Onondaga County Health Department

Division of Environmental Health
421 Montgomery Street
Syracuse, New York 13202

Incinerator Monitoring Program

2012 Soil Metals Analysis Summary

June 1, 2013

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

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Contents:

The following abbreviations may be used in this report:

As	Arsenic.
ATSDR	Agency for Toxic Substances and Disease Registry
Be	Beryllium.
Cd	Cadmium.
CES	Certified Environmental Services.
Cr	Chromium.
CV	Coefficient of Variation.
ELS	Environmental Laboratory Services.
Hg	Mercury.
LD	Limit of Detection.
ND	None Detected.
ug/g	micrograms per gram.
Ni	Nickel.
OCCF	Onondaga County Correctional Facility.
OCHD	Onondaga County Health Department.
PAH	Polyaromatic Hydrocarbon
PCB	Polychlorinated Biphenyls
PCDD/PCDF	Polychlorinated Dibenzo-p-Dioxins/Dibenzofurans
Pb	Lead.
pg/g	picograms per gram
PPM	parts per million.
SD	Standard Deviation.
Se	Selenium.
SHFD	Sentinel Heights Fire Department
V	Vanadium.
WTE	Waste to Energy Facility.
Zn	Zinc.
~	approximately.
<	Less than.
>	Greater than.
NA	Not applicable.
NS	Not sampled.

II. Introduction:

The analysis of soil samples provides a useful and convenient mechanism for monitoring changes in the environment. Surface soil samples can be representative of deposition of atmospheric particulate materials, and normally provides a continuous, cumulative monitor for many such events. The soil sample analyses described in this report is 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 analyses of soils collected during the calendar year 2012, which is the eighteenth year of operation of the Waste to Energy (WTE) Facility. Three samples were collected at each site location during each sampling event. An independent contract laboratory created one composite sample from each sampling event and used this sample for metal content analysis.

II.A. Executive Introduction:

Metals analysis, along with sample composite preparation for this reporting period, was conducted by Life Science Laboratories, Inc. (formerly O'Brien and Gere Laboratory, Inc.) The collection of all environmental samples was, and continues to be, the responsibility of the Onondaga County Health Department's Division of Environmental Health.

Results of soil analyses from the start of the Incinerator Monitoring Program until June 1998 were reported exclusively on a wet weight basis. Starting with the second half of 1998, soil sample results have been reported on both a wet and dry weight basis. Each of these reported values provides important information regarding site specific data. Wet weight values provide ambient concentrations, the conditions in which soil may be ingested. This information is useful in determining risk assessment factors in environmental matrices. Wet weight values will be used for historical site comparison. Dry weight values will allow for better comparison with future metal concentrations, removing the factor of soil moisture variability and seasonal fluctuations. Dry weight values will tend to be higher than wet weight since the weight of the "inert" water is removed in the concentration calculations.

III. Summary:

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 1994 to include short and long term monitoring aspects to document any health implications to the public and environmental changes from the incinerator. 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 allows 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 ten different metals. Half of the sites (7, including one control) are being tested for organics once a year and documented in a separate report. The four ash route 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.

Fourteen soil sample sites are currently established as routine sites. Some of these sites were specifically chosen because of their proximity to the WTE facility, and their potential to show maximum impact from its operation (due either to a high likelihood of deposition or the impact of deposition on any areas with “sensitive individuals”). These sites included Southwood, Sentinel Heights, Channel 3 Towers, Jamesville Pen. DOT @ Jaquith and Clark Reservation. Sites such as Jamesville-Dewitt High School, The Nottingham, and Nob Hill Apartments were chosen because of their large population of “sensitive individuals” (i.e. the very young and the elderly). Regions at or near potentially high impact areas in publicly owned land were chosen to ensure long-term accessibility. These sites include Pratts Falls, Jamesville Beach, and Syracuse University. Two sites (Beaver Lake and Dutch Hill) have been established as routine control sites because they are considered to be outside the impact area of the WTE facility.

The individual values for each element are presented in this report as a means of evaluating the intra-site variation. Element mean values have been calculated based on results above the limit of detection for comparison with historical data. Further, we have prepared an overall summary of all the data points and their associated statistical parameters on an element-specific basis, as a means of evaluating inter-site variation as well.

It is anticipated that the primary basis for evaluation of potential environmental changes will be both site and element specific from a strictly statistical basis. Hence, a single elevated or depressed value will not be assumed to be indicative of a change at a specific site. Rather, the pattern of values for that specific element must demonstrate a statistically significant difference, which may be indicative of a real environmental change.

While this study was designed to be locally focused with a concern for potential environmental contamination of local origin, it is also hoped that this compilation of data may be a useful benchmark for the determination of subtle environmental impacts covering a large area, and not necessarily a function of local activities.

In 2011, due to improvements in laboratory equipment, the detection limits for beryllium, cadmium, and selenium were lowered. Therefore there are detectable levels of these metals in many of the soil samples starting in 2011 as compared to previous years.

The ten metals are discussed individually in the metal specific summaries, which follow. Levels of metals in soils can be compared with background levels (samples taken prior to the operation of the incinerator) and to national averages, as shown in the site specific summaries. In addition, Attachment A provides data on New York State Department of Environmental Conservation Soil Cleanup Objectives, a New York State rural soil survey, and USEPA soil screening levels for residential soil. In general, the metal results for the 2012 soil sampling year fall within the expected range of values. All levels remain below those associated with health concerns.

IV. Soil Sample Site Locations:

Routine Soil Monitoring Sites (*Denotes Control Sites):

1.	*__Beaver Lake:__	Beaver Lake County Park is located approximately 13 miles NW of the City of Syracuse in the Town of Lysander. The sample site is located in the overflow parking area, in the SE corner of the park.
2.	**Clark Reservation:**	Clark Reservation State Park is located approximately 0.5 miles SE of the WTE facility on Route 173. The sample site is in an open grassy area, adjacent to the basketball court.
3.	*__Dutch Hill Road:__	The sampling site is located on the Dutch Hill Road Radio Tower site, approximately 11 miles SSW of the City of Syracuse, in the Town of Otisco.
4.	**Jamesville Beach:**	The Jamesville Beach County Park is located on the western shore of the Jamesville Reservoir, off Apulia Road. The sample site is near the entrance of the park.
5.	**Jamesville-DeWitt H.S.:**	The Jamesville-DeWitt High School is approximately 3.5 miles ENE of the WTE facility. The sample site is located on the southern edge of the property, near the bus garage.
6.	**Nob Hill:**	The Nob Hill Apartments are located between Seneca Turnpike and Lafayette Road. The sampling site is located near the rental office building.
7.	**Nottingham:**	The Nottingham Retirement Complex is located approximately 2 miles ENE of the WTE facility on Nottingham Road. The sample site is in the NE corner of the property, adjacent to the maintenance garage.
8.	**Syracuse University:**	The Syracuse University site is located approximately 1/2 mile north of the WTE facility, near the Skytop administrative building. The sample site is adjacent to the radio towers.
9.	**Channel 3 Tower:**	The Channel 3 Tower site (formerly Tennessee Gas site) is approximately 4 miles south of the WTE on Sentinel Heights Road. The tower site is just south of the Sentinel Heights Road / Bull Hill Road intersection.
10.	**Jamesville Pen.:**	The Jamesville Penitentiary (Onondaga County Correctional Facility) is located on Route 173, just east of the village of Jamesville. The sample site is adjacent to the sewage treatment plant.
11.	**Southwood:**	The Southwood Park is located approximately 1 mile south of the WTE facility, off Barker Hill Road and Southwood Park Drive. The sample site is adjacent to the picnic area.

12. Sentinel Heights: The Sentinel Heights Fire Department is located on Dave Tilden Road, approximately 2.5 miles SSW of the WTE facility. The sampling site is on the lawn, just east of the building.

13. DOT @ Jaquith: The Onondaga County DOT property site borders Brighton Ave, the Jaquith Industries property and Route 81, near the Route 481 - Route 81 interchange. The sampling site is located in the middle of the grassy open field.

14. Pratts Falls: The Pratts Falls County Park is located approximately 2 miles NNE of the Village of Pompey. The sample site is in the center of the park, in an open recreation area.

