	STR05	STR06	STR07	STR08	STR09	STR10	STR11	STR12	STR13	STR14	STR15	STR16	STR17
UNITS	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
TCDFs (total)	77.00	3.20						24.00	7.70	23.00					14.00	17.00	45.00
2,3,7,8-TCDF	4.20	ND	2.2	1.80	0.53	2.30	ND	2.70	1.10	1.90	ND	ND	ND	0.55	1.20	1.10	2.60
PeCDFs (total)	47.00	0.71						15.00	9.70	20.00					8.50	11.00	19.00
1,2,3,7,8-PeCDF	2.20	0.14						ND	ND	ND					0.69	0.82	1.60
2,3,4,7,8-PeCDF	3.90	0.27						2.60	1.90	3.00					0.83	1.00	2.10
HxCDFs (total)	49.00	1.80						17.00	11.00	17.00					10.00	15.00	21.00
1,2,3,4,7,8-HxCDF	6.80	0.27						3.30	2.80	3.90					1.70	3.20	3.80
1,2,3,6,7,8-HxCDF	2.50	ND						ND	ND	ND					0.44	1.20	1.10
2,3,4,6,7,8-HxCDF	0.98	ND						3.80	2.30	3.40					ND	ND	0.57
1,2,3,7,8,9-HxCDF	5.80	ND						ND	ND	ND					1.30	1.60	2.70
HpCDFs (total)	48.00	1.70						30.00	22.00	55.00					23.00	26.00	40.00
1,2,3,4,6,7,8-HpCDF	20.00	0.39						12.00	11.00	17.00					6.40	13.00	13.00
1,2,3,4,7,8,9-HpCDF	1.80	ND						18.00	ND	ND					0.83	ND	1.80
OCDF	53.00	1.90						41.00	23.00	91.00					26.00	24.00	48.00
TCDDs (total)	14.00	ND						3.70	1.60	7.60					5.20	5.30	20.00
2,3,7,8-TCDD	1.70	ND		0.64	ND	1.80	ND	0.45	ND	0.64	ND	ND	ND	ND	ND	ND	0.68
PeCDDs (total)	21.00	0.25						1.30	1.30	9.20					5.90	4.60	28.00
1,2,3,7,8-PeCDD	1.70	0.25						ND	ND	ND					0.77	0.82	1.60
HxCDDs (total)	43.00	2.10						18.00	7.90	32.00					18.00	12.00	46.00
1,2,3,4,7,8-HxCDD	1.50	ND						ND	ND	ND					0.47	0.69	0.83
1,2,3,6,7,8-HxCDD	3.80	ND						2.90	ND	2.60					1.90	1.40	4.00
1,2,3,7,8,9-HxCDD	4.40	0.54						ND	ND	2.50					1.90	1.90	3.70
HpCDDs (total)	130.00	8.00						80.00	28.00	110.00					70.00	60.00	130.00
1,2,3,4,6,7,8-HpCDD	71.00	4.30						43.00	15.00	53.00					39.00	33.00	66.00
OCDD	460.00	35.00						270.00	130.00	430.00					280.00	220.00	460.00

TABLE 11

PPOHL BROTHERS LANDFILL
"AERO" CREEK SEDIMENT SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not detected

	STR01	STR02	STR03	STR04	STR05	STR06	STR07	STR08	STR09	STR10	STR11	STR12	STR13	STR14	STR15	STR16	STR17
UNITS																mg/kg	mg/kg
COMPOUND																	
Aluminium																	
Antimony																	
Arsenic																16.30	28.80
Barium																211.00	237.00
Beryllium																	
Cadmium																1.70	3.00
Calcium																	
Chromium																5.10	11.60
Cobalt																	
Copper																12.70	38.50
Iron																	
Lead																33.80	92.80
Magnesium																	
Manganese																111.00	234.00
Mercury																0.20	0.60
Nickel																	
Potassium																	
Selenium																	
Silver																ND	ND
Sodium																	
Thallium																	
Tin																	
Vanadium																	
Zinc																76.70	185.00

TABLE 12

PPOHL BROTHERS LANDFILL
RESIDENTIAL SURFACE SOIL SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND - compound not detected

		SSS28	SSS29	SSS30	SSS31	SSS32	SSS33	SSS34	SSS35	SSS36	SSS55	SSS56	SSS57	SSS58	SSS59
	UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
COMPOUND															
Aroclor-1016		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1221		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1232		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1242		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1248		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1254		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1260		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

TABLE 13

PPOHL BROTHERS LANDFILL
RESIDENTIAL SURFACE SOIL SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not detected

	SSS28	SSS29	SSS30	SSS31	SSS32	SSS33	SSS34	SSS35	SSS36	SSS55	SSS56	SSS57	SSS58	SSS59
UNITS	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
TCDFs (total)	26.00	5.30	25.00	12.00	30.00	52.00	6.10	35.00	44.00	7.80	7.40	15.00	14.00	10.00
2,3,7,8-TCDF	2.30	ND	3.70	1.20	5.10	3.00	0.63	6.40	3.60	0.86	0.62	1.10	0.74	0.99
PeCDFs (total)	14.00	2.70	11.00	6.20	55.00	33.00	2.10	38.00	25.00	6.80	6.50	11.00	9.60	8.90
1,2,3,7,8-PeCDF	1.00	0.37	1.20	0.61	4.70	1.90	0.00	3.70	0.00	ND	0.47	ND	ND	ND
2,3,4,7,8-PeCDF	1.90	0.54	1.80	0.87	8.50	3.00	0.00	9.00	0.00	ND	0.70	ND	ND	ND
HxCDFs (total)	14.00	9.10	220.00	8.10	120.00	120.00	6.3	47.00	37.00	11.00	9.00	11.00	11.00	10.00
1,2,3,4,7,8-HxCDF	1.50	ND	2.60	1.20	3.30	7.40	0.00	4.60	0.00	ND	1.50	ND	ND	ND
1,2,3,6,7,8-HxCDF	ND	ND	0.52	0.42	0.75	3.30	0.00	0.00	0.00	ND	0.68	ND	ND	ND
2,3,4,6,7,8-HxCDF	3.00	ND	5.70	1.40	5.90	1.30	0.00	0.00	0.00	ND	ND	ND	ND	ND
1,2,3,7,8,9-HxCDF	ND	ND	1.00	0.45	29.00	7.40	0.00	16.00	0.00	ND	0.30	ND	ND	ND
HpCDFs (total)	18.00	12.00	850.00	19.00	91.00	410.00	20.00	42.00	75.00	15.00	10.00	16.00	13.00	36.00
1,2,3,4,6,7,8-HpCDF	6.20	ND	56.00	3.40	14.00	190.00	2.80	8.70	19.00	5.90	9.50	7.20	6.90	13.00
1,2,3,4,7,8,9-HpCDF	ND	ND	19.00	1.10	3.50	4.00	0.68	2.10	1.60	ND	0.66	ND	ND	ND
OCDF	16.00	11.00	490.00	20.00	70.00	200.00	26.00	21.00	52.00	14.00	23.00	14.00	14.00	28.00
TCDDs (total)	3.30	0.47	5.40	2.00	5.60	9.30	0.00	2.10	11.00	4.90	3.70	4.90	4.00	3.90
2,3,7,8-TCDD	ND	ND	0.90	0.53	0.30	0.40	0.00	0.77	0.80	0.46	0.49	ND	ND	ND
PeCDDs (total)	5.20	0.86	14.00	4.20	31.00	19.00	1.60	31.00	19.00	5.70	3.20	7.20	5.50	4.50
1,2,3,7,8-PeCDD	ND	ND	1.70	0.71	2.80	2.20	0.00	4.30	0.00	ND	0.58	ND	ND	ND
HxCDDs (total)	23.00	16.00	270.00	16.00	590.00	110.00	11.00	240.00	39.00	16.00	9.00	11.00	9.10	12.00
1,2,3,4,7,8-HxCDD	0.91	ND	ND	0.56	0.00	2.50	0.00	7.10	0.00	ND	0.34	ND	ND	ND
1,2,3,6,7,8-HxCDD	2.00	ND	48.00	1.60	60.00	25.00	0.00	18.00	0.00	ND	1.10	ND	ND	ND
1,2,3,7,8,9-HxCDD	1.10	ND	15.00	2.40	54.00	8.50	0.00	55.00	0.00	ND	1.40	ND	ND	ND
HpCDDs (total)	87.00	76.00	3500.00	74.00	1300.00	710.00	60.00	250.00	130.00	43.00	43.00	40.00	27.00	80.00
1,2,3,4,6,7,8-HpCDD	46.00	39.00	1600.00	40.00	770.00	430.00	36.00	140.00	75.00	24.00	25.00	23.00	15.00	49.00
OCDD	280.00	330.00	21000.00	260.00	5000.00	3400.00	300.00	530.00	480.00	120.00	130.00	150.00	90.00	270.00

TABLE 14

PFOHL BROTHERS LANDFILL
RESIDENTIAL SURFACE SOIL SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not detected

		SSS28	SSS29	SSS30	SSS31	SSS32	SSS33	SSS34	SSS35	SSS36	SSS55	SSS56	SSS57	SSS58	SSS59
	UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
COMPOUND															
Aluminium															
Antimony		7.10	5.20	5.80	ND	2.50	8.60	11.50	17.30	8.50	3.00	21.00	6.20	9.90	10.80
Arsenic		542.00	257.00	801.00	192.00	254.00	320.00	95.50	237.00	158.00	ND	95.50	72.60	72.60	67.20
Barium															
Beryllium		ND	ND	1.90	ND	3.00	1.90	ND	6.20	4.20	3.30	5.20	2.70	3.00	4.30
Cadmium															
Calcium		3.50	1.90	7.00	1.60	ND	4.40	2.40	6.00	6.20	2.30	14.90	4.00	6.80	6.40
Chromium															
Cobalt		17.60	9.30	44.10	5.40	31.70	93.80	15.00	38.00	28.70	ND	19.70	11.10	17.30	22.20
Copper															
Iron		24.40	11.80	82.80	5.00	33.40	252.00	86.80	242.00	107.00	14.50	65.10	339.00	160.00	48.00
Lead															
Magnesium		252.00	160.00	131.00	208.00	260.00	189.00	99.80	283.00	193.00	52.00	525.00	88.90	127.00	140.00
Manganese		0.10	0.10	0.40	0.10	0.20	0.90	0.30	0.50	0.20	ND	ND	ND	ND	0.10
Mercury															
Nickel															
Potassium															
Selenium		ND	ND	ND	ND	ND	1.40	ND	ND	ND	ND	ND	ND	ND	ND
Silver															
Sodium															
Thallium															
Tin															
Vanadium		92.20	47.10	414.00	65.60	261.00	969.00	139.00	198.00	191.00	49.60	158.00	162.00	140.00	125.00
Zinc															

TABLE 1.

PFOHL BROTHERS LANDFILL
AERO LAKE PATH SURFACE SOIL SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not detected

		SSS37	SSS38	SSS39	SSS40	SSS41	SSS42	SSS43	SSS44
	UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
COMPOUND									
Aroclor-1016		ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1221		ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1232		ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1242		ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1248		ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1254		ND	ND	ND	ND	ND	ND	ND	ND
Aroclor-1260		ND	ND	ND	ND	ND	ND	ND	ND

TABLE 10

PFOHL BROTHERS LANDFILL
AERO LAKE PATH SURFACE SOIL SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not detected

	SSS37	SSS38	SSS39	SSS40	SSS41	SSS42	SSS43	SSS44
UNITS	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
TCDFs (total)	9.90	16.00	2.60	2.80	8.90	6.30	5.70	0.55
2,3,7,8-TCDF	0.62	1.80	ND	ND	1.10	0.82	0.65	ND
PeCDFs (total)	5.60	13.00	3.00	1.40	4.90	3.30	4.80	ND
1,2,3,7,8-PeCDF	ND	ND	ND	ND	ND	ND	ND	ND
2,3,4,7,8-PeCDF	ND	ND	ND	0.41	ND	ND	ND	ND
HxCDFs (total)	6.80	14.00	5.00	3.20	6.00	7.70	6.10	3.90
1,2,3,4,7,8-HxCDF	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3,6,7,8-HxCDF	ND	ND	ND	ND	ND	ND	ND	ND
2,3,4,6,7,8-HxCDF	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3,7,8,9-HxCDF	ND	ND	ND	ND	ND	ND	ND	ND
HpCDFs (total)	10.00	19.00	5.00	3.20	14.00	13.00	3.70	6.40
1,2,3,4,6,7,8-HpCDF	5.20	9.90	3.70	ND	6.60	ND	3.70	2.00
1,2,3,4,7,8,9-HpCDF	ND	ND	ND	ND	ND	ND	ND	ND
OCDF	9.10	14.00	6.10	6.00	12.00	10.00	17.00	12.00
TCDDs (total)	0.74	6.80	1.30	0.97	2.30	1.40	0.48	0.26
2,3,7,8-TCDD	ND	ND	ND	ND	0.52	ND	ND	0.26
PeCDDs (total)	ND	6.50	1.40	1.90	ND	ND	ND	ND
1,2,3,7,8-PeCDD	ND	ND	ND	ND	ND	ND	ND	ND
HxCDDs (total)	2.20	14.00	3.90	6.80	12.00	8.00	12.00	3.90
1,2,3,4,7,8-HxCDD	ND	ND	ND	ND	ND	ND	ND	ND
1,2,3,6,7,8-HxCDD	ND	ND	ND	ND	ND	ND	1.40	0.76
1,2,3,7,8,9-HxCDD	ND	ND	ND	ND	ND	ND	2.00	ND
HpCDDs (total)	33.00	54.00	26.00	30.00	54.00	48.00	57.00	46.00
1,2,3,4,6,7,8-HpCDD	15.00	27.00	ND	14.00	24.00	22.00	28.00	22.00
OCDD	65.00	130.00	63.00	46.00	99.00	94.00	74.00	70.00

