Onondaga County Health Department

Division of Environmental Health
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Incinerator Monitoring Program

2013
Screening Summary
for
Organic Constituents

April 1, 2014

Submitted To: **Cynthia B. Morrow, M.D., M.P.H.**
Commissioner of Health

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I. Table of Abbreviations

The following abbreviations may be used in this report:

ATSDR	Agency for Toxic Substances and Disease Registry.
PCDD/PCDF	Polychlorinated Dibenzo-p-Dioxins/Dibenzofurans.
PCB	Polychlorinated Biphenyls.
PAH	Polycyclic Aromatic Hydrocarbons.
μg/g	micrograms per gram (also denoted as ug/g).
ng/g	nanograms per gram.
ng/kg	nanograms per kilogram (pg/g equivalent).
pg/g	picograms per gram (ng/kg equivalent).
LD	Limit of Detection.
NS	Not sampled.
ND	Not detected.
OCHD	Onondaga County Health Department.
WTE	Waste to Energy.
~	approximately.
<	Less than.
>	Greater than.

II. Executive Summary

Organic sample analyses for the year 2013 of soil and ash for the Incinerator Monitoring Program have been conducted by Axys Analytical Services LTD. Analyses for this summary include PCDD/PCDF, PCB and PAH. Ash collection was conducted by Covanta Energy personnel (formerly Odgen Martin), with random oversight by the Onondaga County Health Department's Division of Environmental Health. The collection of all ambient environmental samples was, and continues to be, the responsibility of the Division of Environmental Health. Final sample composites were prepared by Life Science Laboratories, Inc. (formerly O'Brien and Gere Environmental Laboratory).

Much of the comparative background data and information referenced in this report was obtained from NYDEC Soil Cleanup Objectives, EPA Preliminary Remediation Goals and Soil Screening Levels, along with the U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry's Toxicological Profiles.

The analyses for organics completed during this monitoring period show the parameters are within the expected range for urban and rural environments. The results are below levels associated with health risk. The 2013 sampling revealed levels typical of historical data at all sites. Given the low levels detected and the corresponding variation expected as a result of sample collection, preparation, and laboratory procedures, the levels that have been determined do not allow for comparison to establish change in the environment. In the organic monitoring conducted to date, no relationship between the operation of the incinerator and increased levels of organics has been established.

III. Introduction.

In November 1994, the Onondaga County Resource Recovery Agency, in contract with the Covanta Energy Company (formerly Ogden Martin Company), commenced operation of a municipal solid waste incinerator. This undertaking was part of a multifaceted solid waste management program to achieve a reduction of volume of landfill waste, energy withdrawal, and the removal of solids incompatible with incineration. Part of the management program for the reuse of materials and the removal of materials prior to the municipal waste stream had been started earlier.

The Onondaga County Health Department initiated a program in 1993 to include short and long term monitoring aspects to document any health implications to the public and environmental changes from the incinerator. Changes have been made to the monitoring program several times in response to new information as it became available. In 2003 the monitoring program was re-evaluated to provide a more effective and efficient program. Direct interaction was established with the Onondaga County Resource Recovery Agency (OCCRA) and the New York State Department of Environmental Conservation (DEC) in providing stack monitoring results and improved assurance on reporting of adverse events and equipment failures. This allowed for effective evaluation of short-term change in the incinerator emissions rather than the previous limited scope offsite air monitoring conducted over a nine year period. Several changes were implemented in 2009 based on the low levels of organic constituents detected in the monitoring conducted to date, and the fact that there is no evidence of a trend or levels associated with health risks. The fourteen routine soil sites (which include two control sites) continue to be sampled and analyzed twice a year for metals which are documented in a separate report. Half of the sites (7, including one control) are being tested for organics once a year. The sites will be rotated so that each is tested every other year. The program includes the flexibility to test a site two years in a row if there is an elevated level of any organic constituent. The four ash route soil sites have been eliminated from the program. These sites were located along the route that trucks take to carry ash across and out of the County. To date these sites have not shown any elevation of metals or organics and the trucks are covered at all times. Ash, directly from the incinerator continues to be analyzed for metals twice a year and organics once a year. The department continues to interact directly with OCCRA and DEC in review of stack monitoring results.

This is the fourteenth report for screening of organics, analyzed for dioxin, dibenzofurans, polychlorinated biphenyls and polycyclic aromatic hydrocarbons, from samples of ambient soil and combined ash collected from the incinerator operation. The analysis of soil samples provides a useful and convenient mechanism for monitoring accumulative change of these organics in the environment. Surface soil samples can be utilized to monitor deposition of transient materials that can drop from atmospheric particulate materials, materials spilled in the area and materials spread on the land for agricultural purposes.