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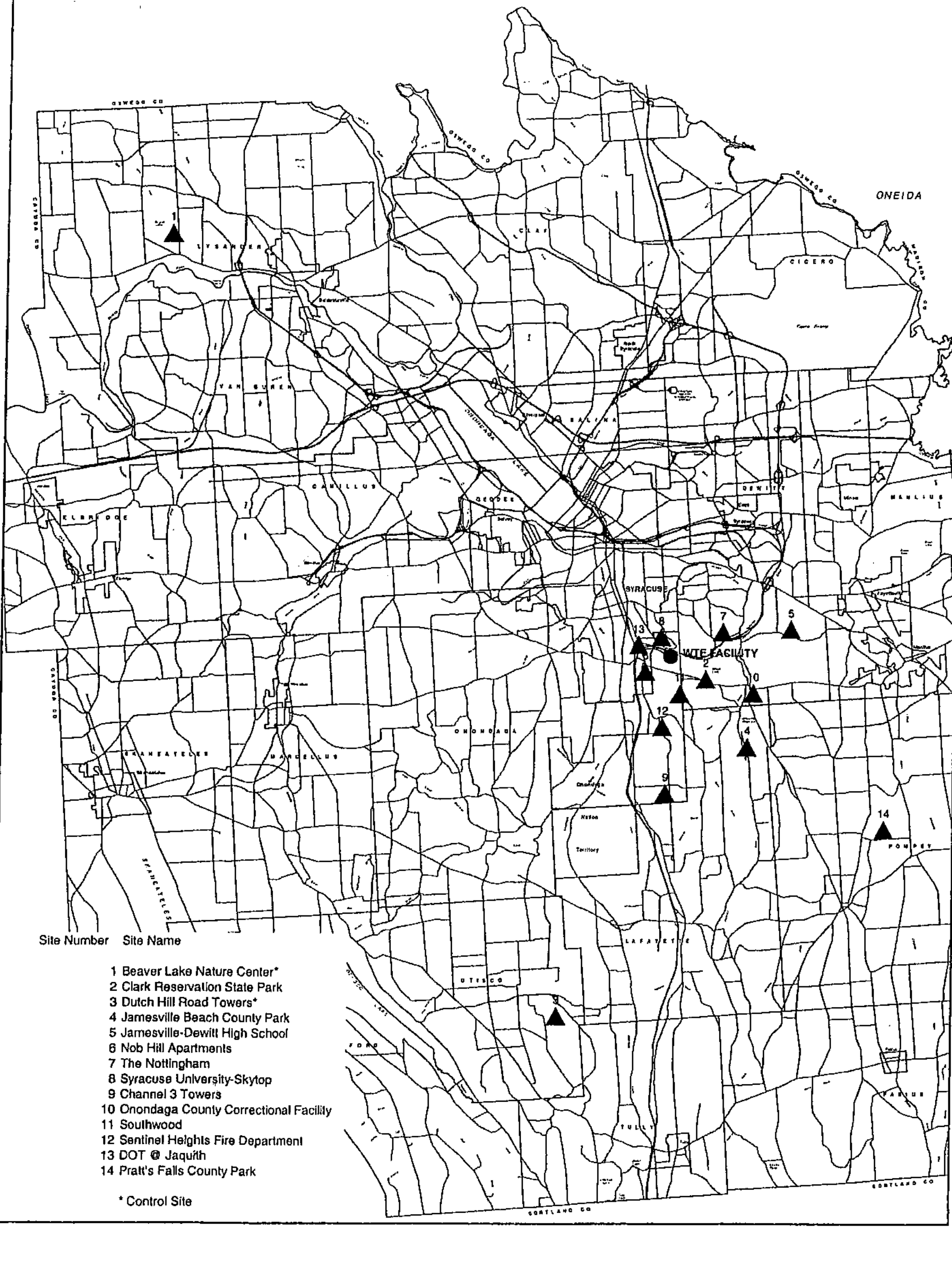
OCHD ROUTINE SOIL MONITORING SITES



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

V. Element Specific Summaries:

A. Arsenic

Soil levels of Arsenic range from 1 - 40 ppm nationwide, while NYS levels average 16 ppm. Routine site values in the 2012 study varied from 3.2 ppm wet weight (3.8 ppm dry wt) to a high value of 8.3 ppm wet weight (11.0 ppm dry wt), and a mean value of 5.23 ppm wet weight.

These do not represent statistically significant changes when compared to background findings and levels remain in the lower range of nationwide and NYS averages.

B. Beryllium

Soil levels of beryllium range from 0.01 - 10 ppm nationwide, while NYS levels average 1.2 ppm. Routine site values in the 2012 study varied from 0.28 ppm wet weight (0.32 ppm dry wt) to a high value of 1.1 ppm wet weight (1.5 ppm dry wt), and a mean value of 0.54 ppm wet weight.

These do not represent statistically significant changes when compared to background findings and levels remain in the range of nationwide and NYS averages.

C. Cadmium

Soil levels for cadmium are highly variable and average ~0.25 ppm nationwide, while NYS levels average 2.5 ppm. Routine site values in the 2012 study varied from 0.12 ppm wet weight (0.15 ppm dry wt) to a high value of 1.1 ppm wet weight (1.4 ppm dry wt), and a mean value of 0.51 ppm wet weight.

These do not represent statistically significant changes when compared to background findings and levels remain in the range of nationwide and NYS averages.

D. Chromium

Soil levels of chromium are highly variable, ranging from “trace” to thousands of ppm nationwide, while NYS levels average 30 ppm. Routine site values in the 2012 study varied from 8.8 ppm wet weight (11.0 ppm dry wt) to a high value of 26.0 ppm wet weight (32.0 ppm dry wt), and a mean value of 14.2 ppm wet weight.

These do not represent statistically significant changes when compared to background findings and levels remain in the range of nationwide and NYS averages.

E. Lead

Soil levels of lead range from <10 to 30 ppm nationwide, with NYS averaging 133 ppm in rural areas. Higher levels can occur as a function of proximity to vehicular traffic.

Routine site values in the 2012 study varied from 6.0 ppm wet weight (7.0 ppm dry wt) to a high value of 56.0 ppm wet weight (69.0 ppm dry wt), and a mean value of 17.4 ppm wet weight.

These do not represent statistically significant changes when compared to background findings and levels remain in the range of nationwide and NYS averages.

F. Mercury

Soil levels of mercury range from 0.02 to 0.60 ppm nationwide, while NYS levels average 0.3 ppm. Routine site values in the 2012 study varied from 0.054 ppm wet weight (0.069 ppm dry wt) to a high value of 0.091 ppm wet weight (0.12 ppm dry wt), and a mean value of 0.07 ppm wet weight.

These do not represent statistically significant changes when compared to background findings and levels remain in the range of nationwide and NYS averages.

G. Nickel

Soil levels of nickel range from 4 to 80 ppm nationwide, while NYS levels average 29.5 ppm. Routine site values in the 2012 study varied from 8.2 ppm wet weight (9.6 ppm dry wt) to a high value of 30.0 ppm wet weight (38.0 ppm dry wt), and a mean value of 16.7 ppm wet weight.

These do not represent statistically significant changes when compared to background findings and levels remain in the range of nationwide and NYS averages.

H. Selenium

Soil levels of selenium range from 0.01 to 0.20 ppm nationwide, while NYS levels average 4 ppm. There were no routine site samples above the detection limit for selenium.

I. Vanadium

Soil levels of vanadium range from 3 to 310 ppm nationwide, while NYS levels average 38 ppm. Routine site values in the 2012 study varied from 14.0 ppm wet weight (18.0 ppm dry wt) to a high value of 29.0 ppm wet weight (38.0 ppm dry wt), and a mean value of 18.5 ppm wet weight.

These do not represent statistically significant changes when compared to background findings and levels remain in the range of nationwide and NYS averages.

J. Zinc

Soil levels of zinc range from 10 to 300 ppm nationwide, while NYS levels average 180 ppm. Routine site values in the 2012 study varied from 24.0 ppm wet weight (28.0 ppm dry wt) to a high value of 110.0 ppm wet weight (130.0 ppm dry wt), and a mean value of 51.4 ppm wet weight.

These do not represent statistically significant changes when compared to background findings and levels remain in the range of nationwide and NYS averages.

2012 Soil Summary Data; Beaver Lake (ppm; ug/g)

			Spring 2012		Fall 2012	
Element	National Average	Background Mean 1994 (wet wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)
Arsenic	1.0 - 40	3.51	4.4	5.1	4.1	5.2
Beryllium	.01-10	0.22	0.27	0.31	0.28	0.36
Cadmium	~0.25	<0.1	<0.1	<0.12	0.27	0.34
Chromium	trace-thousands	5.63	5.9	6.8	6.2	7.9
Lead	<10 - 30	6.02	8.6	9.9	9.3	12
Mercury	.02-.06	0.024	<.050	<0.058	<.050	<0.063
Nickel	4.0 -80	5.72	6	7	5.3	6.7
Selenium	.01 -.2	0.227	<0.5	<0.58	<0.5	<0.63
Vanadium	3.0 -310	8.72	11	13	12	15
Zinc	10.0 -300	22.7	22	25	25	32

Analysis performed by Life Sciences Laboratories, Inc.

2012 Soil Summary Data; Clark Reservation (ppm; ug/g)

			Spring 2012		Fall 2012	
Element	National Average	Background Mean 1994 (wet wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)
Arsenic	1.0-40	4.87	7.4	9.9	7.1	9.6
Beryllium	0.01-10	0.5	1.1	1.5	1.1	1.4
Cadmium	~0.25	0.26	0.43	0.58	0.62	0.83
Chromium	trace-thousands	11.83	15	20	15	21
Lead	<10-30	15.03	22	29	20	27
Mercury	0.02-0.6	0.063	0.091	0.12	0.078	0.11
Nickel	4.0-80	13.39	15	20	17	22
Selenium	0.01-0.2	0.259	<0.5	<0.67	<0.50	<0.67
Vanadium	3.0-310	11.26	20	27	21	28
Zinc	10.0-300	30.7	28	38	34	45

Analysis performed by Life Sciences Laboratories, Inc.

VI. Site Specific Summary

2012 Soil Summary Data; Dutch Hill (ppm; ug/g)

			Spring 2012		Fall 2012	
Element	National Average	Background Mean 1994 (wet wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)
Arsenic	1.0-40	4.58	5.8	7.8	5.9	8.1
Beryllium	0.01-10	0.16	0.59	0.79	0.52	0.7
Cadmium	~0.25	0.15	0.57	0.77	0.69	0.94
Chromium	trace-thousands	10.14	14	18	13	18
Lead	<10-30	15.19	22	30	19	26
Mercury	0.02-0.6	0.048	0.063	0.085	<0.05	<0.068
Nickel	4.0-80	12.45	16	22	15	21
Selenium	0.01-0.2	0.3	<0.50	<0.67	<0.5	<0.68
Vanadium	3.0-310	9.96	19	26	18	24
Zinc	10.0-300	55.8	91	120	80	110

Analysis performed by Life Sciences Laboratories, Inc.

