Ask Glenn/Liz to review outliers for final decision on exclusion. QC documentation

Table __
Summary of Ground Water Data
Albion Sheridan Township Landfill, Albion, Michigan
Units as Given

Sample Identification:
Duplicate/Blank?:
Background?:
EPA Sample Identification:
Sample Date:
Sampled By:
Analyzed By:

		Background Calculations for Shallow Bedrock						
		Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	
Volatiles	***Units***							
Methyl ethyl ketone	ug/L	0	3	ND	-	-	MDL	
Xylene, total	ug/L	0	3	ND	-	-	MDL	
Semi-Volatiles	***Units***							
Bis(2-ethyl hexyl)phthalate	ug/L	0	3	ND	-	-	MDL	
Butyl benzyl phthalate	ug/L	1	3	3.666667	2.309401	0.63	10.5948699	ND if excl. $\bar{x}$+3s would excl.
Di-n-butyl phthalate	ug/L	1	3	4.333333	1.154701	0.27	7.797434948	
Diethyl phthalate	ug/L	1	3	4.333333	1.154701	0.27	7.797434948	
Di-n-octyl phthalate	ug/L	2	3	5	3	0.60	14	Not an outliers 8 is w/in $\bar{x}$+3s
Pesticides/PCBs	***Units***							
Endosulfan sulfate	ug/L	1	3	0.036667	0.023094	0.63	0.105948699	potential outlier is on low end, $\bar{x}$-3s would excl. (ND w/o)
Heptachlor	ug/L	0	3	ND	-	-	MDL	
Methoxychlor	ug/L	1	3	0.178333	0.12413	0.70	0.550724257	ND if excl. $\bar{x}$+3s would exclude.
Inorganics	***Units***							
Aluminum	ug/L	0	3	ND	-	-	MDL	
Antimony	ug/L	0	3	ND	-	-	MDL	
Arsenic	ug/L	0	3	ND	-	-	MDL	
Barium	ug/L	3	3	70.33333	21.53284	0.31	134.9318627	
Calcium	ug/L	3	3	103666.7	2516.611	0.02	111216.5011	
Cobalt	ug/L	0	3	ND	-	-	MDL	
Copper	ug/L	0	3	ND	-	-	MDL	
Iron	ug/L	3	3	533.6667	185.0739	0.35	1088.888244	
Lead	ug/L	1	3	0.833333	0.490748	0.59	2.30557652	ND if excl., $\bar{x}$+3s would excl.
Magnesium	ug/L	3	3	27800	435.8899	0.02	29107.66968	
Manganese	ug/L	3	3	128.1667	58.4002	0.46	303.367266	
Nickel	ug/L	0	3	ND	-	-	MDL	
Potassium	ug/L	3	3	2786.667	1760.237	0.63	8067.376846	$\bar{x}$+3s = 5428 if excl. outlier
Selenium	ug/L	1	3	0.8	0.433013	0.54	2.099038106	ND if excl. $\bar{x}$+3s would excl.
Sodium	ug/L	3	3	36910	25486.67	0.69	113370.0072	potential outlier is on low end
Zinc	ug/L	0	3	ND	-	-	MDL	

= Potential outlier in background (not evaluated due to insufficient samples).

Blanks PB173 PB64
Temp 30 $4750 $64

Back. SB $AT3 : $AY3
Back. SG $AZ3 : $BE3
K = 0.5

AT-AV Vol, SV's, Pesticides
AW-AY Inorganics
AZ-BB Vol, SV's, Pesticides
BC-BE Inorganics

US EPA RECORDS CENTER REGION 5
471040

will wait until more samples available.

How will weathered bedrock (backgrd n=2) and deep bedrock be evaluated? → will compare to shallow bedrock bg
How were parameters picked for calculating bg → for non-detected in gw-bg, will cut down to det. in specific aquifer.

Table __
Summary of Ground Water Data
Albion Sheridan Township Landfill, Albion, Michigan
Units as Given

Sample Identification:
Duplicate/Blank?:
Background?:
EPA Sample Identification:
Sample Date:
Sampled By:
Analyzed By:

		Background Calculations for Shallow Glacial						
		Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	
Volatiles	***Units***							
Methyl ethyl ketone	ug/L	0	3	ND	-	-	MDL	
Xylene, total	ug/L	0	3	ND	-	-	MDL	
Semi-Volatiles	***Units***							
Bis(2-ethyl hexyl)phthalate	ug/L	0	3	ND	-	-	MDL	
Butyl benzyl phthalate	ug/L	0	3	ND	-	-	MDL	
Di-n-butyl phthalate	ug/L	1	3	4	1.7320508	0.43	9.196152423	
Diethyl phthalate	ug/L	1	3	4.333333	1.1547005	0.27	7.797434948	
Di-n-octyl phthalate	ug/L	2	3	3.666667	1.5275252	0.42	8.249242362	
Pesticides/PCBs	***Units***							
Endosulfan sulfate	ug/L	0	3	ND	-	-	MDL	
Heptachlor	ug/L	0	3	ND	-	-	MDL	
Methoxychlor	ug/L	0	3	ND	-	-	MDL	
Inorganics	***Units***							
Aluminum	ug/L	0	3	ND	-	-	MDL	
Antimony	ug/L	0	3	ND	-	-	MDL	
Arsenic	ug/L	0	3	ND	-	-	MDL	
Barium	ug/L	3	3	38.8	6.0695964	0.16	57.00878909	
Calcium	ug/L	3	3	97700	17842.926	0.18	151228.7773	
Cobalt	ug/L	0	3	ND	-	-	MDL	
Copper	ug/L	1	3	5.6	2.9444864	0.53	14.43345912	ND if excl., $\bar{x}+3s$ would incl.
Iron	ug/L	0	3	ND	-	-	MDL	
Lead	ug/L	1	3	0.933333	0.6639528	0.71	2.925191762	(")
Magnesium	ug/L	3	3	23000	2551.4702	0.11	30654.41049	
Manganese	ug/L	1	3	82.73333	141.39308	1.71	506.9125761	(")
Nickel	ug/L	0	3	ND	-	-	MDL	
Potassium	ug/L	3	3	17536.67	26988.294	1.54	98501.5498	Hits 1900, 48700, 2010 outlier
Selenium	ug/L	1	3	1.533333	1.7031833	1.11	6.642883216	ND if excl., $\bar{x}+3s$ would excl.
Sodium	ug/L	2	3	15680	17943.054	1.14	69509.1631	Hits 7500, 36200, ND (2940) outlier
Zinc	ug/L	0	3	ND	-	-	MDL	

= Potential outlier in background (not evaluated due to insufficient samples).

Table
Ground Water Background Calculations
Albion Sheridan Township Landfill, Albion, Michigan
Units as Given

Sample Identification:		Background Calculations for Shallow Bedrock						
Sample Date:		Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?
Volatiles	***Units***							
Acetone	ug/L	1	6	4.333333	1.47196	0.34	8.75	N
Semi-Volatiles	***Units***							
Bis(2-ethyl hexyl)phthalate	ug/L	2	6	28.66667	27.23907	0.95	110	N
Butyl benzyl phthalate	ug/L	1	6	ND	-	-	5 - 10 M	N
Di-n-butyl phthalate	ug/L	1	6	3.416667	1.241639	0.36	7.14	N
Diethyl phthalate	ug/L	1	6	3.416667	1.241639	0.36	7.14	N
Di-n-octyl phthalate	ug/L	3	5	2.8	1.25499	0.45	6.56	8
Pesticides/PCBs	***Units***							
4,4'-DDT	ug/L	1	3	0.010667	0.001155	0.11	0.0141	0.05
Endosulfan sulfate	ug/L	2	6	0.027833	0.020104	0.72	0.0881	N
Endrin ketone	ug/L	2	6	0.036783	0.02168	0.59	0.102	N
Heptachlor	ug/L	0	6	ND	-	-	0.01 - 0.05 M	N
Methoxychlor	ug/L	1	4	0.04625	0.0075	0.16	0.0688	0.25
Inorganics	***Units***							
Aluminum	ug/L	0	6	ND	-	-	25 - 51.6 M	N
Barium	ug/L	6	6	73.83333	20.5204	0.28	135	N
Beryllium	ug/L	0	6	ND	-	-	1 - 2.2 M	N
Calcium	ug/L	6	6	108666.7	5853.774	0.05	126000	N
Copper	ug/L	0	6	ND	-	-	7 - 7.8 M	N
Iron	ug/L	6	6	595.5	222.6376	0.37	1260	N
Lead	ug/L	0	4	ND	-	-	1 - 1.1 M	4.7, 1.4
Magnesium	ug/L	6	6	28883.33	1368.819	0.05	33000	N
Manganese	ug/L	6	6	133.8167	50.05838	0.37	284	N
Potassium	ug/L	5	6	2386.417	1649.61	0.69	7340	N
Selenium	ug/L	1	6	0.65	0.319374	0.49	1.61	N
Sodium	ug/L	6	6	38436.67	24029.39	0.63	111000	N
Thallium	ug/L	0	6	ND	-	-	1.1 - 2 M	N

(see key for footnotes)

NOTE: These cols. exclude outliers

significant digits?

Checked

Table
Ground Water Background Calculations
Albion Sheridan Township Landfill, Albion, Michigan
Units as Given

	Sample Identification:		Background Calculations for Shallow Bedrock							
	Sample Date:		Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?	
	General Water Quality	***Units***								
3	BOD	mg/L	0	3	ND	-	-	2 - 2 M	N	
6	Chloride	mg/L	6	6	71.91667	36.68811	0.51	182	N	check
3	Grease & Oil	mg/L	0	3	ND	-	-	0.4 - 0.4 M	N	
6	Nitrate/ Nitrite	mg/L	2	6	0.035	0.017607	0.50	0.0878	N	
6	Nitrogen, total kjeldahl	mg/L	2	6	0.215833	0.128313	0.59	0.601	N ~~(low)~~	check not < x-3s anyway
3	Total dissolved solids	mg/L	3	3	558	85.51023	0.15	815	N	Bkgd based on 3 samples?
3	Total suspended solids	mg/L	3	3	11	7.81025	0.71	34.4	~~Maybe~~ ~~check~~ N (2 lows)	
6	Sulfate	mg/L	6	6	3.61667	3.253562	0.05	73.4	N	

(see key for footnotes)

Table
Ground Water Background Calculations
Albion Sheridan Township Landfill, Albion, Michigan
Units as Given

# samples originally	Sample Identification: / Sample Date:		Background Calculations for Shallow Glacial							
			Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?	
	Volatiles	***Units***								
6	Acetone	ug/L	0	6	ND	-	-	5 - 10 M	N	
	Semi-Volatiles	***Units***								
6	Bis(2-ethyl hexyl)phthalate	ug/L	0	6	ND	-	-	5 - 32 M	N	
	Butyl benzyl phthalate	ug/L	0	6	ND	-	-	5 - 10 M	N	
	Di-n-butyl phthalate	ug/L	1	6	3.25	1.3693064	0.42	7.36	N	
	Diethyl phthalate	ug/L	1	6	3.416667	1.2416387	0.36	7.14	N	
	Di-n-octyl phthalate	ug/L	4	6	2.533333	1.6872068	0.67	7.59	N	check
	Pesticides/PCBs	***Units***								
4	4,4'-DDT	ug/L	0	4	ND	-	-	0.02 - 0.1 M	N	
	Endosulfan sulfate	ug/L	~~0~~ 1	~~4~~ 3	ND	-	-	0.1 - 0.1 M	N (0.0061 low)	check
	Endrin ketone	ug/L	~~0~~ 1	~~4~~ 3	ND	-	-	0.1 - 0.1 M	N (0.0047 low)	check
	Heptachlor	ug/L	0	4	ND	-	-	0.0019 - 0.05M	N	
	Methoxychlor	ug/L	0	4	ND	-	-	0.1 - 0.5 M	N	
	Inorganics	***Units***								
6	Aluminum	ug/L	0	6	ND	-	-	19.6 - 46.7 M	N	
	Barium	ug/L	6	6	39.71667	4.8860686	0.12	54.4	N	
	Beryllium	ug/L	1	6	0.883333	0.2994439	0.34	1.78	N	
	Calcium	ug/L	6	6	105850	21172.033	0.20	169000	N	
	Copper	ug/L	0	5	ND	-	-	4 - 7.8 M	9	check
	Iron	ug/L	0	6	ND	-	-	6 - 29.4 M	N	
4	Lead	ug/L	0	3	ND	-	-	1 - 1.1 M	0.825	check
6	Magnesium	ug/L	6	6	24733.33	3401.5683	0.14	34900	N	
	Manganese	ug/L	2	6	69.7	109.17498	1.57	397	N	
	Potassium	ug/L	5	6	19948.5	29181.989	1.46	107000	N	
4	Selenium	ug/L	0	3	ND	-	-	1 - 1.1 M	3.5	check
6	Sodium	ug/L	5	6	16885	16982.473	1.01	67800	N	
5	Thallium	ug/L	0	4	ND	-	-	1.1 - 2 M	5.3	check

(see key for footnotes)

Table
Ground Water Background Calculations
Albion Sheridan Township Landfill, Albion, Michigan
Units as Given

	Sample Identification:		Background Calculations for Shallow Glacial						
	Sample Date:		Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?
	General Water Quality	***Units***							
3	BOD	mg/L	1	3	13.66667	21.93931	1.61	79.5	Maybe
6	Chloride	mg/L	6	6	23.59833	20.875967	0.88	86.2	N
3	Grease & Oil	mg/L	0	3	~~ND~~	-	-	0.4 - 0.4 M	N
6	Nitrate/ Nitrite	mg/L	4	6	7.983333	7.0863606	0.89	29.2	N (~~18~~)
6	Nitrogen, total kjeldahl	mg/L	3	6	0.535	0.3529731	0.66	1.59	N (~~1.1~~)
3	Total dissolved solids	mg/L	3	3	482.6667	99.299211	0.21	781	N
3	Total suspended solids	mg/L	3	3	256.6667	93.044792	0.36	536	N
6	Sulfate	mg/L	6	6	52.11667	29.930213	0.57	142	N (~~94~~)

(see key for footnotes)

other sources?
Can't val. - insufficient data
Bkgd based on 3 samples?