A program designed to monitor soil samples collected on a routine basis will provide an assessment of the organic material deposited in the sample area. The limitation of this matrix is that there are numerous sources and a normal action by nature is occurring on the soil at all times. The results reported should be utilized with other reports for studies in other areas. The soil sample analyses described in this

report are part of an ongoing program of environmental monitoring performed by the Onondaga County Health Department as part of its overall Incinerator Monitoring Program.

This report represents data from the screening of soil and ash collected during the calendar year 2013. This is the nineteenth year of operation of the WTE facility. Three samples were collected at each soil location during each sampling event. Ash sampling is conducted by Covanta Energy personnel during their semi-annual collection. Through the sampling year 2002, it was the responsibility of the Onondaga County Health Department Environmental Toxicology Laboratory to create the soil and ash composites. Beginning with 2004, the contract laboratory, Life Science Laboratories, Inc. (formerly O'Brien and Gere Environmental Laboratories) created one composite sample for each organic analysis of soil and a two-day and three-day composite of the ash for analysis.

IV. PCDD/PCDF Specific Summary.

PCDDs are a class of chlorinated tricyclic aromatic hydrocarbons. There are 75 chlorinated dioxins, all varying in toxicity. Generally, the PCDD congeners of relative toxic concern are 2,3,7,8-TCDD, 1,2,3,7,8-PeCDD, 1,2,3,4,7,8-HxCDD, 1,2,3,6,7,8-HxCDD, 1,2,3,7,8,9-HxCDD and 1,2,3,4,6,7,8-HpCDD. PCDFs are also a class of chlorinated tricyclic aromatic hydrocarbons. There are 135 chlorinated furans, of which, approximately 10 to 12 are expected to have significant acute toxicity. The most acutely toxic isomers appear to be 2,3,7,8-TCDF, 1,2,3,7,8-PeCDF and 2,3,4,7,8-PeCDF. Each sample was tested for seventeen different congeners of PCDD/PCDF.

Each congener of PCDD/DF has associated with it a toxic equivalency factor, TEF. This factor is an indication of the toxicity of the individual congeners with respect to 2,3,7,8 TCDD, the most toxic congener. Each sample has a calculated total toxic equivalency, TEQ, shown in Tables 1 and 2. While the toxic equivalency is the main consideration for the determination of change, individual congener concentrations have also been reviewed for significance.

Table 1 displays the results of soil analyses for dioxin and dibenzofurans at the six routine sampling sites and one control site for the spring sampling period of year 2013. In general, the set of TEQ results from these samples confirmed very well the results that were presented in the previously issued "Screening Summary for Organic Constituents" reports (Refer to Attachment A). Results from both the routine sites and the control site demonstrate no distinct pattern from background through year 2013 sampling. The TEQ's for 2013 are well below the screening level of 50 pg/g used by ATSDR and the EPA preliminary remediation goal of 1000 pg/g. The levels as reported are not of health significance and are within expected levels as stated in other documents for background levels in soil.

Table 2 displays the analyses for ash from the incinerator. The TEQ result for the ash composite for day 1 & 2 and day 3-5 are consistent with previous results. Ash is not homogenous and can contain chunks of material which may account for an occasionally inconsistent result. These results are similar to reports for ash identified by other investigators and reported in published literature. All of the ash is transported in closed vehicles and buried at a Department of Environmental Conservation permitted

landfill.

Attachment A shows the historical TEQ values for routine soil sites, control sites, and ash samples.

V. PCB Specific Summary.

Polychlorinated biphenyls, PCB's, are a class of more than 200 man-made chemical compounds. PCB's were widely used in industrial applications due to the physical characteristics of the compounds. Incineration of PCB containing products can lead to a release of PCB's into the environment. Soil sampling is a strong indicator of PCB levels in the environment because of the persistence and adhesion capabilities of the substance. PCB analysis in the past had resulted in less than detectable concentrations. Axys Analytical Services, LTD lowered the limit of detection for PCB starting in 2000 so that usable concentrations are now being presented. The ATSDR Toxicological Profile for PCB (1996) indicates that typical mean PCB concentrations in background soil are <100 μg/kg (<100,000 pg/g). The NYSDEC has a Soil Cleanup Objective of 100,000 pg/g for PCB's and the EPA has a soil screening level of 240,000 pg/g for residential soil.