2012 Soil Summary Data; Jamesville Beach (ppm; ug/g)

			Spring 2012		Fall 2012	
Element	National Average	Background Mean 1994 (wet wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)
Arsenic	1.0-40	2.99	8.1	10	3.8	4.7
Beryllium	0.01-10	0.26	0.88	1.1	0.41	0.51
Cadmium	~0.25	0.16	0.47	0.6	0.31	0.39
Chromium	trace-thousands	9.73	23	29	11	14
Lead	<10-30	8.77	20	26	9.8	12
Mercury	0.02-0.6	0.037	<0.05	<0.063	<0.05	<0.062
Nickel	4.0-80	13.62	30	38	16	20
Selenium	0.01-0.2	0.236	<0.5	<0.63	<0.5	<0.62
Vanadium	3.0-310	9.12	29	36	14	18
Zinc	10-300	27.3	65	82	33	42

Analysis performed by Life Sciences Laboratories, Inc.

VI. Site Specific Summary

2012 Soil Summary Data; Jamesville Dewitt H.S. (ppm; ug/g)

			Spring 2012		Fall 2012	
Element	National Average	Background Mean 1994 (wet wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)
Arsenic	1.0-40	4.98	4.7	6.2	4.7	6.1
Beryllium	0.01-10	0.23	0.5	0.65	0.54	0.7
Cadmium	~0.25	0.17	0.12	0.15	0.64	0.83
Chromium	trace-thousands	11.37	16	21	18	23
Lead	<10-30	12.9	15	20	13	17
Mercury	0.02-0.6	0.041	<0.05	<0.065	0.062	0.08
Nickel	4.0-80	12.07	15	20	19	24
Selenium	0.01-0.2	0.32	<0.5	<0.65	<0.5	<0.64
Vanadium	3.0-310	11.08	19	25	20	28
Zinc	10-300	33.5	54	70	51	66

Analysis performed by Life Sciences Laboratories, Inc.

VI. Site Specific Summary

2012 Soil Summary Data; Nob Hill (ppm; ug/g)

			Spring 2012		Fall 2012	
Element	National Average	Background Mean 1994 (wet wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)
Arsenic	1.0-40	3.75	3.9	4.9	3.9	4.7
Beryllium	0.01-10	0.23	0.43	0.53	0.42	0.5
Cadmium	~0.25	0.17	0.17	0.21	0.54	0.65
Chromium	trace-thousands	8.94	11	13	11	14
Lead	<10-30	11.74	13	16	14	17
Mercury	0.02-0.6	0.037	<0.05	<0.063	<0.05	<0.061
Nickel	4.0-80	12.65	12	15	11	14
Selenium	0.01-0.2	0.355	<0.5	<0.63	<0.5	<0.61
Vanadium	3.0-310	10.15	15	19	17	20
Zinc	10-300	26.5	31	39	33	40

Analysis performed by Life Sciences Laboratories, Inc.

Site Specific Summary

2012 Soil Summary Data; The Nottingham (ppm; ug/g)

Element	National Average	Background Mean 1994 (wet wt.)	Spring 2012 Three Point Composite (wet wt.)	Spring 2012 Three Point Composite (dry wt.)	Fall 2012 Three Point Composite (wet wt.)	Fall 2012 Three Point Composite (dry wt.)
Arsenic	1.0-40	4.4	3.7	4.7	4.8	6.2
Beryllium	0.01-10	0.29	0.53	0.66	0.55	0.71
Cadmium	~0.25	0.21	0.24	0.3	0.57	0.73
Chromium	trace-thousands	10.41	16	20	16	20
Lead	<10-30	8.13	9.3	12	12	16
Mercury	0.02-0.6	<0.50	<0.05	<0.063	0.054	0.069
Nickel	4.0-80	11.26	16	21	16	21
Selenium	0.01-0.2	0.334	<0.5	<0.63	<0.50	<0.64
Vanadium	3.0-310	10.16	15	19	19	24
Zinc	10-300	31.6	41	51	52	67

Analysis performed by Life Sciences Laboratories, Inc.

VI. Site Specific Summary

2012 Soil Summary Data; Syracuse University (ppm; ug/g)

			Spring 2012		Fall 2012	
Element	National Average	Background Mean 1994 (wet wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)
Arsenic	1.0-40	3.15	3.2	3.8	4.1	5.6
Beryllium	0.01-10	0.3	0.28	0.32	0.41	0.56
Cadmium	~0.25	0.22	<.1	<0.12	0.57	0.77
Chromium	trace-thousands	9.3	11	13	14	18
Lead	<10-30	13.41	6	7	15	20
Mercury	0.02-0.6	0.046	<0.05	<0.59	<0.05	<0.067
Nickel	4.0-80	11	8.2	9.6	13	17
Selenium	0.01-0.2	0.306	<0.5	<0.59	<0.5	<0.67
Vanadium	3.0-310	10.49	17	20	17	23
Zinc	10-300	33.4	24	28	48	65

Analysis performed by Life Sciences Laboratories, Inc.

VI. Site Specific Summary

2012 Soil Summary Data; Channel 3 Tower (ppm; ug/g)

			Spring 2012		Fall 2012	
Element	National Average	Background Mean 1994 (wet wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)
Arsenic	1.0-40	5.24	4.5	6.9	6.4	8.3
Beryllium	0.01-10	0.16	0.49	0.76	0.59	0.76
Cadmium	~0.25	0.34	0.31	0.48	1.1	1.4
Chromium	trace thousands	9.83	11	17	15	19
Lead	<10-30	11.18	13	20	14	18
Mercury	0.02-0.6	0.046	<0.05	<0.078	0.057	0.073
Nickel	4.0-80	13.49	15	23	25	32
Selenium	0.01-0.2	0.355	<0.5	<0.78	<0.5	<0.65
Vanadium	3.0-310	8.27	15	23	17	23
Zinc	10-300	56.4	61	95	73	94

Analysis performed by Life Sciences Laboratories, Inc.

VI. Site Specific Summary

2012 Soil Summary Data; Jamesville Pen. (OCCF) (ppm; ug/g)

			Spring 2012		Fall 2012	
Element	National Average	Background Mean 1994 (wet wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)
Arsenic	1.0-40	6.4	5.4	7.1	8.3	11
Beryllium	0.01-10	0.29	0.39	0.51	0.53	0.67
Cadmium	~0.25	0.25	0.22	0.29	0.92	1.2
Chromium	trace-thousands	9.8	8.8	11	13	16
Lead	<10-30	18.38	18	23	20	25
Mercury	0.02-0.6	0.053	<0.05	<0.065	0.059	0.076
Nickel	4.0-80	20.53	19	25	30	38
Selenium	0.01-0.2	0.38	<0.5	<0.65	<0.50	<0.64
Vanadium	3.0-310	12.03	14	18	17	22
Zinc	10-300	38.7	46	60	53	68

Analysis performed by Life Sciences Laboratories, Inc.

VI. Site Specific Summary

2012 Soil Summary Data; Southwood (ppm; ug/g)

			Spring 2012			Fall 2012		
Element	National Average	Background Mean 1994 (wet wt.)	Three Point Composite (wet wt.)		Three Point Composite (dry wt.)	Three Point Composite (wet wt.)		Three Point Composite (dry wt.)
Arsenic	1.0-40	3.23	4		5.6	5		6.8
Beryllium	0.01-10	0.31	0.48		0.67	0.63		0.86
Cadmium	~0.25	0.24	0.19		0.27	0.92		1.2
Chromium	trace-thousands	12.17	12		17	16		22
Lead	<10-30	11.95	12		16	14		18
Mercury	0.02-0.6	0.045	<0.05		<0.07	<0.05		<0.068
Nickel	4.0-80	13.39	13		18	15		21
Selenium	0.01-0.2	0.353	<0.5		<0.7	<0.5		<0.68
Vanadium	3.0-310	13.14	16		23	20		27
Zinc	10-300	44.1	46		65	52		71

Analysis performed by Life Sciences Laboratories, Inc.

VI. Site Specific Summary

2012 Soil Summary Data; Sentinel Heights (ppm; ug/g)

			Spring 2012		Fall 2012	
Element	National Average	Background Mean 1994 (wet wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)
Arsenic	1.0-40	4.71	6.2	9	6.3	8.8
Beryllium	0.01-10	0.41	0.59	0.86	0.59	0.83
Cadmium	~0.25	0.44	0.4	0.59	0.92	1.3
Chromium	trace-thousands	9.98	12	17	13	18
Lead	<10-30	13.16	15	22	15	21
Mercury	0.02-0.6	0.043	<0.05	<0.073	0.05	0.07
Nickel	4.0-80	17.06	19	27	19	27
Selenium	0.01-0.2	0.511	<0.5	<0.73	<0.5	<0.7
Vanadium	3.0-310	14.22	21	30	22	31
Zinc	10-300	46.9	58	84	58	81

Analysis performed by Life Sciences Laboratories, Inc.

VI. Site Specific Summary

2012 Soil Summary Data; DOT@Jaquith Industries (ppm; ug/g)

			Spring 2012		Fall 2012	
Element	National Average	Background Mean 1994 (wet wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)
Arsenic	1.0-40	3.46	5.3	6.7	6.8	8.4
Beryllium	0.01-10	0.21	0.41	0.52	0.48	0.6
Cadmium	~0.25	0.13	0.38	0.48	0.93	1.1
Chromium	trace-thousands	10.17	14	18	26	32
Lead	<10-30	29.67	55	69	55	67
Mercury	0.02-0.6	0.043	0.061	0.1	0.085	0.1
Nickel	4.0-80	9.44	16	20	19	23
Selenium	0.01-0.2	0.15	<0.5	<0.63	<0.50	0.061
Vanadium	3.0-310	8.6	15	18	18	22
Zinc	10-300	34.1	94	120	110	130

Analysis performed by Life Sciences Laboratories, Inc.