Bkgd based on 3 ?
"

Table
Ground Water Background Calculations
Albion Sheridan Township Landfill, Albion, Michigan
Units as Given

# samples originally	Sample Identification: / Sample Date:		Background Calculations for Weathered Bedrock							
			Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?	
	Volatiles	***Units***								
4	Acetone	ug/L	0	4	ND	-	-	5 - 10 M	N	
	Semi-Volatiles	***Units***								
4	Bis(2-ethyl hexyl)phthalate	ug/L	0	4	ND	-	-	5 - 11 M	N	
	Butyl benzyl phthalate	ug/L	2	~~3~~ 4	4.333333	1.1547005	0.27	7.8	N(0.6 low)	check
	Di-n-butyl phthalate	ug/L	2	2	0.95	0.0707107	0.07	1.16	~~5, 2.5~~	check < 1.0, can't evaluate next potential outlier
	Diethyl phthalate	ug/L	1	4	3.275	2.1375609	0.65	9.69	N(~~0.6~~)	check
	Di-n-octyl phthalate	ug/L	1	4	3.35	2.0141168	0.60	9.39	N(~~0.9~~)	check
	Pesticides/PCBs	***Units***								
2	4,4'-DDT	ug/L	0	2	ND	-	-	0.1 - 0.1 M	N	
	Endosulfan sulfate	ug/L	0	2	ND	-	-	0.1 - 0.1 M	N	
	Endrin ketone	ug/L	0	2	ND	-	-	0.1 - 0.1 M	N	
	Heptachlor	ug/L	1	2	0.0173	0.0108894	0.63	0.05	Maybe	- Can't eval. or calc. bkgd based on 2 samples.
	Methoxychlor	ug/L	0	2	ND	-	-	0.5 - 0.5 M	N	
	Inorganics	***Units***								
4	Aluminum	ug/L	0	3	ND	-	-	23 - 46.7 M	442	
	Barium	ug/L	4	4	71.95	27.255886	0.38	154	N	
	Beryllium	ug/L	0	4	ND	-	-	1 - 2.2 M	N	
	Calcium	ug/L	4	4	110750	9569.9181	0.09	139000	N	
	Copper	ug/L	0	3	ND	-	-	3 - 7.8 M	10.4	
	Iron	ug/L	3	3	328.5833	281.52535	0.86	1170	1220, ~~maybe~~	(N = < 23.5 low) - bkgd based on 3
2	Lead	ug/L	1	2	0.875	0.4596194	0.53	2.25	Maybe	- can't eval. or calc. bkgd based on 2 samples.
4	Magnesium	ug/L	4	4	30050	3246.0232	0.11	39800	N	
	Manganese	ug/L	4	4	342.5	28.124722	0.08	427	N	
	Potassium	ug/L	4	4	7430	5329.4715	0.72	23400	N(~~14200~~)	
2	Selenium	ug/L	1	2	1.725	1.6617009	0.96	6.71	Maybe	
4	Sodium	ug/L	4	4	68750	31087.457	0.45	162000	N	
2	Thallium	ug/L	0	2	ND	-	-	1.1 - 1.1 M	N	

(see key for footnotes)

Table
Ground Water Background Calculations
Albion Sheridan Township Landfill, Albion, Michigan
Units as Given

	Sample Identification:		Background Calculations for Weathered Bedrock						
	Sample Date:		Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?
	General Water Quality	***Units***							
2	BOD	mg/L	0	2	ND	-	-	2 - 2 M	N
4	Chloride	mg/L	4	4	116.625	54.591475	0.47	280	N
2	Grease & Oil	mg/L	1	2	0.35	0.212132	0.61	0.4 - 1 M	Maybe
4	Nitrate/ Nitrite	mg/L	3	4	1.18	1.3470709	1.14	5.22	~~N (2.72)~~
4	Nitrogen, total kjeldahl	mg/L	2	3	0.701667	0.2187655	0.31	1.36	2.7 Bkgd calcd based on 3
2	Total dissolved solids	mg/L	2	2	608	82.024387	0.13	854	N
2	Total suspended solids	mg/L	2	2	2858	3764.6365	1.32	392 - 11040 M	Maybe
4	Sulfate	mg/L	4	4	61.725	9.47888	0.15	90.2	N

(see key for footnotes)

Check cols. H + I OK

Ask Glenn/Liz to review outliers for final decision on exclusion.

Documentation

Albion Landfill Sediment Background Calculations

Sample Identification:
Location:
EPA Sample Identification:
Sample Date:
Sampled By:
Analyzed By:

Stats w/d SH 4/5

		River							Wetland						
		Background				MI Act 307 Calculations			Background				MI Act 307 Calculations		
		Hits	N =6	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?	Hits	N =4	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?
Volatiles	***Units***														
Acetone	ug/kg	1	5	ND ~~12.2~~	~~2.564176~~	Only detected conc. excluded ~~0.21~~	~~19.89 MDL~~	86*	2	4	38.625	28.9752	0.75	125.6 OK	N OK
Carbon disulfide	ug/kg	1	6	6.25	2.544602	0.41	13.88	OK	0	4	ND	-	-	MDL	
1,1-Dichloroethane	ug/kg	0	6	ND	-	-	MDL	OK	1	4	11.875	7.099002	0.60	33.17 OK	~~low~~ N(low)
Methylene chloride	ug/kg	1	5	~~8.3~~ ND	~~1.151086~~	~~0.14~~	~~11.75 MDL~~	26*	3	4	29.25	12.14839	0.42	65.7 OK	
Toluene	ug/kg	2	6	6	2.428992	0.40	13.29	OK	0	4	ND	-	-	MDL	
1,1,1-Trichloroethane	ug/kg	1	6	7.25	1.50831	0.21	11.77	OK	0	4	ND	-	-	MDL	
Semi-Volatiles	***Units***														
Benzo(b)fluoranthene	ug/kg	0	6	ND	-	-	MDL		1	4	365	127.6715	0.35	748 OK	
Benzo(k)fluoranthene	ug/kg	0	6	ND	-	-	MDL		1	4	362.5	132.2561	0.36	759.3 OK	
Benzo(a)pyrene	ug/kg	0	6	ND	-	-	MDL		1	4	357.5	141.5097	0.40	782 OK	
Bis(2-ethyl hexyl)phthalate	ug/kg	0	6	ND	-	-	MDL		0	4	ND	-	-	MDL	
Butyl benzyl phthalate	ug/kg	1	6	266.67	102.9401	0.39	575.5	OK	0	4	ND	-	-	MDL	
Chrysene	ug/kg	0	6	ND	-	-	MDL		1	4	355	146.1734	0.41	793.5 OK	
4-Methyl phenol	ug/kg	1	6	211.67	70.33254	0.33	422.7	OK	0	4	ND	-	-	MDL	
Fluoranthene	ug/kg	0	6	ND	-	-	MDL		1	4	362.5	132.2561	0.36	759.3 OK	
2-Methylnaphthalene	ug/kg	0	6	ND	-	-	MDL		0	4	ND	-	-	MDL	
Phenanthrene	ug/kg	0	6	ND	-	-	MDL		0	4	ND	-	-	MDL	
Phenol	ug/kg	0	6	ND	-	-	MDL		1	4	370	118.603	0.32	725.8	
Pyrene	ug/kg	0	6	ND	-	-	MDL		2	4	277.5	157.3478	0.57	749.5 OK	N OK
Pesticides/PCBs	***Units***														
Aldrin	ug/kg	1	6	0.9917	0.222299	0.22	1.659	OK	0	4	ND	-	-	MDL	
b-BHC	ug/kg	0	6	ND	-	-	MDL		0	4	ND	-	-	MDL	
a-Chlordane	ug/kg	1	6	1.1	0.070711	0.06	1.312	OK	3	3	1.14	0.408412	0.36	2.365 OK	U3.4 OK
g-Chlordane	ug/kg	1	6	1.15	0.178885	0.16	1.687	OK	2	4	2.08	1.029693	0.50	5.169 OK	
4,4'-DDD unit errors on hits?	ug/kg	3	5	1.428	0.857129	0.60	3.999 OK	6.8 low	3	3	8.4667	2.302897	0.27	15.38 OK	41 OK
4,4'-DDE	ug/kg	4	5	1.012	0.927454	0.92	3.794 OK	4.9 N	3	3	8.3	2.381176	0.29	15.44 OK	30 OK
4,4'-DDT	ug/kg	1	6	2.1667	0.227303	0.10	2.849 OK		3	4	4.025	3.093407	0.77	13.31 OK	N OK
Dieldrin	ug/kg	1	6	1.8667	0.528835	0.28	3.453 OK		3	3	1.3733	0.840317	0.61	3.894 OK	UJ6.5, ~~low~~ N(low)
b-Endosulfan	ug/kg	0	6	ND	-	-	MDL		0	4	ND	-	-	MDL	
Endrin	ug/kg	0	6	ND	-	-	MDL		0	4	ND	-	-	MDL	

Back. River = ~~$AC~~ - ~~$AK~~ (Vol., SV, Pest/PCBs A.C-AL; Inorganics AM-AR)
Back. Wet = ~~$AC~~ - ~~$BB~~ (Vol., SV., Pest/PCB s A S-AX, Inorganics AY-BB)

Set K = 0.5 and paste formulas

* = only detected concentration.

Albion Landfill Sediment Background Calculations

Sample Identification:
Location:
EPA Sample Identification:
Sample Date:
Sampled By:
Analyzed By:

		River							Wetland						
		Background				MI Act 307 Calculations			Background				MI Act 307 Calculations		
		Hits	N =6	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?	Hits	N =4	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?
Endrin aldehyde	ug/kg	1	6	2.25	0.424264	0.19	3.523	ok	3	4	3.8	2.097618	0.55	10.09 ok	N ok
Endrin ketone	ug/kg	1	6	2.0167	0.175119	0.09	2.542	ok	0	4	ND	-	-	MDL	
Heptachlor	ug/kg	1	6	1.065	0.434223	0.41	2.368	ok	0	4	ND	-	-	MDL	
Heptachlor epoxide	ug/kg	1	6	0.9983	0.206438	0.21	1.618	ok	1	4	2.0375	1.165744	0.57	5.535	N(low)
Methoxychlor	ug/kg	1	6	10.053	5.205868	0.52	25.67(MDL)	ok low (other)	0	4	ND	-	-	MDL	
Inorganics	***Units***														
Aluminum	mg/kg	6	6	1901.7	657.3102	0.35	3874	ok	4	4	4215	1255.72	0.30	7982 ok	
Antimony	mg/kg	1	6	10.15	4.557631	0.45	23.82	ok	0	4	ND	-	-	MDL	
Arsenic	mg/kg	6	6	15.467	18.61813	1.20	71.32	N	4	4	6.8	1.523155	0.22	11.37 ok	
Barium	mg/kg	6	5	7.8	1.014889	0.13	10.84	30.1 ok	4	4	59.9	23.05284	0.38	129.1 ok	
Cadmium	mg/kg	0	6	ND	-	-	MDL		0	4	ND	-	-	MDL	
Calcium	mg/kg	6	6	34717	9660.728	0.28	63700	ok	4	4	54675	14430.84	0.26	97970 ok	
Chromium	mg/kg	6	6	7.2167	2.96676	0.41	16.12	ok	4	4	9.5	2.684524	0.28	17.55 ok	
Cobalt	mg/kg	2	6	3.8333	3.526282	0.92	14.41 ok	N ok	0	4	ND	-	-	MDL	
Copper	mg/kg	5	6	5.5333	3.428508	0.62	15.82 ok	N ok	4	4	12.4	4.510728	0.36	25.93 ok	
Cyanide	mg/kg	0	6	ND	-	-	MDL		0	4	ND	-	-	MDL	
Iron	mg/kg	6	6	8520	5174.727	0.61	24040 ok	N ok	4	4	13125	2647.483	0.20	21070 ok	
Lead	mg/kg	6	5	1.48	0.303315	0.20	2.39 ok	7.1 ok	4	3	16.767	2.804164	0.17	25.18 ok	59.1 ok
Magnesium	mg/kg	6	5	5932	2319.498	0.39	12890 ok	14100 ok	4	4	4460	522.3664	0.12	6027 ok	
Manganese	mg/kg	6	6	158.5	54.12116	0.34	320.9	ok	4	3	269.33	102.7732	0.38	577.7 ok	677 ok
Mercury	mg/kg	1	6	0.0417	0.015706	0.38	0.08878	ok	0	4	ND	-	-	MDL	
Nickel	mg/kg	2	6	8.6167	6.895989	0.80	29.3 ok	N ok	0	4	ND	-	-	MDL	
Potassium	mg/kg	0	6	ND	-	-	MDL		0	4	ND	-	-	MDL	
Selenium	mg/kg	4	5	0.259	0.130882	0.51	0.6516	0.84 N	4	4	1.675	0.732006	0.44	3.871	
Sodium	mg/kg	6	6	85.667	28.6876	0.33	171.7 ok		4	4	149	36.24914	0.24	257.7	
Thallium	mg/kg	0	6	ND	-	-	MDL		0	4	ND	-	-	MDL	
Vanadium	mg/kg	6	6	5.7833	2.16464	0.37	12.28 ok		4	4	9.05	3.781975	0.42	20.4	
Zinc	mg/kg	6	6	24.75	13.12658	0.53	64.13 ok	N	4	3	53.767	4.939973	0.09	68.59 ok	130 ok

low = the suspected outlier is a low value.

Documentation

Albion Landfill Surface Water Statistics (Act 307)

EPA Sample Identification:						River - Filtered Samples		
Sample Date:		Background				MI Act 307 Calculations		
Sampled By:		Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?
Analyzed By:								
Volatiles	***Units***							
Acetone	ug/L	0	6	~~2~~	~~0.83666~~	~~0.42~~	ND	
Carbon disulfide	ug/L	0	6	~~0.5~~	~~0~~	~~0~~	ND	
Methylene chloride	ug/L	2	6	0.8	~~0.309838725~~	0.39	1.73	
Toluene	ug/L	0	6	~~0.5~~	~~0~~	~~0~~	ND	
Semi-Volatiles	***Units***							
Butyl benzyl phthalate	ug/L	0	6	~~2.5~~	~~0~~	~~0~~	ND	
4-Methyl phenol	ug/L	0	6	~~2.5~~	~~0~~	~~0~~	ND	
Diethyl phthalate	ug/L	0	6	~~2.5~~	~~0~~	~~0~~	ND	
Phenol	ug/L	0	6	~~2.5~~	~~0~~	~~0~~	ND	
Inorganics	***Units***							
Aluminum	ug/L	0	6	~~21~~	~~0~~	~~0~~	ND	
Arsenic	ug/L	1	6	0.6	0.244949	0.41	1.33	
Barium	ug/L	6	6	28.16667	0.6592926	0.02	30.1	
Cadmium	ug/L	1	5	0.05	6.585E-10	0.00	MDL	0.55
Calcium	ug/L	6	6	76166.67	926.64269	0.01	78900	78,947.6 — show 1 more digit
Chromium	ug/L	0	6	~~5~~	~~0~~	~~0~~	ND	
Cobalt	ug/L	0	6	~~5~~	~~0~~	~~0~~	ND	
Copper	ug/L	0	6	~~4~~	~~0~~	~~0~~	ND	
Iron	ug/L	5	5	14.44	7.12657	0.49	35.8	116
Lead	ug/L	0	6	~~0.5~~	~~0~~	~~0~~	ND	
Magnesium	ug/L	6	6	25000	200	0.01	25600	
Manganese	ug/L	6	5	4.98	0.9757049	0.20	7.91	16.7
Nickel	ug/L	1	6	7.683333	2.8985629	0.38	16.4	
Potassium	ug/L	0	6	~~685~~	~~0~~	~~0~~	ND	
Selenium	ug/L	0	6	~~1~~	~~0~~	~~0~~	ND	
Sodium	ug/L	6	6	7896.667	77.88881	0.01	8130	
Thallium	ug/L	0	6	~~0.5~~	~~0~~	~~0~~	ND	
Vanadium	ug/L	0	6	~~5~~	~~0~~	~~0~~	ND	
Zinc	ug/L	0	6	~~4.5~~	~~0~~	~~0~~	ND	

change format

= the number of samples used to calculate background (if <6, there is an outlier)