TABLE 17

PFOHL BROTHERS LANDFILL
AERO LAKE PATH SURFACE SOIL SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not detected

		SSS37	SSS38	SSS39	SSS40	SSS41	SSS42	SSS43	SSS44
	UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
COMPOUND									
Aluminium									
Antimony									
Arsenic		8.40	9.00	1.10	1.00	1.10	7.60	10.10	5.80
Barium		103.00	123.00	161.00	180.00	146.00	323.00	ND	167.00
Beryllium									
Cadmium		ND	ND	ND	ND	2.60	3.00	2.90	1.90
Calcium									
Chromium		7.80	7.50	6.00	7.00	4.60	5.80	7.90	ND
Cobalt									
Copper		7.20	12.00	8.30	10.10	11.60	12.00	6.60	8.10
Iron									
Lead		11.40	58.00	24.00	1.60	15.20	23.60	25.00	11.70
Magnesium									
Manganese		124.00	118.00	218.00	189.00	118.00	313.00	59.20	228.00
Mercury		0.20	0.10	0.10	0.10	0.20	ND	0.10	0.10
Nickel									
Potassium									
Selenium									
Silver		ND	ND	ND	ND	ND	ND	ND	ND
Sodium									
Thallium									
Tin									
Vanadium									
Zinc		58.80	106.00	110.00	79.70	100.00	50.90	52.20	35.70

TABLE 18

PFOHL BROTHERS LANDFILL
ELLICOTT CREEK SURFACE WATER SAMPLES
(mg/L = ppm, ug/L = ppb)
Blank = analysis not requested ND = compound not detected

	SWT45	SWT46	SWT47	SWT48
UNITS	ug/L	ug/L	ug/L	ug/L
COMPOUND				
Chloromethane	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND
Choroethane	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND
Acetone	ND	ND	ND	ND
Carbon disulfide	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND
Carbontetrachloride	ND	ND	ND	ND
Vinyl Acetate	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND
Debromochloromethane	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND
Benzene	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND
2-Chloroethylvinylether	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND
4-Methyl-2-pentanone	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND
Toluene	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND
Styrene	ND	ND	ND	ND
Total Xylenes	ND	ND	ND	ND
Total Chlorotoluene	ND	ND	ND	ND
Total Dichlorobenzene	ND	ND	ND	ND

TABLE 19

PFOHL BROTHERS LANDFILL
ELLICOTT CREEK SURFACE WATER SAMPLES
(mg/L = ppm, ug/L = ppb)
Blank = analysis not requested ND = compound not detected

	SWT45	SWT46	SWT47	SWT48
UNITS	ug/L	ug/L	ug/L	ug/L
COMPOUND				
Phenol	ND	ND	ND	ND
2-Chlorophenol	ND	ND	ND	ND
Aniline	ND	ND	ND	ND
Bis (2-Chloroethyl) Ether	ND	ND	ND	ND
1 3-Dichlorobenzene	ND	ND	ND	ND
1 4-Dichlorobenzene	ND	ND	ND	ND
1 2-Dichlorobenzene	ND	ND	ND	ND
Benzyl Alcohol	ND	ND	ND	ND
2-Methylphenol	ND	ND	ND	ND
bis(2-chloroisopropyl)Ether	ND	ND	ND	ND
Hexachloroethane	ND	ND	ND	ND
4-Methylphenol	ND	ND	ND	ND
N-Nitrophenol	ND	ND	ND	ND
Nitrobenzene	ND	ND	ND	ND
Isophorone	ND	ND	ND	ND
2-Nitrophenol	ND	ND	ND	ND
2 4-Dimethylphenol	ND	ND	ND	ND
bis(2-chloroethoxy)Methane	ND	ND	ND	ND
2 4-Chlorophenol	ND	ND	ND	ND
1 2 4-Trichlorobenzene	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND
Benzoic acid	ND	ND	ND	ND
4-Chloroaniline	ND	ND	ND	ND
Hexachlorodutadiene	ND	ND	ND	ND
4-Chloro-3-Methylphenol	ND	ND	ND	ND
2-Methylnaphthalene	ND	ND	ND	ND
Hexachlorocyclopentadiene	ND	ND	ND	ND
2,4,6-Trichlorophenol	ND	ND	ND	ND
2,4,5-trichlorophenol	ND	ND	ND	ND
2-Chloronaphthalene	ND	ND	ND	ND
2-Nitroaniline	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND
Acenaphthene				
Dimethyl Phthalate	ND	ND	ND	ND
2,4-Dinitrophenol	ND	ND	ND	ND
Dibenzofuran	ND	ND	ND	ND
4-Nitrophenol	ND	ND	ND	ND
2,4-Dinitrotoluene	ND	ND	ND	ND
Fluorene	ND	ND	ND	ND
4-Chlorophenyl-phenylether	ND	ND	ND	ND
Diethylphthalate	2.00	ND	ND	ND
2 Methyl 4,6-Dinitrophenol	ND	ND	ND	ND
N-Nitrosodiphenylamine	ND	ND	ND	ND
4-Nitroaniline	ND	ND	ND	ND
4-Bromophenyl-phenylether	ND	ND	ND	ND
Alpha-BHC	ND	ND	ND	ND

TABLE 19 (cont'd)

PFOHL BROTHERS LANDFILL
ELLICOTT CREEK SURFACE WATER SAMPLES
(mg/L = ppm, ug/L = ppb)
Blank = analysis not requested ND = compound not detected

	SWT45	SWT46	SWT47	SWT48
Hexachlorobenzene	ND	ND	ND	ND
Pentachlorophenol	ND	ND	ND	ND
Beta-BHC/Gamma-BHC*	ND	ND	ND	ND
Phenanthrene	ND	ND	ND	ND
Anthracene	ND	ND	ND	ND
Delta-BHC	ND	ND	ND	ND
Heptachlor	ND	ND	ND	ND
Di-N-Butylphthalate	2.00	1.00	1.00	1.00
Aldrin	ND	ND	ND	ND
Heptachlor Epoxide	ND	ND	ND	ND
Fluoranthene	ND	ND	ND	ND
Pyrene	ND	ND	ND	ND
Endosulfan I	ND	ND	ND	ND
4,4'-DDE	ND	ND	ND	ND
Dieldrin	ND	ND	ND	ND
Endrin	ND	ND	ND	ND
Endrin Aldehyde	ND	ND	ND	ND
Endosulfan II	ND	ND	ND	ND
4,4"-DDD	ND	ND	ND	ND
Butylbenzylphthalate	ND	ND	ND	ND
Endosulfan Sulfate	ND	ND	ND	ND
4,4'-DDT	ND	ND	ND	ND
Chrysene	ND	ND	ND	ND
Benzo (a) Anthracene	ND	ND	ND	ND
bis(2-Ethylhexyl)Phthalate	13.00	6.00	17.00	11.00
Di-N-Octyl Phthalate	ND	ND	ND	ND
Benzo(b/k)Fluoranthene				
Benzo(a)Pyrene	ND	ND	ND	ND
Indeno(1,2,3-cd)Pyrene	ND	ND	ND	ND
Dibenz(a,h)Anthracene	ND	ND	ND	ND
Benzo(g,h,i)Perylene	ND	ND	ND	ND

TABLE 20

PFOHL BROTHERS LANDFILL
ELLICOTT CREEK SURFACE WATER SAMPLES
(mg/L = ppm, ug/L = ppb)
Blank = analysis not requested ND = compound not detected

		SWT45	SWT46	SWT47	SWT48
	UNITS	ug/L	ug/L	ug/L	ug/L
COMPOUND					
Aroclor-1016		ND	ND	ND	ND
Aroclor-1221		ND	ND	ND	ND
Aroclor-1232		ND	ND	ND	ND
Aroclor-1242		ND	ND	ND	ND
Aroclor-1248		ND	ND	ND	ND
Aroclor-1254		ND	ND	ND	ND
Aroclor-1260		ND	ND	ND	ND

TABLE 21

PFOHL BROTHERS LANDFILL
ELLICOTT CREEK SURFACE WATER SAMPLES
(mg/L = ppm, ug/L = ppb)
Blank = analysis not requested ND = compound not detected

		SWT45	SWT46	SWT47	SWT48
	UNITS	ug/L	ug/L	ug/L	ug/L
COMPOUND					
Aluminium					
Antimony					
Arsenic		ND	ND	ND	ND
Barium		670.00	620.00	860.00	870.00
Beryllium					
Cadmium		ND	ND	ND	9.00
Calcium					
Chromium		ND	ND	ND	ND
Cobalt					
Copper		ND	ND	ND	ND
Iron					
Lead		ND	3.50	ND	ND
Magnesium					
Manganese		37.00	22.00	37.00	46.00
Mercury		ND	ND	ND	ND
Nickel					
Potassium					
Selenium					
Silver		ND	ND	ND	ND
Sodium					
Thallium					
Tin					
Vanadium					
Zinc		ND	ND	ND	ND

TABLE 22

PFOHL BROTHERS LANDFILL
AREA B SURFACE SOIL SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not detected

		SSS50	SSS51	SSS52	SSS53	SSS54
	UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
COMPOUND						
Aroclor-1016		ND	ND	ND	ND	ND
Aroclor-1221		ND	ND	ND	560	ND
Aroclor-1232		ND	ND	ND	ND	ND
Aroclor-1242		ND	ND	ND	ND	ND
Aroclor-1248		290	310	600	ND	420
Aroclor-1254		510	2600	19000	270	3200
Aroclor-1260		ND	ND	ND	ND	ND

TABLE 23

PFOHL BROTHERS LANDFILL
AREA B SURFACE SOIL SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not detected

	SSS50	SSS51	SSS52	SSS53	SSS54
UNITS	ng/g	ng/g	ng/g	ng/g	ng/g
TCDFs (total)					
2,3,7,8-TCDF	ND	ND	ND	ND	ND
PeCDFs (total)					
1,2,3,7,8-PeCDF					
2,3,4,7,8-PeCDF					
HxCDFs (total)					
1,2,3,4,7,8-HxCDF					
1,2,3,6,7,8-HxCDF					
2,3,4,6,7,8-HxCDF					
1,2,3,7,8,9-HxCDF					
HpCDFs (total)					
1,2,3,4,6,7,8-HpCDF					
1,2,3,4,7,8,9-HpCDF					
OCDF					
TCDDs (total)					
2,3,7,8-TCDD	ND	ND	ND	ND	ND
PeCDDs (total)					
1,2,3,7,8-PeCDD					
HxCDDs (total)					
1,2,3,4,7,8-HxCDD					
1,2,3,6,7,8-HxCDD					
1,2,3,7,8,9-HxCDD					
HpCDDs (total)					
1,2,3,4,6,7,8-HpCDD					
OCDD					

TABLE 24

PFOHL BROTHERS LANDFILL
AREA B SURFACE SOIL SAMPLES
(mg/kg = ppm, ug/kg = ppb, ng/g ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not detected

		SSS50	SSS51	SSS52	SSS53	SSS54
	UNITS	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
COMPOUND						
Aluminium						
Antimony						
Arsenic		10.00	15.50	17.50	6.30	ND
Barium		452.00	656.00	630.00	282.00	962.00
Beryllium						
Cadmium		4.90	27.60	20.00	4.40	3.80
Calcium						
Chromium		11.50	84.00	78.40	14.50	4.80
Cobalt						
Copper		106.00	378.00	1057.00	54.60	74.60
Iron						
Lead		158.00	840.00	851.00	172.00	24.20
Magnesium						
Manganese		360.00	440.00	407.00	151.00	250.00
Mercury		0.20	0.70	6.20	0.20	0.10
Nickel						
Potassium						
Selenium						
Silver		ND	2.00	3.10	ND	ND
Sodium						
Thallium						
Tin						
Vanadium						
Zinc		500.00	1730.00	1547.00	1020.00	114.00

TABLE 25

PFOHL BROTHERS LANDFILL
MARSH SAMPLES AREA C
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not dectected

	SWP23	SWP24	SWP25	SWP26	SWP27
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
COMPOUND					
Chloromethane	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND
Choroethane	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	ND
Carbon disulfide	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND
Carbontetrachloride	ND	ND	ND	ND	ND
Vinyl Acetate	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	9.00	8.00	ND
Debromochloromethane	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND
2-Chloroethylvinylether	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND
Total Xylenes	ND	ND	ND	ND	ND
Total Chlorotoluene	ND	ND	ND	ND	ND
Total Dichlorobenzene	ND	ND	ND	ND	ND

TABLE 26

PFOHL BROTHERS LANDFILL
MARSH SAMPLES AREA C
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not dectected