VI. Site Specific Summary

2012 Soil Summary Data; Pratts Falls (ppm; ug/g)

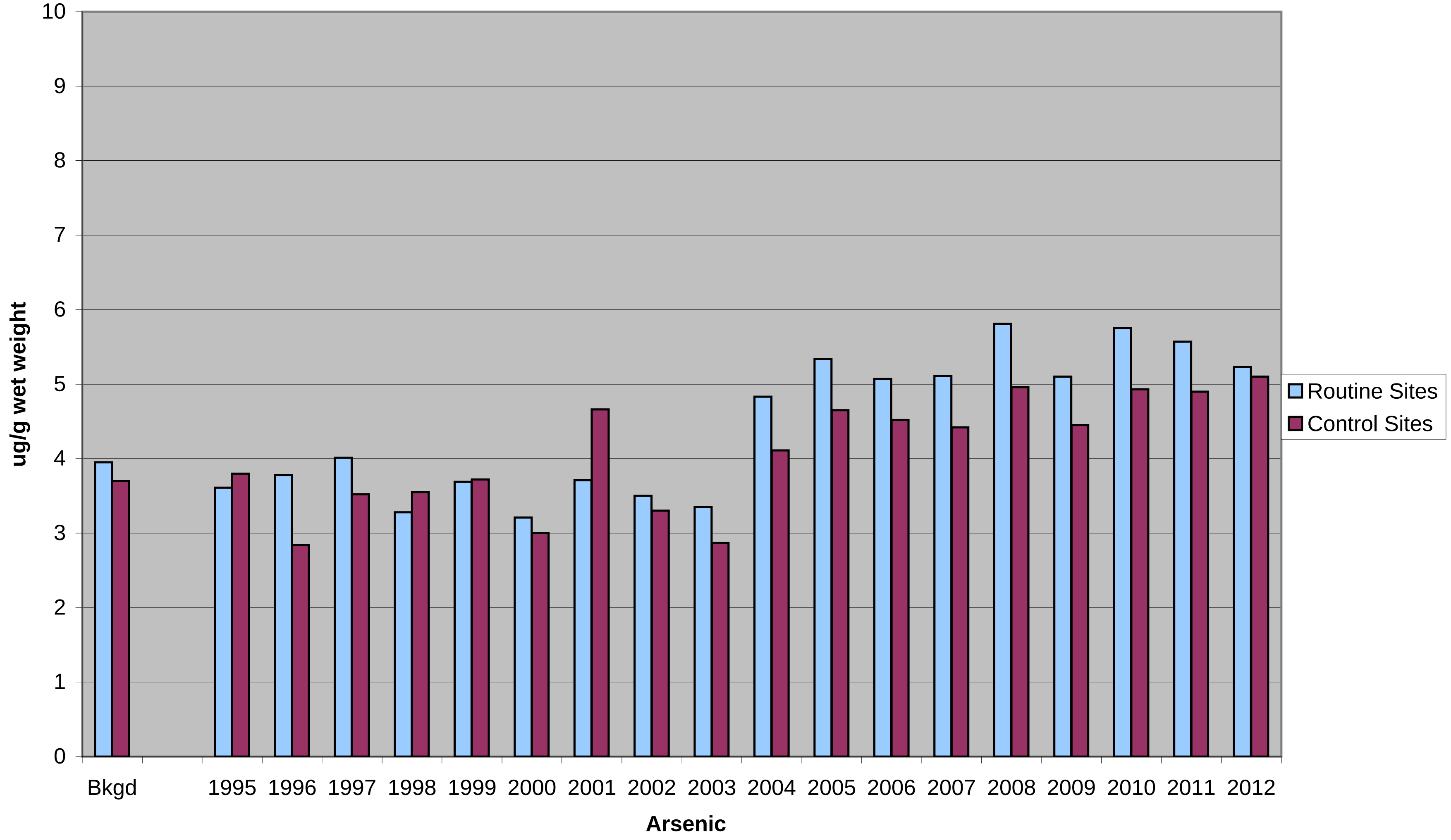
			Spring 2012		Fall 2012	
Element	National Average	Background Mean 1994 (wet wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)	Three Point Composite (wet wt.)	Three Point Composite (dry wt.)
Arsenic	1.0-40	2.51	4.4	6.1	4.2	5.5
Beryllium	0.01-10	0.12	0.35	0.48	0.38	0.49
Cadmium	~0.25	0.22	0.32	0.44	0.4	0.52
Chromium	trace-thousands	9.05	12	17	11	15
Lead	<10-30	11.18	15	21	13	17
Mercury	0.02-0.6	0.034	<0.05	<0.70	<0.05	<0.065
Nickel	4.0-80	9.62	11	15	12	16
Selenium	0.01-0.2	0.269	<0.5	<0.7	<0.5	<0.65
Vanadium	3.0-310	11.44	23	32	20	25
Zinc	10-300	28.4	45	63	44	57

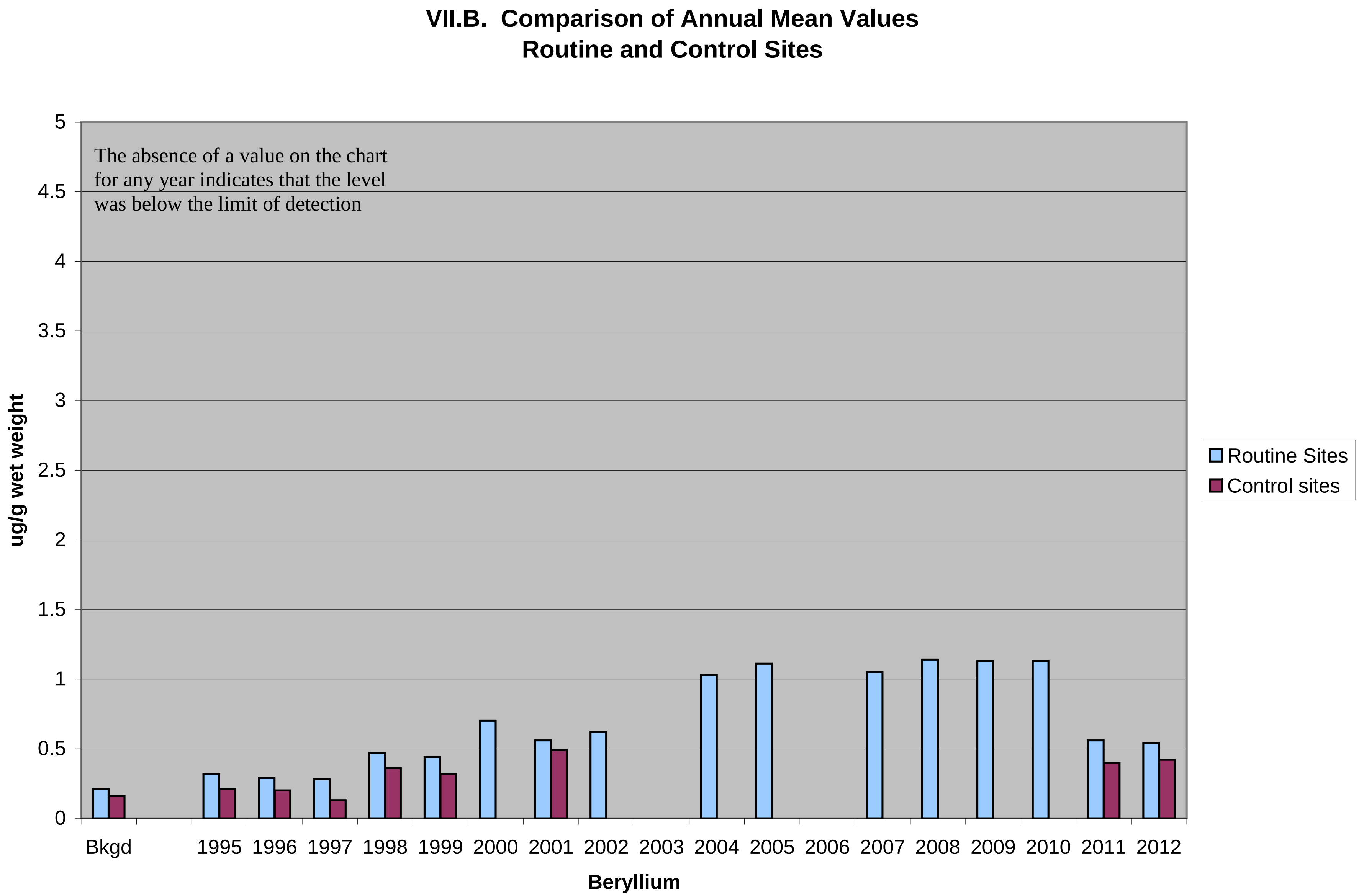
Analysis performed by Life Sciences Laboratories, Inc.