PCB results are presented in Tables 3 and 4. Table 3 displays results for the six routine sites within the impact area of the WTE Facility along with a control site. The mean PCB concentration for routine sites was 7,838 pg/g, with a maximum concentration of 38,400 pg/g at the DOT@Jaquith site. In general, PCB results in this study are well below the ATSDR typical background soil level of 100,000 pg/g. Soil is not homogenous and can contain materials that can account for an occasional inconsistent result. Attachment B shows historical levels of PCB's at routine soil sites along with control sites.

Table 4 displays the results of PCB analyses of ash as collected from the WTE Facility. At 16,200 and 10,100 pg/g, the PCB levels for the year 2013 sampling are lower than the previously stated ATSDR typical background soil level.

VI. PAH Specific Summary.

Polycyclic aromatic hydrocarbons, PAH's, are primarily formed as the result of incomplete combustion of organic matter. PAH's, like PCB's, have a strong persistence and affinity to particulate matter. For this reason, soil and ash sampling are quality measures of the levels attributable to incineration. As with the PCB analyses, Axys Analytical Services, LTD has lowered the limit of detection for PAH congeners for this report so that additional usable concentrations are now being presented.

PAH results for soil are presented in Table 5. Attachment C presents NYSDEC Soil Cleanup Objectives, EPA screening levels, NYS Rural soil survey results, and Toxicological Profile levels for PAH's for rural, agricultural and urban soils. These levels can vary widely for the individual PAH's. The levels reported in the 2013 study are generally within these expected ambient levels.

PAH results for the WTE ash composites are presented in Table 6. Comparison

of the 2013 composite ash results to the averages for years 1999 through 2012 individual results exhibits little variation in PAH congener specific concentrations.