	SWP23	SWP24	SWP25	SWP26	SWP27
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
COMPOUND					
Phenol	ND	ND	ND	ND	ND
2-Chlorophenol	ND	ND	ND	ND	ND
Aniline	ND	ND	ND	ND	ND
Bis (2-Chloroethyl) Ether	ND	ND	ND	ND	ND
1 3-Dichlorobenzene	ND	ND	ND	ND	14.00
1 4-Dichlorobenzene	ND	ND	ND	ND	19.00
1 2-Dichlorobenzene	ND	ND	ND	ND	33.00
Benzyl Alcohol	ND	ND	ND	ND	ND
2-Methylphenol	ND	ND	ND	ND	ND
bis(2-chloroisopropyl)Ether	ND	ND	ND	ND	ND
Hexachloroethane	ND	ND	ND	ND	ND
4-Methylphenol	ND	ND	ND	ND	ND
N-Nitrophenol	ND	ND	ND	ND	ND
Nitrobenzene	ND	ND	ND	ND	ND
Isophorone	ND	ND	ND	ND	ND
2-Nitrophenol	ND	ND	ND	ND	ND
2 4-Dimethylphenol	ND	ND	ND	ND	ND
bis(2-chloroethoxy)Methane	ND	ND	ND	ND	ND
2 4-Chlorophenol	ND	ND	ND	ND	ND
1 2 4-Trichlorobenzene	ND	ND	ND	ND	ND
Naphthalene	ND	ND	620.00	44.00	ND
Benzoic acid	ND	ND	740.00	ND	ND
4-Chloroaniline	ND	ND	ND	ND	ND
Hexachlorodutadiene	ND	ND	ND	ND	ND
4-Chloro-3-Methylphenol	ND	ND	ND	ND	ND
2-Methylnaphthalene	ND	ND	120.00	ND	ND
Hexachlorocyclopentadiene	ND	ND	ND	ND	ND
2,4,6-Trichlorophenol	ND	ND	ND	ND	ND
2,4,5-trichlorophenol	ND	ND	ND	ND	ND
2-Chloronaphthalene	ND	ND	ND	ND	ND
2-Nitroaniline	ND	ND	ND	ND	ND
Acenaphthylene	ND	220.00	230.00	ND	ND
Acenaphthene		17.00	720.00	ND	ND
Dimethyl Phthalate	ND	ND	ND	ND	ND
2,4-Dinitrophenol	ND	ND	ND	ND	ND
Dibenzofuran	ND	ND	430.00	ND	ND
4-Nitrophenol	ND	ND	ND	ND	ND
2,4-Dinitrotoluene	ND	ND	ND	ND	ND
Fluorene	ND	23.00	880.00	ND	ND
4-Chlorophenyl-phenylether	ND	ND	ND	ND	ND
Diethylphthalate	18.00	36.00	ND	ND	ND
2 Methyl 4,6-Dinitrophenol	ND	ND	ND	ND	ND
N-Nitrosodiphenylamine	ND	ND	ND	ND	ND
4-Nitroaniline	ND	ND	ND	ND	ND
4-Bromophenyl-phenylether	ND	ND	ND	ND	ND
Alpha-BHC	ND	ND	ND	ND	ND

Table 26 (cont'd)

PFOHL BROTHERS LANDFILL
MARSH SAMPLES AREA C
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not dectected

	SWP23	SWP24	SWP25	SWP26	SWP27
Hexachlorobenzene	ND	ND	ND	ND	ND
Pentachlorophenol	ND	ND	ND	ND	ND
Beta-BHC/Gamma-BHC*	ND	ND	ND	ND	ND
Phenanthrene	40.00	340.00	5600.00	40.00	17.00
Anthracene	11.00	240.00	1700.00	10.00	ND
Delta-BHC	ND	ND	ND	ND	ND
Heptachlor	ND	ND	ND	ND	ND
Di-N-Butylphthalate	ND	75.00	ND	ND	ND
Aldrin	ND	ND	ND	ND	ND
Heptachlor Epoxide	ND	ND	ND	ND	ND
Fluoranthene	82.00	930.00	5300.00	57.00	35.00
Pyrene	11.00	800.00	4600.00	54.00	36.00
Endosulfan I	ND	ND	ND	ND	ND
4,4'-DDE	ND	ND	ND	ND	ND
Dieldrin	ND	ND	ND	ND	ND
Endrin	ND	ND	ND	ND	ND
Endrin Aldehyde	ND	ND	ND	ND	ND
Endosulfan II	ND	ND	ND	ND	ND
4,4"-DDD	ND	ND	ND	ND	ND
Butylbenzylphthalate	38.00	43.00	ND	ND	ND
Endosulfan Sulfate	ND	ND	ND	ND	ND
4,4'-DDT	ND	ND	ND	ND	ND
Chrysene	34.00	340.00	2600.00	32.00	16.00
Benzo (a) Anthracene	47.00	260.00	1400.00	32.00	26.00
bis(2-Ethylhexyl)Phthalate	2800.00	1500.00	3000.00	1900.00	1900.00
Di-N-Octyl Phthalate	ND	ND	ND	ND	ND
Benzo(b/k)Fluoranthene	38.00	290.00	1700.00	44.00	20.00
Benzo(a)Pyrene	41.00	200.00	2200.00	42.00	21.00
Indeno(1,2,3-cd)Pyrene	ND	360.00	2000.00	30.00	ND
Dibenz(a,h)Anthracene	ND	190.00	480.00	ND	ND
Benzo(g,h,i)Perylene	ND	490.00	2500.00	50.00	ND

TABLE 27

PFOHL BROTHERS LANDFILL
MARSH SAMPLES AREA C
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not dectected

	SWP23	SWP24	SWP25	SWP26	SWP27
UNITS	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
COMPOUND					
Aroclor-1016	ND	ND	ND	ND	ND
Aroclor-1221	ND	ND	ND	ND	ND
Aroclor-1232	ND	ND	ND	ND	ND
Aroclor-1242	ND	ND	ND	ND	ND
Aroclor-1248	ND	ND	ND	ND	ND
Aroclor-1254	ND	ND	ND	ND	ND
Aroclor-1260	ND	ND	ND	ND	ND

TABLE 28

PFOHL BROTHERS LANDFILL
MARSH SAMPLES AREA C
(mg/kg = ppm, ug/kg = ppb, ng/g = ppb, pg/g = ppt)
Blank = analysis not requested ND = compound not dectected

	SWP23	SWP24	SWP25	SWP26	SWP27
UNITS	ng/g	ng/g	ng/g	ng/g	ng/g
TCDFs (total)	ND	ND	ND	ND	ND
2,3,7,8-TCDF	ND	ND	ND	ND	ND
PeCDFs (total)	ND	ND	ND	ND	ND
1,2,3,7,8-PeCDF	ND	ND	ND	ND	ND
2,3,4,7,8-PeCDF	ND	ND	ND	ND	ND
HxCDFs (total)	ND	0.50	0.11	ND	ND
1,2,3,4,7,8-HxCDF	ND	ND	ND	ND	ND
1,2,3,6,7,8-HxCDF	ND	ND	ND	ND	ND
2,3,4,6,7,8-HxCDF	ND	ND	ND	ND	ND
1,2,3,7,8.9-HxCDF	ND	ND	ND	ND	ND
HpCDFs (total)	ND	0.71	0.30	0.02	ND
1,2,3,4,6,7,8-HpCDF	ND	0.29	0.12	0.02	ND
1,2,3,4,7,8,9-HpCDF	ND	ND	ND	ND	ND
OCDF	ND	1.00	0.32	ND	ND
TCDDs (total)	ND	ND	ND	ND	ND
2,3,7,8-TCDD	ND	ND	ND	ND	ND
PeCDDs (total)	ND	ND	0.13	ND	ND
1,2,3,7,8-PeCDD	ND	ND	ND	ND	ND
HxCDDs (total)	ND	0.42	0.23	ND	ND
1,2,3,4,7,8-HxCDD	ND	ND	ND	ND	ND
1,2,3,6,7,8-HxCDD	ND	ND	ND	ND	ND
1,2,3,7,8,9-HxCDD	ND	ND	ND	ND	ND
HpCDDs (total)	ND	1.80	0.83	0.02	0.03
1,2,3,4,6,7,8-HpCDD	ND	1.20	0.46	0.02	0.03
OCDD	0.19	4.00	3.50	0.13	0.26

TABLE

PFOHL BROTHERS LANDFILL
GROUND WATER SAMPLES
(mg/L = ppm, ug/L = ppb)
Blank = analysis not requested ND = compound not detected

	GWS49	GWS60	GWS61	GWS62	GWS63
UNITS	MW-5S ug/L	MW-12S ug/L	MW-9S ug/L	MW-3D ug/L	MW-3S ug/L
COMPOUND					
Chloromethane	ND	ND	ND	ND	ND
Bromomethane	ND	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND
Choroethane	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND
Acetone	ND	ND	ND	ND	ND
Carbon disulfide	ND	ND	ND	ND	ND
1,1-Dichloroethene	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND
Chloroform	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND
2-Butanone	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	ND	ND	ND	ND	ND
Carbontetrachloride	ND	ND	ND	ND	ND
Vinyl Acetate	ND	ND	ND	ND	ND
Bromodichloromethane	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND
1,2-Dichloropropane	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND
Trichloroethene	ND	ND	ND	ND	ND
Debromochloromethane	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	ND	ND	ND	ND	ND
Benzene	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND
2-Chloroethylvinylether	ND	ND	ND	ND	ND
Bromoform	ND	ND	ND	ND	ND
2-Hexanone	ND	ND	ND	ND	ND
4-Methyl-2-pentanone	ND	ND	ND	ND	ND
Tetrachloroethene	ND	ND	ND	ND	ND
Toluene	ND	ND	ND	ND	ND
Chlorobenzene	ND	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	ND	ND
Styrene	ND	ND	ND	ND	ND
Total Xylenes	ND	ND	ND	ND	ND
Total Chlorotoluene	ND	ND	ND	ND	ND
Total Dichlorobenzene	ND	ND	ND	ND	ND

TABLE 30

Radioactivity Comparison
All units in pCi/ml

	Ellicott Creek Surface Water	Monitoring Wells (1)	Standard (2)
Gross Alpha			
Min	< 0.003	< 0.0006	
Max	< 0.005	.01 ± 0.006	.015
Gross Beta			
Min	.002 ± .002	.0012 ± 0.0005	
Max	.006 ± .002	.068 ± .007	1.0

(1) Minimum and maximum values of all samples collected from groundwater monitoring wells in and around Pfohl Brothers Landfill during August and December 1989.

(2) New York State gross alpha (excluding radon and uranium) and radioactivity standards applicable to Class "GA" groundwaters, for which the best usage is as a drinking water supply and any other usage. Source: NYSDEC 6NYCRR, Part 703, March 1986.

ADDENDUM NO.1

NYSDOH Report on Off-Site Sampling

February 8, 1991

PFOHL BROTHERS LANDFILL
Surface Soil Sampling

June 1990

New York State Department of Health

In June 1990 the New York State Departments of Health (DOH) and Environmental Conservation (DEC) collected several sets of surface soil samples from locations along pathways on the Pfohl Brothers Landfill site, along pathways around Aero Lake and off-site in the residential neighborhood along Pfohl Road. A surface soil sample was collected off-site to provide an indication of local background conditions. This report presents the results of the study.

All the surface soil samples were collected to a depth of three (3) inches except three samples which were collected from areas previously used as gardens. These samples were taken to a depth of 12 inches. The samples were analyzed for metals and polychlorinated biphenols (PCBs) by the DEC's Mobile Laboratory in Saratoga, New York, and the chlorinated dioxins and chlorinated furans were analyzed by Enseco Laboratories, California.

Tables I and III through V include the analytical results for all the samples collected. Surface soil samples designated SSS-28 through SSS-36 and SSS-56 through SSS-59 were collected from the off-site residential properties (samples SSS-34, 57 and 58 were collected from areas that have been used as gardens), samples SSS-37 through SSS-44 were collected from pathways around Aero Lake and samples SSS-50 through SSS-54 were collected along pathways on the Pfohl Brothers Landfill site. The background sample, SSS-55, was collected

off-site, near Aero Drive. The general locations of all samples collected are shown on Figure 1.

Table I presents the results of the chemical analysis of samples for metals. For all of the metals, the average levels were lowest for the samples collected around Aero Lake and the highest levels were found in the on-site samples. The levels for the residential area samples were in the middle of the above range of results.

The levels of metals in the background sample (SSS-55) were at the low end of the range we ordinarily find in samples across the State. Although most metals results have been found above the background sample they are within our expected range for a suburban environment. Table II shows the expected range of metals for suburban areas.

Table III presents the results of the analysis of the surface soil samples for polychlorinated biphenols. No PCBs were detected in any of the samples collected in the residential neighborhood, around Aero Lake or in the background sample. The detection limits for the residential, background and Aero Lake pathway samples were 500, 500 and, 50 ug/kg or part per billion, respectively. PCBs were detected in all the on-site samples which were taken along dirt roads on-site. The predominant congener was Aroclor 1254.

The soil samples were also tested for chlorinated dibenzo dioxins (dioxins) and chlorinated dibenzo furans (furans). The off-site residential soils and Aero Lake pathway soil samples were analyzed for five congener groups for

each of the dioxins and furans and a number of different isomers within the congener groups. The on-site samples were only analyzed for 2,3,7,8 tetrachlorodibenzo-p-dioxin (2,3,7,8 TCDD). All of the results of congener and isomer specific analyses are reported in Tables IV (Furans) and V (Dioxins).

In order to estimate the toxicity of all the results for each sample, a method has been developed to reduce all the dioxin and furan data for each sample to a single number. The method uses a set of numbers called Toxicity Equivalence Factors (TEFs). A general description of how TEFs are developed and used are presented in the attached Fact Sheet-Toxicity Equivalence Factors (TEFs) for Dioxins and Furans.