Albion Landfill Surface Water Statistics (Act 307)

EPA Sample Identification:						River - Unfiltered Samples		
Sample Date:		Background				MI Act 307 Calculations		
Sampled By:		Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?
Analyzed By:								
Volatiles	***Units***							
Acetone	ug/L							
Carbon disulfide	ug/L							
Methylene chloride	ug/L							
Toluene	ug/L							
Semi-Volatiles	***Units***							
Butyl benzyl phthalate	ug/L							
4-Methyl phenol	ug/L							
Diethyl phthalate	ug/L							
Phenol	ug/L							
Inorganics	***Units***							
Aluminum	ug/L	2	6	23.43333	10.788636	0.46	55.8	
Arsenic	ug/L	0	6	~~1~~	~~0~~	~~0~~	ND	
Barium	ug/L	6	6	25.48333	0.3430258	0.01	26.5	
Cadmium	ug/L	0	6	~~0.05~~	~~8.33E-10~~	~~0.00~~	ND	
Calcium	ug/L	6	6	77933.33	1338.1579	0.02	81900	81947.8 — Show 1 more digit
Chromium	ug/L	0	6	~~4.5~~	~~0~~	~~0~~	ND	
Cobalt	ug/L	0	6	~~5~~	~~0~~	~~0~~	ND	
Copper	ug/L	0	6	~~3~~	~~0~~	~~0~~	ND	
Iron	ug/L	6	6	82.36667	17.555246	0.21	135	
Lead	ug/L	0	6	~~0.5~~	~~0~~	~~0~~	ND	
Magnesium	ug/L	6	6	23833.33	436.65394	0.02	25100	
Manganese	ug/L	6	6	7.366667	1.5081998	0.20	11.9	
Nickel	ug/L	0	6	~~6.5~~	~~0~~	~~0~~	ND	
Potassium	ug/L	6	6	887.1667	484.88201	0.55	2340	N — Rounding CV w/o = .47 $\bar{x}$+3s = 1770 w/o highest ok
Selenium	ug/L	0	6	~~1~~	~~0~~	~~0~~	ND	
Sodium	ug/L	6	6	7485	168.13685	0.02	7990	
Thallium	ug/L	0	6	~~0.5~~	~~0~~	~~0~~	ND	
Vanadium	ug/L	0	6	~~4.5~~	~~0~~	~~0~~	ND	
Zinc	ug/L	2	6	3.966667	2.2800585	0.57	10.8	N — CV = .55 w/o $\bar{x}$+3s = 8.82 w/o ok

Albion Landfill Surface Water Statistics (Act 307)

EPA Sample Identification:						Wetland - Filtered Samples		
Sample Date:		Background				MI Act 307 Calculations		
Sampled By:		Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?
Analyzed By:								
Volatiles	***Units***							
Acetone	ug/L	3	3	5.666667	2.081666	0.37	11.9	N
Carbon disulfide	ug/L	2	3	0.933333	0.9291573	1.00	3.72	2*
Methylene chloride	ug/L	0	3	~~0.6~~	~~0.35~~	~~0.58~~	ND	
Toluene	ug/L	1	3	0.5	0 using 0 ug/l = 0.5	0	0.5	
Semi-Volatiles	***Units***							
Butyl benzyl phthalate	ug/L	0	3	~~2.5~~	~~0~~	~~0~~	ND	
4-Methyl phenol	ug/L	1	3	2.666667	0.2886751	0.11	3.53	
Diethyl phthalate	ug/L	0	3	~~2.5~~	~~0~~	~~0~~	ND	
Phenol	ug/L	1	3	3	0.8660254	0.29	5.6	
Inorganics	***Units***							
Aluminum	ug/L	0	3	~~21~~	~~0~~	~~0~~	ND	
Arsenic	ug/L	3	3	3.966667	2.4583192	0.62	11.3	N (1.2 low)
Barium	ug/L	3	3	43.1	10.569768	0.25	74.8	
Cadmium	ug/L	0	3	~~0.05~~	~~0~~	~~0~~	ND	
Calcium	ug/L	3	3	92200	6784.5413	0.07	113000	
Chromium	ug/L	0	3	~~5~~	~~0~~	~~0~~	ND	
Cobalt	ug/L	0	3	~~5~~	~~0~~	~~0~~	ND	
Copper	ug/L	0	3	~~4~~	~~0~~	~~0~~	ND	
Iron	ug/L	3	3	703.5333	701.69841	1.00	2810	N
Lead	ug/L	0	3	~~0.5~~	~~0~~	~~0~~	ND	
Magnesium	ug/L	3	3	22666.67	5991.1045	0.26	40600	
Manganese	ug/L	3	2	191.05	138.52222	~~0.73~~ .93	~~607~~ 1500	805*#
Nickel	ug/L	0	3	~~6.5~~	~~0~~	~~0~~	ND	
Potassium	ug/L	3	3	2093.333	450.03704	0.21	3440	
Selenium	ug/L	0	3	~~1~~	~~0~~	~~0~~	ND	
Sodium	ug/L	3	3	8913.333	565.71489	0.06	10600	
Thallium	ug/L	0	3	~~0.5~~	~~0~~	~~0~~	ND	
Vanadium	ug/L	0	3	~~5~~	~~0~~	~~0~~	ND	
Zinc	ug/L	0	3	~~4.5~~	~~0~~	~~0~~	ND	

0.5 ~~[illegible]~~

Wayne, I made these changes.

* = This concentration was identified as an outlier b~~ut was included in the calculation of background due to insufficient data.~~ based on remaining 2 samples; however this is insufficient data to accurately evaluate the magnitude of this concentration.

\# = Coefficient of variance still >0.5 when excluded from background.

Albion Landfill Surface Water Statistics (Act 307)

EPA Sample Identification:						Wetland - Unfiltered Samples		
Sample Date:		Background				MI Act 307 Calculations		
Sampled By:		Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?
Analyzed By:								
Volatiles	***Units***							
Acetone	ug/L							
Carbon disulfide	ug/L							
Methylene chloride	ug/L							
Toluene	ug/L							
Semi-Volatiles	***Units***							
Butyl benzyl phthalate	ug/L							
4-Methyl phenol	ug/L							
Diethyl phthalate	ug/L							
Phenol	ug/L							
Inorganics	***Units***							
Aluminum	ug/L	3	3	4096.667	4229.2355	1.03	16800	8980*
Arsenic	ug/L	3	3	30.5	32.599847	1.07	128	67.5*#
Barium	ug/L	3	3	182.4333	119.69153	0.66	542	N
Cadmium	ug/L	3	3	0.913333	0.8753476	0.96	3.54	1.9*#
Calcium	ug/L	3	3	157666.7	57500.725	0.36	330000	
Chromium	ug/L	2	3	12.5	9.5	0.76	41	23*#
Cobalt	ug/L	1	3	7.066667	3.5795717	0.51	17.8	11.2*
Copper	ug/L	1	3	11.46667	14.664697	1.28	55.5	28.4*
Iron	ug/L	3	3	54316.67	62490.606	1.15	242000	124000*#
Lead	ug/L	3	3	9.433333	2.7465129	0.29	17.7	
Magnesium	ug/L	3	3	25033.33	1484.3629	0.06	29500	
Manganese	ug/L	3	3	1895.667	1497.3698	0.79	6390	N (167 low)
Nickel	ug/L	1	3	9.666667	5.4848276	0.57	26.1	16*
Potassium	ug/L	3	3	1630	502.69275	0.31	3140	
Selenium	ug/L	1	3	2.733333	3.0022214	1.10	11.7	6.2*
Sodium	ug/L	3	3	8203.333	587.31025	0.07	9970	
Thallium	ug/L	0	3	~~0.5~~	~~0~~	~~0~~	ND	
Vanadium	ug/L	1	3	12.1	13.163586	1.09	51.6	27.3*
Zinc	ug/L	3	3	96.8	106.63602	1.10	417	219*#

Check rounding! Shows 1 more digit than in background data

Some pasted, some formulas ✓ formulas.

* = This concentration was identified as an outlier but was included in the calculation of background due to insufficient data.

\# = Coefficient of variance still >0.5 when excluded from background.

Same

Wayne, I made these changes.

Albion Landfill Surface Water Statistics (Act 307) [redacted]

EPA Sample Identification:						River - Filtered Samples		
Sample Date:		Background				MI Act 307 Calculations		
Sampled By:		Hits (original)	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?
Analyzed By:								
Inorganics	***Units***							
Aluminum	ug/L	0	6	21	0	0	ND	
Arsenic	ug/L	1	6	0.6	0.244949	0.41	1.33	
Barium	ug/L	6	6	28.16667	0.6592926	0.02	30.1	
[redacted] Cadmium	ug/L	~~10~~	5	0.05	6.585E-10	0.00	MDL	0.55
Calcium	ug/L	6	6	76166.67	926.64269	0.01	78900 ? 78,947.6	
Chromium	ug/L	0	6	5	0	0	ND	
Cobalt	ug/L	0	6	5	0	0	ND	
Copper	ug/L	0	6	4	0	0	ND	
[redacted] Iron	ug/L	5	5	14.44	7.12657	0.49	35.8	116
Lead	ug/L	0	6	0.5	0	0	ND	
Magnesium	ug/L	6	6	25000	200	0.01	25600	
[redacted] Manganese	ug/L	~~7~~ 6	5	4.98	0.9757049	0.20	7.91	16.7
Nickel	ug/L	1	6	7.683333	2.8985629	0.38	16.4	
Potassium	ug/L	0	6	685	0	0	ND	
Selenium	ug/L	0	6	1	0	0	ND	
Sodium	ug/L	6	6	7896.667	77.88881	0.01	8130	
Thallium	ug/L	0	6	0.5	0	0	ND	
Vanadium	ug/L	0	6	5	0	0	ND	
Zinc	ug/L	0	6	4.5	0	0	ND	

← If bkgd is all ND, should show NA for mean, st.dev. + CV.

← should show 1 more digit

= the number of samples used to calculate background (if <6, there is an outlier)

If outlier is excluded from n, it s/b excl. from hits count.

What is Type A? MDL

Albion Landfill Surface Water Statistics (Act 307)

EPA Sample Identification:						River - Unfiltered Samples		
Sample Date:		Background				MI Act 307 Calculations		
Sampled By:		Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?
Analyzed By:								
Inorganics	***Units***							
Aluminum	ug/L	2	6	23.43333	10.788636	0.46	55.8	
Arsenic	ug/L	0	6	1	0	0	ND	
Barium	ug/L	6	6	25.48333	0.3430258	0.01	26.5	
Cadmium	ug/L	0	6	~~0.05~~	~~8.33E-10~~	0.00	ND	
Calcium	ug/L	6	6	77933.33	1338.1579	0.02	81900 81947.50	Rounding.
Chromium	ug/L	0	6	4.5	0	0	ND	
Cobalt	ug/L	0	6	5	0	0	ND	
Copper	ug/L	0	6	3	0	0	ND	
Iron	ug/L	6	6	82.36667	17.555246	0.21	135	
Lead	ug/L	0	6	0.5	0	0	ND	
Magnesium	ug/L	6	6	23833.33	436.65394	0.02	25100	
Manganese	ug/L	6	6	7.366667	1.5081998	0.20	11.9	
Nickel	ug/L	0	6	6.5	0	0	ND	
Potassium	ug/L	6	6	887.1667	484.88201	0.55	2340	N Rounding. CV w/o = .47 x 1.33 = .1720 w/o
Selenium	ug/L	0	6	1	0	0	ND	
Sodium	ug/L	6	6	7485	168.13685	0.02	7990	
Thallium	ug/L	0	6	0.5	0	0	ND	
Vanadium	ug/L	0	6	4.5	0	0	ND	
Zinc	ug/L	2	6	3.966667	2.2800585	~~0.57~~ .55 w/o	10.8 8.86 w/o	N

Albion Landfill Surface Water Statistics (Act 307)

EPA Sample Identification:						Wetland - Filtered Samples		
Sample Date:		Background				MI Act 307 Calculations		
Sampled By:		Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?
Analyzed By:								
Inorganics	***Units***							
Aluminum	ug/L	0	3	21	0	0	ND	Unable to check for outliers due to insufficient number of background samples
Arsenic	ug/L	3	3	3.966667	2.4583192	0.62	11.3	
Barium	ug/L	3	3	43.1	10.569768	0.25	74.8	
Cadmium	ug/L	0	3	0.05	0	0	ND	
Calcium	ug/L	3	3	92200	6784.5413	0.07	113000	
Chromium	ug/L	0	3	5	0	0	ND	
Cobalt	ug/L	0	3	5	0	0	ND	
Copper	ug/L	0	3	4	0	0	ND	
Iron	ug/L	3	3	703.5333	701.69841	1.00	2810	
Lead	ug/L	0	3	0.5	0	0	ND	
Magnesium	ug/L	3	3	22666.67	5991.1045	0.26	40600	
Manganese	ug/L	3	3	395.7	367.74865	0.93	1500	
Nickel	ug/L	0	3	6.5	0	0	ND	
Potassium	ug/L	3	3	2093.333	450.03704	0.21	3440	
Selenium	ug/L	0	3	1	0	0	ND	
Sodium	ug/L	3	3	8913.333	565.71489	0.06	10600	
Thallium	ug/L	0	3	0.5	0	0	ND	
Vanadium	ug/L	0	3	5	0	0	ND	
Zinc	ug/L	0	3	4.5	0	0	ND	

potential outlier on lowend.

potential outlier is w/in $\bar{x}+3s$ when excl.

potential outlier, but CV is still > .5 when excl.

= Potential outlier for this chemical.

include outlier of 805 - note that it was identified as an outlier based on remaining 2 samples; however, ~~8 samples are to~~ this is insufficient data to accurately eval. the magnitude of the concentration.

Consider - combining river sw + wetland samples. ~~evidence to exclude~~

Albion Landfill Surface Water Statistics (Act 307)

EPA Sample Identification:						Wetland - Unfiltered Samples		
Sample Date:		Background				MI Act 307 Calculations		
Sampled By:		Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?
Analyzed By:								
Inorganics	***Units***							
Aluminum	ug/L	3	3	4096.667	4229.2355	1.03	16800	Unable to check for outliers due to insufficient number of background samples
Arsenic	ug/L	3	3	30.5	32.599847	1.07	128	
Barium	ug/L	3	3	182.4333	119.69153	0.66	542	
Cadmium	ug/L	3	3	0.913333	0.8753476	0.96	3.54	
Calcium	ug/L	3	3	157666.7	57500.725	0.36	330000	
Chromium	ug/L	2	3	12.5	9.5	0.76	41	
Cobalt	ug/L	1	3	7.066667	3.5795717	0.51	17.8	
Copper	ug/L	1	3	11.46667	14.664697	1.28	55.5	
Iron	ug/L	3	3	54316.67	62490.606	1.15	242000	
Lead	ug/L	3	3	9.433333	2.7465129	0.29	17.7	
Magnesium	ug/L	3	3	25033.33	1484.3629	0.06	29500	
Manganese	ug/L	3	3	1895.667	1497.3698	0.79	6390	
Nickel	ug/L	1	3	9.666667	5.4848276	0.57	26.1	
Potassium	ug/L	3	3	1630	502.69275	0.31	3140	
Selenium	ug/L	1	3	2.733333	3.0022214	1.10	11.7	
Sodium	ug/L	3	3	8203.333	587.31025	0.07	9970	
Thallium	ug/L	0	3	0.5	0	0	ND	
Vanadium	ug/L	1	3	12.1	13.163586	1.09	51.6	
Zinc	ug/L	3	3	96.8	106.63602	1.10	417	

= Potential outlier for this chemical.