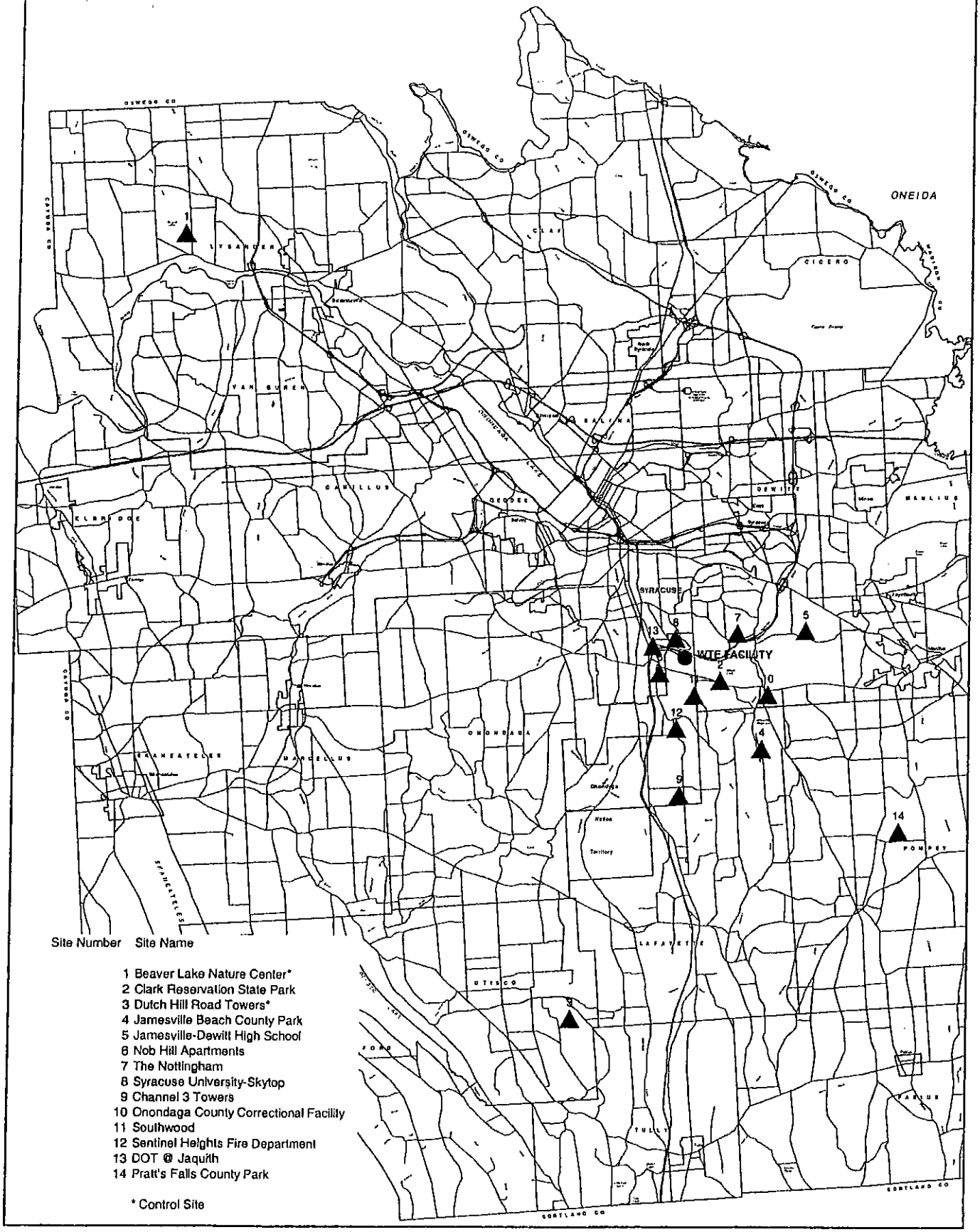
VII. Summary and Conclusions

This screening represents the organic analysis data for calendar year 2013 environmental soil and ash samples. PCDD, PCDF, PCB and PAH levels are all quality indicators of ambient conditions in the environment. By following the concentrations and trends of these compounds, two objectives are accomplished. First, ambient conditions are monitored for changes due to point sources. Second, health risks can be established for the effect of the soil concentrations.

The reported concentrations of all organic compounds in this screening are within expected levels and are below significant health risk levels. In general, little change in levels of these compounds have been observed from background through the present organic screening period.

The Onondaga County Health Department will continue to monitor soil and ash for organic compounds.

OCHD ROUTINE SOIL MONITORING SITES



Site Number Site Name

1 Beaver Lake Nature Center*
2 Clark Reservation State Park
3 Dutch Hill Road Towers*
4 Jamesville Beach County Park
5 Jamesville-Dewitt High School
6 Nob Hill Apartments
7 The Nottingham
8 Syracuse University-Skytop
9 Channel 3 Towers
10 Onondaga County Correctional Facility
11 Southwood
12 Sentinel Heights Fire Department
13 DOT @ Jaquith
14 Pratt's Falls County Park

* Control Site

Table 1

		Control Site	Routine Sites					
		Beaver Lake	Pratts Falls	The Nottingham	DOT @ Jaquith	Channel 3 Tower	Southwood	OCCF
		May 15 2013	May 15 2013	May 15 2013	May 15 2013	May 15 2013	May 15 2013	May 15 2013
Accession Number:		L19931-3	L19931-6	L10031-1	L19931-2	L19931-5	L19931-4	L19931-7
PCDD / PCDF	TEF							
2,3,7,8-TCDD	1	0.118	0.137	0.118	3.91	0.232	0.181	0.249
1,2,3,7,8-PeCDD	0.5	0.221	0.206	0.221	4.33	0.248	0.282	1.32
1,2,3,4,7,8-HxCDD	0.1	0.264	0.247	0.264	8.91	0.378	0.297	3.27
1,2,3,6,7,8-HxCDD	0.1	0.736	0.504	0.736	18.6	0.714	0.593	7.57
1,2,3,7,8,9-HxCDD	0.1	0.725	0.887	0.725	24.2	1.03	0.78	8.11
1,2,3,4,6,7,8-HpCDD	0.01	9.84	10.1	9.84	464	11	11.8	228
OCDD	0.001	55	52.6	55	3030	63.3	72.7	1400
2,3,7,8-TCDF	0.1	0.603	0.463	0.603	3.73	0.934	0.652	1.28
1,2,3,7,8-PeCDF	0.05	0.275	0.244	0.275	1.53	0.377	0.284	0.477
2,3,4,7,8-PeCDF	0.5	0.349	0.324	0.349	2.67	0.474	0.361	0.603
1,2,3,4,7,8-HxCDF	0.1	0.507	0.506	0.507	6.36	0.816	0.557	1.49
1,2,3,6,7,8-HxCDF	0.1	0.359	0.341	0.359	8.78	0.48	0.401	1.04
1,2,3,7,8,9-HxCDF	0.1	< 0.0481	0.069	< 0.0481	0.134	< 0.0468	< 0.0485	0.068
2,3,4,6,7,8-HxCDF	0.1	0.302	0.376	0.302	7.79	0.358	0.357	0.957
1,2,3,4,6,7,8-HpCDF	0.01	3.8	2.91	3.8	128	3.67	3.15	34.2
1,2,3,4,7,8,9-HpCDF	0.01	0.261	0.254	0.261	7.02	0.352	0.284	1.54
OCDF	0.001	8.08	5.67	8.08	186	6.68	5.26	96.1
Total TEQ		0.791	0.91	0.791	24.3	1.02	0.807	7.67
Total Tetra-Dioxins		1.66	0.898	9.87	9.87	0.801	0.723	2.83
Total Penta-Dioxins		2.41	1.47	28.8	28.8	2.02	2.48	9.13
Total Hexa-Dioxins		6.49	7.01	175	175	7.34	7.43	57.7
Total Hepta-Dioxins		19.2	19.9	862	862	19.9	23.1	382
Total Tetra-Furans		4.66	3.24	35.6	35.6	3.45	4.82	9.68
Total Penta-Furans		4.26	3.56	106	106	2.73	4.11	10.4
Total Hexa-Furans		4.74	4.11	202	202	6.18	3.68	29.3
Total Hepta-Furans		8.46	5.6	267	267	7.67	6.42	86.9