While none of the levels of contaminants found in the residential or Aero Lake pathway soil samples represent a threat to human health, the information they provide will be useful as we assess the full impact of the Pfohl Brothers Landfill on human health and the environment. All of these data will be considered with data developed during the Remedial Investigation and from previous studies, as the final risk assessment is completed and the Feasibility Study is developed.

TABLE I

PFOHL BROTHERS LANDFILL
Surface Soil Sample

February 8, 1991

June 1990

Metals mg/kg (ppm)

Sample ID Off-Site Residential	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Manganese	Mercury	Silver	Zinc
SSS-28	7.1	542	0.6u	3.5	17.6	24.4	252	0.1	1.2u	92.2
SSS-29	5.2	257	5.0u	1.9	9.3	11.8	160	0.1	10.0u	47.1
SSS-30	5.8	801	1.9	7.0	44.1	82.8	131	0.4	2.1u	414
SSS-31	1.4u	192	0.7u	1.6	5.4	5.0	208	0.1	1.4u	65.6
SSS-32	2.5	254	3.0	10.0u	31.7	33.4	260	0.2	1.7u	261
SSS-33	8.6	320	1.9	4.4	93.8	252	189	0.9	1.4	969
SSS-34	11.5	95.5	0.6u	2.4	15.0	86.8	99.8	0.3	1.2u	139
SSS-35	17.3	237	6.2	6.0	38.3	242	283	0.5	1.5u	198
SSS-36	8.5	158	4.2	6.2	28.7	107	193	0.2	1.3u	191
SSS-56	21.0	95.5	5.2	14.9	19.7	65.1	525	0.1u	2.2u	158
SSS-57	6.2	72.6	2.7	4.0	11.1	339	88.9	0.1u	1.2u	162
SSS-58	9.9	72.6	3.0	6.8	17.3	160	127	0.1u	1.2u	140
SSS-59	10.8	67.2	4.3	6.4	22.2	48.0	140	0.1	1.6u	125
Aero Lake										
SSS-37	8.4	103	0.57u	7.8	7.2	11.4	124	0.2	1.14u	58.8
SSS-38	9.0	123	0.72u	7.5	12.0	58.0	118	0.1	1.45u	106
SSS-39	1.1	161	0.6u	6.0	8.3	24.0	218	0.1	1.2u	110
SSS-40	1.0	180	0.6u	7.0	10.1	1.6	189	0.1	1.17u	79.7
SSS-41	1.1	146	2.6	4.6	11.6	15.2	118	0.2	1.5u	100
SSS-42	7.6	323	3.0	5.8	12.0	23.6	313	0.1u	1.2u	50.9
SSS-43	10.1	25.0u	2.9	7.9	6.6	25.0	59.2	0.1	1.2u	52.2
SSS-44	5.8	167	1.9	1.2u	8.1	11.7	228	0.1	1.2u	35.7
Background										
SSS-55	3.0	29.u	3.3	2.3	25u	14.5	52.0	0.1u	1.4u	49.6
On-Site										
SSS-50	10.0	452	4.9	11.5	106	158	360	0.2	1.4u	500
SSS-51	15.5	658	27.6	84.0	378	840	440	0.7	2.0	1730
SSS-52	17.5	630	20.0	78.4	1057	851	407	6.2	3.1	1547
SSS-53	6.3	282	4.4	14.5	54.6	172	151	0.2	1.3u	1020
SSS-54	1.2u	962	3.8	4.8	74.6	24.2	250	0.1	1.2u	114

SSS - Surface Soil Samples

u = Indicates element was analyzed for but not detected. Values are reported with the instrument detection limit value.

ND - Non Detected

TABLE II

PFOHL BROTHERS LANDFILL
New York State Department of Health

February 8, 1991

Selected Metals in Suburban Soils

mg/kg (ppm)

Metal	Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Manganese	Mercury	Silver	Zinc
Range	10-20	100-1000	0.01-7.	1.5-40	2-100	10-350	10-3000	0.01-3.4	0.1-5	10-300

References

Dragun, James. The Soil Chemistry of Hazardous Materials 1988. Hazardous Materials Control Research Institute.

Shacklette, H.T., and J.G. Boerngen. 1984. Elemental Concentrations in Soils and Other Surficial Materials of the Conterminous United States. U.S. Geological Survey Professional Paper 1270. U.S. Gov't. Printing Office.

TABLE III

PFOHL BROTHERS LANDFILL
Surface Soil Sample

February 8, 1991

June 1990

Aroclor/PCB ug/kg (ppb)

Sample ID

Off-Site Residential	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260
SSS-28 (500)	ND	ND	ND	ND	ND	ND	ND
SSS-29 (500)	ND	ND	ND	ND	ND	ND	ND
SSS-30 (500)	ND	ND	ND	ND	ND	ND	ND
SSS-31 (500)	ND	ND	ND	ND	ND	ND	ND
SSS-32 (500)	ND	ND	ND	ND	ND	ND	ND
SSS-33 (500)	ND	ND	ND	ND	ND	ND	ND
SSS-34 (500)	ND	ND	ND	ND	ND	ND	ND
SSS-35 (500)	ND	ND	ND	ND	ND	ND	ND
SSS-36 (500)	ND	ND	ND	ND	ND	ND	ND
SSS-56 (500)	ND	ND	ND	ND	ND	ND	ND
SSS-57 (500)	ND	ND	ND	ND	ND	ND	ND
SSS-58 (500)	ND	ND	ND	ND	ND	ND	ND
SSS-59 (500)	ND	ND	ND	ND	ND	ND	ND
Aero Lake							
SSS-37 (50)	ND	ND	ND	ND	ND	ND	ND
SSS-38 (50)	ND	ND	ND	ND	ND	ND	ND
SSS-39 (50)	ND	ND	ND	ND	ND	ND	ND
SSS-40 (50)	ND	ND	ND	ND	ND	ND	ND
SSS-41 (50)	ND	ND	ND	ND	ND	ND	ND
SSS-42 (50)	ND	ND	ND	ND	ND	ND	ND
SSS-43 (50)	ND	ND	ND	ND	ND	ND	ND
SSS-44 (50)	ND	ND	ND	ND	ND	ND	ND
Background							
SSS-55 (500)	ND	ND	ND	ND	ND	ND	ND
On-Site							
SSS-50 (500)	ND	ND	ND	ND	290	510	ND
SSS-51 (500)	ND	ND	ND	ND	310	2,600	ND
SSS-52 (500)	ND	ND	ND	ND	600	19,000	ND
SSS-53 (500)	ND	560	ND	ND	ND	270	ND
SSS-54 (500)	ND	ND	ND	ND	420	3,200	ND

SSS - Surface Soil Sample

( ) Detection Limit ppb

ND - Not Detected

TABLE IV
PFOHL BROTHERS LANDFILL
Surface Soil Sample

February 8, 1991

June 1990
Furans ng/g (ppb)

Sample ID	TCDFs* (Total)	2378 TCDF	PeCDFs (Total)	12378 PeCDF	23478 PeCDF	HxCDFs (Total)	123478 HxCDF	123678 HxCDF	234678 HxCDF	123789 HxCDF	HpCDFs (Total)	1234678 HpCDF	1234789 HpCDF	OCDF
Off-Site Residential														
SSS-28	0.026	0.0023	0.014	0.001	0.0019	0.014	0.0015	ND	0.003	ND	0.018	0.0062	ND	0.016
SSS-29	0.0053	ND	0.0027	0.00037	0.00054	0.0091	ND	ND	ND	ND	0.012	ND	ND	0.011
SSS-30	0.025	0.0037	0.011	0.0012	0.0018	0.22	0.0026	0.00052	0.0057	0.001	0.85	0.056	0.019	0.49
SSS-31	0.012	0.0012	0.0062	0.00061	0.00087	0.0081	0.0012	0.00042	0.0014	0.00045	0.019	0.0034	0.0011	0.02
SSS-32	0.03	0.0051	0.055	0.0047	0.0085	0.12	ND	ND	0.0059	0.029	0.091	0.0014	0.0035	0.007
SSS-33	0.052	0.003	0.033	ND	ND	0.12	0.0074	ND	ND	0.0074	0.41	0.19	0.004	0.2
SSS-34	0.0061	0.00063	0.0021	ND	ND	0.0063	ND	ND	ND	ND	0.02	0.0028	0.00068	0.026
SSS-35	0.035	0.0064	0.038	0.0037	0.009	0.047	0.0046	ND	ND	0.016	0.042	0.0087	0.0021	0.021
SSS-36	0.044	0.0036	0.025	ND	ND	0.037	ND	ND	ND	ND	0.075	0.019	0.0016	0.052
SSS-56	0.0074	0.00067	0.0065	0.00047	0.0007	0.009	0.0015	0.00068	ND	0.0003	0.01	0.0095	0.00066	0.023
SSS-57	0.015	0.0011	0.011	ND	ND	0.011	ND	ND	ND	ND	0.016	0.0072	ND	0.014
SSS-58	0.014	0.00074	0.0096	ND	ND	0.011	ND	ND	ND	ND	0.013	0.0069	ND	0.014
SSS-59	0.01	0.00097	0.0089	ND	ND	0.01	ND	ND	ND	ND	0.036	0.013	ND	0.028
Aero Lake														
SSS-37	0.0099	0.00062	0.0056	ND	ND	0.0068	ND	ND	ND	ND	0.01	0.052	ND	0.0091
SSS-38	0.016	0.0018	0.013	ND	ND	0.014	ND	ND	ND	ND	0.019	0.0099	ND	0.014
SSS-39	0.0026	ND	0.003	ND	ND	0.005	ND	ND	ND	ND	0.005	0.0037	ND	0.0061
SSS-40	0.0028	ND	0.0014	ND	0.00041	0.0032	ND	ND	ND	ND	0.0032	ND	ND	0.006
SSS-41	0.0089	0.0011	0.0049	ND	ND	0.006	ND	ND	ND	ND	0.014	0.0066	ND	0.012
SSS-42	0.0063	0.00082	0.0033	ND	ND	0.0077	ND	ND	ND	ND	0.013	ND	ND	0.01
SSS-43	0.0057	0.00065	0.0048	ND	ND	0.0061	ND	ND	ND	ND	0.0037	0.0037	ND	0.017
SSS-44	0.00055	ND	ND	ND	ND	0.0039	ND	ND	ND	ND	0.0064	0.002	ND	0.012
Background														
SSS-55	0.0078	0.00086	0.0068	ND	ND	0.011	ND	ND	ND	ND	0.015	0.0059	ND	0.014
On-Site														
SSS-50		ND												
SSS-51		ND												
SSS-52		ND												
SSS-53		ND												
SSS-54		ND												

* See Addendum to Tables IV and V

SSS - Subsurface soil samples

ND - Not Detected

TABLE V
PFOHL BROTHERS LANDFILL
Surface Soil Sample
June 1990

February 8, 1991

Dioxins ng/g (ppb)

Sample ID	TCDDs * (Total)	2378 TCDD	PeCDDs (Total)	12378 PeCDD	HxCDDs (Total)	123478 HxCDD	123678 HxCDD	123789 HxCDD	HpCDDs (Total)	1234678 HpCDD	OCDD	TEQ DIOXIN 1	TEQ FURANS 2	TOTAL TEQ 3
Off-Site Residential														
SSS-28	0.0033	ND	0.0052	ND	0.023	0.00091	0.002	0.0011	0.087	0.046	0.28	0.0024	0.0019	0.0043
SSS-29	0.00047	ND	0.00086	ND	0.016	ND	ND	ND	0.076	0.039	0.33	0.0022	0.0005	0.0027
SSS-30	0.0054	0.0009	0.014	0.0017	0.27	ND	0.048	0.015	3.5	1.6	21	0.118	0.006	0.124
SSS-31	0.002	0.00053	0.0042	0.00071	0.016	0.00056	0.0016	0.0024	0.074	0.04	0.26	0.0027	0.0011	0.0038
SSS-32	0.0056	0.0003	0.031	0.0028	0.59	ND	0.06	0.054	1.3	0.77	5	0.037	0.009	0.046
SSS-33	0.0093	0.0004	0.019	0.0022	0.11	ND	0.025	0.0085	0.71	0.43	3.4	0.023	0.005	0.028
SSS-34	ND	ND	0.0016	ND	0.011	ND	ND	ND	0.06	.036	0.3	0.0021	0.0006	0.0027
SSS-35	0.0021	0.00077	0.031	0.0043	0.24	0.0071	0.018	0.055	0.25	0.14	0.53	0.011	0.008	0.019
SSS-36	0.011	0.0008	0.019	ND	0.039	ND	ND	ND	0.13	0.075	0.48	0.0045	0.0022	0.0067
SSS-56	0.0037	0.00049	0.0032	0.00058	0.009	0.00034	0.0011	0.0014	0.043	0.025	0.13	0.0018	0.0009	0.0027
SSS-57	0.0049	ND	0.0072	ND	0.011	ND	ND	ND	0.04	0.023	0.15	0.0017	0.0010	0.0027
SSS-58	0.004	ND	0.0055	ND	0.0091	ND	ND	ND	0.027	0.015	0.09	0.0011	0.0008	0.0019
SSS-59	0.0039	ND	0.0045	ND	0.012	ND	ND	ND	0.08	0.049	.270	0.0022	0.0008	0.0030
Aero Lake														
SSS-37	0.00074	ND	ND	ND	0.0022	ND	ND	ND	0.033	0.015	0.065	0.0008	0.0006	0.0014
SSS-38	0.0068	ND	0.0065	ND	0.014	ND	ND	ND	0.054	0.027	0.13	0.0013	0.0010	0.0023
SSS-39	0.0013	ND	0.0014	ND	0.0039	ND	ND	ND	0.026	ND	0.063	0.0008	0.0003	0.0011
SSS-40	0.00097	ND	0.0019	ND	0.0068	ND	ND	ND	0.03	0.014	0.046	0.0006	0.0004	0.0010
SSS-41	0.0023	0.00052	ND	ND	0.012	ND	ND	ND	0.054	0.024	0.099	0.0014	0.0007	0.0021
SSS-42	0.0014	ND	ND	ND	0.008	ND	ND	ND	0.048	0.022	0.094	0.0010	0.0004	0.0014
SSS-43	0.00048	ND	ND	ND	0.012	ND	0.0014	0.002	0.057	0.028	0.074	0.0009	0.0005	0.0014
SSS-44	0.00026	0.00026	ND	ND	0.0039	ND	0.00076	ND	0.046	0.022	0.07	0.0008	0.0002	0.0010
Background														
SSS-55	0.0049	0.00046	0.0057	ND	0.016	ND	ND	ND	0.043	0.024	0.12	0.0015	0.0008	0.0023
On-Site														
SSS-50		ND												
SSS-51		ND												
SSS-52		ND												
SSS-53		ND												
SSS-54		ND												