Background established if detected in Surface Soils.

TITLE: Summary of all Foreground Detections

Documentation

Table __

Summary of Surface Soil Data

Albion Sheridan Township Landfill, Albion, Michigan

Units as Given

Rounding?

Sample Identification: Background?: EPA Sample Identification: Sample Date: Sampled By: Analyzed By:		Background Calculations for Surface Soils						
		Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?
Volatiles	***Units***							
Acetone	ug/kg	0	4	ND	-	-	MDL	
Methylene chloride	ug/kg	0	4	ND	-	-	MDL	
Xylene	ug/kg	0	4	ND	-	-	MDL	
Semi-Volatiles	***Units***							
Anthracene	ug/kg	0	4	ND	-	-	MDL	
Benzo(a)anthracene	ug/kg	4	4	53	6.9761498	0.13	73.92844954	ok
Benzo(b)fluoranthene	ug/kg	4	4	71.5	10.847427	0.15	104.0422802	ok
Benzo(k)fluoranthene	ug/kg	4	4	54.5	11.090537	0.20	87.77160952	ok
Benzo(ghi)perylene	ug/kg	4	4	60	6.2716292	0.10	78.81488772	ok
Benzo(a)pyrene	ug/kg	4	4	64.5	8.0208063	0.12	88.56241883	ok
Butyl benzyl phthalate	ug/kg	0	4	ND	-	-	MDL	
Chrysene	ug/kg	4	4	75.25	7.3654599	0.10	97.34637979	ok
Dibenz(a,h)anthracene	ug/kg	0	4	ND	-	-	MDL	
Di-n-butyl phthalate	ug/kg	0	4	ND	-	-	MDL	
Di-n-octyl phthalate	ug/kg	0	4	ND	-	-	MDL	
Fluoranthene	ug/kg	4	4	57.25	8.1802608	0.14	81.79078238	ok
Indeno(1,2,3-cd)pyrene	ug/kg	4	4	63	8.2056891	0.13	87.61706725	ok
Phenanthrene	ug/kg	4	4	20	6.4807407	0.32	39.4422221	ok
Pyrene	ug/kg	4	4	54.25	5.2519838	0.10	70.00595126	ok
Pesticides/PCBs	***Units***							
PCB: aroclor 1260	ug/kg	0	4	ND	-	-	MDL	
Inorganics	***Units***							
Aluminum	mg/kg	4	4	4975	489.11485	0.10	6442.34454	
Arsenic	mg/kg	4	4	5.45	1.2396236	0.23	9.168870796	ok
Barium	mg/kg	4	4	58.425	13.280656	0.23	98.26696908	ok
Cadmium	mg/kg	0	4	ND	-	-	MDL	
Calcium	mg/kg	4	4	549.5	121.23943	0.22	913.2182976	ok
Chromium	mg/kg	4	4	8.475	1.56285	0.18	13.16354988	ok
Cobalt	mg/kg	4	4	3.55	0.5322906	0.15	5.146871942	ok
Copper	mg/kg	4	4	7.825	1.7211914	0.22	12.98857434	ok
Cyanide	mg/kg	0	4	ND	-	-	MDL	
Iron	mg/kg	4	4	13455	4602.0394	0.34	27261.11821	
Lead	mg/kg	4	4	21.2	3.5185224	0.17	31.75556725	ok
Magnesium	mg/kg	4	4	852.75	120.02048	0.14	1212.811453	ok
Manganese	mg/kg	4	4	530.5	90.012962	0.17	800.5388861	ok
Nickel	mg/kg	3	4	8.8375	2.9465729	0.33	17.6772186	
Potassium	mg/kg	0	4	ND	-	-	MDL	
Sodium	mg/kg	4	4	155.25	14.174508	0.09	197.7735229	ok
Vanadium	mg/kg	4	4	13.35	2.4556058	0.18	20.71681749	ok
Zinc	mg/kg	4	4	54.85	11.279923	0.21	88.6897695	ok

Back $AH1 : $AG1 (AH-AK: organics, AL-AO: inorganics)

Fore $H1 : $AG1 (H-T = organics, U-AG = inorganics)

K - set to 0.5

Documentation

Summary of Albion Landfill Sediment ~~Foreground~~ Background Data

Sample Identification:
Location:
EPA Sample Identification:
Sample Date:
Sampled By:
Analyzed By:

		River							Wetland						
		Background				MI Act 307 Calculations			Background				MI Act 307 Calculations		
		Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?	Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?
Volatiles	***Units***														
Acetone	ug/kg	0	5	ND	-	-	MDL	86* ok	2	4	38.625	28.9752	0.75	125.6	N
Methylene chloride	ug/kg	0	5	ND	-	-	MDL	26* ok	3	4	29.25	12.14839	0.42	65.7	
Toluene	ug/kg	2	6	6	2.428992	0.40	13.29		0	4	ND	-	-	MDL	
Semi-Volatiles	***Units***														
Benzo(b)fluoranthene	ug/kg	0	6	ND	-	-	MDL		1	4	365	127.6715	0.35	748	
Benzo(k)fluoranthene	ug/kg	0	6	ND	-	-	MDL		1	4	362.5	132.2561	0.36	759.3	
Bis(2-ethyl hexyl)phthalate	ug/kg	0	6	ND	-	-	MDL		0	4	ND	-	-	MDL	
Chrysene	ug/kg	0	6	ND	-	-	MDL	Were these same sample?	1	4	355	146.1734	0.41	793.5	
Fluoranthene	ug/kg	0	6	ND	-	-	MDL		1	4	362.5	132.2561	0.36	759.3	
2-Methylnaphthalene	ug/kg	0	6	ND	-	-	MDL		0	4	ND	-	-	MDL	
Phenanthrene	ug/kg	0	6	ND	-	-	MDL		0	4	ND	-	-	MDL	
Pyrene	ug/kg	0	6	ND	-	-	MDL		2	4	277.5	157.3478	0.57	749.5	N
Pesticides/PCBs	***Units***														
b-BHC	ug/kg	0	6	ND	-	-	MDL		0	4	ND	-	-	MDL	
g-Chlordane	ug/kg	1	6	1.15	0.178885	0.16	1.687		2	4	2.08	1.029693	0.50	5.169	
4,4'-DDD	ug/kg	3	5	1.428	0.857129	0.60	3.999	ok 6.8, N(low)	3	3	8.4667	2.302897	0.27	15.38	41 ok
4,4'-DDE	ug/kg	4	5	1.012	0.927454	0.92	3.794	ok 4.9, N	3	3	8.3	2.381176	0.29	15.44	ok 30 ok
4,4'-DDT	ug/kg	1	6	2.1667	0.227303	0.10	2.849		3	4	4.025	3.093407	0.77	13.31	N
Dieldrin	ug/kg	1	6	1.8667	0.528835	0.28	3.453		3	3	1.3733	0.840317	0.61	3.894	UJ 6.5, N(low)
b-Endosulfan	ug/kg	0	6	ND	-	-	MDL		0	4	ND	-	-	MDL	
Endrin	ug/kg	0	6	ND	-	-	MDL		0	4	ND	-	-	MDL	
Endrin aldehyde	ug/kg	1	6	2.25	0.424264	0.19	3.523		3	4	3.8	2.097618	0.55	10.09	N
Endrin ketone	ug/kg	1	6	2.0167	0.175119	0.09	2.542		0	4	ND	-	-	MDL	
Heptachlor	ug/kg	1	6	1.065	0.434223	0.41	2.368		0	4	ND	-	-	MDL	
Heptachlor epoxide	ug/kg	1	6	0.9983	0.206438	0.21	1.618		1	4	2.0375	1.165744	0.57	5.535	N (low)
Methoxychlor	ug/kg	0	5	ND	-	-	MDL	0.82(low)*	0	4	ND	-	-	MDL	
Inorganics	***Units***														
Aluminum	mg/kg	6	6	1901.7	657.3102	0.35	3874		4	4	4215	1255.72	0.30	7982	
Antimony	mg/kg	1	6	10.15	4.557631	0.45	23.82		0	4	ND	-	-	MDL	
Arsenic	mg/kg	6	6	15.467	18.61813	1.20	71.32	N	4	4	6.8	1.523155	0.22	11.37	
Barium	mg/kg	6	5	7.8	1.014889	0.13	10.84	30.1	4	4	59.9	23.05284	0.38	129.1	

N = No more outliers

Summary of Albion Landfill Sediment ~~Foreground~~ Background Data

Sample Identification:		River							Wetland						
Location:															
EPA Sample Identification:															
Sample Date:		Background				MI Act 307 Calculations			Background				MI Act 307 Calculations		
Sampled By:		Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?	Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?
Analyzed By:															
Cadmium	mg/kg	0	6	ND	-	-	MDL		0	4	ND	-	-	MDL	
Calcium	mg/kg	6	6	34717	9660.728	0.28	63700		4	4	54675	14430.84	0.26	97970	
Chromium	mg/kg	6	6	7.2167	2.96676	0.41	16.12		4	4	9.5	2.684524	0.28	17.55	
Cobalt	mg/kg	2	6	3.8333	3.526282	0.92	14.41	N	0	4	ND	-	-	MDL	
Copper	mg/kg	5	6	5.5333	3.428508	0.62	15.82	N	4	4	12.4	4.510728	0.36	25.93	
Cyanide	mg/kg	0	6	ND	-	-	MDL		0	4	ND	-	-	MDL	
Iron	mg/kg	6	6	8520	5174.727	0.61	24040	N	4	4	13125	2647.483	0.20	21070	
Lead	mg/kg	6	5	1.48	0.303315	0.20	2.39	7.16 OK	4	3	16.767	2.804164	0.17	25.18	59.1 OK
Magnesium	mg/kg	6	5	5932	2319.498	0.39	12890	14100 OK	4	4	4460	522.3664	0.12	6027	
Manganese	mg/kg	6	6	158.5	54.12116	0.34	320.9		4	3	269.33	102.7732	0.38	577.7	677 OK
Mercury	mg/kg	1	6	0.0417	0.015706	0.38	0.08878		0	4	ND	-	-	MDL	
Nickel	mg/kg	2	6	8.6167	6.895989	0.80	29.3	N	0	4	ND	-	-	MDL	
Potassium	mg/kg	0	6	ND	-	-	MDL		0	4	ND	-	-	MDL	
Selenium	mg/kg	4	5	0.259	0.130882	0.51	0.6516	0.84, N	4	4	1.675	0.732006	0.44	3.871	
Sodium	mg/kg	6	6	85.667	28.6876	0.33	171.7		4	4	149	36.24914	0.24	257.7	
Thallium	mg/kg	0	6	ND	-	-	MDL		0	4	ND	-	-	MDL	
Vanadium	mg/kg	6	6	5.7833	2.16464	0.37	12.28		4	4	9.05	3.781975	0.42	20.4	
Zinc	mg/kg	6	6	24.75	13.12658	0.53	64.13	N	4	3	53.767	4.939973	0.09	68.59	130 OK

low = the suspected outlier is a low value.

*= This is the only detected concentration

Summary of Albion Landfill Sediment ~~Foreground~~ Background Data

Sample Identification:		SD04A	SD04B	SD05A	SD05B	SD06A-DP	SD06B	SD10	SD11	SD11	SD12	SD12
Location:		r - Upstream	r - Upstream	r - Upstream	r - Upstream	r - Upstream	r - Upstream	Vetland-Back	Vetland-Back	Vetland-Back	Vetland-Back	Vetland-Back
EPA Sample Identification:		EMC05	EMC74	EMC75	EMC76	EMC91	EMC78	EMC83	EMC84	EMC84RE	EMC85	EMC85RE
Sample Date:		10/14/92	10/14/92	10/14/92	10/14/92	10/14/92	10/14/92	10/14/92	10/14/92	10/14/92	10/14/92	10/14/92
Sampled By:		WWES	WWES	WWES	WWES	WWES	WWES	WWES	WWES	WWES	WWES	WWES
Analyzed By:		PNELI	PNELI	PNELI	PNELI	PNELI	PNELI	PNELI	PNELI	PNELI	PNELI	PNELI
Volatiles	***Units***											
Acetone	ug/kg	UB 20	UB 23	UB 20	UB 27	**86#**	UB 32	**B 74**	**50**			U 40
Methylene chloride	ug/kg	UB 20	UB 17	UB 15	UB 14	**26#**	UB 17	UB 44	**38**			**J 16**
Toluene	ug/kg	U 13	U 12	**J 4**	**J 3**	U 20	U 13	U 28	U 28			UJ 40
Semi-Volatiles	***Units***											
Benzo(b)fluoranthene	ug/kg	U 420	U 410	U 420	U 390	U 660	U 440	U 920		U 920	**J 190**	
Benzo(k)fluoranthene	ug/kg	U 420	U 410	U 420	U 390	U 660	U 440	U 920		U 920	**J 180**	
Bis(2-ethyl hexyl)phthalate	ug/kg	U 420	U 410	U 420	U 390	U 660	U 440	U 920		U 920	U 1300	
Chrysene	ug/kg	U 420	U 410	U 420	U 390	U 660	U 440	U 920		U 920	**J 150**	
Fluoranthene	ug/kg	U 420	U 410	U 420	U 390	U 660	U 440	U 920		U 920	**J 180**	
2-Methylnaphthalene	ug/kg	U 420	U 410	U 420	U 390	U 660	U 440	U 920		U 920	U 1300	
Phenanthrene	ug/kg	U 420	U 410	U 420	U 390	U 660	U 440	U 920		U 920	U 1300	
Pyrene	ug/kg	U 420	U 410	U 420	U 390	U 660	U 440	**J 110**		U 920	**J 190**	
Pesticides/PCBs	***Units***											
b-BHC	ug/kg	UJ 2.2	UJ 2.1	U 2.2	UJ 2	UJ 3.4	UJ 2.3	UJ 4.7	UJ 4.7		UJ 6.8	
g-Chlordane	ug/kg	UJ 2.2	UJ 2.1	U 2.2	UJ 2	**J 1.5**	UJ 2.3	**J 2.2**	**JP 0.92**		UJ 6.8	
4,4'-DDD	ug/kg	UJ 4.2	**JP 0.6**	U 4.2	UJ 3.9	**6.8#**	**JP 0.39**	**41#**	**JP 7.9**		UJ 13	
4,4'-DDE	ug/kg	**J 0.32**	**JP 0.41**	U 4.2	UJ 3.9	**4.9#**	**J 0.28**	**30#**	**JP 7.4**		UJ 13	
4,4'-DDT	ug/kg	UJ 4.2	UJ 4.1	U 4.2	UJ 3.9	**J 2.6**	UJ 4.4	**JP 6.9**	**JP 1.4**		UJ 13	
Dieldrin	ug/kg	UJ 4.2	UJ 4.1	U 4.2	UJ 3.9	**J 0.8**	UJ 4.4	**JP 1.4**	**JP 2.2**		#UJ13	
b-Endosulfan	ug/kg	UJ 4.2	UJ 4.1	U 4.2	UJ 3.9	UJ 6.6	UJ 4.4	UJ 9.2	UJ 9.2		UJ 13	
Endrin	ug/kg	UJ 4.2	UJ 4.1	U 4.2	UJ 3.9	UJ 6.6	UJ 4.4	UJ 9.2	UJ 9.2		UJ 13	
Endrin aldehyde	ug/kg	UJ 4.2	UJ 4.1	U 4.2	UJ 3.9	**J 3.1**	UJ 4.4	UJ 9.2	**JP 2.2**		**J 6.4**	
Endrin ketone	ug/kg	UJ 4.2	UJ 4.1	U 4.2	UJ 3.9	**JP 1.7**	UJ 4.4	UJ 9.2	UJ 9.2		UJ 13	
Heptachlor	ug/kg	UJ 2.2	**JP 0.34**	U 2.2	UJ 2	UJ 3.4	UJ 2.3	UJ 4.7	UJ 4.7		UJ 6.8	
Heptachlor epoxide	ug/kg	UJ 2.2	UJ 2.1	U 2.2	UJ 2	**JP 0.59**	UJ 2.3	**JP 0.6**	UJ 4.7		UJ 6.8	
Methoxychlor	ug/kg	UJ 22	UJ 21	U 22	UJ 20	UJ 34	**JP 0.82**	UJ 47	UJ 47		UJ 68	