Results reported in pg/g (ng/kg equivalent) dry weight.

Comparison Values	
EPA Action Level	1,000 ng/kg (Total TEQ)
ATSDR EMEG Value	50 ng/kg (Total TEQ)

Table 2

		Combined Ash	
		Spring 2013	
		Day 1 & 2	Day 3 - 5
Accession Number:		L19931-8	L19931-9
PCDD / PCDF	TEF		
2,3,7,8-TCDD	1	17.2	18.7
1,2,3,7,8-PeCDD	0.5	43.6	41.5
1,2,3,4,7,8-HxCDD	0.1	29.8	30.2
1,2,3,6,7,8-HxCDD	0.1	48.7	49.4
1,2,3,7,8,9-HxCDD	0.1	72.8	74.5
1,2,3,4,6,7,8-HpCDD	0.01	410	410
OCDD	0.001	1050	961
2,3,7,8-TCDF	0.1	363	302
1,2,3,7,8-PeCDF	0.05	124	102
2,3,4,7,8-PeCDF	0.5	124	107
1,2,3,4,7,8-HxCDF	0.1	125	107
1,2,3,6,7,8-HxCDF	0.1	132	113
1,2,3,7,8,9-HxCDF	0.1	9.92	9.2
2,3,4,6,7,8-HxCDF	0.1	95.8	84.8
1,2,3,4,6,7,8-HpCDF	0.01	326	323
1,2,3,4,7,8,9-HpCDF	0.01	39.7	48
OCDF	0.001	119	183
Total TEQ		176	161
Total Tetra-Dioxins		353	311
Total Penta-Dioxins		451	414
Total Hexa-Dioxins		622	646
Total Hepta-Dioxins		861	875
Total Tetra-Furans		2700	2490
Total Penta-Furans		1960	1660
Total Hexa-Furans		1230	1050
Total Hepta-Furans		513	519

Results reported in pg/g dry weight.

Table 3

	Control Site	Routine Sites					
	Beaver Lake	Pratts Falls	The Nottingham	DOT @ Jaquith	Channel 3 Tower	Southwood	OCCF
	May 15 2013	May 15 2013	May 15 2013	May 15 2013	May 15 2013	May 15 2013	May 15 2013
Accession Number:	L1991-3	L1991-6	L1991-1	L16543	L1654-7	L1654-5	L1654-6(A)
PCB							
Total Monochloro Biphenlys	0.643	0.81	1.28	34.6	2.15	1.75	2.35
Total Dichloro Biphenyls	2.89	4.05	16.3	180	2.8	8.28	15.7
Total Trichloro Biphenyls	7.91	10.8	20	759	9.37	26.2	52.5
Total Tetrachloro Biphenyls	32.4	37	71	2090	38.2	68.2	144
Total Pentachloro Biphenyls	170	158	252	7300	174	206	541
Total Hexachloro Biphenyls	536	346	409	13900	333	366	1430
Total Heptachloro Biphenyls	387	276	304	8940	258	301	1220
Total Octachloro Biphenyls	165	170	149	3470	143	180	449
Total Nonachloro Biphenyls	46.3	66.1	48.8	1120	46.5	62.1	86.7
Decachloro Biphenyl	34.4	32.9	17.1	628	22.3	24.1	26.3
Total PCB'S	1380	1100	1290	38400	1030	1240	3970

Results reported in pg/g dry weight.