* See Addendum to Tables IV and V
SSS - Surface Soil Sample
TEQ-Dioxin - Toxic equivalent for polychlorinated dibenzo dioxins, based on equivalence to 2,3,7,8 TCDD
TEQ-Furan - Toxic equivalent for polychlorinated dibenzo furans, based on equivalence to 2,3,7,8 TCDD
TOTAL TEQ - Total toxic equivalent for dioxins and furans, based on equivalence to 2,3,7,8 TCDD.
ND - Non Detected

ADDENDUM TO TABLES IV AND V

February 8, 1991

Furans

TCDFs (Total)	Total tetrachlorodibenzofurans
2378 TCDF	2,3,7,8 tetrachlorodibenzofuran
PeCDFs (Total)	Total pentachlorodibenzofuran
12378 PeCDF	1,2,3,7,8 pentachlorodibenzofuran
23478 PeCDF	2,3,4,7,8 pentachlorodibenzofuran
HxCDFs (Total)	Total hexachlorodibenzofurans
123478 HxCDF	1,2,3,4,7,8 hexachlorodibenzofuran
123678 HxCDF	2,3,4,6,7,8 hexachlorodibenzofuran
234678 HxCDF	2,3,4,6,7,8 hexachlorodibenzofuran
123789 HxCDF	1,2,3,7,8,9 hexachlorodibenzofuran
HpCDFs (Total)	Total heptachlorodibenzofurans
1234678 HpCDF	1,2,3,4,6,8,9 heptachlorodibenzofuran
1234789 HpCDF	1,2.3,4,7,8,9 heptachlorodibenzofuran
OCDF	Octachlorodibenzofuran

Dioxins

TCDDs (Total)	Total tetrachlorodibenzodioxins
2,3,7,8 TCDD	2,3,7,8 tetrachlorodibenzodioxin
PeCDDs (Total)	Total pentachlorodibenzodioxin
1,2,3,7,8 PeCDD	1,2,3,7,8 pentachlorodibenzodioxin
HxCDDs (Total)	Total hexachlorodibenzodioxins
123478 HxCDD	1,2,3,4,7,8 hexachlorodibenzodioxins
123678 HxCDD	1,2,3,6,7,8 hexachlorodibenzodioxins
123789 HxCDD	1,2,3,7,8,9 hexachlorodibenzodioxins
HpCDDs (Total)	Total heptachlorodibenzodioxins
1234678 HpCDD	1,2,3,4,6,7,8 heptachlorodibenzodioxins
OCDD	Octachlorodibenzodioxin

Fact Sheet

TOXICITY EQUIVALENCE FACTORS (TEFs) FOR DIOXINS AND FURANS

February 1991

Prepared by

New York State Health Department

SUMMARY

Dioxins and furans are groups of chemicals which have attracted much attention because some of them are very toxic (dangerous) to animals, and probably to humans, as well. We are still learning about the effects of these chemicals, but decisions about protecting human health from them must be made with the available information.

The most studied dioxin is 2,3,7,8-TCDD (2,3,7,8-tetrachlorodibenzo-p-dioxin). The remaining individual dioxins and furans are not equally toxic. Scientists describe approximately how toxic each one of these chemicals is by comparing what is known about its toxicity with 2,3,7,8-TCDD. When the compared toxicities of all dioxins and furans in a mixture are added up, decision-makers can make judgments about the relative toxicities of mixtures.

This fact sheet describes the process by which scientists compare the toxicities of dioxins and furans with 2,3,7,8-TCDD.

Toxicity Equivalence Factors (TEFs) for Dioxins and Furans

Introduction

Chlorinated dibenzo-p-dioxins (also known as CDDs or, simply, dioxins) and chlorinated dibenzofurans (also known as CDFs or furans) are two closely-related groups of chemical compounds. Some dioxins and furans are produced as unwanted byproducts in chemical manufacturing processes, such as in the production of herbicides and disinfectants. They are also found in the smoke or ash from motor vehicles, municipal waste incinerators and wood fires. There are 210 different dioxin and furan compounds. The general chemical term used to describe the individual compounds in a group of closely-related compounds is "congener." There are 75 dioxin congeners and 135 furan congeners.

Some dioxin and furan congeners are very toxic to animals and are believed to be toxic to humans, as well. The most toxic of these compounds in studies with laboratory animals is 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD). Exposure to very small amounts of this congener causes a variety of health effects in animals. Environmental samples that contain 2,3,7,8-TCDD usually contain other dioxin and furan congeners. Other congeners are less toxic than 2,3,7,8-TCDD; it takes a much larger exposure to cause the effects. To describe the different toxicities of dioxin and furan congeners, scientists have developed toxicity equivalence factors (TEFs) which show how other congeners compare in toxicity to 2,3,7,8-TCDD.

Sometimes environmental samples are analyzed to find out the concentrations of dioxin and furan congeners. Toxicity equivalence factors are used to determine the 2,3,7,8-TCDD concentration that would have the same toxicity as the mixture of congeners. This concentration is called the total 2,3,7,8-TCDD toxicity equivalent (TEQ) concentration of the sample.

Toxicity Equivalence Factors (TEFs)

Dioxins and furans are usually found in waste products or in contaminated soil or water as a mixture. The toxicity equivalence method was developed to help assess the health risks to people who may be exposed to these mixtures. Information from animal tests and other tests is used to compare the toxicities of the various dioxin and furan congeners. Congeners are given Toxicity Equivalence Factors (TEFs), which are based on how toxic the congeners are in comparison to 2,3,7,8-TCDD. For example, dioxin and furan congeners that are roughly half as toxic as 2,3,7,8-TCDD have TEFs of 0.5 (one half).

The general chemical structures of dioxin and furan congeners are shown in Figure 1. They contain atoms of carbon, hydrogen, oxygen and chlorine. Each of the eight "corners" on the two rings of carbon atoms can have either a hydrogen atom or a chlorine atom. The first two diagrams shows the basic dibenzo-p-dioxin and dibenzofuran molecules, with no chlorines attached. The third diagram shows the 2,3,7,8 - tetrachlorinated dibenzo-p-dioxin molecule, which has four chlorine atoms. Although all of the atoms are shown in these diagrams of dioxin and furan molecules, the hydrogen atoms and carbon atoms are not usually shown in scientific reports. The fourth diagram shows 2,3,7,8 - TCDD as it is usually shown.

The toxicity of individual dioxin and furan congeners is largely determined by the number and location of chlorine atoms in the congener. Chlorine atoms can be attached in eight positions as shown in the figure. Congeners having the same number of chlorine atoms are grouped together and referred to by the Greek word for that number (mono-, di-, tri-, tetra-, penta-, hexa-, hepta- or octa-). Thus, the group of dioxin or furan congeners with four chlorine atoms is called "tetrachlorinated." Studies show that congeners with chlorine atoms located in positions numbered 2, 3, 7 and 8 (see the figure) are the most toxic forms. Congeners with chlorine atoms in at least three of these positions generally have larger TEFs than the other congeners. Tetrachlorinated and pentachlorinated congeners have higher TEFs than congeners with less than four or more than five chlorine atoms.

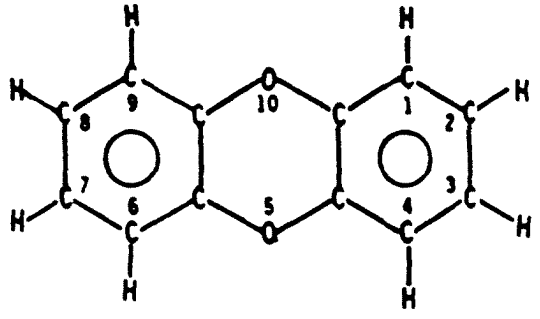
Dioxin and furan toxicity has been studied by many scientists around the world, using different toxicity tests. The TEFs are based on the available information. Some congeners have been studied thoroughly; some have not been studied at all. For congeners that have not been tested for toxicity, structural similarities with other dioxins and furans are used to determine TEFs. Comparing the toxicity test results for different congeners to establish TEFs requires scientific judgement. This has led to minor differences in TEF schemes proposed by various groups. Two sets of TEFs are given in Table 1. They are the TEFs first proposed by the New York State Department of Health (DOH) in 1982, and TEFs proposed by an international group organized by NATO, which were adopted by the U.S. Environmental Protection Agency in 1989. All TEF schemes are subject to change when new toxicological data become available.

2,3,7,8-TCDD Equivalents (TEQs)

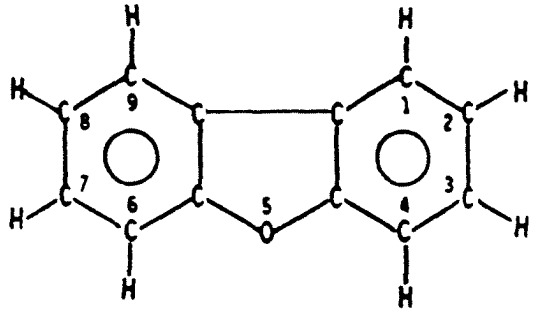
The concentration of a dioxin or furan congener in an environmental sample can be related to a concentration of 2,3,7,8 - TCDD that would pose the same health risk by using the TEF for the congener. The 2,3,7,8-TCDD toxicity equivalent concentration of the congener is called the TEQ. For example, the 2,3,7,8-TCDD toxicity equivalent of 3 ppb of a congener with a TEF of 0.5 is 1.5 ppb (0.5 x 3 = 1.5).

Figure 1. CHEMICAL STRUCTURE OF DIOXINS AND FURANS

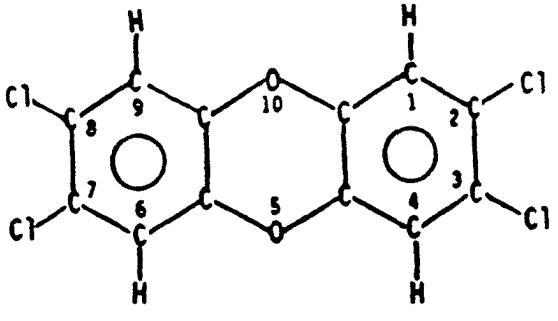
Dibenzo-p-dioxin (dioxin)



Dibenzofuran (furan)

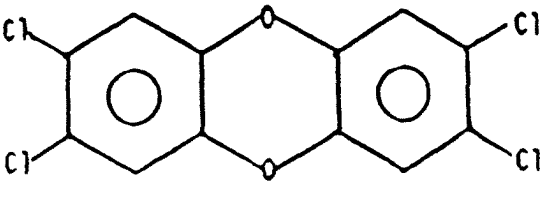


2,3,7,8 - Tetrachlorodibenzo-p-dioxin



2,3,7,8 - Tetrachlorodibenzo-p-dioxin

(as usually shown)



This calculation is repeated for the other congeners in an environmental sample that contains a mixture of congeners. The concentrations of the dioxin and furan congeners in the sample are measured and the concentration of each congener or group of congeners is multiplied by its TEF to give the 2,3,7,8-TCDD equivalent concentration (TEQ) for that congener or group. When these numbers are added together, the result is referred to as the total concentration of 2,3,7,8-TCDD equivalents (the total TEQ) in the sample. For example, the TEQ result for a soil sample containing a mixture of dioxin and furan congeners might be one part per billion (1 ppb), meaning that the health risk from exposure to the mixture of dioxins and furans in the soil is approximately the same as the risk from exposure to soil containing 2,3,7,8-TCDD alone, at a concentration of 1 ppb.

The TEQ procedure is as follows:

- First, the environmental sample is analyzed in a laboratory and the results are given for the concentration of each dioxin or furan congener or group of congeners detected in the sample. Some of the results may be given as "not detected" or "ND," meaning that that congener or group was not present in the sample, or the concentration was too low to be measured. In this case the detection limit, the lowest amount that could be measured, is usually stated.

- Second, the concentration of each dioxin and furan congener or group of congeners is multiplied by its Toxicity Equivalence Factor (TEF), which is a number between 0 and 1. (The TEF of 2,3,7,8-TCDD is 1.) These numbers are the TEQ concentrations for the individual dioxin and furan congeners or congener groups.