P >25% diff @ columns
J estimated
= outlier
N

Where is other duplicate? Only 1 sample

missing data?

all in one sample

Summary of Albion Landfill Sediment ~~Foreground~~ Background Data

Sample Identification:		SD14
Location:		Wetland-Back
EPA Sample Identification:		EMC87
Sample Date:		10/14/92
Sampled By:		WWES
Analyzed By:		PNELI
Volatiles	***Units***	
Acetone	ug/kg	U 21
Methylene chloride	ug/kg	**41**
Toluene	ug/kg	U 21
Semi-Volatiles	***Units***	
Benzo(b)fluoranthene	ug/kg	U 700
Benzo(k)fluoranthene	ug/kg	U 700
Bis(2-ethyl hexyl)phthalate	ug/kg	U 700
Chrysene	ug/kg	U 700
Fluoranthene	ug/kg	U 700
2-Methylnaphthalene	ug/kg	U 700
Phenanthrene	ug/kg	U 700
Pyrene	ug/kg	U 700
Pesticides/PCBs	***Units***	
b-BHC	ug/kg	UJ 3.6
g-Chlordane	ug/kg	UJ 3.6
4,4'-DDD	ug/kg	**JP 11**
4,4'-DDE	ug/kg	**J 11**
4,4'-DDT	ug/kg	**JP 1.3**
Dieldrin	ug/kg	**JP 0.52**
b-Endosulfan	ug/kg	UJ 7
Endrin	ug/kg	UJ 7
Endrin aldehyde	ug/kg	**JP 2**
Endrin ketone	ug/kg	UJ 7
Heptachlor	ug/kg	UJ 3.6
Heptachlor epoxide	ug/kg	UJ 3.6
Methoxychlor	ug/kg	UJ 36

Summary of Albion Landfill Sediment ~~Foreground~~ Background Data

Sample Identification:		SD04A	SD04B	SD05A	SD05B	SD06A-DP	SD06B	SD10	SD11	SD12	SD14
Location:		ver - Upstream	ver - Upstream	ver - Upstream	ver - Upstream	ver - Upstream	ver - Upstream	Wetland-Back	Wetland-Back	Wetland-Back	Wetland-Back
EPA Sample Identification:		MELX05	MELX90	MELX91	MELX92	MELX93	MELX94	MELX99	MELX40	MELX39	MELX42
Sample Date:		10/14/92	10/14/92	10/14/92	10/14/92	10/14/92	10/14/92	10/14/92	10/14/92	10/14/92	10/14/92
Sampled By:		WWES	WWES	WWES	WWES	WWES	WWES	WWES	WWES	WWES	WWES
Analyzed By:		DataChem	DataChem	DataChem	DataChem	DataChem	DataChem	DataChem	DataChem	DataChem	DataChem
Inorganics	***Units***										
Aluminum	mg/kg	**1120**	**1730**	**1920**	**2620**	**2710**	**1310**	**3560**	**3350**	**6070**	**3880**
Antimony	mg/kg	*** 18.6**	U* 14.6	U* 14.7	U* 15	U* 24.5	U* 15.8	U* 31.9	U* 34.3	U* 49	U* 29.6
Arsenic	mg/kg	**B 1.2**	**B 2.2**	**33.4**	**44.4**	**B 3.8**	**7.8**	**6.6**	**7.4**	**8.4**	**B 4.8**
Barium	mg/kg	**B 6.9**	**B 8.5**	**B 8.5**	**B 6.5**	**30.1#**	**B 8.6**	**B 44.2**	**B 58.3**	**B 93**	**B 44.1**
Cadmium	mg/kg	U 1.3	U 1.2	U 1.2	U 1.2	U 2	U 1.3	U 2.7	U 2.9	U 4.1	U 2.5
Calcium	mg/kg	**J* 30900**	**J* 23500**	**J* 46900**	**J* 36100**	**J* 44800**	**J* 26100**	**J* 56700**	**J* 62200**	**J* 66000**	**J* 33800**
Chromium	mg/kg	**3.7**	**7.1**	**8.5**	**12.3**	**6.3**	**5.4**	**8.9**	**6.5**	**13**	**9.6**
Cobalt	mg/kg	U 2.9	U 2.7	**B 7**	**B 9.5**	U 4.5	U 2.9	U 5.9	U 6.3	U 9	U 5.4
Copper	mg/kg	**10.5**	**8.2**	**B 3.3**	**B 4.8**	**B 5.5**	U 1.8	**B 11**	**B 10.8**	**B 19**	**B 8.8**
Cyanide	mg/kg	U 0.66	U 0.61	U 0.61	U 0.62	U 1	U 0.66	U 1.3	U 1.4	U 2	U 1.2
Iron	mg/kg	**3030**	**4060**	**14700**	**15000**	**7130**	**7200**	**13700**	**13200**	**16000**	**9600**
Lead	mg/kg	**1.3**	**1.9**	**JW 1.1**	**JW 1.6**	**7.1#**	**1.5**	**19.2**	**13.7**	**59.1#**	**17.4**
Magnesium	mg/kg	**J* 7250**	**J* 5800**	**J* 9120**	**14100#**	**J* 3880**	**J* 3610**	**J* 4370**	**J* 5140**	**J* 4460**	**J* 3870**
Manganese	mg/kg	**JN* 188**	**JN* 184**	**JN* 103**	**JN* 105**	**JN* 239**	**JN* 132**	**JN* 209**	**677#**	**JN* 388**	**JN* 211**
Mercury	mg/kg	U 0.07	U 0.06	**B 0.07**	U 0.06	U 0.1	U 0.07	U 0.13	U 0.14	U 0.2	U 0.12
Nickel	mg/kg	U 7.7	U 7.1	**15.3**	**19.3**	U 11.8	U 7.6	U 15.4	U 16.6	U 23.7	U 14.3
Potassium	mg/kg	U 273	U 251	U 252	U 257	U 420	U 271	U 548	U 589	U 841	U 507
Selenium	mg/kg	**JBNW 0.29**	**JBN 0.43**	**JBNW 0.32**	UJN 0.25	**0.84#**	UJN 0.26	**JBNW 1.7**	**JBNW 1.2**	**JBNW 2.7**	**JBNW 1.1**
Sodium	mg/kg	**B 66.7**	**JB 61**	**B 84.5**	**B 92.9**	**B 139**	**B 69.9**	**B 119**	**B 149**	**B 200**	**B 128**
Thallium	mg/kg	U 0.53	U 0.49	U 0.49	U 0.5	U 0.82	U 0.53	U 1.1	U 1.1	U 1.6	U 0.99
Vanadium	mg/kg	**B 3.1**	**B 4.6**	**B 8.3**	**B 8.4**	**B 5.8**	**B 4.5**	**B 6.7**	**B 6.3**	**B 14.5**	**B 8.7**
Zinc	mg/kg	**11.6**	**12.4**	**39.5**	**38.4**	**31.3**	**15.3**	**59.3**	**52.2**	**130#**	**49.8**

= ?

B = ?

DP?

1 of 4
Documentation

Albion Landfill Surface Water Background Calculations (River and Wetland Samples)

Sample Identification:						River Water - Filtered Samples		
EPA Sample Identification:								
Sample Date:		Background				MI Act 307 Calculations		
Sampled By:		Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?
Analyzed By:								
Volatiles	***Units***							
Acetone	ug/L	0	6	ND	-	-	MDL	
Carbon disulfide	ug/L	0	6	ND	-	-	MDL	
Methylene chloride	ug/L	2	6	0.8	0.3098387	0.39	1.73	
Semi-Volatiles	***Units***							
Butyl benzyl phthalat	ug/L	0	6	ND	-	-	MDL	
Diethyl phthalate	ug/L	0	6	ND	-	-	MDL	
Inorganics	***Units***							
Aluminum	ug/L	0	6	ND	-	-	MDL	
Arsenic	ug/L	1	6	0.6	0.244949	0.41	1.335	
Barium	ug/L	6	6	28.16667	0.6592926	0.02	30.14	
Cadmium	ug/L	1	5	ND	-	-	MDL	0.55
Calcium	ug/L	6	6	76166.67	926.64269	0.01	78950	
Chromium	ug/L	0	6	ND	-	-	MDL	
Iron	ug/L	5	5	14.44	7.12657	0.49	35.82	116 OK
Lead	ug/L	0	6	ND	-	-	MDL	
Magnesium	ug/L	6	6	25000	200	0.01	25600	
Manganese	ug/L	6	5	4.98	0.9757049	0.20	7.907	16.7 OK
Potassium	ug/L	0	6	ND	-	-	MDL	
Sodium	ug/L	6	6	7896.667	77.88881	0.01	8130	
Thallium	ug/L	0	6	ND	-	-	MDL	
Zinc	ug/L	0	6	ND	-	-	MDL	

include

What is MDL in relation to outliers?

= the number of samples used to calculate background (if <6, there is an outlier)

Albion Landfill Surface Water Background Calculations (River and Wetland Samples)

Sample Identification:						River Water - Unfiltered Samples		
EPA Sample Identification:								
Sample Date:		Background				MI Act 307 Calculations		
Sampled By:		Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?
Analyzed By:								
Volatiles	***Units***							
Acetone	ug/L							
Carbon disulfide	ug/L							
Methylene chloride	ug/L							
Semi-Volatiles	***Units***							
Butyl benzyl phthalat	ug/L							
Diethyl phthalate	ug/L							
Inorganics	***Units***							
Aluminum	ug/L	2	6	23.43333	10.788636	0.46	55.8	
Arsenic	ug/L	0	6	ND	-	-	MDL	
Barium	ug/L	6	6	25.48333	0.3430258	0.01	26.51	
Cadmium	ug/L	0	6	ND	-	-	MDL	
Calcium	ug/L	6	6	77933.33	1338.1579	0.02	81950	
Chromium	ug/L	0	6	ND	-	-	MDL	
Iron	ug/L	6	6	82.36667	17.555246	0.21	135	
Lead	ug/L	0	6	ND	-	-	MDL	
Magnesium	ug/L	6	6	23833.33	436.65394	0.02	25140	
Manganese	ug/L	6	6	7.366667	1.5081998	0.20	11.89	
Potassium	ug/L	6	6	887.1667	484.88201	0.55	2342	N
Sodium	ug/L	6	6	7485	168.13685	0.02	7989	
Thallium	ug/L	0	6	ND	-	-	MDL	
Zinc	ug/L	2	6	3.966667	2.2800585	0.57	10.81	N

Albion Landfill Surface Water Background Calculations (River and Wetland Samples)

Sample Identification:						Wetland Water - Filtered Samples		
EPA Sample Identification:						MI Act 307 Calculations		
Sample Date:		Background						
Sampled By:		Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?
Analyzed By:								
Volatiles	***Units***							
Acetone	ug/L	3	3	5.666667	2.081666	0.37	11.91	N
Carbon disulfide	ug/L	2	3	0.933333	0.9291573	1.00	3.721	2* include
Methylene chloride	ug/L	0	3	ND	-	-	MDL	
Semi-Volatiles	***Units***							
Butyl benzyl phthalat	ug/L	0	3	ND	-	-	MDL	
Diethyl phthalate	ug/L	0	3	ND	-	-	MDL	
Inorganics	***Units***							
Aluminum	ug/L	0	3	ND	-	-	MDL	
Arsenic	ug/L	3	3	3.966667 high	2.4583192	0.62	11.34	N (1.2 low) ok ~~probably should include~~
Barium	ug/L	3	3	43.1	10.569768	0.25	74.81	
Cadmium	ug/L	0	3	ND	-	-	MDL	
Calcium	ug/L	3	3	92200	6784.5413	0.07	112600	
Chromium	ug/L	0	3	ND	-	-	MDL	
Iron	ug/L	3	3	703.5333	701.69841	1.00	2809	N
Lead	ug/L	0	3	ND	-	-	MDL	
Magnesium	ug/L	3	3	22666.67	5991.1045	0.26	40640	
Manganese	ug/L	3	3	395.7	367.74865	0.93	1499	805* # ok
Potassium	ug/L	3	3	2093.333	450.03704	0.21	3443	
Sodium	ug/L	3	3	8913.333	565.71489	0.06	10610	
Thallium	ug/L	0	3	ND	-	-	MDL	
Zinc	ug/L	0	3	ND	-	-	MDL	

3

* = This concentration was identified as an outlier based on the remaining 2 samples; however, this is insufficient data to accurately evaluate the magnitude of this concentratio
\# = Coefficient of variance still >0.5 when excluded from background.