Comparison Value	
ATSDR Typical Mean Background Value	< 100,000 pg/g

Table 4

	Combined Ash	
	Spring 2013	
	Day 1 & 2	Day 3 - 5
Accession Number:	L19931-8W	L19931-9W
PCB		
Total Monochloro Biphenlys	287	347
Total Dichloro Biphenyls	1970	1910
Total Trichloro Biphenyls	6710	3400
Total Tetrachloro Biphenyls	5320	2770
Total Pentachloro Biphenyls	1180	902
Total Hexachloro Biphenyls	393	380
Total Heptachloro Biphenyls	178	192
Total Octachloro Biphenyls	68.6	92.2
Total Nonachloro Biphenyls	28	55.6
Decachloro Biphenyl	20.7	29.4
Total PCB'S	16200	10100

Results reported in pg/g dry weight.

Table 5

	Control Site	Routine Sites					
	Beaver Lake	Pratts Falls	The Nottingham	DOT @ Jaquith	Channel 3 Towers	Southwood	OCCF
	May 15 2013	May 15 2013	May 15 2013	May 15 2013	May 15 2013	May 15 2013	May 15 2013
Accession Number:	L19931-3	L19931-6	L10031-1	L19931-2	L19931-5	L19931-4	L19931-7
PAH							
Naphthalene	1.99	2.74	4.22	204	7.2	3.76	7.96
Acenaphthylene	1.42	3.26	6.11	1180	34	5.3	8.98
Acenapthene	0.503	0.649	1.02	131	10.7	1.78	1.9
Fluorene	0.412	0.643	0.798	216	19.5	2.55	2.15
Phenanthrene	7.82	14	24.9	3240	228	26.7	40.3
Anthracene	1.49	2.68	4.38	1310	59.8	6.01	8.72
Fluoranthene	19.2	28.2	63.9	8600	328	57.8	75.4
Pyrene	17.2	25.8	53.2	7210	278	48.7	69.2
Benzo(A)Anthracene	8.47	12.6	21.7	3970	117	22.4	29
Chrysene	12.2	22.2	35.1	4450	148	30.4	45.9
Benzo(B)Flouranthene	11.3	15.9	30.1	3780	85.4	25.5	36.1
Benzo(J,K)Fluoranthene	10.9	14.9	30.8	4210	105	26.9	38.4
Benzo(E)Pyrene	8.83	15	23.4	3420	73.3	20.8	30.5
Benzo(A)Pyrene	12.8	17.9	31.8	4770	120	32.1	41.6
Perylene	2.51	3.52	6.19	1070	23.1	5.86	8.21
Dibenzo(A,H)Anthracene	1.85	3.38	5.26	664	18.9	4.9	6.86
Indeno(1,2,3-CD)Pyrene	8.9	12.2	23	3000	65.4	20.7	28.6
Benzo(G,H,I)Perylene	7.89	12.6	21.9	2760	59.6	20.3	29.1
2-Methylnaphthalene	1.33	2.52	5.17	157	6.12	3.79	9.2
2,6-Dimethylnaphthalene	0.719	1.34	2.38	85.3	5.37	1.91	4.6
2,3,5-Trimethylnaphthalene	0.596	1.19	2.9	124	7.41	1.92	4.92
1-Methylphenanthrene	1.42	2.78	5.62	494	35	4.67	9.02
Dibenzothiophene	0.87	2.12	1.97	155	14.7	2.05	3.19
2-Chloronaphthalene	0.0451	0.02	0.0464	0.02	0.03	0.02	0.02

Results reported in ng/g dry weight.

Table 6

	Combined Ash	
	Spring 2013	
	Day 1 & 2	Day 3 - 5
Accession Number:	L19931-8	L19931-9
PAH		
Naphthalene	70.4	62.4
Acenaphthylene	21.7	17.3
Acenapthene	19	19.9
Fluorene	32.2	30.5
Phenanthrene	169	162
Anthracene	40.3	28.4
Fluoranthene	148	129
Pyrene	116	103
Benzo(A)Anthracene	51.9	48.9
Chrysene	62.2	56.9
Benzo(B)Fluoranthene	43.1	39.1
Benzo(J,K)Fluoranthene	42.1	42.8
Benzo(E)Pyrene	35.7	53
Benzo(A)Pyrene	50.3	49.4
Perylene	13.5	12.7
Dibenzo(A,H)Anthracene	8.66	8.23
Indeno(1,2,3-CD)Pyrene	31.5	31.8
Benzo(G,H,I)Perylene	31.9	31.8
2-Methylnaphthalene	23.7	20.8
2,6-Dimethylnaphthalene	6.02	6.14
2,3,5-Trimethylnaphthalene	3.56	3.59
1-methylphenanthrene	10.5	11.1
Dibenzothiophene	10.1	9.92
2-Chloronaphthalene	0.226	0.227

Results reported in ng/g dry weight.