- Third, the TEQs for all of the dioxin and furan congeners and groups are added together. This total TEQ is the dioxin and furan concentration for the sample, expressed as the equivalent 2,3,7,8-TCDD concentration. Table 2 below shows an example of the calculation.

Applying the two TEF schemes to the mixture of dioxins and furans in the example, yields total 2,3,7,8-TCDD toxic equivalents for the sample of 0.571 ppb and 0.412 ppb. Simply adding the concentrations of all dioxin and furan congeners in the sample, without considering their toxicity, shows that the total CDD and CDF concentration in the sample is 11.30 ppb.

Scientists generally agree that until we know more about the toxicity of the individual dioxin and furan congeners, TEFs and TEQs should be used to make practical decisions about the potential toxicity of dioxins and furans.

Table 1. Toxicity Equivalence Factors for Dioxin and Furan Congeners

	Toxicity Equivalence Factor (TEF)	
	DOH, 1982	International and USEPA, 1989
Dioxins		
Mono-, Di-, and TriCDDs	0	0
2,3,7,8-TCDD	1	1
Other TCDDs*	0	0
1,2,3,7,8-PeCDD	1	0.5
Other PeCDDs*	0	0
2,3,7,8-HxCDDs	0.03	0.1
Other HxCDDs*	0	0
1,2,3,4,6,7,8-HpCDD	0	0.01
Other HpCDDs*	0	0
OCDD	0	0.001
Furans		
Mono-, Di-, and TriCDFs	0	0
2,3,7,8-TCDF	0.33	0.1
Other TCDFs*	0	0
1,2,3,7,8-PeCDF	0.33	0.05
2,3,4,7,8-PeCDF	0.33	0.5
Other PeCDFs*	0	0
2,3,7,8-HxCDFs	0.01	0.1
Other HxCDFs*	0	0
2,3,7,8-HpCDFs	0	0.01
Other HpCDFs*	0	0
OCDF	0	0.001

* congeners that do not have chlorine atoms at the 2, 3, 7 and 8 positions; also known as non-2, 3, 7, 8 congeners.

Table 2. Calculation of Toxicity Equivalents (TEQs) for a Sample Mixture Containing Dioxin and Furan Congeners Using Two Different TEF Ranking Schemes.

Congeners	Concentration (ppb)**	DOH, 1982		International/EPA, 1989	
		TEF	TEQ*** (ppb)	TEF	TEQ (ppb)
Dioxins					
2,3,7,8-TCDD	0.02	1	0.02	1	0.02
Other TCDDs*	0.03	0	0	0	0
1,2,3,7,8-PeCDD	0.06	1	0.06	0.5	0.03
Other PeCDDs*	0.09	0	0	0	0
1,2,3,4,7,8-HxCDD	0.20	0.03	0.006	0.1	0.02
Other HxCDDs*	0.30	0	0	0	0
1,2,3,4,6,7,8-HpCDD	0.15	0	0	0.01	0.0015
Other HpCDDs*	0.20	0	0	0	0
OCDD	0.50	0	0	0.001	0.005
Furans					
2,3,7,8-TCDF	0.40	0.33	0.13	0.1	0.04
Other TCDFs*	0.60	0	0	0	0
1,2,3,7,8-PeCDF	1.00	0.33	0.33	0.05	0.05
Other PeCDFs*	1.50	0	0	0	0
1,2,3,6,7,8-HxCDFs	2.50	0.01	0.025	0.1	0.25
Other HxCDFs*	3.75	0	0	0	0
Total HpCDFs	< 0.10	0	0	0	0
OCDF	< 0.15	0	0	0.001	< 0.0015
Total dioxin/furan Concentration	11.30				
Total 2,3,7,8-TCDD Equivalents			0.571		0.412

* congeners that do not have chlorine atoms at the 2, 3, 7 and 8 positions; also known as non-2, 3, 7, 8 congeners

** ppb = parts per billion

*** TEQ = concentration (ppb) x TEF

< means "less than" the stated concentration

cvm/91025PRO0070

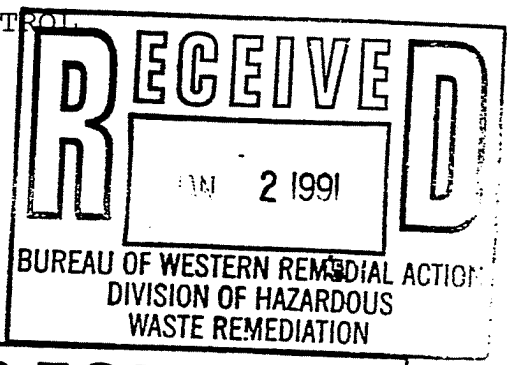
ADDENDUM NO. 2

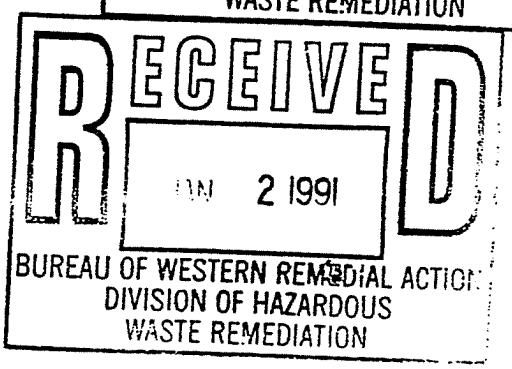
December 1990 Ellicott Creek Sample Results

N.Y.S. DEPARTMENT OF ENVIRONMENTAL CONSERVATION

DIVISION OF HAZARDOUS WASTE REMEDIATION

BUREAU OF HAZARDOUS SITE CONTROL





****
* ANALYTICAL REPORT *
****

SITE NAME:PFOHL BROTHERS

SITE CODE: 915043

SUBMITTED BY:JOE WHITE

DATE OF REPORT: 1/2/91 DATA RELEASED BY: F.WOODWARD

REPORT QUALIFIERS:

FIELD ID	LAB ID			
897-SW-18-001	990-344-01	VOA	BNA	METALS
879-SW-17-001	990-344-02	VOA	BNA	METALS
897-SE-17-001 (WATER)	990-344-03	VOA	BNA	METALS
897-SE-17-001 (SOIL)	990-344-04	VOA	BNA	METALS
TRIP BLANK	990-344-05	VOA		

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

MOBILE LABORATORY SAMPLE SUBMISSION

SITE NAME:PFOHL BROTHERS SET 2

REGISTRY NUMBER: 0915043 SAMPLE SUBMISSION DATE: 12/11/90

SAMPLES SUBMITTED BY: JOE WHITE T&A code:1858

TOTAL NUMBER OF SAMPLES SUBMITTED: 3

********* ORGANIC SAMPLES BY MATRIX *********

WATER: VOA: 3 BNA: 3 PEST/xxx: 3

SOIL: VOA: BNA: PEST/PCB:

OTHER: VOA: PEST/PCB:

OTHER:

********* METALS SAMPLES BY MATRIX *********

WATER: 3 SOIL: OTHER:

METALS SELECTED: As,Ba,Cd,Cr,Cu,Pb,Mn,Hg,Ag,Zn

==========

COMMENTS:

Water samples are background upstream of site.

NOTE: PESTICIDES WERE RUN UNDER PCB PROTOCOL

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********** REPORT INFORMATION **********

VOLATILE DATA REPORTED	_12/_19/_90	BY_P.B.MALONE_____
BNA DATA REPORTED	_12/_20/_90	BY_M.McEWEN_____
PEST/PCB DATA REPORTED	___/___/___	BY_____
METALS DATA REPORTED	_12/_20/_90	BY_G.DANO_____
REPORT COMPLETED AND FILED	_1_/_2_/_91	BY_F.WOODWARD_____

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

MOBILE LABORATORY VOLATILE ANALYSIS

SITE NAME:PFOHL BROS.

FIELD ID:897-SW-18-001

SITE CODE: 915043 PERCENT SOLIDS: 0.0

SAMPLE NUMBER:990-344-01 MATRIX:WATER

SUBMISSION DATE:12/11/90 ARCHIVE NO.:*3878A

ANALYSIS DATE:12/12/90 DATA FILE NO.:9003878A.D

COMPOUND	CONC (PPB)
Chloromethane	ND
Bromomethane	ND
Vinyl chloride	ND
Chloroethane	ND
Methylene chloride	ND
Acetone	ND
Carbon disulfide	ND
1,1-Dichloroethene	ND
1,1-Dichloroethane	ND
trans-1,2-Dichloroethene	ND
Chloroform	ND
1,2-Dichloroethane	ND
2-Butanone	ND
1,1,1-Trichloroethane	ND
Carbontetrachloride	ND
Vinyl acetate	ND
Bromodichloromethane	ND
1,1,2,2-Tetrachloroethane	ND
1,2-Dichloropropane	ND
trans-1,3-Dichloropropene	ND
Trichloroethene	ND
Dibromochloromethane	ND
1,1,2-Trichloroethane	ND
Benzene	ND
cis-1,3-Dichloropropene	ND
2-Chloroethylvinylether	ND
Bromoform	ND
2-Hexanone	ND
4-Methyl-2-pentanone	ND
Tetrachloroethene	ND
Toluene	ND
Chlorobenzene	ND
Ethylbenzene	ND
Styrene	ND
Total Xylenes	ND
Total Chlorotoluene	ND

NON TARGET COMPOUNDS:

ND = LESS THAN 5 PPB

ALL CONCENTRATIONS LESS THAN 5 PPB ARE ESTIMATES

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

MOBILE LABORATORY SEMI-VOLATILE ANALYSIS

SITE NAME: PFOHL BROS LANDFILL

FIELD ID: 897-SW-18-001 % SOLID: NA

SAMPLE NUMBER: 990-344-01 MATRIX: AQUEOUS

SUBMISSION DATE: 12/11/90 ARCHIVE NO.: *3E55A

ANALYSIS DATE: 12/13/90 DATA FILE NO.: 9003E55A

COMPOUND	CONC (ug/l)	TIC AND COMMENT SECTION
Phenol	ND	
2-Chlorophenol	ND	Detection limit - CRDL
Aniline	ND	(Pesticide detection limit - 5)
Bis(2-Chloroethyl)Ether	ND	
1 3-Dichlorobenzene	ND	
1 4-Dichlorobenzene	ND	* Beta and Gamma BHC coelute -
1 2-Dichlorobenzene	ND	reported as the sum of the isomers
Benzyl Alcohol	ND	
2-Methylphenol	ND	
bis(2-chloroisopropyl)Ether	ND	
Hexachloroethane	ND	TIC - No TICs identified
4-Methylphenol	ND	
N-Nitroso-di-propylamine	ND	
Nitrobenzene	ND	
Isophorone	ND	
2-Nitrophenol	ND	
2 4-Dimethylphenol	ND	
bis(2-chloroethoxy)Methane	ND	
2 4-Dichlorophenol	ND	
1 2 4-Trichlorobenzene	ND	
Naphthalene	ND	
Benzoic acid	ND	
4-Chloroaniline	ND	
Hexachlorobutadiene	ND	
4-Chloro-3-Methylphenol	ND	
2-Methylnaphthalene	ND	
Hexachlorocyclopentadiene	ND	
2,4,6-Trichlorophenol	ND	
2,4,5-Trichlorophenol	ND	
2-Chloronaphthalene	ND	
2-Nitroaniline	ND	
Acenaphthylene	ND	
Dimethyl Phthalate	ND	
2,6-Dinitrotoluene	ND	
Acenaphthene	ND	
3-Nitroaniline	ND	
2,4-Dinitrophenol	ND	
Dibenzofuran	ND	
4-Nitrophenol	ND	

CON'T SAMPLE NUMBER: 90090-344-01 DATA FILE:9003E55A

COMPOUND	CONC(ug/l)	
2,4-Dinitrotoluene	ND	
Fluorene	ND	
4-Chlorophenyl-phenylether	ND	
Diethylphthalate	1	B - 1
2 Methyl 4,6-Dinitrophenol	ND	
N-Nitrosodiphenylamine	ND	
4-Nitroaniline	ND	
4-Bromophenyl-phenylether	ND	
Alpha-BHC	ND	
Hexachlorobenzene	ND	
Pentachlorophenol	ND	
Beta-BHC/Gamma-BHC *	ND	
Phenanthrene	ND	
Anthracene	ND	
Delta-BHC	ND	
Heptachlor	ND	
Di-N-Butylphthalate	3	B - 5
Aldrin	ND	
Heptachlor Epoxide	ND	
Fluoranthene	ND	
Pyrene	ND	
Endosulfan I	ND	
4,4'-DDE	ND	
Dieldrin	ND	
Endrin	ND	
Endrin Aldehyde	ND	
Endosulfan II	ND	
4,4'-DDD	ND	
Butylbenzylphthalate	ND	
Endosulfan Sulfate	ND	
4,4'-DDT	ND	
Chrysene	ND	
Benzo (a) Anthracene	ND	
bis(2-Ethylhexyl)Phthalate	4	B - 3
Di-N-Octyl Phthalate	ND	
Benzo(b)Fluoranthene	ND	
Benzo(a)Pyrene	ND	
Indeno(1,2,3-cd)Pyrene	ND	
Dibenz(a,h)Anthracene	ND	
Benzo(g,h,i)Perylene	ND	

N.Y.S. DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION
BUREAU OF HAZARDOUS SITE CONTROL

H.S.L. METALS REPORT

SITE NAME: PFOHL BROTHERS LANDFILL
FIELD ID: 897-SW-18-001

SAMPLE NUMBER: 990-344-01
DATE COLLECTED: 12/11/90
DATE ANALYZED: 12/12/90
DATE REPORTED: 12/20/90

SITE CODE: 9-15-043
MATRIX: AQUEOUS
PERCENT SOLIDS: N/A
CONC. UNITS: UG/L
ARCHIVE NO.: M2065

METAL	CONC	
ALUMINIUM	NR	
ANTIMONY	NR	NR = NOT REQUESTED
ARSENIC	10U	
BARIUM	600	
BERYLLIUM	NR	
CADMIUM	7.0	
CALCIUM	NR	
CHROMIUM	10U	
COBALT	NR	
COPPER	25U	
IRON	NR	
LEAD	5U	
MAGNESIUM	NR	
MANGANESE	15U	
MERCURY	0.2U	
NICKEL	NR	
POTASSIUM	NR	
SELENIUM	NR	
SILVER	10U	
SODIUM	NR	
THALLIUM	NR	
TIN	NR	
VANADIUM	NR	
ZINC	20U	

COMMENTS:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

MOBILE LABORATORY VOLATILE ANALYSIS

SITE NAME:PFOHL BROS.