Albion Landfill Surface Water Background Calculations (River and Wetland Samples)

Sample Identification:						Wetland Water - Unfiltered Samples		
EPA Sample Identification:						MI Act 307 Calculations		
Sample Date:		Background						
Sampled By:		Hits	N	Average	Standard Deviation	Coefficient of Variance	Background Concentration	Outliers?
Analyzed By:								
Volatiles	***Units***							
Acetone	ug/L							
Carbon disulfide	ug/L							
Methylene chloride	ug/L							
Semi-Volatiles	***Units***							
Butyl benzyl phthalat	ug/L							
Diethyl phthalate	ug/L							
Inorganics	***Units***							
Aluminum	ug/L	3	3	4096.667	4229.2355	1.03	16780	8980*
Arsenic	ug/L	3	3	30.5	32.599847	1.07	128.3	67.5* #
Barium	ug/L	3	3	182.4333	119.69153	0.66	541.5	N
Cadmium	ug/L	3	3	0.913333	0.8753476	0.96	3.539	1.9* #
Calcium	ug/L	3	3	157666.7	57500.725	0.36	330200	
Chromium	ug/L	2	3	12.5	9.5	0.76	41	23* #
Iron	ug/L	3	3	54316.67	62490.606	1.15	241800	124000* #
Lead	ug/L	3	3	9.433333	2.7465129	0.29	17.67	
Magnesium	ug/L	3	3	25033.33	1484.3629	0.06	29490	
Manganese	ug/L	3	3	1895.667	1497.3698	0.79	6388	N (167 low)
Potassium	ug/L	3	3	1630	502.69275	0.31	3138	
Sodium	ug/L	3	3	8203.333	587.31025	0.07	9965	
Thallium	ug/L	0	3	ND	-	-	MDL	
Zinc	ug/L	3	3	96.8	106.63602	1.10	416.7	219* #

very high

normally n.d.

very high

should include, only 3 data points

* = This concentration was identified as an outlier based on the remaining 2 samples; however, this is insufficient data to accurately evaluate the magnitude of this concentration.
\# = Coefficient of variance still >0.5 when excluded from background.

chlorinated benzenes
" Naphthalenes
Chloroalkyl Ethers

QC Documentation

		ug/kg	ug/L	ug/L	ug/kg		ug/L		ug/L		ug/L	ug/L	
			CRQL		Soil		GW		Rule 57		MCL	SMCL	WQC
		low Soil	MW	RW/SW	Type A	Type B	Type A	Type B	DW	Non-DW			Acute / chronic
Volatiles	**Units**												
Acetone	ug/L	10	10	~~75~~ 5	100	14000	50	700	244	500	#N/A	#N/A	
Benzene	ug/L	~~5~~ 10	~~5~~ 10	~~1.5~~ 1	10	20	1	1	6.2	60	~~0.005~~	#N/A	5300*
Bromochloromethane	ug/L	#N/A	#N/A	~~#N/A~~ 1	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
Bromoform	ug/L	~~5~~ 10	~~5~~ 10	~~1.5~~ 1	10	80	1	4	25	65	#N/A	#N/A	
Bromomethane	ug/L	10	10	~~10~~ 1	10	200	1	10	9.94	11	#N/A	#N/A	
Carbon disulfide	ug/L	~~5~~ 10	~~5~~ 10	~~3~~ 1	100	36	50	700	~~ID~~	~~ID~~	#N/A	#N/A	
Carbon tetrachloride	ug/L	~~5~~ 10	~~5~~ 10	~~1.5~~ 1	10	6	1	0.3	3	21	~~0.005~~	#N/A	35,200*
Chlorobenzene	ug/L	~~5~~ 10	~~5~~ 10	~~1.5~~ 1	10	2000	1	100	71	71	→ 0.1	#N/A	250* 50* class
Chloroethane	ug/L	10	10	~~1.5~~ 2	10	180	1	9	~~ID~~	~~ID~~	#N/A	#N/A	
Chloroform	ug/L	~~5~~ 10	~~5~~ 10	~~1.5~~ 1	10	120	1	6	1.8	43	#N/A	#N/A	28,900* 1240*
Chloromethane	ug/L	10	10	~~10~~ 1	10	60	1	3	~~ID~~	~~ID~~	#N/A	#N/A	
Dibromochloromethane	ug/L	~~5~~ 10	~~5~~ 10	~~1.5~~ 1	10	8	1	0.4	3.2	29	#N/A	#N/A	
1,2-Dibromo-3-chloropropane	ug/L	#N/A	#N/A	~~#N/A~~ 1	#N/A	#N/A	#N/A	#N/A	~~ID~~	~~ID~~	0.0002	#N/A	
1,2-Dibromoethane 106-93-4? wrong in dcaa	ug/L	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	~~#N/A~~ 0.05	~~#N/A~~ 1	#N/A	#N/A	
1,2-Dichlorobenzene	ug/L	330	10	~~2.5~~ 1	330	12000	5	600	7	7	0.6	#N/A	1120* 763*
1,3-Dichlorobenzene =612 now, change to 176	ug/L	330	10	~~2~~ 1	330	12000	5	600	179	180	0.6	#N/A	class
1,4-Dichlorobenzene	ug/L	330	10	~~2~~ 1	330	20	5	1	6.9	15	0.075	#N/A	
Dichlorobromomethane	ug/L	~~5~~ 10	~~5~~ 10	~~1.5~~ 1	10	6	1	0.3	18	24	#N/A	#N/A	
1,1-Dichloroethane	ug/L	~~5~~ 10	~~5~~ 16	~~1.5~~ 1	10	14000	1	700	~~ID~~	~~ID~~	#N/A	#N/A	
1,2-Dichloroethane	ug/L	~~5~~ 10	~~5~~ 10	~~1.5~~ 1	10	8	1	0.4	10	560	0.005	#N/A	118,000* 20,000*
1,1-Dichloroethylene	ug/L	~~5~~ 10	~~5~~ 10	~~1.5~~ 1	10	140	1	7	7	67	0.007	#N/A	
1,2 DCE cis-1,2-Dichloroethylene	ug/L	10 #N/A	10 #N/A	~~#N/A~~ 1	10	1400	1	70	~~ID~~	~~ID~~	0.07	#N/A	11,600* — class
trans-1,2-Dichloroethylene	ug/L	#N/A	#N/A	~~#N/A~~ 1	10	2000	1	100	300	300	0.1	#N/A	
1,2-Dichloropropane	ug/L	~~5~~ 10	~~5~~ 10	~~1.5~~ 1	10	10	1	0.5	5	64	0.005	#N/A	23,000* 5700* gen
cis-1,3-Dichloropropene	ug/L	~~5~~ 10	~~5~~ 10	~~2~~ 1	10	4	1	0.2	#N/A	~~#N/A~~ 3	#N/A	#N/A	
trans-1,3-Dichloropropene	ug/L	~~5~~ 10	~~5~~ 10	1	10	4	1	0.2	#N/A	~~#N/A~~ 3	#N/A	#N/A	6060* 2444* gen
Ethylbenzene	ug/L	~~5~~ 10	~~5~~ 10	~~1.5~~ 1	10	1400	1	70	30	31	0.7	#N/A	32,000*
2-Hexanone	ug/L	10	10	~~50~~ 5	100	ID	50	ID	~~ID~~	~~ID~~	#N/A	#N/A	
Methylene chloride	ug/L	~~5~~ 10	~~5~~ 10	1	10	100	1	5	59	59	#N/A	#N/A	
Methyl ethyl ketone	ug/L	10	10	~~50~~ 5	100	8000	50	400	1590	4100	#N/A	#N/A	
4-methyl-2-pentanone	ug/L	10	10	~~3~~ 3	100	8000	50	400	~~ID~~	~~ID~~	#N/A	#N/A	
Styrene	ug/L	~~5~~ 10	~~5~~ 10	1	10	20	1	1	8.2	19	0.1	#N/A	
1,1,2,2-Tetrachloroethane	ug/L	~~5~~ 10	~~5~~ 10	~~1.5~~ 1	10	4	1	0.2	1.9	32	#N/A	#N/A	9320* — class
Tetrachloroethylene	ug/L	~~5~~ 10	~~5~~ 10	~~1.5~~ 1	10	14	1	0.7	3.91	~~16~~ 72	0.005	#N/A	5280* 840*

		ug/kg	ug/L	ug/L	ug/kg		ug/L		ug/L		ug/L	ug/L	
		CRQL			Soil		GW		Rule 57		MCL	SMCL	WQC
		Soil	MW	RW/SW	Type A	Type B	Type A	Type B	DW	Non-DW			
Volatiles	*Units*												
Toluene	ug/L	~~5~~10	~~5~~10	~~1.5~~1	10	16000	1	800	100	110	1	#N/A	17500* —
1,1,1-Trichloroethane	ug/L	~~5~~10	~~5~~10	~~1.5~~1	10	4000	1	200	117	120	0.2	#N/A	18000* —
1,1,2-Trichloroethane	ug/L	~~5~~10	~~5~~10	~~1.5~~1	10	12	1	0.6	5.4	65	#N/A	#N/A	↓ ~~9400*~~ class
Trichloroethylene	ug/L	~~5~~10	~~5~~10	~~1.5~~1	10	60	1	3	25	94	0.005	#N/A	~~45000*~~ 21900* not class
Vinyl chloride	ug/L	10	10	~~1.5~~1	10	0.4	1	0.02	0.16	3.1	0.002	#N/A	
Xylene	ug/L	~~5~~10	~~5~~10	1	30	6000	3	300	59	59	10	#N/A	
Acenaphthene	ug/L	330	10	~~1.5~~5	330	8000	5	400	ID	~~ID~~ 54	#N/A	#N/A	1700* 520*
Acenaphthylene	ug/L	330	10	~~1.5~~5	330	ID	5	ID	#N/A	#N/A	#N/A	#N/A	
Anthracene	ug/L	330	10	~~2.5~~5	330	40000	5	2000	#N/A	#N/A	#N/A	#N/A	
Benzo(a)anthracene	ug/L	330	10	~~1.5~~5	330	200	5	0.006	#N/A	#N/A	#N/A	#N/A	
Benzo(b)fluoranthene	ug/L	330	10	~~1.5~~5	330	200	5	0.006	#N/A	#N/A	#N/A	#N/A	
Benzo(k)fluoranthene	ug/L	330	10	~~1.5~~5	330	200	5	0.006	#N/A	#N/A	#N/A	#N/A	
Benzo(ghi)perylene	ug/L	330	10	~~4~~5	330	ID	5	ID	#N/A	#N/A	#N/A	#N/A	
Benzo(a)pyrene	ug/L	~~100~~ 330	10	~~2~~5	330	200	5	0.006	~~ID~~ Blank	~~ID~~	#N/A	#N/A	
Bis(2-chloroethoxy)methane	ug/L	330	10	~~2.5~~5	330	#N/A	5	#N/A	2.3	4.6	#N/A	#N/A	
Bis(2-chloroethyl)ether	ug/L	330	10	~~1.5~~3	330	0.6	5	0.03	0.3	4.2	#N/A	#N/A	
Bis(2-Chloroisopropyl) ether 2,2-oxybis(1-chloropropane)	ug/L	330	10	~~2.5~~5	330	5600	5	280	#N/A	#N/A	#N/A	#N/A	
Bis(2-ethyl hexyl)phthalate	ug/L	330	10	~~1~~5	330	40	5	2	~~ID~~	~~ID~~	#N/A	#N/A	400 360 prop
4-Bromodiphenyl ether	ug/L	330	10	~~1.5~~5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
Butyl benzyl phthalate	ug/L	330	10	~~3.5~~5	330	20000	5	1000	#N/A	#N/A	#N/A	#N/A	940* 3* class
Carbazole 4-Chloroaniline	ug/L	330 330	10 10	~~2.5~~	1700	560	20	28	~~ID~~	~~ID~~	#N/A	#N/A	
p-Chloro-m-cresol	ug/L	330	10	~~1.5~~5	330	280000	5	14000	4.4	4.4	#N/A	#N/A	30* —
4-Chlorodiphenyl ether	ug/L	330	10	~~1~~5	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	
2-Chloronaphthalene	ug/L	330	10	~~1.5~~5	330	#N/A	5	#N/A	#N/A	#N/A	#N/A	#N/A	1600* — class
2-Chlorophenol	ug/L	330	10	~~2~~5	330	800	5	40	10	9.8	#N/A	#N/A	4380* —
Chrysene	ug/L	330	10	~~1.5~~5	330	200	5	0.006	#N/A	#N/A	#N/A	#N/A	
2-Methyl phenol	ug/L	330	10	~~1~~5	#N/A	8000	#N/A	400	40	38	#N/A	#N/A	
4-Methyl phenol } out of order	ug/L	330	10	? 1	#N/A	8000	#N/A	400	24	24	#N/A	#N/A	
Dibenz(a,h)anthracene	ug/L	330	10	~~2.5~~5	330	200	5	0.006	#N/A	#N/A	#N/A	#N/A	
Dibenzofuran	ug/L	330	10	~~1~~5	#N/A	ID	#N/A	ID	#N/A	#N/A	#N/A	#N/A	
Di-n-butyl phthalate	ug/L	330	10	~~2~~5	330	14000	5	700	~~ID~~	~~ID~~	#N/A	#N/A	940* 3* class
3,3'-Dichlorobenzidine	ug/L	~~660~~ 330	~~20~~10	5	2000	1.6	20	0.08	0.05	0.063	#N/A	#N/A	
2,4-Dichlorophenol (120830)	ug/L	330	10	~~2~~5	330	400	5	20	33.8869505	33.8869505	#N/A	#N/A	2020* 365*
Diethyl phthalate	ug/L	330	10	~~1~~5	330	120000	5	6000	#N/A	#N/A	#N/A	#N/A	940* 3* class