VII. Routine Sites Mean Comparison

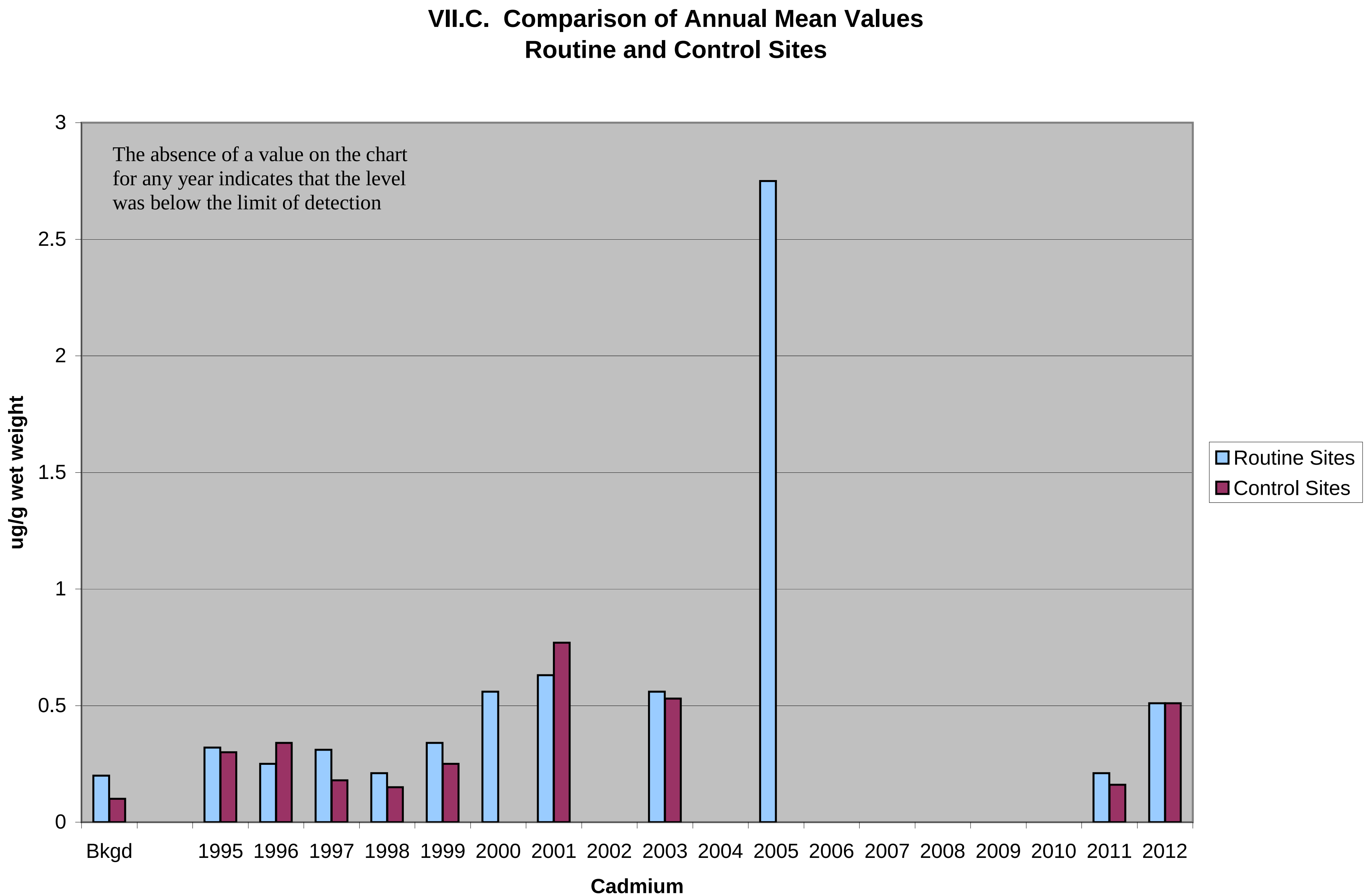
Soil Metal Analysis - ug/g wet weight	**As**	**Be**	**Cd**	**Cr**	**Pb**	**Hg**	**Ni**	**Se**	**V**	**Zn**
Background Mean - Routine Sites	3.95	0.21	0.2	9.99	13.2	0.05	12.7	0.35	10.6	35.6
Background Mean - Routine Control Sites	3.7	0.16	0.1	9.71	10.5	0.04	10	0.26	10.2	36
1995 Mean - Routine Sites	3.61	0.32	0.32	12.7	14.7	0.05	15	0.48	13.8	45.3
1995 Mean - Routine Control Sites	3.8	0.21	0.3	12.2	14.4	0.04	12.3	0.39	14.3	50.3
1996 Mean - Routine Sites	3.78	0.29	0.25	12.6	12.9	0.06	14.2	0.3	15	43.4
1996 Mean - Routine Control Sites	2.84	0.2	0.34	12	13.7	0.05	9.95	0.22	15.1	48.2
1997 Mean - Routine Sites	4.01	0.28	0.31	11.6	12.3	0.06	13	0.37	13.4	37.4
1997 Mean - Routine Control Sites	3.52	0.13	0.18	10.3	11.8	NA	10.1	0.27	11.4	41.3
1998 Mean - Routine Sites	3.28	0.47	0.21	9.23	13.5	0.08	12.3	1.32	12.4	41.4
1998 Mean - Routine Control Sites	3.55	0.36	0.15	8.42	11.7	NA	9.54	NA	12.3	35.5
1999 Mean - Routine Sites	3.69	0.44	0.34	12.8	17.3	0.05	15	1.24	15.8	44.9
1999 Mean - Routine Control Sites	3.72	0.32	0.25	12.2	12.6	NA	11.4	NA	15.3	45
2000 Mean - Routine Sites	3.21	0.7	0.56	10.55	16.02	0.05	12.53	0.84	13.84	41.46
2000 Mean - Routine Control Sites	3	NA	NA	9.12	11.41	0.05	9.7	NA	12.07	37.39
2001 Mean - Routine Sites	3.71	0.56	0.63	12.24	15.65	0.06	15.01	0.79	14.75	45.07
2001 Mean - Routine Control Sites	4.66	0.49	0.77	12.03	14.08	0.05	12.26	5.11	13.85	44.51
2002 Mean - Routine Sites	3.5	0.62	NA	11.96	16.4	0.07	13.71	0.83	16.08	41.02
2002 Mean - Routine Control Sites	3.3	NA	NA	11.99	11.43	0.04	11.46	0.51	14.24	42.87
2003 Mean - Routine Sites	3.35	NA	0.56	11.65	10	0.05	12.17	NA	14.32	36.08
2003 Mean - Routine Control Sites	2.87	NA	0.53	15.24	8.76	NA	10.29	NA	15.08	36.26
2004 Mean - Routine Sites	4.83	1.03	NA	13.1	16.6	NA	15.12	0.91	16.34	48.79
2004 Mean - Routine Control Sites	4.11	NA	NA	8.26	11.15	NA	8.67	0.75	12.58	43.23
2005 Mean - Routine Sites	5.34	1.11	2.75	13.51	20.64	0.1	16.98	0.77	16.94	50.34
2005 Mean - Routine Control Sites	4.65	NA	NA	9.85	13.97	NA	10.2	0.93	13.87	51.55
2006 Mean - Routine Sites	5.07	NA	NA	14.16	19.92	NA	17.2	0.9	18.68	55.98
2006 Mean - Routine Control Sites	4.52	NA	NA	9.72	13.67	NA	10.6	0.89	14.93	49.46
2007 Mean - Routine Sites	5.11	1.05	NA	14.13	17.15	0.08	17.14	1.21	17.01	50.95
2007 Mean - Routine Control Sites	4.42	NA	NA	9.42	12.91	0.06	9.46	1.18	13.62	52.5
2008 Mean - Routine Sites	5.81	1.14	NA	14.16	52.02	0.1	18.16	1.33	18.08	72.83
2008 Mean - Routine Control Sites	4.96	NA	NA	8.36	11.67	NA	8.87	NA	13.73	38.1
2009 Mean- Routine Sites	5.1	1.13	NA	12.99	16.66	0.07	16.69	1.14	16.73	53.85
2009 Mean- Routine Control Sites	4.45	NA	NA	9.33	13.01	NA	10.56	NA	13.97	51.28
2010 Mean-Routine Sites	5.75	1.13	NA	14.08	24.9	0.08	17.8	1.14	18.6	57.91
2010 Mean- Routine Control Sites	4.93	NA	NA	30.5	13.2	NA	17.7	1.2	15.5	54.8
2011 Mean-Routine Sites	5.57	0.56	0.21	14.32	19.8	0.06	16.9	0.8	19.7	65.75
2011 Mean- Routine Control Sites	4.9	0.4	0.16	10.6	13.8	NA	10.6	0.82	15.3	53.3
2012 Mean-Routine Sites	5.23	0.54	0.51	14.2	17.4	0.07	16.7	NA	18.5	51.4
2012 Mean-Routine Control Sites	5.1	0.42	0.51	9.8	13.1	0.06	10.6	NA	15	54.5