FIELD ID:897-SW-17-001

SITE CODE: 915043 PERCENT SOLIDS: 0.0

SAMPLE NUMBER:990-344-02 MATRIX:WATER

SUBMISSION DATE:12/11/90 ARCHIVE NO.:*3B79A

ANALYSIS DATE:12/12/90 DATA FILE NO.:9003B79A.D

COMPOUND	CONC (PPB)
Chloromethane	ND
Bromomethane	ND
Vinyl chloride	ND
Chloroethane	ND
Methylene chloride	ND
Acetone	ND
Carbon disulfide	ND
1,1-Dichloroethene	ND
1,1-Dichloroethane	ND
trans-1,2-Dichloroethene	ND
Chloroform	ND
1,2-Dichloroethane	ND
2-Butanone	ND
1,1,1-Trichloroethane	ND
Carbontetrachloride	ND
Vinyl acetate	ND
Bromodichloromethane	ND
1,1,2,2-Tetrachloroethane	ND
1,2-Dichloropropane	ND
trans-1,3-Dichloropropene	ND
Trichloroethene	ND
Dibromochloromethane	ND
1,1,2-Trichloroethane	ND
Benzene	ND
cis-1,3-Dichloropropene	ND
2-Chloroethylvinylether	ND
Bromoform	ND
2-Hexanone	ND
4-Methyl-2-pentanone	ND
Tetrachloroethene	ND
Toluene	ND
Chlorobenzene	ND
Ethylbenzene	ND
Styrene	ND
Total Xylenes	ND
Total Chlorotoluene	ND

NON TARGET COMPOUNDS:

ND = LESS THAN 5 PPB

ALL CONCENTRATIONS LESS THAN 5 PPB ARE ESTIMATES

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

MOBILE LABORATORY SEMI-VOLATILE ANALYSIS

SITE NAME: PFOHL BROS LANDFILL

FIELD ID: 897-SW-17-001 % SOLID: NA

SAMPLE NUMBER: 990-344-02 MATRIX: AQUEOUS

SUBMISSION DATE: 12/11/90 ARCHIVE NO.: *3E56A

ANALYSIS DATE: 12/13/90 DATA FILE NO.: 9003E56A

COMPOUND	CONC (ug/l)	TIC AND COMMENT SECTION
Phenol	ND	
2-Chlorophenol	ND	Detection limit - CROL
Aniline	ND	(Pesticide detection limit - 5)
Bis(2-Chloroethyl)Ether	ND	
1 3-Dichlorobenzene	ND	
1 4-Dichlorobenzene	ND	* Beta and Gamma BHC coelute -
1 2-Dichlorobenzene	ND	reported as the sum of the isomers
Benzyl Alcohol	ND	
2-Methylphenol	ND	
bis(2-chloroisopropyl)Ether	ND	
Hexachloroethane	ND	TIC - No TICs identified
4-Methylphenol	ND	
N-Nitroso-di-propylamine	ND	
Nitrobenzene	ND	
Isophorone	ND	
2-Nitrophenol	ND	
2 4-Dimethylphenol	ND	
bis(2-chloroethoxy)Methane	ND	
2 4-Dichlorophenol	ND	
1 2 4-Trichlorobenzene	ND	
Naphthalene	ND	
Benzoic acid	ND	
4-Chloroaniline	ND	
Hexachlorobutadiene	ND	
4-Chloro-3-Methylphenol	ND	
2-Methylnaphthalene	ND	
Hexachlorocyclopentadiene	ND	
2,4,6-Trichlorophenol	ND	
2,4,5-trichlorophenol	ND	
2-Chloronaphthalene	ND	
2-Nitroaniline	ND	
Acenaphthylene	ND	
Dimethyl Phthalate	ND	
2,6-Dinitrotoluene	ND	
Acenaphthene	ND	
3-Nitroaniline	ND	
2,4-Dinitrophenol	ND	
Dibenzofuran	ND	
4-Nitrophenol	ND	

CON'T SAMPLE NUMBER: 990-344-02 DATA FILE: 9003E56A

COMPOUND	CONC(ug/l)	
2,4-Dinitrotoluene	ND	
Fluorene	ND	
4-Chlorophenyl-phenylether	ND	
Diethylphthalate	1	B - 1
2 Methyl 4,6-Dinitrophenol	ND	
N-Nitrosodiphenylamine	ND	
4-Nitroaniline	ND	
4-Bromophenyl-phenylether	ND	
Alpha-BHC	ND	
Hexachlorobenzene	ND	
Pentachlorophenol	ND	
Beta-BHC/Gamma-BHC *	ND	
Phenanthrene	ND	
Anthracene	ND	
Delta-BHC	ND	
Heptachlor	ND	
Di-N-Butylphthalate	4	B - 5
Aldrin	ND	
Heptachlor Epoxide	ND	
Fluoranthene	ND	
Pyrene	ND	
Endosulfan I	ND	
4,4'-DDE	ND	
Dieldrin	ND	
Endrin	ND	
Endrin Aldehyde	ND	
Endosulfan II	ND	
4,4'-DDD	ND	
Butylbenzylphthalate	ND	
Endosulfan Sulfate	ND	
4,4'-DDT	ND	
Chrysene	ND	
Benzo (a) Anthracene	ND	
bis(2-Ethylhexyl)Phthalate	2	B - 3
Di-N-Octyl Phthalate	ND	
Benzo(b&k)Fluoranthene	ND	
Benzo(a)Pyrene	ND	
Indeno(1,2,3-cd)Pyrene	ND	
Dibenz(a,h)Anthracene	ND	
Benzo(g,h,i)Perylene	ND	

N.Y.S. DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION
BUREAU OF HAZARDOUS SITE CONTROL

H.S.L. METALS REPORT

SITE NAME: PFOHL BROTHERS LANDFILL
FIELD ID: 897-SW-17-001

SAMPLE NUMBER: 990-344-02
DATE COLLECTED: 12/11/90
DATE ANALYZED: 12/12/90
DATE REPORTED: 12/20/90

SITE CODE: 9-15-043
MATRIX: AQUEOUS
PERCENT SOLIDS: N/A
CONC. UNITS: UG/L
ARCHIVE NO.: M2066

METAL	CONC	
ALUMINIUM	NR	
ANTIMONY	NR	NR = NOT REQUESTED
ARSENIC	10U	
BARIUM	650	
BERYLLIUM	NR	
CADMIUM	8.0	
CALCIUM	NR	
CHROMIUM	10U	
COBALT	NR	
COPPER	25U	
IRON	NR	
LEAD	5U	
MAGNESIUM	NR	
MANGANESE	15U	
MERCURY	0.2	
NICKEL	NR	
POTASSIUM	NR	
SELENIUM	NR	
SILVER	10U	
SODIUM	NR	
THALLIUM	NR	
TIN	NR	
VANADIUM	NR	
ZINC	20U	

COMMENTS:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

MOBILE LABORATORY VOLATILE ANALYSIS

SITE NAME:PFOHL BROS.

FIELD ID:897-SW-19-001

SITE CODE: 915043 PERCENT SOLIDS: 0.0

SAMPLE NUMBER:990-344-03 MATRIX:WATER

SUBMISSION DATE:12/11/90 ARCHIVE NO.:*3B80A

ANALYSIS DATE:12/12/90 DATA FILE NO.:9003B80A.D

COMPOUND	CONC (PPB)	NON TARGET COMPOUNDS:
Chloromethane	ND	
Bromomethane	ND	
Vinyl chloride	ND	
Chloroethane	ND	
Methylene chloride	ND	
Acetone	ND	
Carbon disulfide	ND	
1,1-Dichloroethene	ND	
1,1-Dichloroethane	ND	
trans-1,2-Dichloroethene	ND	
Chloroform	ND	
1,2-Dichloroethane	ND	
2-Butanone	ND	
1,1,1-Trichloroethane	ND	
Carbontetrachloride	ND	
Vinyl acetate	ND	
Bromodichloromethane	ND	
1,1,2,2-Tetrachloroethane	ND	
1,2-Dichloropropane	ND	
trans-1,3-Dichloropropene	ND	
Trichloroethene	ND	
Dibromochloromethane	ND	
1,1,2-Trichloroethane	ND	
Benzene	ND	
cis-1,3-Dichloropropene	ND	
2-Chloroethylvinylether	ND	
Bromoform	ND	
2-Hexanone	ND	
4-Methyl-2-pentanone	ND	
Tetrachloroethene	ND	
Toluene	ND	
Chlorobenzene	ND	
Ethylbenzene	ND	
Styrene	ND	
Total Xylenes	ND	
Total Chlorotoluene	ND	

ND = LESS THAN 5 PPB

ALL CONCENTRATIONS LESS THAN 5 PPB ARE ESTIMATES

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

MOBILE LABORATORY SEMI-VOLATILE ANALYSIS

SITE NAME: PFOHL BROS LANDFILL

FIELD ID: 897-SW-19-001 % SOLID: NA

SAMPLE NUMBER: 990-344-03 MATRIX: AQUEOUS

SUBMISSION DATE: 12/11/90 ARCHIVE NO.: *3E59A

ANALYSIS DATE: 12/14/90 DATA FILE NO.: 9003E59A

COMPOUND	CONC (ug/l)	TIC AND COMMENT SECTION
Phenol	ND	
2-Chlorophenol	ND	Detection limit - CRDL
Aniline	ND	(Pesticide detection limit - 5)
Bis(2-Chloroethyl)Ether	ND	
1 3-Dichlorobenzene	ND	
1 4-Dichlorobenzene	ND	* Beta and Gamma BHC coelute -
1 2-Dichlorobenzene	ND	reported as the sum of the isomers
Benzyl Alcohol	ND	
2-Methylphenol	ND	
bis(2-chloroisopropyl)Ether	ND	
Hexachloroethane	ND	TIC - No TICs identified
4-Methylphenol	ND	
N-Nitroso-di-propylamine	ND	
Nitrobenzene	ND	
Isophorone	ND	
2-Nitrophenol	ND	
2 4-Dimethylphenol	ND	
bis(2-chloroethoxy)Methane	ND	
2 4-Dichlorophenol	ND	
1 2 4-Trichlorobenzene	ND	
Naphthalene	ND	
Benzoic acid	ND	
4-Chloroaniline	ND	
Hexachlorobutadiene	ND	
4-Chloro-3-Methylphenol	ND	
2-Methylnaphthalene	ND	
Hexachlorocyclopentadiene	ND	
2,4,6-Trichlorophenol	ND	
2,4,5-trichlorophenol	ND	
2-Chloronaphthalene	ND	
2-Nitroaniline	ND	
Acenaphthylene	ND	
Dimethyl Phthalate	ND	
2,6-Dinitrotoluene	ND	
Acenaphthene	ND	
3-Nitroaniline	ND	
2,4-Dinitrophenol	ND	
Dibenzofuran	ND	
4-Nitrophenol	ND	

CON'T SAMPLE NUMBER: 990-344-03 DATA FILE: 9003E59A

COMPOUND	CONC(ug/l)	
2,4-Dinitrotoluene	ND	
Fluorene	ND	
4-Chlorophenyl-phenylether	ND	
Diethylphthalate	1	B - 1
2 Methyl 4,6-Dinitrophenol	ND	
N-Nitrosodiphenylamine	ND	
4-Nitroaniline	ND	
4-Bromophenyl-phenylether	ND	
Alpha-BHC	ND	
Hexachlorobenzene	ND	
Pentachlorophenol	ND	
Beta-BHC/Gamma-BHC *	ND	
Phenanthrene	ND	
Anthracene	ND	
Delta-BHC	ND	
Heptachlor	ND	
Di-N-Butylphthalate	6	B - 5
Aldrin	ND	
Heptachlor Epoxide	ND	
Fluoranthene	ND	
Pyrene	ND	
Endosulfan I	ND	
4,4'-DDE	ND	
Dieldrin	ND	
Endrin	ND	
Endrin Aldehyde	ND	
Endosulfan II	ND	
4,4'-DDD	ND	
Butylbenzylphthalate	ND	
Endosulfan Sulfate	ND	
4,4'-DDT	ND	
Chrysene	ND	
Benzo (a) Anthracene	ND	
bis(2-Ethylhexyl)Phthalate	4	B - 3
Di-N-Octyl Phthalate	ND	
Benzo(b/k)Fluoranthene	ND	
Benzo(a)Pyrene	ND	
Indeno(1,2,3-cd)Pyrene	ND	
Dibenz(a,h)Anthracene	ND	
Benzo(g,h,i)Perylene	ND	

N.Y.S. DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION
BUREAU OF HAZARDOUS SITE CONTROL

H.S.L. METALS REPORT

SITE NAME: PFOHL BROTHERS LANDFILL
FIELD ID: 897-SW-19-001

SAMPLE NUMBER: 990-344-03
DATE COLLECTED: 12/11/90
DATE ANALYZED: 12/12/90
DATE REPORTED: 12/20/90

SITE CODE: 9-15-043
MATRIX: AQUEOUS
PERCENT SOLIDS: N/A
CONC. UNITS: UG/L
ARCHIVE NO.: M2067

METAL	CONC
ALUMINIUM	NR
ANTIMONY	NR
ARSENIC	10U
BARIUM	650
BERYLLIUM	NR
CADMIUM	5.0
CALCIUM	NR
CHROMIUM	10U
COBALT	NR
COPPER	25U
IRON	NR
LEAD	5U
MAGNESIUM	NR
MANGANESE	15U
MERCURY	0.2U
NICKEL	NR
POTASSIUM	NR
SELENIUM	NR
SILVER	10U
SODIUM	NR
THALLIUM	NR
TIN	NR
VANADIUM	NR
ZINC	59.0

NR = NOT REQUESTED

COMMENTS:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

MOBILE LABORATORY VOLATILE ANALYSIS

SITE NAME:PF9OHLOHL BROS.