pH

Halo ether
Halo methane

Volatiles	Units	CRQL Soil (ug/kg)	CRQL MW (ug/L)	CRQL RW/SW (ug/L)	Soil Type A (ug/kg)	Soil Type B (ug/kg)	GW Type A (ug/L)	GW Type B (ug/L)	Rule 57 DW (ug/L)	Rule 57 Non-DW (ug/L)	MCL (ug/L)	SMCL (ug/L)	WQC Acute	WQC Chronic
2,4-Dimethylphenol	ug/L	330	10	~~25~~	330	8000	5	400	31	31	#N/A	#N/A	2120*	
Dimethyl phthalate	ug/L	330	10	~~1.5~~ 5	330	140000	5	7000	#N/A	#N/A	#N/A	#N/A	940*	3* class
4,6-Dinitro-o-cresol	ug/L	~~1600~~ 800	~~50~~ 25	~~15~~ 20	1700	60	20	3	0.6	0.59	#N/A	#N/A		
2,4-Dinitrophenol	ug/L	~~1600~~ 800	~~50~~ 25	~~15~~ 20	1700	280	20	14	9.8	9.8	#N/A	#N/A		
2,4-Dinitrotoluene	ug/L	330	10	~~1~~ 5	330	1	5	0.05	#N/A	#N/A	#N/A	#N/A	330*	230*
2,6-Dinitrotoluene	ug/L	330	10	~~1~~ 5	330	1	5	0.051	#N/A	#N/A	#N/A	#N/A		
Di-n-octyl phthalate	ug/L	330	10	~~1.5~~ 5	330	2000	5	100	ID	ID	#N/A	#N/A	940*	3* class
Fluoranthene	ug/L	330	10	~~1.5~~ 5	330	6000	5	300	ID	ID	#N/A	#N/A	3980*	
Fluorene	ug/L	330	10	~~1~~ 5	330	6000	5	300	ID	ID	#N/A	#N/A		
Hexachlorobenzene	ug/L	330	10	~~#N/A~~ 5	330	0.4	5	0.02	0.0018	0.0018	#N/A	#N/A	6	3.68 prop
Hexachloro-1,3-butadiene	ug/L	330	10	~~#N/A~~ 5	330	8	5	0.4	ID	ID	#N/A	#N/A	90*	9.3*
Hexachlorocyclopentadiene	ug/L	330	10	~~#N/A~~ 5	330	1000	5	50	0.5	0.54	#N/A	#N/A	7*	5.2*
Hexachloroethane	ug/L	330	10	~~2~~ 5	330	40	5	2	8	13	#N/A	#N/A	980*	540*
Indeno(1,2,3-cd)pyrene	ug/L	330	10	~~3.5~~ 5	330	200	5	0.006	#N/A	#N/A	#N/A	#N/A		
Isophorone	ug/L	330	10	~~2.5~~ 5	330	160	5	8	61.5	860	#N/A	#N/A	117,000*	—
2-Methylnaphthalene	ug/L	330	10	~~2~~ 5	#N/A	200	#N/A	10	#N/A	#N/A	#N/A	#N/A		
Naphthalene	ug/L	330	10	~~2~~ 5	330	600	5	30	29	29	#N/A	#N/A	2300*	620*
2-Nitroaniline	ug/L	~~1600~~ 800	~~50~~ 25	20	1700	#N/A	20	#N/A	#N/A	#N/A	#N/A	#N/A		
3-Nitroaniline	ug/L	~~1600~~ 800	~~50~~ 25	~~2.5~~ 20	1700	#N/A	20	#N/A	#N/A	#N/A	#N/A	#N/A		
4-Nitroaniline	ug/L	~~1600~~ 800	~~50~~ 25	~~3~~ 20	1700	#N/A	20	#N/A	#N/A	#N/A	#N/A	#N/A		
Nitrobenzene	ug/L	330	10	~~2.5~~ 5	330	80	5	4	ID	ID	#N/A	#N/A	27,000*	
2-Nitrophenol	ug/L	330	10	~~2~~ 5	330	#N/A	5	#N/A	ID	ID	#N/A	#N/A	230*	150* (class)
4-Nitrophenol	ug/L	~~1600~~ 800	~~50~~ 25	~~3~~ 20	1700	#N/A	20	#N/A	ID	ID	#N/A	#N/A		
n-Nitrosodi-n-propylamine	ug/L	330	10	~~1.5~~ 5	330	0.1	5	0.005	#N/A	#N/A	#N/A	#N/A	5850*	—
n-Nitrosodiphenylamine	ug/L	330	10	~~1.5~~ 5	330	140	5	7	ID	ID	#N/A	#N/A		class
(a) Pentachlorophenol	ug/L	~~1600~~ 800	~~50~~ 25	20	1700	6	20	0.3 check	14.9643394	~~14.9643394~~ 0.8	0.001 f	#N/A	20	13
Phenanthrene	ug/L	330	10	~~1~~ 5	330	ID	5	ID	#N/A	#N/A	#N/A	#N/A	30	6.3 (proposed)
Phenol	ug/L	330	10	~~2~~ 5	330	80000	5	4000	1100	1100	#N/A	#N/A	10,200*	2560*
Pyrene	ug/L	330	10	~~1.5~~ 5	330	4000	5	200	ID	ID	#N/A	#N/A		
1,2,4-Trichlorobenzene	ug/L	330	10	~~2~~ 5	330	180	5	9	12	22	#N/A	#N/A	250*	50* (class)
2,4,5-Trichlorophenol	ug/L	~~1600~~ 800	~~50~~ 25	~~1.5~~ 20	#N/A	14000	#N/A	700	ID	ID	#N/A	#N/A	100	63 (prop)
2,4,6-Trichlorophenol	ug/L	330	10	~~1.5~~ 5	330	60	5	3	1.4	1.5	#N/A	#N/A		970*
Aldrin	ug/L	~~8~~ 1.7	0.05	~~0.005~~ 0.01	1.7	0.04	0.01	0.002	ID	ID	#N/A	#N/A	3	—
a-BHC	ug/L	~~8~~ 1.7	0.05	0.01	1.7	0.12	0.01	0.006	ID	ID	#N/A	#N/A	100*	

360* 122*
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(a)

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		ug/kg	ug/L	ug/L	ug/kg		ug/L		ug/L		ug/L	ug/L	ug/L	
		CRQL			Soil		GW		Rule 57		MCL	SMCL	WQC	
		Soil	MW	RW/SW	Type A	Type B	Type A	Type B	DW	Non-DW			Acute	chronic
Volatiles	*Units*													
b-BHC	ug/L	~~8~~ 1.7	0.05	~~0.0050~~ 0.01	1.7	0.4	0.01	0.02	~~ID~~	~~ID~~	#N/A	#N/A	100*	
d-BHC	ug/L	~~8~~ 1.7	0.05	~~0.005~~	1.7	#N/A	0.01	#N/A	#N/A	#N/A	#N/A	#N/A	100*	
a-Chlordane	ug/L	1.7	~~0.05~~		1.7	0.6	0.01	0.03	0.00052	0.00053	~~#N/A~~ 0.0002	g #N/A	2.4	0.0043
g-Chlordane	ug/L	1.7	0.05		1.7	0.6	0.01	0.03	0.00052	0.00053	~~#N/A~~ 0.0002	g #N/A	2.4	0.0043
4,4'-DDD	ug/L	~~16~~ 3.3	0.1	0.02	3.3	2	0.01	0.1	#N/A	#N/A	#N/A	#N/A		
4,4'-DDE	ug/L	~~16~~ 3.3	0.1	~~0.005~~ 0.02	3.3	2	0.01	0.1	~~ID~~	~~ID~~	#N/A	#N/A	1050*	—
4,4'-DDT	ug/L	~~16~~ 3.3	0.1	0.02	3.3	2	0.01	0.1	0.00023	0.00023	#N/A	g #N/A	1.1	0.001
Dieldrin	ug/L	~~16~~ 3.3	0.1	~~0.01~~ 0.02	3.3	0.04	0.01	0.002	0.0000315	0.000032	#N/A	#N/A	2.5	0.0019
a-Endosulfan	ug/L	~~8~~ 1.7	0.05	0.01	3.3	8	0.01	0.4	#N/A	#N/A	#N/A	g #N/A	0.22	0.056
b-Endosulfan	ug/L	~~16~~ 3.3	0.1	~~#N/A~~ 0.02	3.3	8	0.01	0.4	#N/A	#N/A	#N/A	g #N/A	0.22	0.056
Endosulfan sulfate	ug/L	~~16~~ 3.3	0.1	0.1	3.3	#N/A	0.01	#N/A	#N/A	#N/A	#N/A	#N/A		
Endrin	ug/L	~~16~~ 3.3	0.1	0.01	3.3	40	0.01	2	#N/A	#N/A	#N/A	g #N/A	0.18	0.0023
Endrin aldehyde	ug/L	~~#N/A~~ 3.3	~~#N/A~~ 0.1	#N/A	3.3	#N/A	0.01	#N/A	#N/A	#N/A	#N/A	#N/A		
Endrin ketone	ug/L	~~16~~ 3.3	0.1	0.03	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Heptachlor	ug/L	~~8~~ 1.7	0.05	~~0.03~~ 0.01	1.7	0.16	0.01	0.008	0.002	0.0016	0.0004	g #N/A	0.52	0.0038
chlor Heptachlor epoxide	ug/L	~~8~~ 1.7	0.05	0.005	1.7	0.08	0.01	0.004	~~ID~~	~~ID~~	0.0002	g #N/A	0.52	0.0038
Lindane	ug/L	~~8~~ 1.7	~~0.05~~	~~0.005~~ 0.01	1.7	0.6	0.01	0.03	0.071	0.097	0.0002	g #N/A	2	0.08
Methoxychlor	ug/L	~~80~~ 17	0.5	~~0.02~~ 0.1	#N/A	800	#N/A	40	#N/A	#N/A	0.04	g #N/A	—	0.03 (poster)
PCB: aroclor 1016	ug/L	~~80~~ 33	~~0.5~~ 1	~~0.1~~ 0.2	330	1000	0.1	0.02	~~#N/A~~ 2E-5	~~#N/A~~	#N/A	g #N/A	—	0.014
chlor PCB: aroclor 1221	ug/L	~~80~~ 33	~~0.5~~ 1	~~0.1~~ 0.2	330	1000	0.1	0.02	#N/A	#N/A	#N/A	#N/A		
PCB: aroclor 1232	ug/L	~~80~~ 67	~~0.5~~ 2	~~0.1~~ 0.2	330	1000	0.1	0.02	#N/A	#N/A	#N/A	#N/A		
PCB: aroclor 1242	ug/L	~~80~~ 33	~~0.5~~ 1	~~0.1~~ 0.2	330	1000	0.1	0.02	#N/A	#N/A	#N/A	#N/A		
PCB: aroclor 1248	ug/L	~~80~~ 33	~~0.5~~ 1	~~0.1~~ 0.2	330	1000	0.1	0.02	#N/A	#N/A	#N/A	#N/A		
PCB: aroclor 1254	ug/L	~~160~~ 33	1	~~0.1~~ 0.2	330	1000	0.1	0.02	#N/A	#N/A	#N/A	#N/A		
PCB: aroclor 1260	ug/L	~~160~~ 33	1	~~0.1~~ 0.2	330	1000	0.1	0.02	#N/A	#N/A	#N/A	#N/A		
Toxaphene	ug/L	~~160~~ 5.170	~~1~~ 5	~~0.25~~ 1.0	170	0.6	0.1	0.03	~~ID~~	0.0017 ~~ID~~	0.003	#N/A	0.73	0.0002
Aluminum	ug/L	40000	200	~~100~~ 80	500	1000	20	50	#N/A	#N/A	#N/A	0.05 -0.2 (pH)	pH	
Antimony	ug/L	12000	60	~~2~~ 60	500	60	5	3	#N/A	#N/A	#N/A	#N/A	88	30 (proposed)
Arsenic	ug/L	2000	10	~~2~~ 5	100	0.4	1	0.02	~~#N/A~~ 49	~~#N/A~~ 11	0.05	(m) #N/A	360	190
Barium	ug/L	40000	200	~~50~~ 20	1000	40000	200	2000	#N/A	#N/A	2	#N/A		
Beryllium	ug/L	1000	5	5	#N/A	0.16	#N/A	0.0081	#N/A	#N/A	#N/A	#N/A	130*	5.3*
Cadmium	ug/L	1000	5	~~0.2~~ 0.5	50	80	0.2	4	#N/A	#N/A	0.005	m,e #N/A	3.9	1.1
Calcium	ug/L	1000000	5000	1000	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Chromium	ug/L	2000	10	10	2500	2000 (VI)	50	100 (VI)	#N/A (2 (VI))	#N/A (1.7 (VI))	0.1	m #N/A	16 (VI)	11 (VI)

		ug/kg	ug/L	ug/L	ug/kg		ug/L		ug/L		ug/L	ug/L		
		CRQL			Soil		GW		Rule 57		MCL	SMCL	WQC	
		Soil	MW	RW/SW	Type A	Type B	Type A	Type B	DW	Non-DW				
Volatiles	*Units*													
Cobalt	ug/L	10000	50	10	#N/A	1.4	#N/A	0.07	#N/A	#N/A	#N/A	#N/A		
Copper	ug/L	5000	25	10	1000	20000	25	1000	#N/A H	#N/A H	#N/A	em 1	18	12
Cyanide	ug/L	2000	10	~~5~~ 10	100	2000	5	100	#N/A 4	#N/A 32 55	#N/A	#N/A	22	5.2
Iron	ug/L	20000	100	100	#N/A	6000	100	300	#N/A	#N/A	#N/A	0.3	—	1000 (post)
Lead	ug/L	~~1000~~ 600	~~5~~ 3	2	1000	80	3	4	#N/A H	#N/A H	.015 (A)T	em #N/A	82	3.2
Magnesium	ug/L	1000000	5000	1000	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Manganese	ug/L	3000	15	10	2000	1000	20	50	#N/A	#N/A	#N/A	0.05		
Mercury	ug/L	40	0.2	0.2	100	40	0.2	2	0.0013	0.0013	0.002	#N/A	24 m	0.012(i)
Nickel	ug/L	8000	40	20	1000	2000	50	100	#N/A H	#N/A H	#N/A	em #N/A	1400	160
Potassium	ug/L	1000000	5000	2000	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A		
Selenium	ug/L	1000	5	2	500	800	5	40	~~#N/A~~ 8.2	~~#N/A~~ 2	0.05	#N/A	20	5
Silver	ug/L	2000	10	5	500	800	0.5	40	~~#N/A~~ .1	~~#N/A~~ .01	#N/A	em 0.1	4.1	—
Sodium	ug/L	1000000	5000	1000	#N/A	3000000	#N/A	150000	#N/A	#N/A	#N/A	#N/A		
Thallium	ug/L	2000	10	2	500	10	2	0.5	#N/A	#N/A	#N/A	#N/A	1400*	40*
Vanadium	ug/L	10000	50	10	#N/A	980	#N/A	49	1.43	~~3.7~~ 8	#N/A	#N/A		
Zinc	ug/L	4000	20	20	1000	20000	20	1	#N/A H	#N/A H	#N/A	em 5	120	110

* Insufficient data to develop criteria value presented is the L.O.E.L (Lowest Observed Effect Level)

Table I-2
Summary of Soil Detection Limits and Applicable Criteria
Albion Sheridan Township Landfill, Albion, Michigan
Units as Given

QC
Type A&B
Criteria

Chemical \ Criteria		Soil/ Sediment CRQL	Act 307 Soil Criteria		Soil PRG (residential)
			Type A	Type B	
Volatiles	***Units***			14,000	
Acetone	ug/kg	10	100	1400	27400000
Carbon disulfide	ug/kg	10	100	14000	27400000
Chlorobenzene	ug/kg	10	10	2000	5480000
1,4-Dichlorobenzene	ug/kg	330	10	20	26600
Ethylbenzene	ug/kg	10	10	1400	27400000
Methylene chloride	ug/kg	10	10	100	85200
Methyl ethyl ketone	ug/kg	10	100	8000	13700000
4-Methyl-2-pentanone	ug/kg	10	100	8000	13700000
Toluene	ug/kg	10	10	16000	54800000
1,1,1-Trichloroethane	ug/kg	10	10	4000	24600000
Xylene	ug/kg	10	30	6000	548000000
Semi-Volatiles	***Units***				
Anthracene	ug/kg	330	330	40000	82100000
Benzo(a)anthracene	ug/kg	330	330	200	87.5
Benzo(b)fluoranthene	ug/kg	330	330	200	87.5
Benzo(k)fluoranthene	ug/kg	330	330	200	55.5
Benzo(ghi)perylene	ug/kg	330	330	930000Note	1100000
Benzo(a)pyrene	ug/kg	330	330	200	87.5
Bis(2-ethyl hexyl)phthalate	ug/kg	330	330	40	45600
Butyl benzyl phthalate	ug/kg	330	330	20000	54800000
p-Chloro-m-cresol	ug/kg	330	330	280000	548000000
Chrysene	ug/kg	330	330	200	87.5
2-Methyl phenol	ug/kg	330	330	8000	13700000
4-Methyl phenol	ug/kg	330	330	8000	13700000
Dibenz(a,h)anthracene	ug/kg	330	330	200	87.5
Di-n-butyl phthalate	ug/kg	330	330	14000	27400000
Diethyl phthalate	ug/kg	330	330	120000	219000000
Di-n-octyl phthalate	ug/kg	330	330	2000	5480000
Fluoranthene	ug/kg	330	330	6000	11000000
Fluorene	ug/kg	330	330	6000	11000000

sort

Table I-2
Summary of Soil Detection Limits and Applicable Criteria
Albion Sheridan Township Landfill, Albion, Michigan
Units as Given