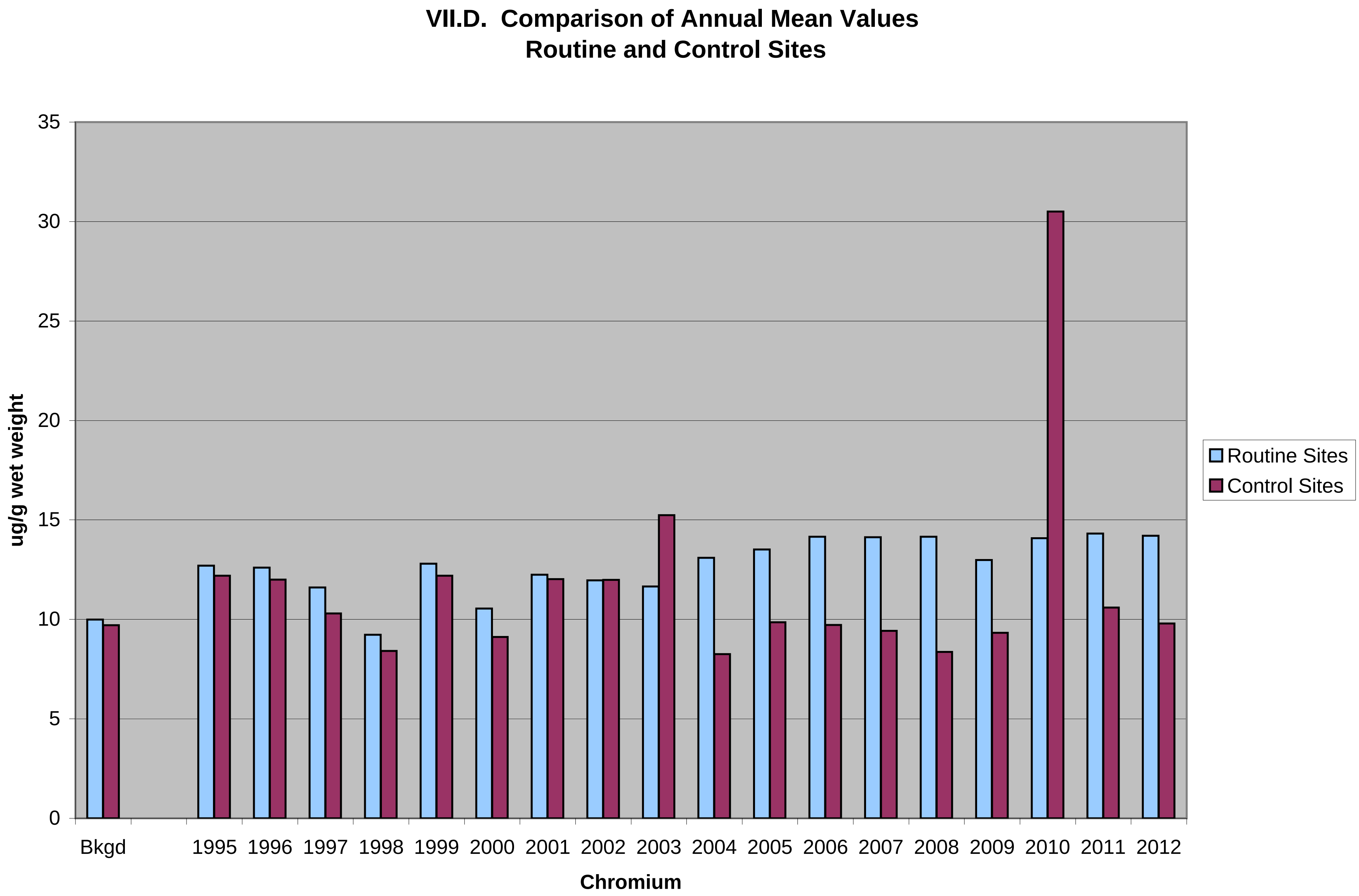
VII.A. Comparison of Annual Mean Values
Routine and Routine Control Sites

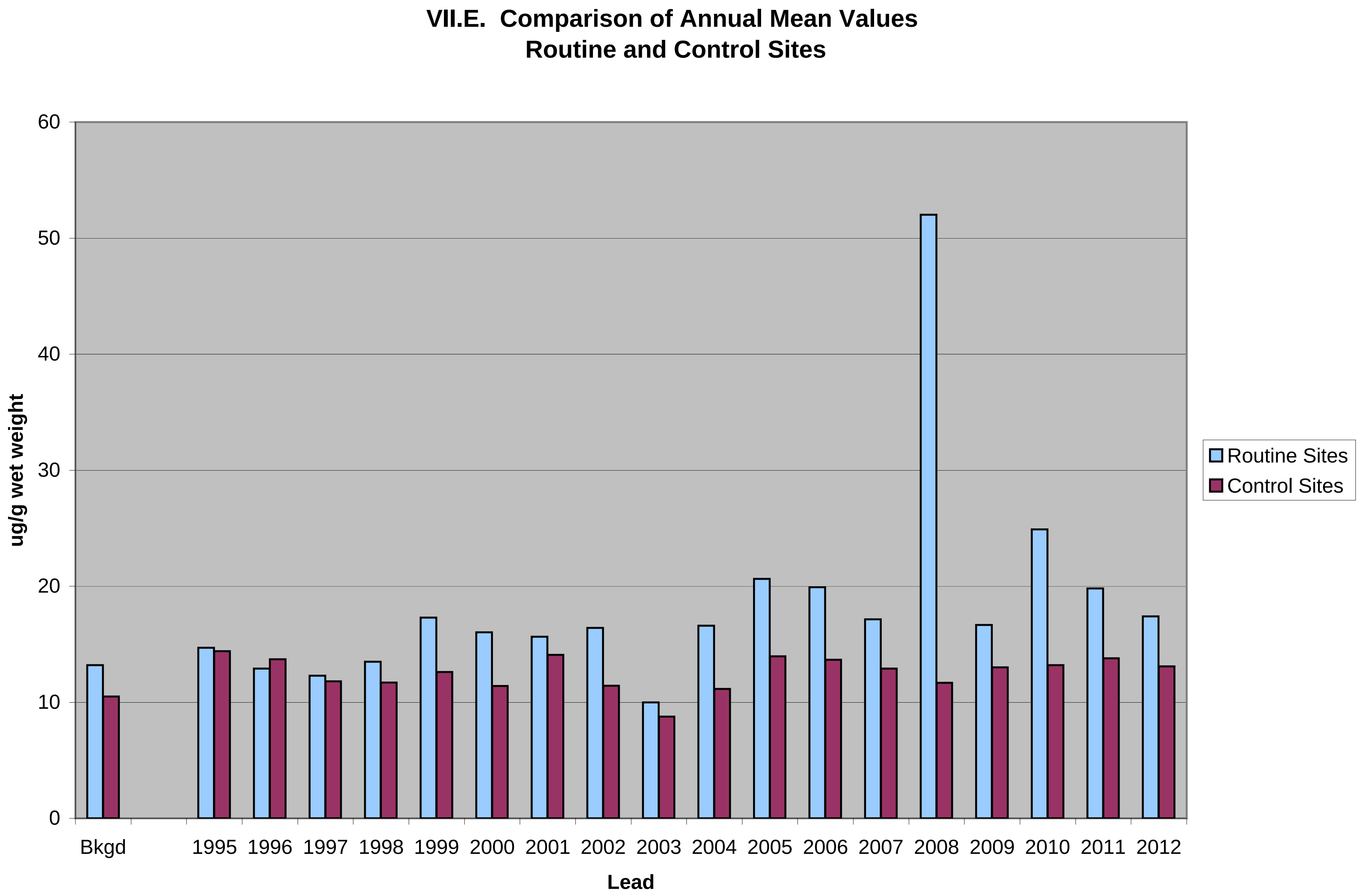




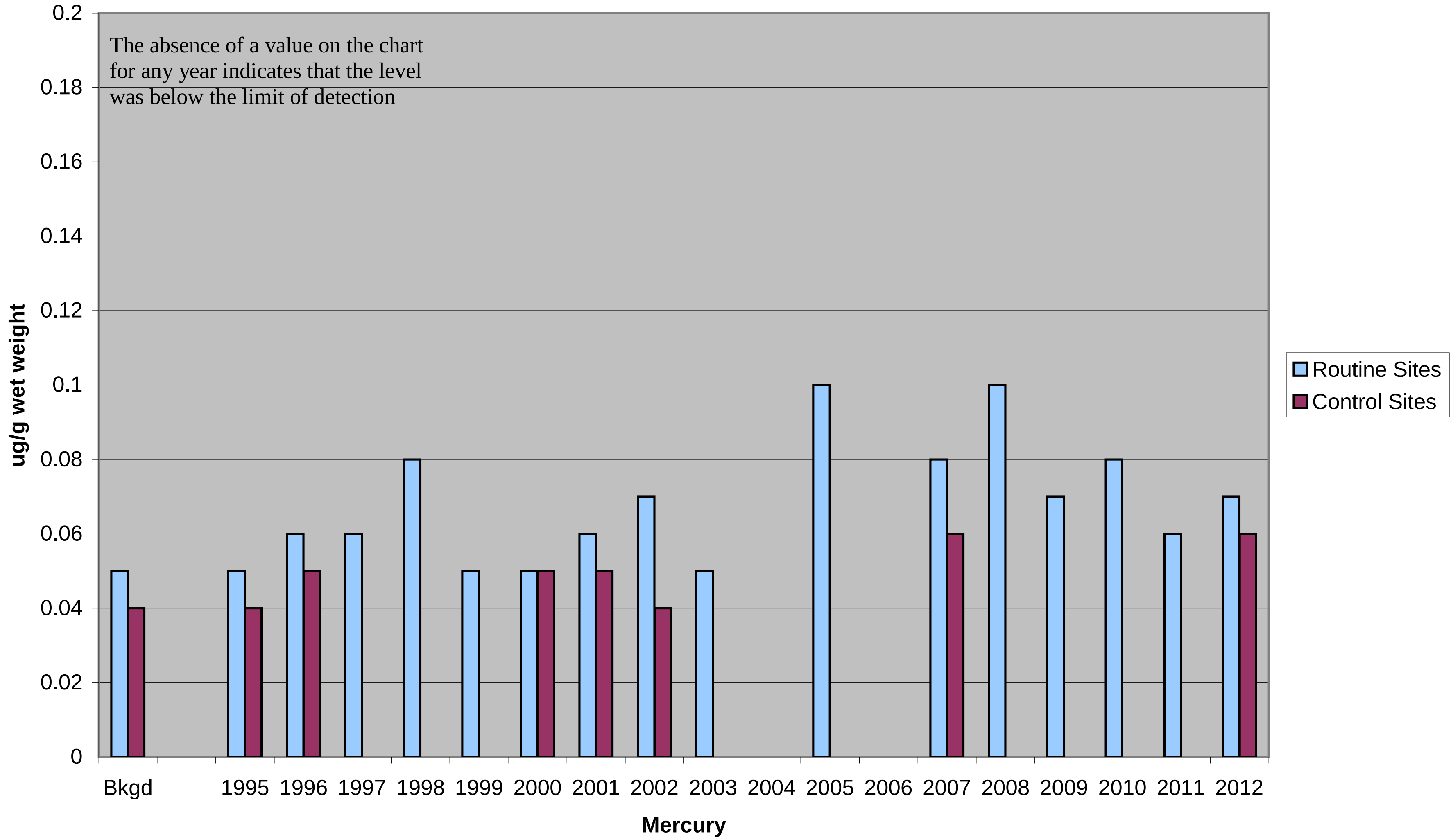
VII.B. Comparison of Annual Mean Values
Routine and Control Sites
The absence of a value on the chart
for any year indicates that the level
was below the limit of detection
ug/g wet weight
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Bkgd
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Beryllium
Routine Sites
Control sites