FIELD ID:897-SE-17-001

SITE CODE: 915043 PERCENT SOLIDS: 65.0

SAMPLE NUMBER:990-344-04 MATRIX:SEDIMENT

SUBMISSION DATE:12/11/90 ARCHIVE NO.:*4C42A

ANALYSIS DATE:12/12/90 DATA FILE NO.:9004C42A.D

COMPOUND	CONC (PPB)	NON TARGET COMPOUNDS:
Chloromethane	ND	
Bromomethane	ND	
Vinyl chloride	ND	
Chloroethane	ND	
Methylene chloride	ND	
Acetone	ND	
Carbon disulfide	ND	
1,1-Dichloroethene	ND	
1,1-Dichloroethane	ND	
trans-1,2-Dichloroethene	ND	
Chloroform	ND	
1,2-Dichloroethane	ND	
2-Butanone	ND	
1,1,1-Trichloroethane	ND	
Carbontetrachloride	ND	
Vinyl acetate	ND	
Bromodichloromethane	ND	
1,1,2,2-Tetrachloroethane	ND	
1,2-Dichloropropane	ND	
trans-1,3-Dichloropropene	ND	
Trichloroethene	ND	
Dibromochloromethane	ND	
1,1,2-Trichloroethane	ND	
Benzene	9 B	
cis-1,3-Dichloropropene	ND	
2-Chloroethylvinylether	ND	
Bromoform	ND	
2-Hexanone	ND	
4-Methyl-2-pentanone	ND	
Tetrachloroethene	ND	
Toluene	150	
Chlorobenzene	ND	
Ethylbenzene	ND	
Styrene	ND	
Total Xylenes	9	
Total Chlorotoluene	ND	

ND = LESS THAN 5 PPB

ALL CONCENTRATIONS LESS THAN 5 PPB ARE ESTIMATES

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

MOBILE LABORATORY SEMI-VOLATILE ANALYSIS

SITE NAME: PFOHL BROS LANDFILL

FIELD ID: 897-SE-17-001 % SOLID: 72

SAMPLE NUMBER: 990-344-04 MATRIX: SOIL

SUBMISSION DATE: 12/11/90 ARCHIVE NO.: *3E60A

ANALYSIS DATE: 12/14/90 DATA FILE NO.: 9003E60A

COMPOUND	CONC(ug/kg)
Phenol	ND
2-Chlorophenol	ND
Aniline	ND
Bis(2-Chloroethyl)Ether	ND
1 3-Dichlorobenzene	ND
1 4-Dichlorobenzene	ND
1 2-Dichlorobenzene	ND
Benzyl Alcohol	ND
2-Methylphenol	ND
bis(2-chloroisopropyl)Ether	ND
Hexachloroethane	ND
4-Methylphenol	ND
N-Nitroso-di-propylamine	ND
Nitrobenzene	ND
Isophorone	ND
2-Nitrophenol	ND
2 4-Dimethylphenol	ND
bis(2-chloroethoxy)Methane	ND
2 4-Dichlorophenol	ND
1 2 4-Trichlorobenzene	ND
Naphthalene	ND
Benzoic acid	ND
4-Chloroaniline	ND
Hexachlorobutadiene	ND
4-Chloro-3-Methylphenol	ND
2-Methylnaphthalene	ND
Hexachlorocyclopentadiene	ND
2,4,6-Trichlorophenol	ND
2,4,5-trichlorophenol	ND
2-Chloronaphthalene	ND
2-Nitroaniline	ND
Acenaphthylene	ND
Dimethyl Phthalate	ND
2,6-Dinitrotoluene	ND
Acenaphthene	ND
3-Nitroaniline	ND
2,4-Dinitrophenol	ND
Dibenzofuran	ND
4-Nitrophenol	ND

TIC AND COMMENT SECTION

Detection limit - CRDL
(Pesticide detection limit - 230)

* Beta and Gamma BHC coelute - reported as the sum of the isomers

TIC - No TICs identified

CON'T SAMPLE NUMBER: 990-344-04 DATA FILE: 9003E60A

COMPOUND	CONC(ug/kg)	
2,4-Dinitrotoluene	ND	
Fluorene	ND	
4-Chlorophenyl-phenylether	ND	
Diethylphthalate	ND	
2 Methyl 4,6-Dinitrophenol	ND	
N-Nitrosodiphenylamine	ND	
4-Nitroaniline	ND	
4-Bromophenyl-phenylether	ND	
Alpha-BHC	ND	
Hexachlorobenzene	ND	
Pentachlorophenol	ND	
Beta-BHC/Gamma-BHC *	ND	
Phenanthrene	50	
Anthracene	ND	
Delta-BHC	ND	
Heptachlor	ND	
Di-N-Butylphthalate	29	B - 46
Aldrin	ND	
Heptachlor Epoxide	ND	
Fluoranthene	140	
Pyrene	110	
Endosulfan I	ND	
4,4'-DDE	ND	
Dieldrin	ND	
Endrin	ND	
Endrin Aldehyde	ND	
Endosulfan II	ND	
4,4'-DDD	ND	
Butylbenzylphthalate	ND	
Endosulfan Sulfate	ND	
4,4'-DDT	ND	
Chrysene	65	
Benzo (a) Anthracene	ND	
bis(2-Ethylhexyl)Phthalate	280	B - 190
Di-N-Octyl Phthalate	ND	
Benzo(b/k)Fluoranthene	66	
Benzo(a)Pyrene	52	
Indeno(1,2,3-cd)Pyrene	42	
Dibenz(a,h)Anthracene	ND	
Benzo(g,h,i)Perylene	34	

N.Y.S. DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF HAZARDOUS WASTE REMEDIATION
BUREAU OF HAZARDOUS SITE CONTROL

H.S.L. METALS REPORT

SITE NAME: PFOHL BROTHERS LANDFILL
FIELD ID: 897-SE-17-001

SAMPLE NUMBER: 990-344-04
DATE COLLECTED: 12/11/90
DATE ANALYZED: 12/12/90
DATE REPORTED: 12/20/90

SITE CODE: 9-15-043
MATRIX: SOIL
PERCENT SOLIDS: 65
CONC. UNITS: MG/KG
ARCHIVE NO.: M2068

METAL	CONC
ALUMINIUM	NR
ANTIMONY	NR
ARSENIC	6.4
BARIUM	91.2
BERYLLIUM	NR
CADMIUM	0.8
CALCIUM	NR
CHROMIUM	9.0
COBALT	NR
COPPER	14.4
IRON	NR
LEAD	21.5
MAGNESIUM	NR
MANGANESE	199
MERCURY	0.1
NICKEL	NR
POTASSIUM	NR
SELENIUM	NR
SILVER	1.2U
SODIUM	NR
THALLIUM	NR
TIN	NR
VANADIUM	NR
ZINC	54.1

NR = NOT REQUESTED

COMMENTS:

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

MOBILE LABORATORY VOLATILE ANALYSIS

SITE NAME:PFOHL BROS.

FIELD ID:TRIP BLANK

SITE CODE: 915043 PERCENT SOLIDS: 0.0

SAMPLE NUMBER:990-344-05 MATRIX:WATER

SUBMISSION DATE:2112/11/90 ARCHIVE NO.:*3B81A

ANALYSIS DATE:12/12/90 DATA FILE NO.:9003B81A.D

COMPOUND	CONC (PPB)
Chloromethane	ND
Bromomethane	ND
Vinyl chloride	ND
Chloroethane	ND
Methylene chloride	ND
Acetone	ND
Carbon disulfide	ND
1,1-Dichloroethene	ND
1,1-Dichloroethane	ND
trans-1,2-Dichloroethene	ND
Chloroform	ND
1,2-Dichloroethane	ND
2-Butanone	ND
1,1,1-Trichloroethane	ND
Carbontetrachloride	ND
Vinyl acetate	ND
Bromodichloromethane	ND
1,1,2,2-Tetrachloroethane	ND
1,2-Dichloropropane	ND
trans-1,3-Dichloropropene	ND
Trichloroethene	ND
Dibromochloromethane	ND
1,1,2-Trichloroethane	ND
Benzene	ND
cis-1,3-Dichloropropene	ND
2-Chloroethylvinylether	ND
Bromoform	ND
2-Hexanone	ND
4-Methyl-2-pentanone	ND
Tetrachloroethene	ND
Toluene	ND
Chlorobenzene	ND
Ethylbenzene	ND
Styrene	ND
Total Xylenes	ND
Total Chlorotoluene	ND

NON TARGET COMPOUNDS:

ND = LESS THAN 5 PPB

ALL CONCENTRATIONS LESS THAN 5 PPB ARE ESTIMATES

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
MOBILE LABORATORY PCB ANALYSIS

SITE NAME: PFOHL BROTHERS LANDFILL

SITE CODE: 915043

SAMPLE NUMBER:990-344-01 FIELD ID:897-SW-18-001

DATE RECEIVED: 12/11/90 ANALYSIS DATE: 12/20/90

ARCHIVE NUMBER:P34401 MATRIX: WATER % SOLID: NA

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**** AROCLOR - 1016 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 0.5 PPB

MASS SPECTROMETER RESULTS: ND

**** AROCLOR - 1221 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 0.5 PPB

MASS SPECTROMETER RESULTS: ND

**** AROCLOR - 1232 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 0.5 PPB

MASS SPECTROMETER RESULTS: ND

**** AROCLOR - 1242 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 0.5 PPB

MASS SPECTROMETER RESULTS: ND

**** AROCLOR - 1248 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 0.5 PPB

MASS SPECTROMETER RESULTS: ND

**** AROCLOR - 1254 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 0.5 PPB

MASS SPECTROMETER RESULTS: ND

**** AROCLOR - 1260 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 0.5 PPB

MASS SPECTROMETER RESULTS: ND

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
MOBILE LABORATORY PCB ANALYSIS

SITE NAME: PFOHL BROTHERS LANDFILL

SITE CODE: 915043

SAMPLE NUMBER:990-344-02 FIELD ID:897-SW-17-001

DATE RECEIVED: 12/11/90 ANALYSIS DATE: 12/20/90

ARCHIVE NUMBER:P34402 MATRIX: WATER % SOLID: NA

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**** AROCLOR - 1016 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 0.5 PPB

MASS SPECTROMETER RESULTS: ND

**** AROCLOR - 1221 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 0.5 PPB

MASS SPECTROMETER RESULTS: ND

**** AROCLOR - 1232 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 0.5 PPB

MASS SPECTROMETER RESULTS: ND

**** AROCLOR - 1242 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 0.5 PPB

MASS SPECTROMETER RESULTS: ND

**** AROCLOR - 1248 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 0.5 PPB

MASS SPECTROMETER RESULTS: ND

**** AROCLOR - 1254 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 0.5 PPB

MASS SPECTROMETER RESULTS: ND

**** AROCLOR - 1260 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 0.5 PPB

MASS SPECTROMETER RESULTS: ND

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
MOBILE LABORATORY PCB ANALYSIS

SITE NAME: PFOHL BROTHERS LANDFILL

SITE CODE: 915043

SAMPLE NUMBER:990-344-04 FIELD ID:897-SE-17-001

DATE RECEIVED: 12/11/90 ANALYSIS DATE: 12/20/90

ARCHIVE NUMBER:P34404 MATRIX: SOIL % SOLID: 72

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**** AROCLOR - 1016 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 110 PPB

MASS SPECTROMETER RESULTS: ND

**** AROCLOR - 1221 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 110 PPB

MASS SPECTROMETER RESULTS: ND

**** AROCLOR - 1232 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 110 PPB

MASS SPECTROMETER RESULTS: ND

**** AROCLOR - 1242 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 110 PPB

MASS SPECTROMETER RESULTS: ND

**** AROCLOR - 1248 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 110 PPB

MASS SPECTROMETER RESULTS: ND

**** AROCLOR - 1254 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 110 PPB

MASS SPECTROMETER RESULTS: ND

**** AROCLOR - 1260 ****

GAS CHROMATOGRAPH RESULTS: ND DETECTION LIMIT 110 PPB

MASS SPECTROMETER RESULTS: ND