Chemical \ Criteria		Soil/ Sediment CRQL	Act 307 Soil Criteria		Soil PRG (residential)
			Type A	Type B	
Indeno(1,2,3-cd)pyrene	ug/kg	330	330	200	87.5
2-Methylnaphthalene	ug/kg	330	330	200	#N/A
Naphthalene	ug/kg	330	330	5000Note	11000000
Phenanthrene	ug/kg	330	330	500Note	1100000
Phenol	ug/kg	330	330	80000	164000000
Pyrene	ug/kg	330	330	4000	8210000
Aldrin	ug/kg	1.7	1.7	0.04	37.6
a-Chlordane	ug/kg	1.7	1.7	0.6	491
g-Chlordane	ug/kg	1.7	1.7	0.6	491
4,4'-DDD	ug/kg	3.3	3.3	2	2660
4,4'-DDE	ug/kg	3.3	3.3	2	1880
Dieldrin	ug/kg	3.3	3.3	0.04	39.9
a-Endosulfan	ug/kg	1.7	3.3	8	13700
b-Endosulfan	ug/kg	3.3	3.3	8	13700
Endrin	ug/kg	3.3	3.3	40	82100
PCB: aroclor 1232	ug/kg	67	330	1000	83
PCB: aroclor 1254	ug/kg	33	330	1000	83
PCB: aroclor 1260	ug/kg	33	330	1000	83
Inorganics	***Units***				
Aluminum	mg/kg	40	0.5	1	#N/A
Antimony	mg/kg	12	0.5	0.06	110
Arsenic	mg/kg	2	0.1	0.0004	0.355
Barium	mg/kg	40	1	40	19200
Beryllium	mg/kg	1	#N/A	0.00016	0.149
Cadmium	mg/kg	1	0.05	0.08	137
Calcium	mg/kg	1000	#N/A	#N/A	#N/A
Chromium	mg/kg	2	2.5	2 (VI)	1370
Cobalt	mg/kg	10	#N/A	0.0014	2.74
Copper	mg/kg	5	1	20	10200
Cyanide	mg/kg	2	0.2	2	5480
Iron	mg/kg	20	2	6	#N/A

Table I-2
Summary of Soil Detection Limits and Applicable Criteria
Albion Sheridan Township Landfill, Albion, Michigan
Units as Given

Chemical \ Criteria		Soil/ Sediment CRQL	Act 307 Soil Criteria		Soil PRG (residential)
			Type A	Type B	
Lead	mg/kg	0.6	1	0.08	#N/A
Magnesium	mg/kg	1000	#N/A	#N/A	#N/A
Manganese	mg/kg	3	2	1	1370
Mercury	mg/kg	0.04	0.1	0.04	82.1
Nickel	mg/kg	8	1	2	5480
Potassium	mg/kg	1000	#N/A	#N/A	#N/A
Selenium	mg/kg	1	0.5	0.8	1370
Silver	mg/kg	2	0.5	0.8	1370
Sodium	mg/kg	1000	#N/A	3000	#N/A
Thallium	mg/kg	2	0.5	0.01	19.2
Vanadium	mg/kg	10	1	0.98	1920
Zinc	mg/kg	4	1	20	82100
Other Parameters	***Units***				
Total Organic Carbon	%	#N/A	#N/A	#N/A	#N/A

(see key for footnotes)

Table J-2
Summary of Ground Water Detection Limits and Applicable Criteria
Albion Sheridan Township Landfill, Albion, Michigan
Units as Given

Chemical \ Criteria	Units	Monitoring Well CRQL	Residential Well CRQL	Act 307 Ground Water Criteria Type A	Act 307 Ground Water Criteria Type B	Maximum Contaminant Level
Volatiles	***Units***					
Acetone	ug/L	10	5	50	700	#N/A
Benzene	ug/L	10	1	1	1	5
Chlorobenzene	ug/L	10	1	1	100	100
1,2-Dichloroethylene	ug/L	10	#N/A	1 ~~#N/A~~	70 (cis)	~~#N/A~~ 70 (cis)
Ethylbenzene	ug/L	10	1	1	70	700
2-Hexanone	ug/L	10	5	50	ID	#N/A
Methyl ethyl ketone	ug/L	10	5	50	400	#N/A
4-Methyl-2-pentanone	ug/L	10	3	50	400	#N/A
Toluene	ug/L	10	1	1	800	1000
Vinyl chloride	ug/L	10	1	1	0.02	2
Xylene	ug/L	10	1	3	300	10000
Benzo(a)anthracene	ug/L	10	5	5	0.006	#N/A
Benzo(b)fluoranthene	ug/L	10	5	5	0.006	#N/A
Bis(2-ethyl hexyl)phthalate	ug/L	10	5	5	2	#N/A
Butyl benzyl phthalate	ug/L	10	5	5	1000	#N/A
Di-n-butyl phthalate	ug/L	10	5	5	700	#N/A
Diethyl phthalate	ug/L	10	5	5	6000	#N/A
Di-n-octyl phthalate	ug/L	10	5	5	100	#N/A
2-Methylnaphthalene	ug/L	10	5	5	10	#N/A
4-Methyl phenol	ug/L	10	5	5	400	#N/A
Naphthalene	ug/L	10	5	5	250(a) ~~30~~	#N/A
Phenol	ug/L	10	5	5	4000	#N/A
Endosulfan sulfate	ug/L	0.1	0.02	0.02	#N/A	#N/A
Heptachlor	ug/L	0.05	0.01	0.01	0.008	0.4
Heptachlor epoxide	ug/L	0.05	0.005	0.01	0.004	0.2
Lindane	ug/L	0.05	0.01	0.01	0.03	0.2
Methoxychlor	ug/L	0.5	0.1	0.5	40	40
Aluminum	ug/L	200	80	20	50	#N/A
Antimony	ug/L	60	60	5	3	#N/A
Arsenic	ug/L	10	5	1	0.02	50

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Table J-2
Summary of Ground Water Detection Limits and Applicable Criteria
Albion Sheridan Township Landfill, Albion, Michigan
Units as Given

Chemical \ Criteria		Monitoring Well CRQL	Residential Well CRQL	Act 307 Ground Water Criteria Type A	Act 307 Ground Water Criteria Type B	Maximum Contaminant Level
Barium	ug/L	200	20	200	2000	2000
Calcium	ug/L	5000	1000	#N/A	#N/A	#N/A
Chromium	ug/L	10	10	50	100 (VI)	100
Cobalt	ug/L	50	10	#N/A	0.07	#N/A
Copper	ug/L	25	10	25	1000	~~#N/A~~ 1.3 (A)TT
Iron	ug/L	100	100	100	300	~~#N/A~~
Lead	ug/L	3	2	3	4	0.015 (A)TT
Magnesium	ug/L	5000	1000	#N/A	#N/A	#N/A
Manganese	ug/L	15	10	20	50	#N/A
Nickel	ug/L	40	20	50	100	#N/A
Potassium	ug/L	5000	2000	#N/A	#N/A	#N/A
Selenium	ug/L	5	2	5	40	50
Sodium	ug/L	5000	1000	#N/A	150000	#N/A
Vanadium	ug/L	50	10	20	49	#N/A
Zinc	ug/L	20	20	20	1000	#N/A
Ammonia nitrogen	ug/L		100	NA	NA	#N/A
BOD	ug/L	2000	NA			#N/A
Chloride	ug/L		5000		250000	#N/A
COD	ug/L	5000	NA		NA	#N/A
Grease & Oil	ug/L	~~5000~~ 400				#N/A
Nitrate/ Nitrite	ug/L	~~10~~ 10	10		200	#N/A
Nitrogen, total kjeldahl	ug/L	100	NA		NA	#N/A
Total dissolved solids	ug/L	20 000				#N/A
Total suspended solids	ug/L	2000				#N/A
Sulfate	ug/L	5000 2000			250000	#N/A
Total organic carbon	~~%~~ mg/L	~~#N/A~~	~~#N/A~~	#N/A	#N/A	#N/A

(see key for footnotes)

1300

300 (SMCL

units

100

5000 (SMCL)

250,000 (SMCL)

10000

500,000 (SMCL)

250,000 (SMCL)

ignore SMCLs

Table M-2
Summary of Surface Water Detection Limits and Applicable Criteria
Albion Sheridan Township Landfill, Albion, Michigan
Units as Given

Parameter ~~Chemical~~ / Criteria		Surface Water CRQL	Rule 57 Guidelines (Non-DW)	Federal Fresh Water Water Quality Criteria		
				Acute	Chronic	Notes
Volatiles	***Units***					
Acetone	ug/L	5	500	#N/A	#N/A	
Carbon disulfide	ug/L	1	ID	#N/A	#N/A	
Methylene chloride	ug/L	1	59	#N/A	#N/A	
Toluene	ug/L	1	110	17500	#N/A	*, d
Butyl benzyl phthalate	ug/L	5	#N/A	940	3	*, ~~class~~ phthalate excess
Diethyl phthalate	ug/L	5	~~#N/A~~ ID	940	3	*, class
4-Methyl phenol	ug/L	5	24	#N/A	#N/A	
Phenol	ug/L	5	1100	10200	2560	*
Aluminum	ug/L	80	#N/A	#N/A	#N/A	~~pH~~
Arsenic	ug/L	5	11	360	190	m
Barium	ug/L	20	#N/A	#N/A	#N/A	
Cadmium	ug/L	0.5	0.409 H	3.9 H	1.1 H	e,m
Calcium	ug/L	1000	#N/A	#N/A	#N/A	
Chromium	ug/L	10	48.1 H	16 (VI)	11 (VI)	m
Cobalt	ug/L	10	#N/A	#N/A	#N/A	
Copper	ug/L	10	10.7 H	18 H	12 H	e,m
Iron	ug/L	100	#N/A	~~#N/A~~	1000	(poster only) c
Lead	ug/L	2	2.88 H	82 H	3.2 H	e,m
Magnesium	ug/L	1000	#N/A	#N/A	#N/A	
Manganese	ug/L	10	#N/A	#N/A	#N/A	
Nickel	ug/L	20	33.3 H	1400 H	160 H	e,m
Potassium	ug/L	2000	#N/A	#N/A	#N/A	
Selenium	ug/L	2	~~20~~ 22	20	5	
Sodium	ug/L	1000	~~#N/A~~	#N/A	#N/A	
Thallium	ug/L	2	#N/A	1400	40	*
Vanadium	ug/L	10	8	#N/A	#N/A	
Zinc	ug/L	20	49.6 H	120 H	110 H	e,m
Chloride	ug/L	5000	#N/A	860,000 ~~#N/A~~	230,000 #N/A	poster only (c)
Total dissolved solids	ug/L	20000	#N/A	#N/A	#N/A	
Total suspended solids	ug/L	2000	#N/A	#N/A	#N/A	
Sulfate	ug/L	5000	#N/A	#N/A	#N/A	

e = H = Hardness dependant (used 100 mg/L default)

m = function of water effect Ratio (WER) as defined in 40 CFR 131.36(c). WER=1

Ignore (notes on sheet not on table)

* = ID - value is L.O.E.L.

~~Est~~

(c) = 53 FR 19028

— = checked on Fed Reg. Final Rule

— = checked on Poster

documentation

CASE 18924
SDG EMC02

An out-of-control trap heater on instrument HPMSD-A caused a large amount of tenax breakdown products to be deposited in the purge-and-trap gas lines. Thorough rinsing with methanol eliminated most of these products; however, a small amount (1-2 ppb) of benzene was detected for several days afterwards.

The EICP area of internal standard chlorobenzene-d5 was below the QC limit in the analysis of sample EMC86. Re-analysis showed similar results so the problem can be attributed to interference by the sample matrix. Both analyses are being reported and billed.

SEMIVOLATILES ANALYSIS

use original WDS 8/8/93

The extract of sample EMC02 was lost on the GPC. The sample was re-extracted (within the hold time) with no problems.

PESTICIDE/PCBs ANALYSIS

The GPC calibration samples for 10/24/92 were lost. The calibration results for 10/14/92 and 10/31/92 are included.

An unknown peak was found to co-elute with tetrachloro-meta-xylene on the DB1701 column, interfering with retention time and quantitation of this compound.

The recovery %RPD for 4,4'-DDT in standard INDAM04 on the DB1701 column exceeded the allowed maximum by 7.2%.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package and in the computer-readable data submitted on diskette has been authorized by the Laboratory Manager or designee, as verified by the following signature:

R R Whitney for
R. Jenkins

Rand Jenkins, CLP Project Manager
November 19, 1992

CASE 19427 -3- 2-4-93 samples

Standard	cis- isomer	trans- isomer
VSTD010	10.6 ppb	9.2 ppb
VSTD020	21.2	18.4
VSTD050	53	46
VSTD100	106	92
VSTD200	212	184

Semivolatile fraction: The surrogate 2,4,6-Tribromophenol (TBP) is quantitated using the internal standard Phenanthrene-d10 (PHEN), instead of Acenaphthene-d10 (ACEN), which is required by the SOW. The reason for this change is that TBP elutes closer to PHEN than ACEN. The change was made because PHEN better represents the chromatographic region in which TBP elutes.

Method Blanks. The method blanks extracted and analyzed with the samples met CLP criteria.

Surrogate Recoveries. All calculated surrogate recoveries met CLP QC limits, with the following exceptions.

Semivolatile fraction: The original analysis of sample EFR42 resulted in two base/neutral surrogate recoveries outside of QC limits. A reanalysis confirmed the outliers. The sample was reextracted thirteen days past the holding time, and reanalyzed. All surrogate recoveries were within CLP limits in the reanalysis. Both analyses are submitted.

use original analysis. WDS 6/4/93

Pesticide fraction: The decachlorobiphenyl (DCB) recovery was slightly below advisory QC limits (56%) on the DB-608 column for sample EFR42.

Internal Standard Response. All internal standard responses were within the QC limits as established by the daily 50 ppb standard, with the following exception in the semivolatile fraction.

The original analysis of sample EFR42 resulted in responses below the QC limits for Acenaphthene-d10, Chrysene-d12, and Perylene-d12. The sample was reextracted and reanalyzed, resulting in acceptable responses for all internal standards. Please see surrogate recoveries section for additional information regarding this sample.

Matrix Spike/Duplicate. The 1,1-Dichloroethene recovery fell below the QC limits in the volatile MS analysis. An acceptable recovery was reported in the MSD analysis, with the resulting relative percent difference (RPD) exceeding the QC limit.

Telephone Memorandum

Project No.: 04011.03 Client: Albion Landfill Date: 12/10/92

Subject: questions on Lab qualifications

Your Name: Wayne Schall Outside Party: Pat Churilla

Made Call (✓) USEPA CRL

Rec'd Call ( ) 312-353-5210

Comments

- called 12/10 am - left voice mail
- called 12/11 3pm - left message w/ receptionist.
- he returned call ~3:45pm 12/11/92

Summary of Conversation:

1. lab control samples associate? yes. by extraction date.

2. Storage blanks → all associated? yes. → use 10 x rule for common lab contaminants to compare to all samples

3. SVOA Reanalysis → ignore? - 2 BEHP hits in RE < RQL
   ↳ Keep reanalysis. → probably lab storage contamination

CC: 04011.03
Liz Uhl