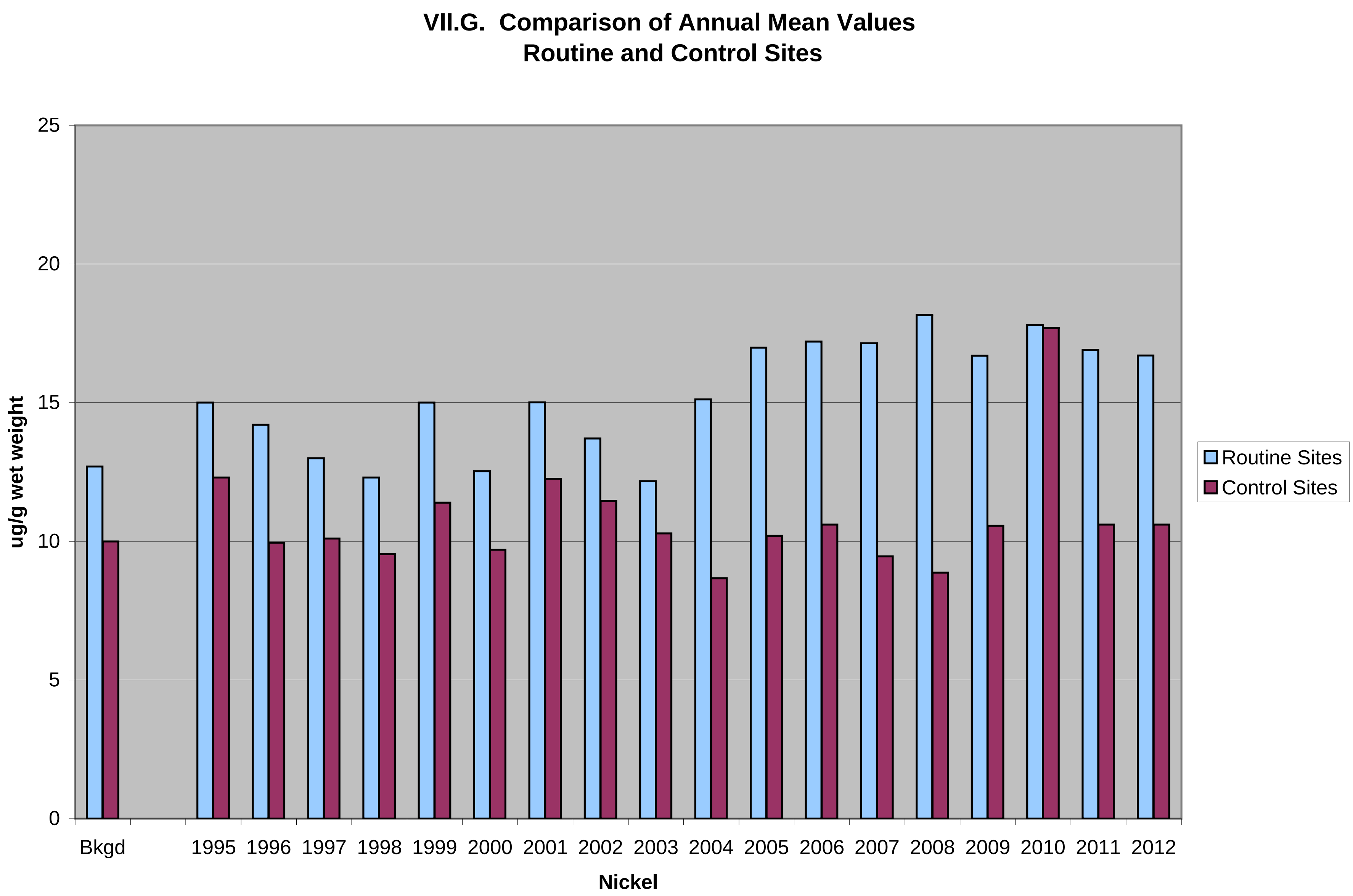

VII.C. Comparison of Annual Mean Values
Routine and Control Sites
The absence of a value on the chart for any year indicates that the level was below the limit of detection
ug/g wet weight
3
2.5
2
1.5
1
0.5
0
Bkgd
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Cadmium
Routine Sites
Control Sites


VII.D. Comparison of Annual Mean Values
Routine and Control Sites
35
30
25
20
15
10
5
0
ug/g wet weight
Bkgd
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Chromium
Routine Sites
Control Sites

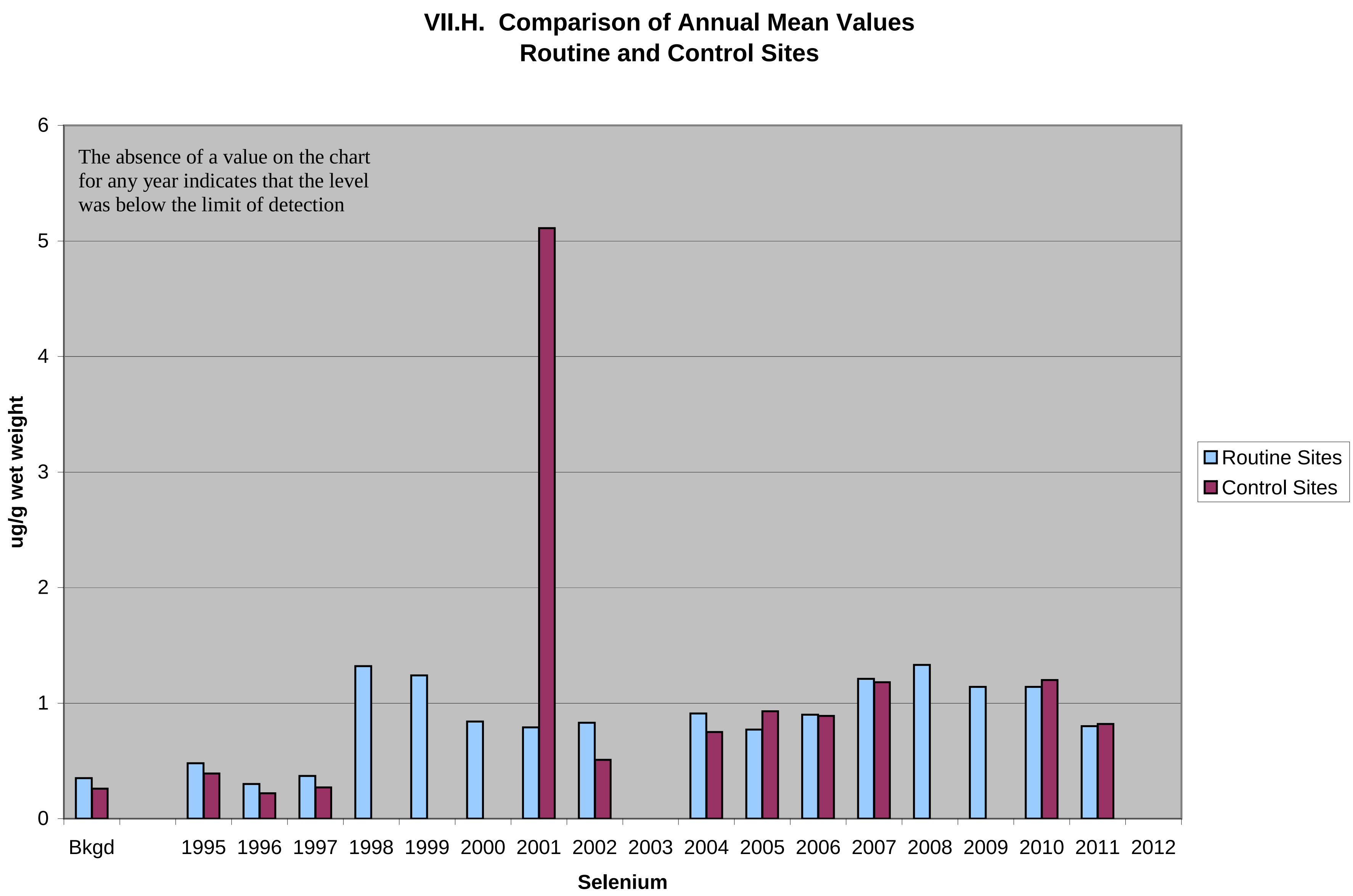

VII.E. Comparison of Annual Mean Values
Routine and Control Sites
ug/g wet weight
0
10
20
30
40
50
60
Bkgd
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Lead
Routine Sites
Control Sites