Attachment A

Dioxin/Furan TEQ Soil Resuts Through Year 2013 (pg/g dry weight)

Routine Soil Sites

Site	Year														
	1994	1999	2000	2001	2002	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Clark Reservation	1.8	1.2	2.27	1.42	1.23	2.03	1.90	1.76	1.73	1.26	***	1.64	***	1.75	***
Jamesville Beach	0.6	0.5	1.09	0.82	0.70	0.71	0.97	0.86	0.93	0.77	***	0.52	***	0.488	***
OCCF	0.79	2.2	1.68	1.47	1.26	1.38	5.54	1.52	1.94	1331.72@	1.72	***	2.13	***	7.67
DOT @ Jaquith	2		1.5	1.64	3.41	2.41	3.78	3.38	1.73	39.90@	2.62	***	3.95	***	2.43
Dutch Hill *	**0.77**		**1.41**	**1.16**	**1.40**	**1.03**	**1.26**	**1.02**	**1.02**	**0.64**	*******	**0.73**	*******	**2.44**	*******
Erie - Poolsbrook *	**1.39**		**1.5**	**1.14**	**1.86**	**	**	**	**	**	**	**	**	**	**
Nottingham	0.51		0.78	0.79	0.80	0.70	0.94	0.85	0.84	0.74	0.76	***	0.43	***	0.791
SHFD	12		8.02	9.89	9.72	7.02	8.09	6.27	7.20	10.74	***	7.12	***	16	***
Sevier Rd	1.8		2.07	2.58	2.56	**	**	**	**	**	**	**	**	**	**
Beaver Lake *			**0.51**	**0.53**	**0.85**	**0.70**	**0.72**	**0.64**	**0.69**	**0.65**	**0.38**	*******	**0.5**	*******	**0.751**
Ch. 3 Towers			3.36	3.88	3.35	9.66	7.79	7.69	5.39	2.44	3.72	***	0.45	***	1.02
Gen.Crushed Stone			2.77	1.98	2.13	**	**	**	**	**	**	**	**	**	**
Highland Forest			1.18	1.24	0.96	**	**	**	**	**	**	**	**	**	**
JD High School			1.32	1.29	1.12	1.10	1.48	1.16	1.06	1.28	***	1.13	***	0.951	***
Nob Hill			0.93	0.91	0.90	6.83	1.01	1.00	1.07	1.05	***	0.78	***	0.488	***
Pratts Falls			0.91	0.98	0.77	0.87	0.98	0.83	0.94	1.17	0.82	***	0.94	***	0.91
Southwood			0.6	1.14	1.01	1.08	1.05	0.97	1.09	1.01	0.80	***	0.93	***	0.807
Syracuse University			3.11	6.97	9.47	13.89	3.14	3.66	12.96	0.67	***	2.45	***	1.63	***

* Denotes Control Sites
** Site no longer sampled due to program re-evaluation
*** Site not sampled this year. Sites are sampled every other year.
@ A single elevated value will not be assumed to be indicative of a change at a specific site, rather a pattern of values must demonstrate a statistically significant difference.

Combined Ash

Site	Year														
	1999-Spring	1999-Fall	2000-Fall	2001-Fall	2002-Fall	2004-Spring	2005-Spring	2006-Spring	2007-Spring	2008-Spring	2009-Spring	2010-Spring	2011-Spring	2012-Spring	2013-Spring
Day 1 and 2	256	153	109	123	177	72	191	246	250	243	168	200	197	116	176
Day 3, 4, and 5	242	205	154	137	220	445	142	148	276	240	126	172	129	127	161

Note: For reference purposes, the ATSDR investigation level for Dioxin/Furan TEQ is 50 pg/g and the EPA clean up level is 1,000 pg/g.

Attachment B

PCB Results through Year 2013 (pg/g dry weight)

Routine Soil Sites

Site	2000	2001	2002	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Clark Reservation	6010	2360	3150	2780	3610	2770	4110	2640	***	2960	***	2980	***
Jamesville Beach	1260	644	683	703	1110	781	1220	1610	***	589	***	707	***
OCCF	3080	5230	2000	2310	6940	3120	6320	2190	2810	***	2650	***	3970
DOT @ Jaquith	16100	15400	45100	9220	67100	49100	18000	14200	34700	***	31800	***	38400
Dutch Hill *	**2210**	**1170**	**1400**	**1200**	**1380**	**1140**	**1450**	**1340**	*******	**1060**	*******	**2350**	*******
Erie - Poolsbrook *	**2620**	**1400**	**2020**	**	**	**	**	**	**	**	**	**	**
Nottingham	2140	2280	3610	1640	7380	2850	3050	2110	4200	***	2020	***	1290
SHFD	3080	2970	1760	1900	2730	1610	2510	1730	***	2240	***	1260	***
Sevier Rd	1870	1600	2250	**	**	**	**	**	**	**	**	**	**
Beaver Lake *	**1970**	**1210**	**5250**	**2650**	**1420**	**1360**	**1360**	**1370**	**2450**	*******	**1110**	*******	**1380**
Ch. 3 Towers	3360	2310	2490	1620	1830	1730	2220	1400	1510	***	723	***	1030
General Crushed Stone	9430	3160	5450	**	**	**	**	**	**	**	**	**	**
Highland Forest	2120	1210	1270	**	**	**	**	**	**	**	**	**	**
JD High School	3580	1780	1732	1810	2640	1780	1720	2720	***	1750	***	1450	***
Nob Hill	3500	2480	2500	3440	2810	2970	2830	2950	***	2510	***	1820	***
Pratts Falls	1890	1840	1440	1620	1650	1220	1450	2050	1230	***	1910	***	1100
Southwood	2240	2160	1150	1480	1470	1470	2750	1640	1640	***	1120	***	1240
Syracuse University	10700	114000	11000	9510	6940	11400	10900	1170	***	78600	***	17400	***

* Denotes Control Sites
** Site no longer sampled due to program re-evaluation
*** Site not sampled this year. Sites are sampled every other year.

Combined Ash

Site	2000-Fall	2001-Fall	2002-Fall	2004-Spring	2005-Spring	2006-Spring	2007-Spring	2008-Spring	2009-Spring	2010-Spring	2011-Spring	2012-Spring	2013-Spring
Day 1 and 2	79000	22000	13600	7850	2470	5770	3080	23000	3100	5930	1260	1800	16200
Day 3, 4, and 5	4700	7020	6580	38000	33000	57000	3060	5550	51900	8840	6060	20500	10100

PCB results prior to 2000 were all less than detection limits. Starting in 2000 detection limits were lowered so that usable concentrations were available.

Note: For reference purposes, the ATSDR indicates that typical mean PCB concentrations in background soil are less than 100,000 pg/g

Results reported in ng/g dry weight. Attachment C.

PAH	NYSDEC SCO[1] unrestricted	NYSDEC SCO[2] restricted	EPA screening level[3]	NYS Rural soil survey[4]	Tox.[5] Profile Rural soil background	Tox.[6] Profile Agr. Soil background	Tox.[7] Profile Urban soil background
Napthalene	12,000	100,000	3,900	17-24	NA	NA	NA
Acenaphthylene	100,000	100,000	3,400,000	110-500	NA	5	NA
Acenapthene	20,000	100,000	NA	150	1.7	6	NA
Fluorene	30,000	100,000	2,300,000	580	NA	9.7	NA
Phenanthrene	100,000	100,000	NA	8,500	30	48-140	NA
Anthracene	100,000	100,000	17,000,000	620	NA	11-13	NA
Fluoranthene	100,000	100,000	2,300,000	7,400	0.3-40	120-210	200-166,000
Pyrene	100,000	100,00	1,700,000	8,700	1-19.7	99-150	145-147,000
Benzo(A)Anthracene	1,000	1,000	150	2,900	5-20	56-110	169-59,000
Chrysene	1,000	1,000	15,000	1,300	38.3	78-120	251-640
Benzo(B,K)Fluoranthene	1,000	1,000	150-1500	1,500-3,300	10-110	58-250	15,000-62,000
Benzo(E)Pyrene	NA	NA	NA	NA	NA	53-130	60-14,000
Benzo(A)Pyrene	1,000	1,000	15	2,400	2-1,300	4.6-900	165-220
Perylene	NA	NA	NA	8,700	NA	NA	NA
Dibenzo(A,H)Anthracene	330	330	15	NA	NA	NA	NA
Indeno(1,2,3-CD)Pyrene	500	500	150	660	10-15	63-100	8,000-61,000
Benzo(G,H,I)Perylene	100,000	100,000	NA	630	10-70	66	900-47,000
2-Methylnaphthalene	NA	NA	310,000	NA	NA	NA	NA
2-Chloronaphthalene	NA	NA	NA	NA	NA	NA	NA

Sources:
1,2. New York State Department of Environmental Soil Cleanup Objectives, 9/06. Unrestricted use accounts for the use of the land for raising livestock.
3. USEPA residential soil screening levels (SSL's), September, 2008/
4. NYS Rural Soil Survey, NYSDEC, 2005.
5,6,7. Agency for Toxic Substances and Disease Registry (ATSDR), Toxicological Profiles, 1995/