VII.F. Comparison of Annual Mean Values Routine and Control Sites

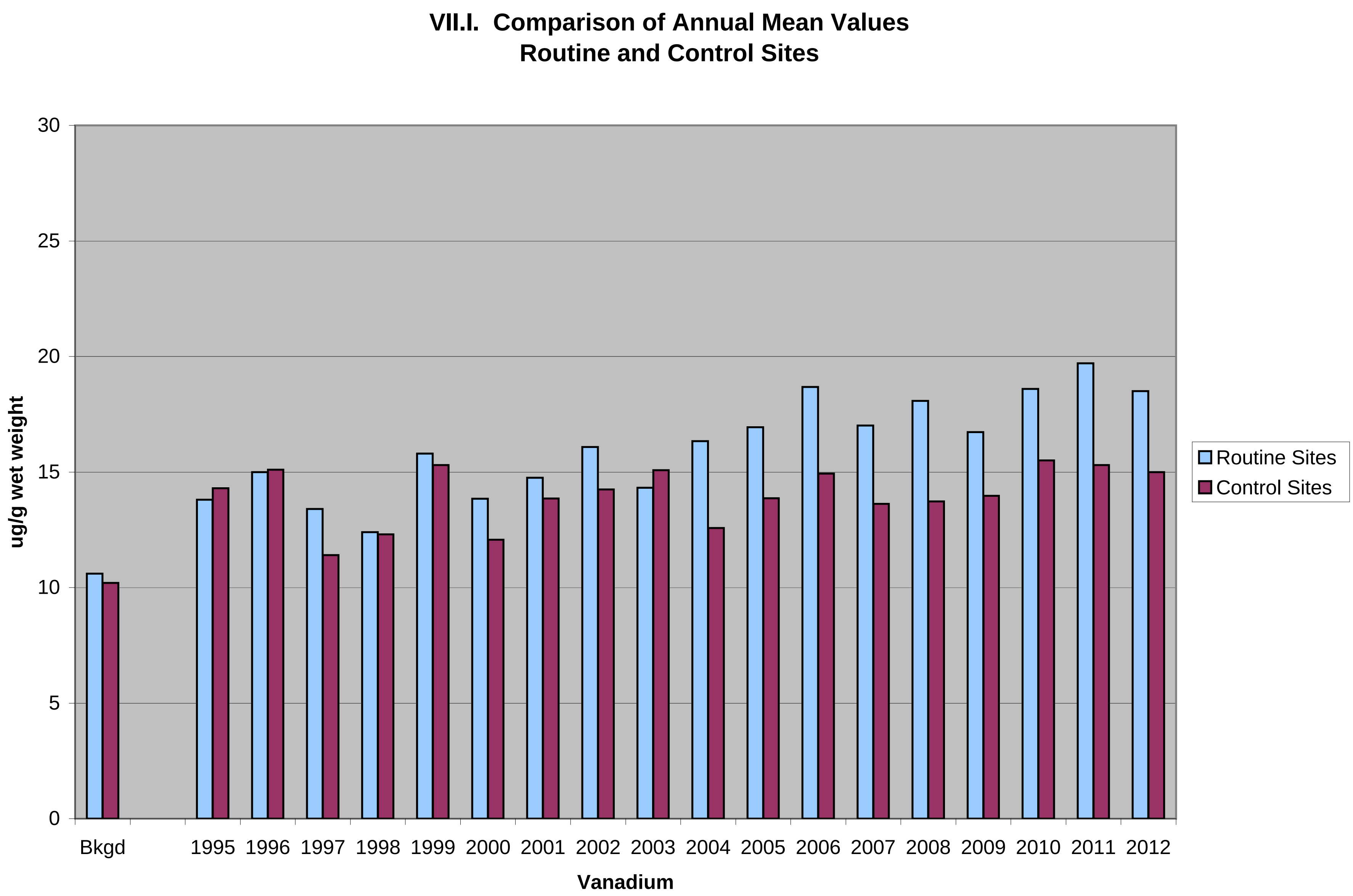




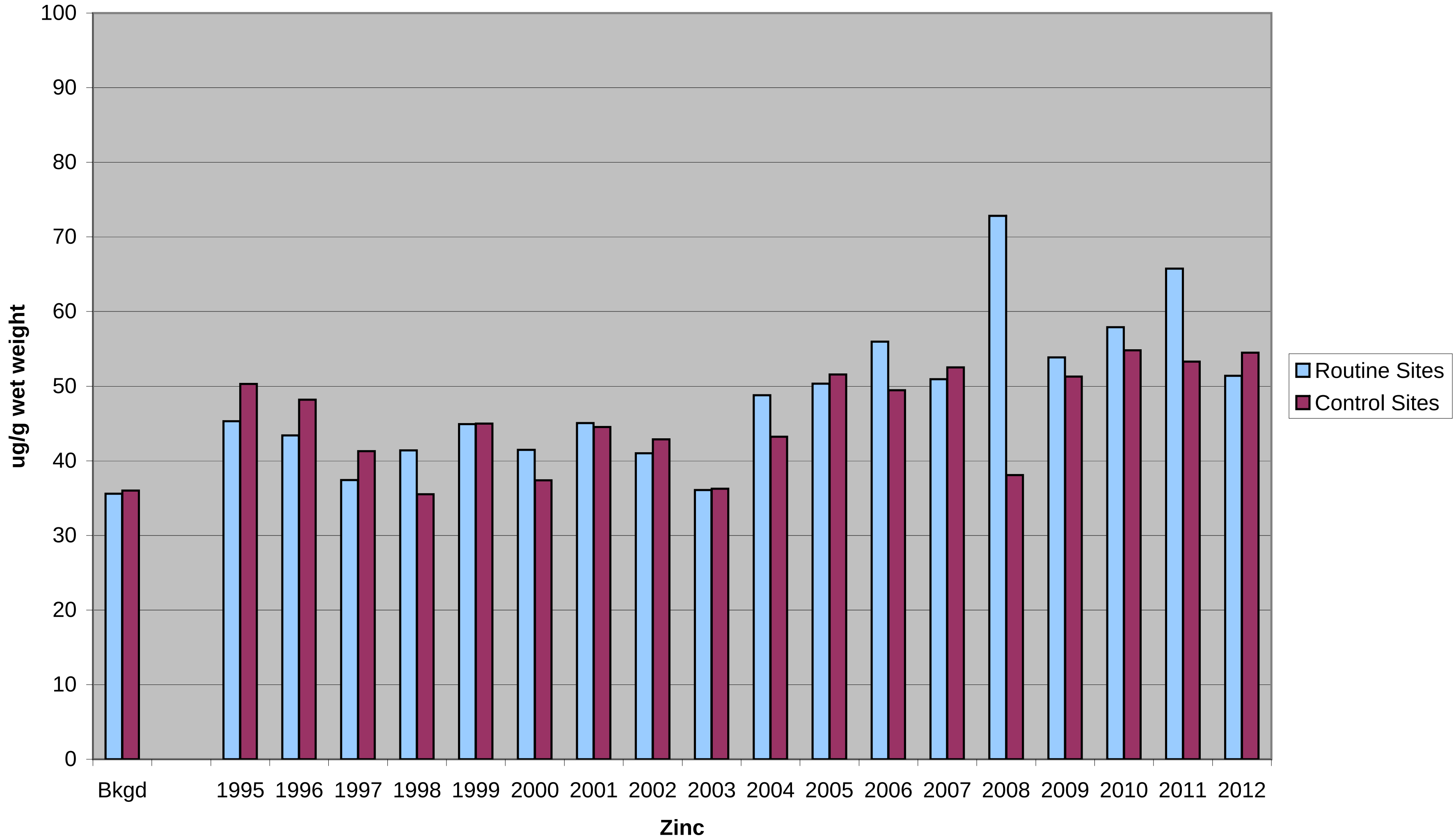
VII.G. Comparison of Annual Mean Values
Routine and Control Sites
25
20
15
10
5
0
ug/g wet weight
Bkgd
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Nickel
Routine Sites
Control Sites



VII.H. Comparison of Annual Mean Values
Routine and Control Sites
The absence of a value on the chart
for any year indicates that the level
was below the limit of detection
ug/g wet weight
0
1
2
3
4
5
6
Bkgd
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Selenium
Routine Sites
Control Sites


VII.I. Comparison of Annual Mean Values
Routine and Control Sites
ug/g wet weight
0
5
10
15
20
25
30
Bkgd
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
Vanadium
Routine Sites
Control Sites

VII.J. Comparison of Annual Mean Values
Routine and Routine Control Sites



Metal	NYS SCO's for restricted use residential (ppm)	Rural Soil Survey (ppm)	USEPA Soil Screening levels for residential (ppm)
Arsenic	16 (0.21)	16	0.39
Beryllium	14	1.2	160
Cadmium	2.5 (0.86)	2.5	70
Chromium	36	30	280
Lead	400	133	400
Mercury	0.81	0.3	6.7
Nickel	140	29.5	1600
Selenium	36	4	390
Vanadium	NA	38	390
Zinc	2,200	180	23,000

New York State Department of Environmental Conservation Soil Cleanup Objectives. The Health Based SCO's were calculated considering all exposure pathways:ingestion, inhalation, dermal, carcinogenic (1 in a million cancer risk), and non-carcinogenic (using risk reference doses). The final health based SCO is based on the most conservative pathway calculation. In some cases the SCO has been modified to match background if the rural background levels for NYS are above the calculated SCO (the health based SCO is in parenthesis). Restricted use means no livestock or animal product consumption.

NYS Statewide Rural Surface Soil Survey (2005)-determined concentration ranges for 170 commonly assessed analytes in discrete surface soil samples collected at randomly selected rural NYS properties.

USEPA Soil Screening Levels for residential–Values were calculated based on the ingestion-dermal exposure pathway for residential soils. These screening levels are not action levels or clean up levels, they are a tool for further evaluation.